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SOME FUNDAMENTAL CONCEPTS IN TAXONOMY

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Since the beginning of taxonomy as a science, which we may date at 1753, it has been beset by objectors. Every innovation in the accepted procedure has been criticized. Linnaeus' sexual system, the first forward step in classification in half a century, had its opponents. Binomial nomenclature was not fully adopted for a few decades. Except binomial names, which had long been and still are in common use by various peoples, and except the subordination of species to genus, which dates back at least two thousand years, every important principle and practive in taxonomy has been an innovation, and we may be sure that each of them has received its due share of objection and criticism before it was generally accepted. Even these may theoretically be discarded in the future, just as various other ideas have already been permanently rejected after experience with them.

The reason for this condition will be obvious, if one will stop to reflect on the fundamental nature of taxonomic research. Our science is not an exact mental discipline, as mathematics; neither is it an exact experimental science, as chemistry or physics. No field of botany can compare with these sciences in precision; genetics and plant physiology offer the nearest approach to them.

Taxonomy must be regarded as an interpretative science. We observe various phenomena of plants as completely and as accurately as we can with our limited powers. We cogitate on our observations and the result of our thought is expressed as a taxonomic conclusion. We have interpreted our observations and formed an opinion.

Those who engage in taxonomic research have always previouly acquired a considerable body of botanical knowledge. This knowledge is unavoidably a potent factor in directing and controlling our taxonomic conclusions. We invariably try to make our opinions conform to ous established ideas. Usually we succeed, and we emerge with an opinion which offers nothing new but is merely an extension or continuation of the prevailing thought of the time. Innovations in taxonomic thought and procedure, some of which fall, some of which are eventually generally adopted, come only from those with the courage to depart from convention, a courage which is forced upon them by the weight of their own observations.

Taxonomists no longer propound theories which are based on pure speculation without some foundation of observable fact.

They may carry their reasoning further than their basic knowledge justifies, or we may think that they do if we disagree with them, but back of every theory there is always some fact. Botanical facts enter our mind through our five senses, chiefly through our sight. Taxonomists have, in general, about the same powers of observation. What is known to one is known to another, or can be verified by another if he desires. To be sure, no one knows everything about any plant, and new facts are constantly being discovered and our existing ideas amended accordingly.

After taking full account of new discoveries, after making every allowance for errors in our conclusions caused by incomplete or faulty observation, it is still apparent that the mental processes of taxonomists, by which these facts are digested, differ so widely and have differed so continuously that various taxonomic matters have been in controversy for two centuries. If we look over the field of taxonomy even hastily, we can find three general subjects on which there has been, is, and probably long will be great discussion. In two hundred years we have reached no permanent conclusion.

Probably most of us will think first of the problems of nomenclature. The International Rules, since their adoption in 1867, have been considerably amended three times and somewhat changed twice. Scores of proposed amendments, often conflicting, submitted to the Stockholm Congress by scores of taxonomists from many countries, indicate the dissatisfaction and disagreement still prevalent among botanists. If the experience of the past five sessions of the International Congress can be any guide to the future, we may confidently expect still other proposed changes and still other adopted amendments at the next meetings. Nomenclature, however, is not a taxonomic problem. It has nothing to do with the kinds of plants and deals only with the names applied to them. We exclude it from further discussion here.

A second problem is the arrangement of the families and orders in accordance with their probable phylogeny. The change from the old sequence of Bentham and Hooker to that of Engler and Prantl was severe, but no greater than the change from both advocated by Hallier and in this country by Bessey, Schaffner, and Pool, or the still later proposals of Lotsy, Hutchinson, Pulle, and others. Although phylogeny is one of the most important problems of taxonomy, it will not be discussed further here.

Distinctly taxonomic is the third problem of the nature and scope of the species, the genus, and the various other categories of classification. Much has been written on the concept of the genus, on the difference subspecies and variety, and similar topics. Many attempts have been made to

define the species, and most of the definitions have been fully satisfactory only to the definer. This is the problem which we propose to discuss in the following paragraphs. If the reader expects to find a weighty pronouncement on any of these matters all ready for him to demolish by his own superior wisdom, he would do better to turn to the statements of various contemporaries who apparently know all about them. If he expects to chortle in glee at the wit and sarcasm which we shall direct against some hapless botanist, he had better lay this down and pick up a copy of the New Yorker.

The concept of genus and species is not a new one, although some biosystematists give one the impression that they are the original discoverers, or even the inventors of the idea. The concept is vastly old, and because it is so old we have to consider some of the fundamental ideas which underly it. Of course it has changed somewhat with the increase of botanical knowledge, and its use by the taxonomist of today differs somewhat from its earlier use by the laity. Just the same, its present connotation in even our most advanced (or most radical) taxonomic work is a direct result of its earlier and simpler history. Our science has grown, both in breadth and depth, out of the contacts of early man with the world of plants about him. The changes which we may detect are the changes of a normal ontogeny. As the poet said, "the child is father to the man."

The concept of species and genus is inextricably bound with certain matters of semantics and certain mental processes. To get it properly before us, I propose to discuss three general concepts or principles upon which taxonomy is founded and a fourth which we have developed for ourselves. Some of these will have to be presented in a very elementary way.

As every taxonomist knows, the original meaning of genus in the Latin tongue was a kind of something, while a species was a special kind. From the general meaning of the two words in ancient times, through the loose application to plants by the pre-Linnaean fathers of botany and their restricted application in post-Darwinian time, down to the present day, the words have changed from the common speech of the laity and become technical terms of the taxonomist. Nevertheless, the words still carry inherently within them some implications derived with little or no change from the original usage. The most apparent of these is the subordination of species to genus. There is nothing in the origin of the words to indicate that every species must belong to a genus or that every genus must contain a species. The next apparent implication in meaning is more obvious in the English translation kind. As soon as we stop to consider, we realize

that in every instance, we know or we infer from past experience that a kind of plant includes a number of individuals all more or less alike. Washington Elm or Charter Oak or General Grant Sequoia do not denote kinds of plants; they are proper nouns applied to individuals. Ulmus americana or American Elm denote a plurality of individuals! they are common nouns. The mere fact that each of these terms consists of two epithets does not affect their standing as nouns, even though the grammarian may insist that half of each term is adjectival. This brings us to the first and most elementary idea in taxonomy, the population.

The Concept of Population

This word, derived from the Latin populus, people, soon lost its original meaning in English and became, according to Webster, "the whole number of people or inhabitants in a country, section, or area." It was only a short step from this meaning to apply it to other organisms besides Homo sapiens. It was taken over by the biologist and used to indicate, again quoting Webster, "the organisms, collectively, inhabiting an area or region." Such an expression as 'the bird population of an orchard' is intelligible to anyone. It is equally practicable to speak of the 'weed population' of the same orchard. Still later, according to Webster, the word was used in statistics to denote "the entire group of organisms, from which samples are taken for measurement," or any "group of persons, objects, or items." In this sense the word is commonly used in various branches of science today.

How does it happen that a group of objects can be established? What is the real basis of this concept of population? Webster's definition of the cognate word people emphasizes a point which also appears but is not clearly expressed in the other definitions. People denotes a body of persons "united by a common character," and it is at once apparent that the only basis and the only reason for the modern concept of population lies in the similarity of the component individuals. As used by the biologist, the word is always a collective noun and connotes a plurality of individuals all of which have some point or points of similarity. This likeness may be of any kind qualitatively (that is, based on any common character) and of any degree quantitatively. Thus, the bird population of an orchard is composed of individuals with just two effective points of similarity: they are all birds and they all live in the same orchard. From this loose but perfectly valid use of the term, there is every gradation to the highly restricted populations of the geneticist, who may have for study a group of plants or

animals in which the individuals are so closely related by descent, so closely similar in every observable character, that they are essentially identical.

When population was defined as a group from which samples were taken for statistical study, it might more appropriately have been stated 'for any kind of scientific study.' With either term, the selection of samples and the conclusions drawn from their study are based on the assumption that all the individuals of the population are alike, at least in the features which are the subjects of the study, and therefore that the results derived from the study of some will be applicable to the group as a whole.

Now that is precisely what we do in taxonomy. Our studies of a kind of plant are never based on the whole population, but only on that fraction of the total which we are able to see alive in the field and preserved in the herbarium. When we write a description of a species or a genus or any other taxonomic group, we believe that our description will apply to all the individuals which constitute that unit.

It is only natural that the new systematists' should adopt the term population for groups of individuals which have some sort of taxonomic status. They find it to be a very useful term and other taxonomists will also use it to advantage.

Ecologists think without mental strain of the bird population of an orchard, a group whose only taxonomic similarity is their membership in the class Aves, or even of the biota of the same orchard, including all the plants and animals. Taxonomists and geneticists commonly use the term in a more restricted sense, limiting it to a species or part of a species. It is equally applicable to any superior group. A genus or a family is composed of a number (presumably large) of individuals all possessing in common a certain set of characters. The use of the term population for such a group may seldom be useful, but it is certainly technically admissible.

The Concept of Kind

In taxonomy, the first and most fundamental of all concepts is that of the existence of kinds of plants. Kinds were recognized long before the emergence of botany as a science. Dioscorides and Theophrastus and Vergil wrote about them; scores of kinds are named in the Bible. Even the first chapter of Genesis says "Let the earth bring forth the living creature after his kind." They were known before language was committed to writing; all contemporary primitive races know them and have names for them. They antedate the human race; certainly the monkeys distinguish kinds, eating the one and refusing the other. They were distinguished at a still

level of animal evolution; the Zebra Swallowtail butterfly flits through our woods and deposits its eggs only on the Papaw.

The only way to understand the basic nature of the concept, to formulate an adequate definition of kind, is to consider many kinds of plants and ascertain what characters they possess in common. Since we desire to get to the fundamentals of the problem, we must draw our ideas not from the kinds of plants accepted by the modern taxonomist, but from those known to the layman. I have developed the ideas which are presented below not from literature or from the opinions of professional taxonomists, but from actual conversation with a number of persons of intelligence but uneducated and untrained in botanical matters.

First, a kind consists of and includes a plurality of individuals. So far as the actual number is concerned, it may vary from the score of Sequoias which he sees on a vacation in California to the millions of plants of wheat which he raises on his Kansas farm. The taxonomist will retort that there are many kinds of plants known only through a single individual. That is true, but, in originally describing a species from a single individual, the taxonomist tacitly assumes or piously hopes that additional plants will eventually be found and experience teaches that they usually are. It is of course theoretically possible that a kind might arise by evolution as a single first plant, and practically possible that a moribund kind might persist as a single last individual, as did that last passenger pigeon in the Cincinnati zoo.

Second, the individuals of a kind are alike, perceptibly alike to the human senses. Keeping to the kinds known to the layman, we can easily see that the likeness may be of any degree and lie in any or all features of the plant. We observe, in general, that striking or conspicuous features or superficialities are sometimes given greater weight than by the taxonomist. An orchardist, for example, will speak of the many different kinds of apple, basing his kinds on the color, size, shape, and flavor of the fruit, while the taxonomist is content with the single kind Pyrus Malus. The layman very seldom tries to analyze what the features of similarity are. He recognizes a kind by the totality of its characters and is often unable to tell or lacks the words to tell how or why he knows it. In the field, the taxonomist recognizes plants in exactly the same way. It is only in writing for others that he finds it necessary to express in words certain distinctive and often minute diagnostic characters.

Third, a kind of plant is not divided. It seems to be an indivisible unit. If a group of plants can be and is divided

by the layman, the result is not subdivisions of a kind but two or more kinds. I once got a number of ideas from a farmer that I knew. I asked him the name of a plant growing along his fence, I believe it was Specularia perfoliata, and his reply was "That's just a weed." I wondered if I could now get any evidence that to him a 'weed' was one kind of plant. So I asked him about another, and he replied that it was "another kind of weed." In other words, among observant people, such as a farmer with his weeds, a lumberman with his trees, a gardener with his flowers, kinds are recognized but names are not always available to apply to them.

Fourth, every kind of plant, so far as known to the layman by actual experience, has genetical continuity, and this belief is instinctively extended to every other kind of plant as well. It is axiomatic in the minds of all people who have any contact with plants. It dates back to the very dawn of agriculture. Nineteen hundred years ago it was so well established that the Apostle wrote to the Galatians "Whatsoever a man soweth, that shall he also reap," and on this platitude as a text he developed a sermon. To be sure, the layman has not demanded continuity through seed-reproduction; he has long known that some kinds of plants will not 'come true' by seed and must be maintained by grafts or cuttings.

The recognition of kinds of plants, each one with morphological similarity and genetical continuity, is fundamental to all our practical work in agriculture, horticulture, and forestry and to all our research in pure botany. The cytologist who observes the various stages in the development of the embryo-sac of Lilium Martagon correctly concludes that the same phenomena occur in every other plant of the same kind. The physiologist who finds that seeds from a certain individual plant will not germinate until they have been frozen correctly concludes that seeds from any other plant of the same kind will need the same treatment. And in general, all our botanical discoveries are made from individuals and are then extended to cover all plants of that particular kind.

This analysis of kind has been drawn from contemporary experience. There is no reason to think or to expect that the concept among thelaity has changed in the last several centuries; in the writings of herbalists and pre-Linnaean botanists there is no evidence that it has changed. Kinds were accepted intuitively and no one stopped to ask or consider whether a certain population should be called a kind or not. The characters of a kind, which I have tried to reduce to four, were axiomatic. Every one knew that there were many pea vinesin the world; that they were all so much alike that one name would serve for all of them; that they were still

peas, even though they did vary a little in size or other features; and that ripe peas, if planted, would produce another crop of peas next year. Nothing could be simpler.

And yet these kinds (excepting horticultural varieties, as we now know them), called that or some other homely term by the English writers, or some equally familiar term in the other languagesof the time, were known by the equivalent Latin word species when they were discussed by the learned. As species they came down to Linnaeus and were accepted by him; as species we still know them today.

If we next compare the modern popular concept of kind with the modern taxonomist's concept of species, we find that they are still essentially identical. We admit freely that there are kinds accepted by the laity which will not be regarded as species by the taxonomist. Some of these are based on too narrow a degree of similarity, as the varieties of apples. Some lack the sort of genetical continuity which the taxonomist usually requires, as the varieties of cultivated Dahlia, although I never knew a taxonomist who rejected Lilium tigrinum as a species because it produces no seeds. Some species are distinguished by characters which the layman can not or does not easily observe and are accordingly neglected by him; these are usually accepted by the layman as soon as their characters are pointed out. (I remember the intelligent man in Illinois who knew just one kind of Milkweed, not distinguishing between Asclepias syriaca and A. Sullivantii, and I remember the smile that spread over his face when I showed him the difference between them.)

The accuracy with which the layman knows kinds in precisely the same sense as the taxonomist knows his species is often surprising. I have remarked on this matter before, but will repeat some instances. A boy of fourteen in California, who had not studied even high school botany, told me there were four kinds of Filaria. I identified them to four species of Erodium as accepted by Jepson in his Manual. A Maryland farmer was asked about a tree which grew near his home. He relied "That is a 'specie' of Red Oak." So it was: the Southern Red Oak or Spanish Oak, Quercus falcata. A botanist at Buitenzorg told me that the Malays who served as field assistants in botanical exploration had names for almost all kinds of plants and that their use of a different name was an almost infallible guide to a different species, even though its specific characters were not immediately detected by the botanist. I had personally the same experience with an Indian in South America, but soon discovered that there were certain groups of plants, notably the epiphytes, for which he had no specific names. It may seem a blow to our taxonomic pride, but we might conclude that our own discernment of species

depends on the same sort of intuitive recognition possessed by all people in all countries and at all times. We merely go a step farther, analyze the cause of our intuitions, and reduce our findings to words.

Kind and Population

In now becomes necessary to consider in more detail the relation between these two concepts. Since both denote groups of individuals and are characterized by similarities among these individuals, it is clear that a kind of plant is a population. It should be equally clear that not all populations are kinds. Some groups lack the morphological similarity or the genetical continuity requisite to the concept of kind.

I wish to develop this thesis by using one particular kind of plant as an example. It is our common source of hay fever, known to us as Ambrosia trifida and to the layman as Ragweed or Horseweed. It constitutes a population, unified by the possession of structural features. Because of them you and I know the plant at sight, even from a considerable distance. Most plants have three-lobed leaves; some have five-lobed; in every community some may be found with ovate unlobed leaves; still others have part of the leaves lobed and part unlobed. Some plants have a single terminal spike of flowers; others branch above and bear several spikes. Some plants are tall and bear many pairs of leaves; others are short and bear only a few pairs. All combinations of these three sets and of still other characters may be made, and every such combination can be illustrated by a group of individuals. Each such group will fully correspond to our idea of a population. Every set of features, as chosen by me, is distinctly morphological in nature. On just three classes of characters, lobing of leaves, number of spikes, and number of nodes, one might easily distinguish a hundred populations, every one fully definable. A similarly large number of populations may be differentiated within any species by any one who cares to waste his time at it. Some taxonomists have.

"Balderdash," says the taxonomist, an expression which might well be couched in shorter and uglier words. But I have made no claims that these populations have any importance. They are merely to illustrate the fact that in any species an indefinitely large number of populations can be distinguished.

Now that each of you taxonomists who may read this paper has turned from these minor populations in Ambrosia trifida with abhorrence or disgust, let me ask you frankly why. Your

first reply will probably be that they are not worth bothering with. I admit that, but it is not a real answer. We want to know why they are not worth bothering with, especially since they are all based on morphological characters. Analyze your own ratiocination carefully and you will soon get the answer. Basing your opinion on your experience with these plants and with many others, you believe that these plants do not have genetical continuity. They are not races in which the distinguishing characters are transmissible to the progeny. You do not know that; you merely infer it, and you are almost certainly right. So there we are, right back to one of the pre-Linnaean concepts of kind rife for hundreds of years among the laity, that a kind is a self-perpetuating population. You will also say that the nature (qualitative) and the degree (quantitative) of the differences between these populations is not sufficient to warrant taxonomic recognition. But notice that this conclusion is not a matter of botanical fact but merely one of personal opinion. Nevertheless, it brings us back to another fundamental concept of kind, that a kind is the smallest population which is not divided. A kind can be divided but is not, because the differences separating the minor populations are trivial when measured by our standards.

Consider two other examples. The cultivated Dahlia is now separable into several thousand populations which have received names from the horticulturists. The differences which separate them are so great, according to his standards, that they need names; to him they are kinds of plants. In fact, the differences between collarette, cactus, peony-flowered, and pompon types are so great that they might be placed in different genera if they occurred in nature. But they lack genetical continuity; every one of them must be propagated as a clon. Lacking this continuity, they are not recognized as kinds by the taxonomist. In the eastern states, as far west as Indiana, *Phlox divaricata* has rounded petals; farther west it has notched petals. Since the races are geographically separate, cross-breeding is impossible in nature. Obviously they have genetical continuity. Still the taxonomist keeps both types in the same species because the differences between them are trivial according to his standards. To be sure, they have been given varietal status, but both are still in the same species; they are all *Phlox divaricata*.

From all the evidence at hand, it seems that the taxonomist uses just two criteria in distinguishing kinds of plants: the one, a degree of morphological similarity within the population and of dissimilarity from other populations which is satisfactory to him; the other, a belief, seldom substantiated by experimental evidence, that each kind forms

a genetic continuum. Both of these criteria are essential; neither is sufficient without the other.

Turning now in the other direction from a kind of plant, we can envision a long series of assemblages of kinds, each of them in turn more inclusive in its scope. Every one of them is a population according to our definition of the term, yet they are rarely thought of as such. The fact that they are assemblages rather than kinds is attested by the names given to some of them, which are almost invariably plural. Every one of them is characterized by certain features of structural similarity, features not only distinguishable by the eye but subject to expression in words. Many of them are believed to be composed of genetically related plants. As examples, beginning with the Ragweed already used as such, we may cite such superior groups as Ambrosia, Heliantheae, Tubiflorae, Compositae (which is co-extensive with Asterales), Inferae, Sympetalae, Dicotyledoneae, Angiospermae, and Spermatophyta. But they are by no means all, since additional populations may be intercalated at many points in the series.

The taxonomist will at once see a vast differences between a kind of plant and these larger and more inclusive populations. He will call the latter classificatory groups and will regard them as actually or theoretically formed by successive syntheses. They are therefore easily divisible, in contrast to the kind or species. While they are considered to be related, he will regard them as theproducts of genetic discontinuity, that is, of evolution, while the kind is maintained by genetic continuity.

A kind or species of plants marks a turning point in our ideas. Above it we synthesize; below it we can but do not divide. The superior synthesis is always possible. Since it may be done in various ways, it has led to our manifold systems of classification. The inferior division is always possible but is not used. Why not? Because, by our definition, a kind (or species) of plant is the smallest population which has satisfactory morphological distinctness and inferential genetical continuity. If a kind is subdivided, the minor populations are separated by features which we regard as trivial, or they lack genetical continuity, or they fail in both essentials. The Ragweed has never been so divided. To be sure, the variety or form integrifolia has been noticed, but it is rejected by most botanists; even if it were accepted it would still be a part of Ambrosia trifida. Neither has Phlox divaricata been divided; the characters of its variety Laphami are considered trivial. If they were not so regarded, the variety would satisfy our definition of a species and would by this time have been named Phlox Laphami.

I have been trying to develop a picture of a long series of plant populations, each in turn more comprehensive in its scope, beginning with small groups of comparatively few individuals and ending with the whole plant kingdom. This we can all grasp, but I have also been trying to emphasize the idea that this long series is hinged, so to speak, somewhere near the middle at what we are pleased to call a kind or a species of plant; that below this turning point the populations are obtained by subdivision of the species, while above it they are regularly regarded as groups obtained by the combination of species.

The species is the starting point from which we begin our taxonomic work. From it as a vantage point, we can turn in two directions and see entirely different landscapes. In one view we see a long series of populations, progressively increasing in size and scope, many of them valuable to us in the formation or expression of our ideas on classification and phylogeny, many of them distinguished by names commonly used by taxonomists, all of them regularly regarded as groups of species. In the other direction we see (or we can see, if we are so disposed), but with an entirely different mental attitude, a similarly long series of populations, becoming successively smaller the farther we look and becoming also, in our opinion, successively less important, less worthy of attention by the busy taxonomist. And why are they less important? Simply because they lack one or both of the fundamental requirements of a kind of plant, morphological distinction and genetical continuity. We may sometimes suspect the accuracy and completeness of our knowledge and opinions. We may investigate these minor populations with the improved and comparatively new methods taught us by the morphologist, the cytologist, the geneticist, and even the phytogeographer and the physiologist, not in the hope, but on the chance of finding more important characters which might lead us to change our opinion. Usually we do not find them.

The Concept of Category

Starting from the species and considering the successively larger groups which may be formed by associating other species with it, we find that many of these groups are of such importance that names are given to them, as Hibiscus, Malvaceae, and Malvales. These groups differ in their size and scope, the latter term merely signifying the degree of morphological similarity which the group exhibits. This is a matter of classification, not of category.

We are also required to indicate the relative rank of these groups by referring them to certain categories and by

designating them by descriptive terms, as genus, family, and order, and by certain indicative endins, as -aceae and -ales. The sequence of these categories is fixed by botanical legislation. This is ordinarily a useful bit of taxonomic formality, but one which can not always be fully justified by taxonomic logic. We may illustrate this by the tropical seashore plant Batis maritima. It is the only species of the family Batidaceae and of the order Batidales. This apparently indicates that the nature and degree of the differences which separate this one species from all other kinds of plants are of the same nature and degree as those which usually separate orders from each other. If this is true, it might be useful to admit the order Batidales, but still superfluous to distinguish Batidaceae and Batis, both of which are exactly coextensive. It might even be argued that, in a discussion of classification, Batis maritima might be contrasted directly with Ranales, Fagales, and other orders, and its order and family eliminated.

The principle trouble with the enforced use of categories is that no attempt has been made to supplement legislation with advice or requirement about their nature. The scope of any category above the species is left completely to individual opinion and usage. In taxonomic research we develop and express our own opinions and often change the category to which a population is assigned. In taxonomic practice (not the same as research) we commonly accept the opinion of some qualified student and are guided by usage alone.

As a result, categories above the rank of genus have been subject to frequent change since the time of Linnaeus, and the general tendency has been to increase the number of families and orders. Some changes of category have been based on significant new knowledge, as the union of Lacistemaceae and Flacourtiaceae or the transfer of Nyssa from the Cornaceae of the Umbellales to an independent family within the Myrtales. Very few, possibly only one, the Degeneriaceae, are based on the actual discovery of previously unknown plants. Even this remarkable plant could have been assigned to another family by only a slight extension of definition.

Sometimes the changes have been based on erroneous information. There are still among us some who remember the observation of chalazogamy in Casuarina. Shortly thereafter an entirely new superior category appeared in print, the Chalazogamae, a subclass of dicotyledons contrasted with Porogamae. Its content was the single order Casuarinales, including the single family Casuarinaceae, including the single genus Casuarina, including a handful of species. No one knew whether Chalazogamy was universal in Casuarina; no one knew that it never occurred elsewhere. We know better today.

The vast majority of changes represent nothing more than differences of opinion. No new information is involved in assigning the pod-bearing plants of the Rosales to a single family Leguminosae or to three separate families, or the Oaks to one genus or to three. Their classification has bot been changed one iota.

Objections to changes of category at or above the level of the family are seldom voiced. To be sure, there was some mild protest in this country over the proposed division of Compositae into a dozen or more families. That was probably because the name Compositae was so familiar to all and not because of any intensive knowledge of the family. The great body of taxonomists work mostly at the level of the genus and species. Changes of category at the generic level are often severely criticized. Note the numerous criticims leveled at Rydberg, who advocated the division of Astragalus into a large number of smaller genera, or at Britton and Rose, who similarly divided Cassia. The odious word 'splitter' was often applied to all of them. A similar word was probably used on Nees a century ago, when he fragmented the old genus Laurus, although we of today are quite content to use Persea, Sassafras, Nectandra, and the numerous other segregate terms for these plants. One objection to Rydberg's action was that his segregations could not be maintained in the genus as a whole, including the Eurasian species, but I never heard this objection advanced by anyone who had personal knowledge of these foreign plants. The chief cause of all such criticism seems to rise from the fact that the generic name, under our binomial nomenclature, is part of the specific name, and any change of category at this level, whether by the division or the union of genera, is bound to result in change of name for some species. The whole purpose of our rules of nomenclature is to promote stability* of names.

Also below the rank of species certain categories are specified by name and must be used, if used at all, in a prescribed sequence. While these categories share with those above the species the complete lack of legislated definition, they differ radically in that they are not necessarily used. That difference is based absolutely on the nature of the species, which has already been discussed. Recognition of subspecific categories does not affect the species; every one of is still a part of the species and still bears the same name. It makes no difference whether we recognize Linnaea borealis

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*Dr. Rogers correctly points out that the word in the International Rules is fixity, not stability. The general desire of botanists seems to be stability, while the original purpose of the Rules was apparently to promote uniformity.

borealis and L. borealis americana, or whether we call them subspecies or varieties; they are still all Linnaea borealis. The species is not divided. Since there is so little agreement about the connotation of categories below the species; since their epithets all have the form of a specific epithet; since their use is optional, not obligatory; since the differences between them are of minor importance or trivial; since they often have no genetical continuity, or are chance ephemeral mutants, or teratological forms, or mere ecads, the distinguishing of subspecific populations and their subordination in categories is a difficult and precarious undertaking.

The Concept of Classification

The only practicable way to investigate the classification of plants by the laity in early times is to search our language for group terms, but to consider only those which are purely names of plants and to exclude all which refer in any way to the properties or uses of plants. Oak and Maple are usable terms; Snakeroot is not.

English plant-names include hundreds of generic rank, each covering two or more species which resemble each other in structure and are more or less equivalent to modern taxonomic genera. Very often the species are named by adjectival epithets, resulting in binomials. Some popular genera are more or less co-extensive with taxonomic ones, as Oak and Elm; some were drawn too large, as Mint and Mustard, while others were certainly not recognized at all. For example, the English had the two words Leek and Garlic, to which were soon added from the French Onion, Chive, and Shallot, but our language does not have any one word for the genus Allium as a whole. The Romans knew five kinds of trees as Quercus, Robur, Cerris, Ilex, and Suber, but apparently had no generic word for Oak.

American usage gives us little evidence about classification, since so many English names were misapplied by early colonists to unrelated plants and many English plants and plant-names had been forgotten before their American relatives had been discovered. Ivy, as applied here to Rhus radicans and Kalmia latifolia and in England to Hedera Helix, Buckeye and Horse Chestnut do not indicate that they were regarded as two groups or genera of plants. Excellent examples of American generic names are Hickory and Goldenrod. A farmer may call Carya ovata Shellbark, but he will tell you that it is a kind of Hickory. On the other hand, in the few inquiries I have made, I have not found a farmer who uses the name Goldenrod for a member of the section Euthamia. The common people of Illinois half a century ago knew the genus

Sweet William, with its three species Phlox divaricata, P. pilosa, and P. glaberrima, but they did not know the equally conspicuous genus Silphium. Its two species were kept separate as Prairie Dock and Rosinweed.

Of superior classification into families we can find scarcely a trace, unless we regard the ancient terms Grass, Mustard, and Mint as of this category. In modern times Palm, Orchid, and perhaps others have been added to this list. Beech, Oak, and Chestnut were common words in England, yet our language contains no word for the Fagaceae. No families are more easily recognized than Umbelliferae and Leguminosae, but we have no English word for either. 'Pulse,' sometimes used by botanists as the English name of the latter family, properly refers only to the edible seeds of peas and beans.

The first faint trace of classification appears in numerous works of the sixteenth and seventeenth centuries. Then as now it was customary to divide books into chapters, and the herbalists often put into one chapter their discussions of plants having similar habits or similar uses. If this can be called classification, it is based mostly on the relation of plants to man. Not until the eighteenth century, with several earlier exceptions, were plants studied as objects of interest in themselves, and botany as a science was differentiated from botany as a part of horticulture and medicine. The number of known species grew rapidly; they were organized into genera.

There seems to be an innate urge in the human mind to keep knowledge in small and conveniently assorted packages, small enough that we may easily comprehend their contents, assorted so that we may easily compare one with the other. Even today we search the larger genera for ways to sort the species subgenera, sections, and species-groups. Following this urge and departing completely from the humanistic viewpoint, Linnaeus sorted his numerous genera according to his well known sexual system. There followed a full century in which taxonomists were busily engaged in discovering more genera and species and a few, notably Jussieu and DeCandolle, were attempting to classify these genera into superior groups. Every proposed change in classification was intended to set up groups based on a greater number of similarities or on structural features which their authors considered more important. They did not understand what the word 'important" meant.

The general acceptance or organic evolution explained the meaning of the term and gave an impetus to fresh attempts at improvement of classification. For the past century all revisions of classification have been made in the hope of a better expression of the course of evolution.

Conclusions

The task of the taxonomist is and has been the discovery of the kinds of plnats which exist, the description of them so that they can be recognized by others, the assignment of convenient names to them, and their classification in accordance with their probable evolution. Great progress has been made; much remains to be done.

In the United States and many other countries, taxonomists have the advantage of easy travel and huge collections of preserved material and consequent extensive acquaintance with plants. They are not discovering many 'new' species; their chief business is reforming their odeas of those already known. It is evident that the vast majority of thinking taxonomists, knowingly or unwittingly, base their species on the two features of morphological distinctness and genetical continuity which have been emphasized so often in this paper.

Nevertheless, we are frequently criticized for lack of agreement among ourselves. We admit that there is such disagreement at times, but we can easily find the causes of it and see that our work has constantly tended and doubtless will continue to converge on general agreement.

Certainly more than half of the criticism has been based on the use of different names. In many instances this is solely a matter of nomenclature, not of taxonomy, and with the general use of the International Rules of Nomenclature such differences are rapidly disappearing. There are some features of the rules which are elusive and may be interpreted in different ways, as the validity of publication of some of Muhlenberg's names. The various articles and sections of the rules do not obviously conflict, yet there are isolated examples in which different names for the same plant may apparently be legal under different clauses. The rules still lack clearly expressed directives for typification and some difference in usage may persist until this is remedied. The rules fortunately do not require that we must guess at the application of names published originally with scanty or faulty description and not associated with an authentic type specimen. Too much of that has been done in the past.

Another cause for criticism of names has resulted from the segregation and union of genera. Usually we think of it as a result of segregation, but that is because there are more 'splitters' than 'lumpers' among us. Few American botanists will care if I segregate the tropical genus Miconia into a dozen fragments (I shall not do so), but we can imagine the howls that will rise to the stratosphere if the Pin Oak appears in a frequently consulted reference book as *Erythrobalanus palustris*. Whether we call it uniformity, stability,

or fixity of names, that is what the botanist wants and what he ought to have. After all, why are genera segregated? I know very well the reasons used by Small and Rydberg. Rydberg's segregates differed from each other in the same general way and the same general degree as other commonly accepted genera of the same family. Small's segregates differed in what we often call 'technical characters,' as distinguished from the vegetative characters which may separate species. For this reason he segregated Wallia from Juglans, the former having a very rough nut, and Oligoneuron with striate bracts from Solidago. We admit that such procedure will suggest to any tyro that the Butternut and Black Walnut are much alike, but it will obscure tha fact that both are much like the English Walnut. How many amateurs and non-taxonomic botanists are eager to get such information? And if they consult Small's Flora to find out, can they not get it just as easily through the use of appropriate subgenera or sections? Similar reasons can be adduced for the union of genera and families. Some are not separated by characters of generic or familiar significance, whatever that may mean, as Aster and Solidago, Rubiaceae and Caprifoliaceae. Some tend to merge and have to be separated more or less arbitrarily, as Anemone and Hepatica. Close relationships are concealed by the use of different generic names, as Houstonia and Hedyotis.

All arguments for segregation may be condensed into a single legitimate excuse: the proponent wants greater homogeneity within the group. All arguments for combination may be reduced to the converse: the author wants greater separation between groups. Both desires are purely matters of individual opinion. We believe that our system of classification represents fairly well the course and the end results of evolution. In the end results, which are the species existing today, we can distinguish populations of specific rank which resemble each other more that they resemble any other populations. These make up a superior group which deserves taxonomic attention; it may or may not deserve a name. If it is given a name, it then <u>must</u> be assigned to a category, and there is nothing in the entire history of taxonomy to guide us to the proper choice of category except individual opinion; nothing, that is, in the plants themselves. There is an independent guide, the innate desire of botanists to have their knowledge classified, as I said before, in packages of convenient size and to have a stable system of names. We should keep this desire in mind when we contemplate changing a category, but we must not let it deter us from expressing what we sincerely believe to be the course of evolution.

At the present time there is very little discrepancy among taxonomists in the recognition of species. The vast majority of species in the United States, as presented in current Manuals, are accepted by all authors in precisely the same circumscription. Errors have been made in thepast and corrected later, and other errors may still be extant which we shall discover and correct in the future. We have done well to achieve this happy condition.

There is greater discrepancy in the subdivision of species into minor groups. These may be regarded by us as the different manifestations of a species, not distinct enough to be called independent species, but conspicuous enough to draw the attention of the observant botanist. They are not homogeneous in nature. They may be caused by slight differences in genes, or by mutation, or by the direct effect of the environment; they may or may not be correlated with geographic distribution. There is no necessity of describing or naming and of them, and failure to give them names or to use names for them can not be regarded as a denial of their existence. Names should be given and used only when they serve some useful taxonomic purpose. Otherwise we may conceivably approach the chaor imagined in this paper for Ambrosia trifida, or the septinomials of Stellaria and Saxifraga, or the triplicate sets of varieties in Cruciferae.

There are still several unsolved problems in taxonomic procedure, most of them connected with the process of evolution. We all believe that evolution has occurred and has produced our present flora; it is sometimes hard to understand that it is still proceeding. The dictum of Linnaeus, that God made species, Linnaeus describes them, continued well into the present century and is still apparent in some taxonomic research. Under that view, we are competent to handle most of our plants but we do not know what to do with others. More and more apogamous plants are being discovered. Shall we call them species, as has been done ad nauseam in Hieracium, or varieties of original sexual species, waiting of course for the discovery of what that species was, or shall we invent a special new term to be used as their name, a new category to include them, and a new system of nomenclature for them? We are finding, with the help of the geneticist and cytologist, more and more hybrids, and hybrid swarms, and introgressions; more and more polyploids. Some of these anomalous populations seem to represent the inception of species, others the gradual merging of two or more species into one. At present we do not know how to refer such plants to a place in our legislated categories or how to give them appropriate names. Most of the confusion in taxonomy are caused by plants of this nature.

Your author is one of the so-called old-fashioned taxonomists, or, as they say at Harvard, a classical taxonomist. He is just modern enough to recognize these problems but sufficiently old-fashioned and conservative to offer no solution for them. So far as he is concerned, that is a task for the future. In performing it, the taxonomists must keep their heads and not be led astray by any clique of botanical new-dealers.

The settled results of taxonomic study, fortunately accepted by a great majority of taxonomists and for a great majority of American plants, seem to be based on a concept of the species essentially or quite identical with that presented in these pages. This concept implies a nature and degree of morphological similarity satisfactory to us under our standards, and almost all of us have the same standards.

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CHANGE OF NAME FOR CERTAIN PLANTS OF THE 'MANUAL RANGE.'

H. A. Gleason

During the preparation of manuscript for the forthcoming Illustrated Flora, it seemed desirable to change the status of a number of taxonomic groups. Most of these changes were reductions of species to varieties; for many of these varieties valid names were found and new names were unnecessary. For others the use of the valid varietal epithet under the proper specific term resulted in a new combination. Five apparently undescribed entities were detected and considered to be sufficiently important to deserve varietal status. Only three changes of specific epithets are included, two necessitated by the rules of nomenclature and one by the elevation of a variety to specific rank. All these changes and additions require publication in accordance with the International Rules of Nomenclature and these formalities are complied with below.

My concept of species and my opinion of infraspecific taxa have been presented in the preceding article. As stated there, varieties are regarded as manifestations of a species caused by slight differences due to heredity, mutation, or direct effect of the environment. There is no necessity of recognizing varieties or using varietal names, but failure to do so does not deny the existence of such minor populations. Names and descriptions should be provided only for those which are conspicuous enought to attract attention. All reductions of species to varieties have been made in accordance with my idea that a species must be clearly distinguished

from other species by definite morphological characters. Those which have been reduced do not, in my opinion, qualify as independent species. This statement is in itselfy sufficient expression of my reasons for making most of these taxonomic changes. Additional notes are given only where needed. All names are chargeable to the author, except a few after which a different name appears.

FESTUCA OVINA L. var. SAXIMONTANA (Rydb.) Festuca saximontana Rydb. Bull. Torrey Club 36: 536. 1909; Fern. Man. 105.

FESTUCA ALTAICA var. MAJOR (Vasey) Festuca scabrella var. major Vasey, Contr. U. S. Nat. Herb. 1: 278. 1893; Fern. Man. 107.

DIARRHENA AMERICANA var. OBOVATA. Paniculae rami scabri, vagina basali deficiente; gluma exterior circa 2.4 mm., interior 3.5 mm. longa; lemma inferius circa 6 mm. longum, supra medium latissimum, apice in cuspidem rotundatum. Type, Amer. Gr. Nat. Herb. 694, from Stark Co., Ill., in the herbarium of the New York Botanical Garden.

AGROPYRON TRACHYCAULUM var. CILIATUM (Scribn. & Sm.) Agropyron tenerum var. ciliatum Scribn. & Sm. U. S. Dep. Agr. Div. Agrost. Bull. 4: 30. 1897.

HYSTRIX PATULA forma BIGELOVIANA (Fern.) Asperella hystrix var. Bigeloviana Fern. Rhodora 24: 230. 1922.

DANTHONIA SERICEA var. EPILIS (Scribn.) Danthonia epilis Scribn. U. S. Dep. Agr. Div. Agrost. Circ. 30: 7. 1901, based on the homonym D. glabra Nash; D. epilis Fern. Man. 150.

AGROSTIS HYEMALIS var. TENUIS (Tuckerm.) Agrostis scabra var. tenuis Tuckerm. Am. Jour. Sci. 45: 45. 1843.

LEPTOCHLOA FASCICULARIS var. MARITIMA (Bickn.) Diplachne maritima Bickn. Bull. Torrey Club 35: 195. 1908, based on the homonym D. procumbens Nash; D. maritima, Fern. Man. 127.

LEPTOCHLOA FASCICULARIS var. ACUMINATA (Nash) Diplachne acuminata Nash; Britton, Man. 128. 1901; D. acuminata Fern. Man. 127.

PANICUM LANUGINOSUM var. TENNESSEENSE (Ashe) Panicum tennesseense Ashe, Jour. Elisha Mitchell Soc. 15: 52. 1898; P. lanuginosum var. fasciculatum, Fern. Man. 215.

PANICUM SCABRIUSCULUM var. CRYPTANTHUM (Ashe) Panicum cryptanthum Ashe, N. C. Agr. Exp. Sta. Bull. 175: 115. 1900; Fern. Man. 221.

PANICUM BICKNELLII var. CALLIPHYLLUM (Ashe) Panicum calliphyllum Ashe, Jour. Elisha Mitchell Soc. 15: 31. 1898; Fern. Man. 211.

PANICUM ANNULUM var. GLABRESCENS. Spiculis 2.3--2.5 mm. longis, sparsissime puberulis. Type, Fernald & Long 16044,

Harwich, Barnstable Co., Mass., in the herbarium of the New York Botanical Garden. The variety annulum extends north only to New Jersey; its spikelets are 1.8--2.2 mm. long and densely short-pubescent.

ELEOCHARIS FLAVESCENS var. OLIVACEA (Torr.) Eleocharis olivacea Torr. Ann. Lyc. N. Y. 3: 300. 1836; Fern. Man. 254.

ELEOCHARIS TENUIS var. BOREALIS (Svenson) Eleocharis capitata Svenson, Rhodora 34: 200, pl. 219, 221. 1932; Eleocharis elliptica, Fern. Man. 258.

CAREX CEPHALOPHORA var. MESOCHOREA (Mack.) Carex mesochorea Mack. Bull. Torrey Club 37: 246. 1910; Fern. Man. 306.

CAREX SPARGANIOIDES var. AGGREGATA (Mack.) Carex aggregata Mack. Bull. Torrey Club 37: 246. 1910; Fern. Man. 307.

CAREX ANNECTENS var. AMBIGUA (Barratt) Carex vulpinoidea var. ambigua Barratt; Boott, Illust. Carex 125, pl. 406. 1862.

CAREX STIPATA var. OKLAHOMENSIS (Mack.) Carex oklahomensis Mack. Torreya 14: 126. 1914; Fern. Man. 310.

CAREX MURICATA var. STERILIS (Willd.) Carex sterilis Willd. Sp. Pl. 4: 208. 1805, "in greater part;" Mack. N. Am. Fl. 18: 108. 1931; Fern. Man. 317.

CAREX MURICATA var. LARICINA (Mack.) Carex laricina Mack. N. Am. Fl. 18: 113. 1931; C. cephalantha, Fern. Man. 318.

CAREX MURICATA var. RUTHII (Mack.) Carex Ruthii Mack. N. Am. Fl. 18: 112. 1931; Fern. Man. 318.

CAREX NIGROMARGINATA var. ELLIPTICA (Boott) Carex Emmonsii var. elliptica Boott, Illust. Carex 97, pl. 287. 1860; C. Peckii, Fern. Man. 333.

CAREX NIGROMARGINATA var. MUHLENBERGII (Gray) Carex pennsylvanica var. Muhlenbergii Gray; Torr. Ann. Lyc. N. Y. 3: 410. 1836; C. artitecta, Fern. Man. 334.

CAREX NIGROMARGINATA var. MINOR (Boott) Carex varia var. minor Boott; Hook. Fl. Bor. Am. 2: 223. 1839.

CAREX LAXIFLORA var. ORMOSTACHYA (Wieg.) Carex ormostachya Wieg. Rhodora 24: 196. 1922; Fern. Man. 367.

CAREX LAXIFLORA var. PURPURIFERA (Mack.) Carex purpurifera Mack. N. Am. Fl. 18: 253. 1935.

CAREX FLAVA var. LAXIOR (Kükenth.) Carex lepidocarpa var. laxior Kükenth. Pflanzenreich 4: fam. 20. 673. 1909.

CAREX COMPLANATA var. HIRSUTA (Bailey) Carex triceps var. hirsuta Bailey, Mem. Torrey Club 1: 35. 1889; C. hirsutella, Fern. Man. 351.

CAREX LASIOCARPA var. LATIFOLIA (Böck.) Carex filiformis var. latifolia Böck. Linnaea 41: 309. 1877; Carex lanuginosa, Fern. Man. 349.

CAREX STRICTA var. ELONGATA (Böck.) Carex virginiana var. elongata Böck. Linnaea 40: 432. 1876; C. Emoryi, Fern. Man. 343.

CAREX CRINITA var. MITCHELLIANA (M. A. Curt.) Carex Mitchelliana M. A. Curt. Am. Jour. Sci. 44: 84. 1843; Fern. Man. 340.

TRILLIUM VIRIDE var. LUTEUM (Muhl.) Trillium sessile var. luteum Muhl. Cat. 38. 1813; T. luteum, Fern. Man. 445.

MYRICA ASPLENIFOLIA var. TOMENTOSA (Chev.) Comptonia peregrina var. tomentosa Chev. Mém. Soc. Sci. Nat. Cherbourg 32: 196. 1901.

BETULA GLANDULOSA var. GLANDULIFERA (Regel) Betula pumila var. glandulifera Regel, Bull. Soc. Nat. Moscou 38 pt. 2: 410. 1865; B. pumila var. glandulifera, Fern. Man. 536.

QUERCUS PRINOIDES var. ACUMINATA (Michx.) Quercus Prinus var. acuminata Michx. Hist. Chênes Am. no. 5, pl. 8. 1801; Q. acuminata (Michx.) Sarg.; Q. Muehlenbergii or Q. Muhlenbergii of most recent literature, including Fern.

POLYGONUM HYDROPIPEROIDES var. ADENOCALYX (Stanford) Polygonum opelousanum var. adenocalyx Stanford, Rhodora 28: 28. 1926; Fern. Man. 587.

POLYGONUM HYDROPIPEROIDES var. SETACEUM (Baldw.) Polygonum setaceum Baldw.; Ell. Bot. S. C. & Ga. 1: 455. 1817. Fern. Man. 587.

POLYGONUM SCANDENS var. DUMETORUM (L.) Polygonum dumetorum L. Sp. Pl. ed. 2: 522. 1762.

POLYGONUM SCANDENS var. CRISTATUM (Engelm. & Gray) Polygonum cristatum Engelm. & Gray, Boston Jour. Nat. Hist. 5: 259. 1847; Fern. Man. 588.

STELLARIA SILVATICA (Beg.) Maguire. Stellaria pubera subsp. silvatica Beg. Nuov. Giorn. Bot. Ital. n.s. 17: 385. 1910. S. pubera var. silvatica, Fern. Man. 622.

ARABIS SHORTII (Fern.) Arabis perstellata var. Shortii Fern. 48: 208. 1946; Man. 727; A. dentata, of most American literature.

The homonymity of the well known name Arabis dentata for the common midwestern plant has long been known to many. Fernald combined this plant with the rare, highly local, and recently discovered A. perstellata Braun and used Miss Braun's name as the valid epithet of the species, distinguishing the original A. dentata as var. Shortii. Not agreeing with Fernald's opinion, I restore the plant to specific rank, adopting Fernald's very appropriate epithet as its specific name.

RUBUS STRIGOSUS forma EGGLESTONII (Blanchard) Rubus Egglestonii Blanchard, Torreya 7: 140. 1907; R. strigosus var. Egglestonii Fern. Man. 822.

PRUNUS PUMILA var. DEPRESSA (Pursh) Prunus depressa Pursh, Fl. Am. Sept. 1: 332. 1814; Fern. Man. 878.

PRUNUS PUMILA var. BESSEYI (Bailey) Prunus Besseyi Bailey, Bull. Cornell Agr. Exp. Sta. 70: 261. 1894; Fern. Man. 878.

PHACELIA DUBIA var. FALLAX (Fern.) Phacelia fallax Fern. Rhodora 46: 51. 1944.

PHACELIA DUBIA var. GILIOIDES (Brand) Phacelia gilioides Brand, Pflanzenreich 4, Fam 251: 63. 1913; Fern. Man. 1194.

TRICHOSTEMA DICHOTOMUM var. LINEARE (Walt.) Trichostema lineare Walt. Fl. Carol. 164. 1788; T. setaceum Houtt.; Ferm. Man. 1216.

SCUTELLARIA OVATA var. CALCAREA (Epling) Scutellaria ovata subsp. ovata Epling, Univ. Calif. Publ. Bot. 20: 55. 1942.

DRACOCEPHALUM PURPUREUM (Walt.) McClintock. Prasium purpureum Walt. Fl. Carol. 166. 1788.

GERARDIA PURPUREA var. NEOSCOTICA (Greene) Gerardia neoscotica Greene, Leafl. Bot. Obs. & Crit. 2: 106. 1910; Fern. Man. 1288.

GERARDIA PURPUREA var. RACEMULOSA (Pennell) Gerardia racemulosa Pennell, Torreya 11: 15. 1911; Fern. Man. 1289.

JUSTICIA HUMILIS var. LANCEOLATA (Chapm.) Dianthera ovata var. lanceolata Chapm. Fl. S. States 304. 1860.

LITTORELLA UNIFLORA var. AMERICANA (Fern.) Littorella americana Fern. Rhodora 20: 62. 1918; Man. 1318.

GALIUM OBTUSUM var. RAMOSUM. Caules e nodis superioribus plurimis ramosi, flexuosi; folia tenuia, quam latitudine 4-plo longiora, ad vel infra medium latissima, ad marginem et saepissime ad venam mediam subtus hispida pilis subulatis ca. 0.2 mm. longis. Type, Gleason 9128, from wet prairie near Seymour, Champaign Co., Ill., in the herbarium of the New York Botanical Garden.

VIBURNUM DENTATUM var. VENOSUM (Britt.) Viburnum venosum Britt. Man. 871. 1901.

VIBURNUM DENTATUM var. INDIANENSE (Rehder) Viburnum pubescens Rehder, Jour. Arnold Arb. 5: 59. 1924; V. dentatum var. Deamii, Fern. Man. 1341.

LONICERA HIRSUTA var. INTERIOR. Tubus corollae 1o--18 mm. longus; hypanthium glabrum vel sparsissime glandulosum. Type, Gleason 9561, from a rocky, densely wooded hillside five miles northeast of Two Harbors, Minn., in the herbarium of the New York Botanical Garden.

LONICERA DIOICA var. ORIENTALIS. Folia subtus sparse vel molliter villosa; hypanthium dense glandulosum; corolla plusminusve glandulosa et villosa; stylus hirsutus. Type, F. A. Gilbert 829, a vine climbing over underbrush, one mile from Carter's Caves, Carter Co., Ky., in the herbarium of the New York Botanical Garden.

LONICERA DIOICA var. DASYGYNA (Rehder) Lonicera glaucescens var. dasygyna Rehder, Ann. Red. Mo. Bot. Gard. 14: 181. 1903. L. dioica var. glaucescens f. dasygyna, Fern. Man. 1335.

LONICERA FLAVA var. FLAVESCENS (Small) Lonicera flavescens Small, Fl. Se. U. S. 1126. 1903; L. flavida, Fern. Man. 1335.

LONICERA PROLIFERA var. GLABRA. Folia subtus glabra. Type, Bush 10135, from open woods, Dumas, Missouri, in the herbarium of the New York Botanical Garden. The variety is restricted to Missouri and Arkansas. The typical variety prolifera, with leaves thinly villous beneath, ranges from central New York to Wisconsin and Illinois.

VALERIANA SEPTENTRIONALIS var. ULIGINOSA (T. & G.) Valeriana sylvatica var. uliginosa T. & G. Fl. N. Am. 2: 47. 1841; V. uliginosa, Fern. Man. 1344.

VALERIANELLA RADIATA var. INTERMEDIA (Dyal) Valerianella intermedia Dyal, Rhodora 40: 202. 1938; Fern. Man. 1346.

CAMPANULA APARINOIDES var. ULIGINOSA (Rydb.) Campanula uliginosa Rydb.; Britt. Man. 885. 1901; Fern. Man. 1353.

SOLIDAGO SPATHULATA subsp. RANDII (Porter) Cronquist. Solidago Virgaurea var. Randii Porter, Bull. Torrey Club 20: 208. 1893; S. Randii, Fern. Man. 1396.

SOLIDAGO SPATHULATA subsp. RANDII var. GILLMANI (Gray) Cronquist. S. humilis var. Gillmani Gray, Proc. Am. Acad. 17: 191. 1882; S. racemosa var. Gillmani, Fern. Man. 1397.

SOLIDAGO SPATHULATA subsp. RANDII var. RACEMOSA (Greene) Cronquist. Solidago racemosa Greene, Pittonia 3: 160. 1897; Fern. Man. 1397.

RHAMNUS LANCEOLATUS var. GLABRATUS. Folia et ramuli novelli ad anthesin glabri vel glabrati. Type, Deam 787, from a rocky wooded hillside one-third mile north of Brookville, Franklin County, Indiana, in the herbarium of the New York Botanical Garden. In the typical variety lanceolatus the twigs and leaves are densely and softly pubescent at anthesis and the leaves remain pubescent beneath throughout the season; it ranges from southern Pennsylvania to Alabama. Our variety is the mid-western plant, from Ohio and Kentucky to Nebraska, Kansas, and Arkansas.

JUNIPERUS TEXENSIS SP. NOV. - WEST-TEXAS JUNIPER IN RELATION TO J. MONOSPERMA, J. ASHEI ET AL.

P. J. van Melle

JUNIPERUS TEXENSIS SP. NOV.

J. monospermae (Engelm.) Sarg. similis sed galbulis non glaucescentibus nunquam coeruleis violaceisve, ante maturitatem in vivo viridibus in sicco brunneis, maturis in vivo siccoque brunneis raro roseis rubrisve, post maturitatem surde griseo-brunneis vel griseo-purpurascentibus, hilo longitudine dimidio seminis differt. Floribus vulgo dioicis raro (ut in typo) monoicis.

TYPE: J. F. Brenckle 51019, Big Bend National Park, Brewster Co., Texas; deposited in the N. Y. Bot. Gdn. Isotype at the Arnold Arboretum.

SPECIMENS

Texas Agricultural Experiment Station, Sonora: Cory 38605, 38606, Brewster Co., Tex.; Hinckley 2594, Presidio Co., Tex.

New York Botanical Garden:

Texas. Terrell Co.: Muenscher & Muensch. 14484; van Melle 502, 503, 504, 505. Brewster Co.: Brenckle 51018; Ferris & Duncan 2830 (cf. Martinez, Jun. Mex. in An. Inst. Biol. 17, Nos. 1, 2 : 108, 1946); C. H. Mueller 7945; Muenscher & Muns. 14488, 14534; P. Koch 3, 6 (both rose-fruited variants), 4; E. J. Palmer 34142; van Melle 517. Presidio-Brewster Co.: Hanson 632. Guadelupe Mts.: Moore & Steyermark 3418, 3520 (cf. Steyerm. & Moore in An. Mo. Bot. Gdn. 20 : 812, 1933). Jeff Davis Co.: van Melle 518, 519. Howard Co.: Palmer 33998; Ross, Standley & Russell 12214. Mitchell Co.: van Melle 520, 521, 522. Nolan Co.: Palmer 34593. Floyd Co.: Ferris & Duncan 3365-A. Paloduro Canyon: Brenckle 51011, 51012. "N. W. Texas": Buckley anno 1875.

Probably intermediate between J. texensis and J. monosperma: Oklahoma: Goodman 2218, Cimarron Co. New Mexico: M. E. Jones 9.7.1903, Florita Mts. Arizona: Pringle 6.7.1882, Rincon Mts.; N. L. Goodding 1272, Mouth of Mohave Creek (Mohave Co.).

Probably intermediate between J. texensis and J. Ashei: Texas: Palmer 6555, Hood Co. (All the above intermediates at the N. Y. Bot. Gdn.)

DISTRIBUTION: Western Texas. In the southwestern mountains with J. Deppeana Steud. and here and there with J. monosperma; in the Chisos Mts. (Brewster Co.) also with J. flaccida Schl. Northward, it is the only Juniper on the slopes and plains to the east of the Staked Plains, and extends into the Paloduro Canyon, where it occurs with J. monosperma and J. Pinchotii Sudw. We have seen no material of it from the Edwards Pla-

teau, where J. Ashei Buchh. is reported to predominate (Hopkins in Rhodora 40 : 425, foot-note 3 1938; et al.). Eastern limit in northern Texas: about the 100th meridian.

With the exception of J. Deppeana and J. flaccida Schlecht., no other Juniper than J. texensis was seen by us along the following route travelled by us in western Texas in July, 1951:

Junction of the Pecos River and Rio Grande; U.S. Route 90 to Marathon (Brewster Co.); Big Bend National Park; Marathon; Route 90 to Alpine; Routes 118 and 17 to Pecos; thence eastward on Route 80 into Eastland Co. About 3½ miles east of Ranger, Eastland Co., J. Ashei replaced our species along this route.

One would expect J. texensis to occur south of the Rio Grande; but we have seen no Mexican material of it.

COMPARATIVE DESCRIPTION.

Our species differs from J. monosperma only in its fruit and seed. It shows, in the adult foliage, the same inconsistent ratio of opposite to ternate leaves, and the same, wide variation of dorsal characters. In scattered stands on open slopes and levels it forms mostly a bushy tree with a crown built upon two or more main limbs ascending more or less widely from a point at or somewhat above the ground and much ramified in their upper parts; mostly not over 6 m high, but often taller in arroyos, canyons and wooded parts. In the Big Bend National Park we found it mostly much wider than high; along Route 118, along the fringes of the Davis Mts., relatively narrower, sometimes of equal height and width. In an area between the Big Bend National Park and the mouth of the Pecos River it remains mostly much lower and relatively wider, often approximately 1.5 x 4 m, but here, too, mostly much taller in arroyos, and occasionally in the open.

As in J. monosperma, the bark exfoliates in thin longitudinal strips.

But the fruit of J. texensis is conspicuously distinct. It has not the slightest trace of bluish or gray bloom. In living material it is, before maturity, as green as the foliage, and, at maturity, nut-brown or sometimes yellowish brown, rarely varying to shades of rose or bright brownish red. As it ripens and dries on the bush it turns mostly a dull gray to dull grayish brown or purplish gray. Fruit collected before or at maturity is, on herbarium sheets, a distinctive brown, by which the species is very readily distinguished from both J. monosperma and J. Ashei. Fruit collected after it has dried on the bush is likely to retain its dull color on the sheets, as in our No. 521. Mr. P. Koch, of the Big Bend National Park Photo Shop, writes me that he has seen only very few of the rose- or red-fruited variants; and I am not sure that when such fruit occurs, it persists throughout the plants on which they are found.

In the Big Bend the mature fruit is mostly globose and about

5 mm long and wide, but sometimes to 7.5 mm. Farther north it varies freely to a conico-ovoid shape and is often to 7.5 mm long.

Mr. Koch writes me that the occasional red fruits are eaten by Townsend Solitaires from late October on. This would indicate that it ripens at that time. He writes, further, that the birds leave the somewhat drier, duller fruit alone, and that it remains and dries on the bush. In July, 1951, we found dry fruit persisting, apparently abnormally late, in only a single bush (our No. 521), in Mitchell Co.

The ripe fruit, though somewhat juicy, is less so, and less coarsely wrinkled, and dries and hardens less slowly than that of J. monosperma, which, not rarely, remains quite resilient on herbarium sheets some 25 to 35 years old.

The ripening season of the fruit appears to vary somewhat between the southern and northern extremities of the distribution. We have seen collections of apparently newly matured and maturing fruit made between early January and the middle of March. From data at hand we conclude that the fruit of J. texensis ripens within a year from the time of its inception.

There are predominantly 1 or 2 seeds to a fruit in individual plants or small communities of them. Fruits with 3 seeds occur only very occasionally and apparently never consistently in any one plant.

Basing comparisons upon large quantities of fully matured solitary seeds, we find that those of J. texensis are of somewhat smaller average size than those of J. monosperma and have a relatively larger hilum, the larger lobe of which reaches about halfway up the surface, against hardly 1/3 of the way in J. monosperma. In both kinds there are usually some 3 to 5 more or less clearly or vaguely defined longitudinal grooves extending upward from near the base; often 2 or 3 placed a little higher up, and sometimes one or more located entirely above the middle.

RELATION TO EARLIER PUBLICATIONS

J. texensis has been vaguely included in treatments of J. monosperma - more as to distribution than description. Actually, the latter species spills over into Texas from New Mexico into the southwestern mountains, and occurs, farther north, in the Staked Plains and in the Paloduro Canyon and beyond it in the Panhandle. In the mountains it is represented by the following specimens in the N. Y. Bot. Gdn. Herbarium: Hinckley 801, Chinati Mts., Presidio Co.; Waterfall 4800, Sierra Diablos, Hudspeth Co., and 4990, Culberson Co; Koch 5. We did not see it in the Big Bend National Park; but Cory's type specimen of J. erythrocarpa, at the Arnold Arboretum, from the base of Mt. Emory, in the Park, appears to us as conspecific. Koch 5 is, also, from the Park. In the Panhandle, notably in the Paloduro Canyon, J. monosperma occurs with J. Pinchotii.

As for J. Pinchotii, it seems to us that Sudworth's publication of that species (cited below) hardly represents a contrast with J. monosperma, but rather with the less juicy- and duller-fruited J. texensis. The only element in this original description that distinguishes J. Pinchotii from J. monosperma is the "large hilum" of the seed. We find, moreover, that the seeds of J. Pinchotii are of somewhat smaller average size than those of J. monosperma.

The difference between the two kinds is slight. Yet it appears to us to have some significance, and to merit recognition. We therefore place Sudworth's Juniper in varietal rank under J. monosperma, as follows:

JUNIPERUS MONOSPERMA (Engelm.) Sarg. var. PINCHOTII (Sudw.) Comb. nov.

J. Pinchotii Sudw. in For. & Irrig. 11 : 204 (1905).

A speciei typo seminibus minoribus hilo dimidio seminum longitudine differt.

The difference in relative length of the hilum, best observed in solitary seeds, is clear and consistent to us in a comparison of some 1500 seeds of each of the two kinds.

We have seen specimens of the variety from the following localities: Texas, Armstrong, Briscoe and Randall Counties. Oklahoma, Cimarron Co.

It seems to us that many specimens have been identified as J. Pinchotii on the basis of their localities rather than that of the relative length of the hilum.

We regard the variety not as of lesser philogenetic rank than the nomenclatural type, but simply as a slightly distinct phase of the species.

As to J. erythrocarpa, described by Cory in Rhodora 38 : 186 (1936) as a species distinct by its red fruit and seed characters - we conclude, from examination of his type specimen (Cory 7642, at the Arnold Arboretum) that it is conspecific with J. monosperma, differing from it by the relatively larger hilum of the seed. The grooves on the seed appear to be particularly well defined but we do not think that they constitute a clear-cut difference from typical J. monosperma, in which sometimes they are equally distinct. In all other respects J. erythrocarpa appears to us, from the type specimen, to represent the normally fruited J. monosperma, of which Cory described, in the same paper, the teratological material with exposed seed as J. gymnocarpa. In the same paper, also, he transfers J. occidentalis Hook. var. monosperma Engelm. to the species mexicana Spreng., which is now believed to equal the geographically rather remote, 3- to 4-seeded J. monticola f. compacta of Martinez (o.c. 85). In fact, Cory's over-all picture of the monosperma situation does not seem very clear.

His type sheet of J. erythrocarpa contains, besides several normal fruits, one abnormally developed one of brownish-violet color, about 7 x 5 mm, as well as a number of abnormal processes with elongated, supernumerous floral scales. The rather pointed leaves of the specimen are not unusual in J. monosperma. The large hilum matches that of the var. Pinchotii, from which variety Cory's Juniper may not be clearly distinguishable and to which, upon examination of additional material, we may want to refer it. To date we have seen only one collection, Koch 5, from the Big Bend National Park, which matches Cory's type specimen as to fruit and seed.

Meanwhile, the name J. erythrocarpa invites confusion with the more strikingly erythrocarpous forms of J. texensis. Prior to our examination of Cory's type we supposed that the name covered the rose- to red-fruited forms of our J. texensis, and that the brown-fruited material of our species was, therefore, conspecific with J. erythrocarpa. Under that impression we so misidentified one of three specimens of our J. texensis from the Texas Agricultural Experiment Station (Hinckley 2594). The other two sheets (Cory 38605, 38606) had been so indentified by I. W. Johnston.

J. texensis is not likely to be confused with its easterly neighbor, J. Ashei, in which the fruit, in living material, is, before maturity, bright-blue and at maturity, living and preserved, a very dark blue. Though there is only little pulp, the fruit is quite juicy. The seeds (1 or 2) are only faintly pitted or grooved, or both, and the small hilum is of the same relative length as in J. monosperma.

Along Routes 80 and 67, eastward of Ranger, Eastland Co., Texas, J. Ashei mostly resembles J. texensis in habit, but is, generally, of somewhat lesser relative width; often with obliquely diverging limbs ascending in their upper parts; varying to rather narrow, nearly erect, plural stemmed trees, often to 8 m high. Buchholz, in his original description (Bot. Gaz. 90 : 329, 1930) mentions heights of 12 to 20 ft. in northwestern Arkansas; Palmer (43032, 43986) indicates heights of 10 to 15 m in the Arbuckle Mts. in Oklahoma.

The color of the adult foliage is mostly deeper green than in J. texensis; the lesser branches are less rigid, and the terminal shoots are often drooping, like those often seen in J. virginiana L. The ultimate adult branchlets are mostly thinner than in J. texensis, and thicker than in J. virginiana. Particularly in the more narrow and more erect plants there is considerable resemblance to J. virginiana, except for the consistent plural-stemmed habit.

In fact, it is difficult to avoid the impression that J. Ashei shows signs of intermediacy between J. texensis and J. virginiana. More particularly, it is in the northerly material that there appears a strong influence of J. virginiana, while

in the more southerly, in the general vicinity of Austin, Tex., there appears to be a strong infusion of J. silicicola (Small) Bailey.

We think of J. Ashei, then, not in terms of a hybrid species of recent origin, but as a pretty well jelled, though not comparatively old species of composite derivation. But before venturing more detailed speculation as to its origin, let us return to J. texensis.

GROUNDS FOR SPECIFIC STATUS OF J. TEXENSIS

Despite admitted resemblances between it and J. monosperma we refrain from publishing it as a variety of the last-named because of a belief that the two taxons do not represent, simply, two varietal phases of a single species. We think that, of the two, J. texensis represents the more primitive species, and J. monosperma a more recent one of composite derivation, involving, on the one hand, J. texensis and, on the other, an eastern Red Cedar influence. We believe that J. monosperma is of the same basic derivation as is J. Ashei, but that the texensis influence is more prominent in it than in J. Ashei.

Our diagnosis of J. texensis as a comparatively primitive species, based upon a monoecious type, proceeds from a view that appears not to have been applied by others to the study of Junipers, but which appears to us as helpful in the discernment of patterns of relationships and distributions. It is this: that the occurrence of monoecism in Junipers is indicative of comparatively primitive stocks.

It appears to be a well established opinion (Arnold, Intr. Paleobot. 325, 1947) that, in relation to the Pinaceae, the Family Cupressinaceae (or the Subfamily Cupressineae) constitutes for the greater part a comparatively recent group. In it appears a trend toward the breaking up of the monoecism of the older group into a more specialized, dioecious biosis. This trend comes into view clearly in the genus Juniperus, in which may be observed both monoecious and dioecious as well as transitional phases.

In our Review of J. Chinensis et Al. (N.Y. Bot. Gdn., 1947) we applied this view to the restoration of J. sphaerica Lindl., calling attention to the occurrence in it of the three phases - the transitional represented by belatedly monoecious materials in which pistillate flowers appear in plants of a more or less advanced (sometimes considerable) age.

We do not mean, here, to go into a lengthy discussion of our view, which, with pertinent data, might well furnish subject matter for a separate paper. But we venture to present, here, a few of the indications yielded by the study of the phenomenon of monoecism - which we have limited to the heterophyllous Junipers.

It seems, for instance, that monoecious elements of species never occur in a casual, scattered manner, but always by way of monoecious "cores", so located as to constitute probable centers of origin of dioecious distributions, whether of a single or of several species. Once broken up, it seems that monoecism does not recur.

It appears, also, that, around the world, monoecious "cores" occur in only a few areas, which may contain the monoecious elements of a single or of several species. For instances, in and about Turkey and certain coastal parts along the Black Sea occurs the monoecious element of one, distinct relationship. Here is found the largely monoecious J. excelsa Bieb., of which J. isophyllos C. Koch appears to be only a somewhat modified, dioecious development. But of the large group of Asiatic one-seeded heterophyllae, some 15 or 16 species of which have been published, it seems that all the known monoecious elements are concentrated in a relatively small, contiguous area comprising Sikang, southern Kansu, parts of Szechuan Province, part of the Ku-Ku-Nor Range and possibly adjacent parts of Yunnan - while dioecious phases, species and derivatives are spread over large parts of central Asia.

In fact, more often than not, monoecious elements are found clustered together in what may well be taken for centers of origin. For instance, those of J. Sabina L. and of J. phoenicea L. concur in southeastern France and adjacent parts of the Pyrenees, at the western end of their obvious eastward distributions. In and about Chekiang Province, China, occur the monoecious elements of J. sphaerica and of J. Sheppardii van Melle, dioecious radiations of which can be traced readily in every direction.

Known monoecious "cores" are in some instances large in relation to the distribution of their dioecious developments, as in the case of J. osteosperma (Torrey) Little - even if one includes in the over-all dioecious distribution J. californica Carr., which would seem to represent a somewhat modified, dioecious development of J. osteosperma. More often monoecious "cores" are relatively smaller, as in the case of J. Sabina. In some cases they represent probably mere remnants. There are undoubtedly one or more undiscovered "cores"; and possibly one or more are extinct.

With allowance for undiscovered "cores", it seems that in every one of the major, distinctive types in which the heterophyllous Junipers may be readily grouped a monoecious "core" exists. The most important instance known to us of an undiscovered "core" is that of the Red Cedar group of eastern North America, continental and insular. Though there is repeated mention in literature of monoecious material of "J. virginiana", we have not seen indication of its geographical location; and there is, moreover, a probability that the name

J. virginiana was used in such instances for some other species of the Red Cedar group.

In the case of J. flaccida - a very distinct species with a wide distribution in Mexico, spilling over into the Big Bend National Park - no reference to monoecious material is known to us in literature. We have seen only imperfect evidence of it. Brenckle 51017, from the Park, contains, besides abundant staminate cones, two or three abnormal processes which appear to represent pistillate inflorescences stung by an insect into a development of supernumerous, elongated scales - an injury to pistillate inflorescences which is very commonly found on J. osteosperma and other species, as well as on the type sheet of J. erythrocarpa Cory. Imperfect though the evidence of the Brenckle sheet is, it is, nevertheless, evidence of monoecism. We deem it probable that more conclusive evidence of it will be found in the Big Bend National Park.

Martinez (o.c.) makes casual mention of monoecism in J. Deppeana, without geographical data. North of the Rio Grande there is the following evidence of monoecism in this species in the Herbarium of the N. Y. Bot. Gdn.: J. C. Blumer 1256, Paradise, Chiricahua Mts., Ariz., is annotated as representing three trees, staminate, pistillate and monoecious. Otto Kuntze 28239 "Arizona", without locality, is obscurely monoecious. We think that monoecious material of this species may occur also farther eastward. When we visited the Big Bend National Park in July, 1951, staminate cones were not, or only rarely and obscurely, in evidence. Yet we noted a few plants as possibly monoecious, including our No. 517.

It seems to us that, generally, monoecious elements may be regarded as the purest and most distinct evidences of their kinds. We have seen no evidence of monoecism in any Juniper of discernible composite derivation.

Available data on monoecious materials are inevitably incomplete. As far as they go they seem to point unanimously to the conclusion that monoecious elements are indicative of comparatively primitive stocks, and the areas in which they occur of probable centers of origin.

We have, therefore, based our J. texensis intentionally upon a monoecious type, J. F. Brenckle 51019, collected by Dr. Brenckle, of Milette, S. D., from a single plant in the Big Bend National Park on March 16, 1951, and kindly placed at our disposal by him. The plant growing immediately near that from which the type was taken, Brenckle 51018, is dioecious. It seems probable to us that additional monoecious material will be found in the Park, or perhaps also in other mountain ranges in southwestern Texas. The fact that no other monoecious material had come into our view among earlier collections leads us

to think that probably only a small remnant of a monoecious "core" exists in this species.

By our own reasoning we should be bound to accord to J. monosperma and to J. Ashei, also, the status of basic, primitive species in the event that monoecious material of them were found - in which case our speculations as to their composite origin would stand refuted. For the present it seems to us improbable that it will be found. The characters of both species appear to us as not original, but derived. It seems to us improbable that a primitive speciation should have occurred quite so devoid of discernible distinctive characters. Consider how very distinct are the American species known to contain dioecious elements: J. occidentalis, J. osteosperma, J. Deppeana, J. flaccida and J. texensis.

PROBABLE DERIVATION OF J. ASHEI AND J. MONOSPERMA

From the morphology of these species we judge that both are composites of, on the one hand, J. texensis, and, on the other, of J. virginiana.

J. virginiana extends into southwestern Oklahoma, where it is abundant in the Wichita Mts. - an area not very remote from the northern limit known to us of J. texensis. We deem it very probable that the two species overlapped, and that J. Ashei is a result of hybridity between them. This species is now abundant on the Arbuckle Plateau in south-central Oklahoma. It extends southward to near San Antonio, Texas, and eastward in northeastern Texas. It is known, also, from northwestern Arkansas and adjacent parts of Missouri and Oklahoma. It may be believed to occur, also, at points connecting the latter area with the Arbuckle Plateau or northeastern Texas.

There appears to us to exist a difference, not quite definable geographically, between the northerly materials which occur with and in proximity to J. virginiana, and those from the more southerly Austin - San Antonio area, which bear equally strong resemblances to J. silicicola. The southerly material has thinner ultimate branchlets and often approaches the dorsal leaf characters of the last-named species. It seems probable to us that this southerly material may represent the result of back-crossing between J. Ashei and J. silicicola.

As for J. monosperma - it seems probable to us that at some point in southwesternmost Oklahoma or in northwestern Texas it resulted from back-crossing of J. Ashei with northern material of J. texensis; and that it represents today one of two apparent well settled results from an originally probably more unsettled hybrid population; the other result being the var. Pinchotii. In other words, we seem to have, today, two discernibly distinct results of the supposed hybridity: J. monosperma, with the small hilum of J. Ashei; and the variety, with the larger hilum of J. texensis.

Our general picture, then, of the relationships dealt with in this paper is one of a comparatively primitive species, J. texensis, representing a northward, dioecious extension from a monoecious "core" in the Chisos Mts. in Brewster Co., Texas. At the northern end of its distribution, where it overlapped upon J. virginiana, hybridity between the two species is believed to have given rise to a hybrid species, J. Ashei, which found its distribution eastward and which extends along the eastern fringe of J. texensis. Subsequently, through backcrossing with J. texensis, in or near southwesternmost Oklahoma, another hybrid species is believed to have resulted: J. monosperma, which, through the northwest of Texas, passed into a large distribution westward, in southern Colorado, New Mexico, Arizona and northern Mexico.

We did not see J. Ashei along Route 90 between San Antonio and Del Rio; nor have we seen living or preserved material of it from between this route and the Rio Grande. Yet there appears to exist a strong resemblance between this species and the Mexican, slender-fruited, thin-branchleted J. monosperma var. gracilis of Martinez (Los Juniperus Mexicanos 109); and one easily supposes that a relationship exists between them. Investigation of it would involve an extension of the scope of the present paper which we must forgo - not, however, without pointing to the desirability of closer correlation between the admirable study by Martinez and available treatments of Junipers north of the Rio Grande.

Grateful acknowledgement is made of courtesies extended to the writer by the New York Botanical Garden, the Arnold Arboretum, the Texas Agricultural Experiment Station, and by Mr. Peter Koch, of the Big Bend National Park Photo Shop; particularly, by Dr. J. F. Brenckle, of Milette, S. D., in placing at our disposal valuable study material, collected by him.

SUMMARY

Available data on the occurrence of monoecism among the heterophyllous Junipers point to monoecious elements as indicative of comparatively primitive stocks, and to the areas in which they occur as probable centers of origin.

J. texensis sp. nov. is based upon a monoecious type.

J. Ashei is believed to be of composite derivation from J. texensis and J. virginiana; and J. monosperma, from J. texensis and J. Ashei.

J. Pinchotii is presented in a new combination as J. monosperma var. Pinchotii. J. erythrocarpa Cory is regarded as conspecific with J. monosperma and hardly distinct from the var. Pinchotii.

A NEW SPECIES OF ORMOSIA FROM BAHIA

Joseph V. Monachino

ORMOSIA BAHIENSIS Monachino, sp. nov.

Arbor, ca. 9 m. alta, 10 cm. diametro; ramulis ca. 7 mm. diametro, cinereis glabris vel glabrescentibus; foliis 7-foliolatis, secus rhachidem parce pubescentibus; petiolis 3.0--3.5 cm. longis; petiolulis ca. 4 mm. longis parce pubescentibus; laminis foliolorum ovatis vel ovato-lanceolatis vel ellipticis, 6.5--9.5 cm. longis et 3.0--4.5 cm. latis, ad basin rotundatis vel subcordatis asymmetricis, ad apicem breviter acuminatis obtusis, utrinque subglabris (costa subtus parcissime pilosis); reticulo venarum venulorumque supra obscuro; venis secundariis subtus subelevatis arcuatis utrinsecus ca. 8, venulis ultimis obscuris; ramis infructescentiae arcte pubescentibus; pedicellis brevissimis; bracteolis lanceolatis ca. 1.5 mm. longis; fructibus breviter stipitatis vel sessilibus, 2.5--5.0 cm. longis, 2.5--3.0 cm. latis dehiscentibus, senectute subtortulosis, glabris; seminibus solitariis vel binariis ca. 13 mm. longis, 10 mm. latis, rubris unicoloratis, hilo ca. 1 mm. longo.

Tree, about 9 m. high and 10 cm. DBH; branchlets about 7 mm. diam., cineraceous, glabrous or glabrescent, the buds generally several together, superposed, brown-ferrugineous tomentose, the leaf-scars raised, shield-shaped, margins slightly elevated, the bundle-scars contiguous near center of leaf-scar; leaves 7-foliolate, the rachis 9--12 cm. long with a terminal prolongation of 1.0--17 mm., sparsely pilose, indumentum longest persistent at base of petioles and petiolules, the petioles 3.0--3.5 cm. long, the petiolules about 4 mm. long, incrassate, sparsely pilose, the leaflet-blades ovate to ovate-lanceolate or elliptic, 6.5--9.5 cm. long and 3.0--4.5 cm. broad, rounded to subcordate and inequilateral at base, short-acuminate and blunt at apex, essentially glabrous except for a few pale-brown hairs (up to 0.5 mm. long) along midrib on underside, dotted with scattered brown resinous atoms, somewhat shining yellow-olive on upperside and pale on underside, the nervature faint on upperside, the secondaries few, about 8 pairs, arcuate, slightly raised on underside, the ultimate veinlets obscure, seen faintly raised under a lense, the tissue of leaves coriaceous; flowers not seen; infructescence-branches pubescent with rusty or greyish, mostly appressed hairs; pedicels very short, the bracteoles lanceolate, about 1.5 mm. long; legumes shortly stipitate or sessile, 2.5--5.0 cm. long and 2.5--3.0 cm. broad, more or less compressed, sharp-keeled on dorsal or placental side, dehiscent and becoming subtortulose, the valves glabrous, punctate, lightly rugulose or smooth, dark-brown and somewhat

shining outside, ligneous; seeds single or two in each legume, about 13 mm. long and 10 mm. broad, red, unicolored, the hilum about 1 mm. long.

Type: Ricardo de Lemos Froes 12629, Brazil, Bahia, municip. Andarahy, "Carrasco" dry land, 1000 m. alt.; October 10, 1942; "Mongolo"; deposited at The New York Botanical Garden.

Ormosia bahiensis is a distinctive species in its nearly glabrous leaflets with few secondaries and obscure reticulation. Not more than a single leaflet is necessary to separate it easily from all the other species of which material is available at The New York Botanical Garden.

The description of Ormosia holerythra Ducke is strikingly like that of our plant, but Ducke's species is here judged to be distinct from ours upon consideration of its geographical distribution. O. holerythra is known from Pará, Obidos and the lower Rio Trombetas in the Amazon system. Furthermore, Ducke states that his species has completely glabrous leaves, whereas O. bahiensis is distinctly short-pilose on its petiolules and elsewhere.

The affinity of O. bahiensis is probably closer with O. nitida Vogel. The type of the latter was collected by Sellow between Vittoria and Bahia; Ducke reports the species from the Rio Dôce, Espirito Santo, on the basis of Kuhlmann 110. There is at The New York Botanical Garden a photo of the type that was in the Berlin herbarium. The leaflets of O. nitida are more or less distinctly cuneiform at the base, the sparse lateral nerves diverge from the midrib at an acute angle (about 30--40 degrees, whereas in O. bahiensis they form an angle of about 60 degrees with the midrib), the petiolules appear to be 6--7 mm. long. Bentham (in Mart. Fl. Bras. 15 (1): 315. 1862) describes the seeds of O. nitida as bicolored. According to Harms (in Fedde Rep. Sp. Nov. 19: 288. 1924) Bentham's description refers to O. arborea (Vell.) Harms, and Ducke (Ann. Acad. Brasil Sci. 11: 187. 1939) places O. nitida in subsect. Unicolores, characterized by entirely red seeds. O. arborea, which O. bahiensis more resembles in leaflet shape, has a greater number of lateral nerves, bolder veinlets, and a more pubescent habit. Its furfuraceous indumentum consists of very short appressed hairs, much different from the pilosity of O. bahiensis. The seeds are bicolored (e.g., Hoehne 29416).

Besides O. nitida and O. arborea, four additional species are known from southern Brazil. O. fastigiata Tul. has densely tomentose leaflets with numerous lateral nerves. This is the only southern Ormosia with a distributional range embracing northern Brazil (Minas Gerais to Venezuela). O. friburgensis Glaziou & Taub. ex Harms has small leaflets 2--3.5 cm. long, 1--2 cm. wide, and large seeds, up to 25 mm. in diameter. O. Glazioviana Harms has leaflets tomentose or subtomentose be-

neath and bicolored seeds. O. minor Vogel has clearly different nervature from O. bahiensis, tomentose fruits, and bicolored seeds.

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A NEW VARIETY OF CHRYSOPHYLLUM AURATUM MIQ.

Joseph V. Monachino

The Sapotaceae, more so than other families of plants, often evince morphological characters or trends which seem to suggest almost contradictory criteria. On the one hand, small structural differences may indicate specific distinctions, and on the other hand, conspicuous characters may signify only variation or merely a varietal distinction. Some species of not too close affinity, or even different genera, simulate each other, so to make identification from incomplete material hazardous. As an example of a feature which is generally unreliable can be counted foliage indumentum, the customarily deciduous habit of which is well known. There are many instances of variation in number of flower parts and in cells of the ovary, sometimes even on the same branch. Yet it should be kept in mind that every character is sometimes diagnostic, and, as to the rest of the plant kingdom, there is no infallible rule. As a general rule, the character of pubescence on the corolla is reliable, but, as can be seen from the variety described below, it may be of less than specific importance.

CHRYSOPHYLLUM AURATUM var. GLABRIFLORUM Monachino, var. nov.

A varietate typica corolla extus glabra vel sparse strigosa recedit.

Branchlets lightly verrucose; petioles 7--18 mm. long, blades 5.5--16 cm. long, 3.2--7.8 cm. broad, closely rufous-sericeous beneath, the principal lateral nerves arcuate, well-spaced, ca. 13 pairs; pedicels ca. 5--6 mm. long; sepals orbicular-ovate, ca. 1.7 cm. long, sericeous outside, glabrous within; corolla-tube 3.3--3.7 mm. long, glabrous or very sparsely strigose outside near summit, corolla-lobes 1--1.4 mm. long; ovary sericeous; stigma-lobules 5.

Type: W. H. Camp No. E 3837, Ecuador, junction of the provinces of Guayas, Cañar, Chimborazo, and Bolívar, foothils of the western cordillera near the village of Bucay, 1000--1200 feet elevation; June 8--15, 1945; forest tree, 12 m., with milky sap, leaves deep green, nitid above, pale yellow green beneath, calyx reddish, corolla pale greenish yellow. (Deposited in the New York Botanical Garden).

C. auratum var. majus Miquel has typically strigose corollas, and the varieties acutifolium and obtusifolium of C. sericeum (placed in the synonymy of C. auratum by Cronquist) were distinguished by Miquel on the basis of leaf characters.

In the key to the South American species of Chrysophyllum in Cronquist's revision (Bull. Torr. Bot. Club 73: 289. 1946) the present variety, having a glabrous corolla, falls erroneously to C. parvulum Pittier. It is readily separated from the latter by its clearly arcuate lateral nerves, larger leaves, and more persistent pubescence on the lower surface of the leaves. However, good distinguishing characters are lacking; but this is generally true in the whole typical section of the genus, the species of which are very closely connected.

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A NEW COMBINATION IN SCHINDLERIA

Joseph V. Monachino

SCHINDLERIA DENSIFLORA (Kuntze) Monachino, comb. nov.
Rivina densiflora Kuntze, Rev. Gen. Pl. 3 (3): 268. 1898.

Only six species have hitherto been proposed in Schindleria, as follows: S. glabra H. Walter, from Peru, described in 1906; S. mollis H. Walter, Bolivia, 1909; S. racemosa (Britt. ex Rusby) H. Walter, based on Villamilla racemosa Britton ex Rusby in Mem. Torr. Bot. Club (1895) 4: 251, Bolivia; S. rivinoides (Rusby) H. Walter, based on Villamilla rivinioides Rusby (error for rivinoides), Bolivia, 1907; S. rosea H. Walter, Bolivia, 1909; S. Weberbaueri O. C. Schmidt, Peru, 1923.

Schindleria rivinoides H. Walter, with Villamilla rivinoides Rusby in synonymy, was first published in 1906, but the name was based on a cheironym: "Villamilla rivinoides Rusby! Exsicc. Boliv. Bang. no. 1292, 2607." Likewise, S. rosea, with V. rosea in synonymy. In the latter case, "Villamilla rosea" was never published by Rusby. The name appeared merely on the label of the herbarium sheet Bang 1292, and the specific part of this name was subsequently changed (probably in Rusby's own hand) to "rosea-oenia (Lem.) Rusby". The combination Villamilla rosea-oenia (Lem.) Rusby, based on Ledenbergia rosea-aenea Lem. (not Ladenbergia rosea-oenia, as spelled by Rusby), 1869, was published in 1896. The specimen Bang 1292, however, is a Schindleria, whereas Lemaire's species is Trichostigma peruvia-

num, as indicated by Walter.

As can be seen from my enumeration of the species together with their dates of publication, only Villamilla racemosa has priority over Rivina densiflora. These two species are at about opposite poles, as far as differences can be observed in a genus of very closely allied species. The black color of the dried flowers and the comparatively dense bristly indumentum of S. racemosa distinguish it rather easily from S. densiflora.

Kuntze cited two taxa under Rivina densiflora: subrosa O. Ktze. Flores subrosei, f. erecta herbacea. Bolivia: 2000 m. Santa Rosa. flavida O. Ktze. Flores flavidi, f. subscandens fruticosa. Bolivia: Tunari. I select the first cited, that from Santa Rosa, collected by Kuntze in April 1892, as the type of the species. It is deposited in the herbarium of The New York Botanical Garden.

Rivina densiflora was missed by Hans Walter in his monograph of the Phytolaccaceae in Engler's Das Pflanzenreich (1909) IV 83. The leaves are glabrous or very sparsely puberulent on the nerves beneath and the inflorescence is glabrous in the type, whereas the Tunari plant has the nerves of the underside of the leaves manifestly puberulent and the axis of the inflorescence tomentulose. S. rivinoides is close to the Tunari specimen in pubescence character. Rusby described its flower as having a reddish keel; Walter, as having "tepala.... alba". The sepals in S. Weberbaueri, a species of the glabrous kind, were described as greenish.

I have not seen sufficient material to draw a sure identity between the above three species, although I strongly suspect such specific equivalancy. The poke (Phytolacca americana L.), which is found frequently in the vicinity of New York, shows white, pinkish or greenish sepals, with obviously no diagnostic value. That the indumentum differences in the above three species is probably merely an insignificant variation is further indicated by the following three collections, which were originally distributed without names but belong somewhere in the densiflora-rivinoides-Weberbaueri group.

Steinbach 9361, Bolivia, Cochabamba, Chaparé, 26 Feb. 1929. Leaves puberulent beneath and inflorescence tomentulose, but not as densely so as in S. rivinoides.

Rosa Scolnik 906, Peru, Cuzco, Paucartambo, 950 m., 23--31 July 1948. Leaves and inflorescence glabrous.

D. McCarroll 54, Peru, Puno, Sandia, Santo Domingo area, 4 November 1939. White flowers pink-tipped. Leaves puberulent beneath, inflorescence glabrous or minutely roughened.

Bang 1292 is the type of S. rosea, and this number is cited in part by Walter in Das Pflanzenreich for S. rivinoides. The nerves on the underside of the leaves and the inflorescence of

S. rosea are puberulent; the sepals are described as rose by Walter. I am not sure that S. rosea is distinct from S. rivinoides.

I recognize the genus Schindleria principally on the authority of Walter, who first proposed it in 1906 and three years later elaborated it in his monograph of the Phytolaccaceae. The flower of Schindleria is hermaphroditic, has four sepals, irregularly disposed many stamens, a superior unilocular uniovulate ovary, penicillate stigma, and a dry fruit. Rivina has four stamens, capitate stigma, and baccate fruit. Kuntze, in 1898, transferred Villamilla racemosa to Rivina. Villamilla Ruíz & Pav. ex Moq. (=Trichostigma A. Rich.) differs from Schindleria chiefly in its baccate fruit; Ledenbergia Klotzsch ex Moq. (=Flueckigera Kuntze), in the arrangement of its stamens.

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NOTES ON NEW AND NOTEWORTHY PLANTS. XIII

Harold N. Moldenke

CALLICARPA BREVIPES f. ANNAMENSIS Moldenke, f. nov.

Haec forma a forma typica recedit laminis foliorum arcte ellipticis usque ad 15 cm. longis et 6 cm. latis minute serrulatis, ad basin attenuato-acutis.

This form differs from the typical form of the species and from the several other described forms in having its leaf-blades decidedly elliptic, the larger ones about 15 cm. long and 6 cm. wide, minutely serrulate from below the middle to below the terminal acumination, attenuate-acute at the base.

The type of this form was collected by Joseph and Mary Knapp Clemens (no. 4499) at Tourane or its vicinity, Annam, French Indochina, between May and July, 1927, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CALLICARPA FORMOSANA var. GLABRESCENS Moldenke, var. nov.

Haec varietas a forma typica speciei foliis subtus glaberrimis vel in venis majoribus sparse stellatis recedit.

This variety differs from the typical form of the species in having the lower leaf-surfaces entirely glabrous or else sparsely stellate only on the midrib and larger veins.

The type of the variety was collected by Maximo Ramos and Gregorio E. Edaño [Herb. Philippine Bureau of Science 29137] on Mount Tulaog, province of Tayabas, Luzon, Philippine Islands, in May, 1917, and is deposited in the Britton Herbarium at the

New York Botanical Garden.

CALLICARPA KINABALUENSIS Bakh., sp. nov.

Frutex vel arbor parva; ramis percrassis obtuse tetragonis permedullosis densissime hirsutis, pilis ferrugineo-fulvis; foliis oppositis magnis; petiolis percrassis densissime patenti-hirsutis; laminis crassis firme chartaceis vel subcoriaceis ellipticis vel obovatis acutis vel acuminatis dentatis, ad basin cuneatis vel rotundatis, supra densiuscule villosulo-pubescentibus, subtus densissime tomentosis, pilis ferrugineo-fulvis; inflorescentiis axillaribus, subrecurvatis cymosis ubique densissime ferrugineo-hirsutis furcatis.

Shrub about 3 feet tall or small tree; branches and stems very heavy and coarse, obtusely tetragonal, very medullose, very densely hirsute with ferruginou-fulvous hairs about 5 mm. long standing at right angles to the stem, more matted and finally even glabrescent toward the base of the plant in age; principal internodes 3--8 cm. long; nodes annulate; leaves decussate-opposite, large; petioles very stout, 2.5--3 cm. long, very densely spreading-hirsute like the branches; blades thick-textured, firmly chartaceous or subcoriaceous, elliptic or obovate, 15--30 cm. long, 7.5--11 cm. wide, acute or acuminate at the apex, dentate from near the base to just below the terminal acumination, cuneate or rounded at base, rather densely villosulous-pubescent above, less so in age, very densely matted-tomentose beneath with ferruginous-fulvous hairs; midrib very stout, flat above, very densely tomentose on both surfaces, very prominent beneath; secondaries slender, 10--12 per side, flat or slightly prominulent above, prominent beneath, arcuate-ascending, running to the margins but not anastomosing; veinlet reticulation quite abundant, obscure above, prominulous beneath, normally hidden by the dense tomentum; inflorescence axillary, 2 per node, somewhat recurved, cymose, 5--7 cm. long, much shorter than the subtending leaf, 4--6.5 cm. wide, composed normally of two lateral widely divergent branches and no terminal one, the branches stout, 1--1.5 cm. long, very densely ferruginous-hirsute like the stems, once or twice furcate, bearing 2--4 densely many-flowered subcapitate cymules; peduncles stout, 3--4 cm. long, very densely ferruginous-villous like the stems; bractlets lanceolate-ovate, 8--10 mm. long, attenuate-acute, densely ferruginous-hirsute with more or less appressed hairs; pedicels completely obscured by the dense villous hairs; calyx campanulate, about 5 mm. long, very densely hirsute with ferruginous many-celled erect hairs, its rim deeply apiculate-lobed; corolla white or cream-colored; stamens yellow; pistil white.

The type of this most remarkable species was collected by Joseph and Mary Knapp Clemens (no. 33200) at Marai Parai, Mount Kinabalu, British North Borneo, on May 22, 1933, and is depos-

ited in the Herbarium Bogoriense at Buitenzorg.

CALLICARPA LONGIPETIOLATA var. GLABRESCENS Moldenke, var. nov.

Haec varietas a forma typica speciei laminis subtus arcte argentatis sparsissime (in venis majoribus) furfuraceis recedit.

This variety differs from the typical form of the species in having its lower leaf-surfaces decidedly silvery, but only very sparsely furfuraceous on the larger venation when mature.

The type of the variety was collected by Father Morice Vanoverbergh (no. 1376) in Bontoc Subprovince, Luzon, Philippine Islands, on June 20, 1914, and is deposited in the herbarium of the Botanisch Museum at Utrecht.

CITHAREXYLUM STANDLEYI var. MEXICANUM Moldenke, var. nov.

Haec varietas a forma typica speciei recedit racemis fructiferis 3.5--8 cm. longis et laminis foliorum subtus ubique minute puberulis.

This variety differs from the typical form of the species in having its fruiting-racemes only 3.5--8 cm. long and its leaf-blades minutely puberulous throughout on the lower surface, much more densely so on the larger venation.

The type of the variety was collected by B. L. Turner (no. 2077) in gravelly-clay soil on a dry stream-bank, one mile east of La Placita, 45 air miles south of Colima, Michoacán, Mexico, on July 4, 1950, and is deposited in the herbarium of the University of Michigan.

CLERODENDRUM BAKHUIZENI Moldenke, sp. nov.

Frutex vel arbor; ramis ramulisque gracilibus griseis obtuse tetragonis dense breviterque pubescentibus, in statu senili glabrescentibus; foliis ternatis; petiolis gracillimis dense breviterque pubescentibus; laminis tenuiter chartaceis fragilibus late ellipticis vel elliptico-ovatis rotundatis vel obtusis integris, ad basin late rotundatis, supra plusminusve dense puberulis, subtus plusminusve dense puberulis vel breviter pubescentibus et impresso-punctatis; inflorescentiis terminalibus dense adpresso-puberulis.

Shrub or tree; branches and branchlets rather slender, light-gray, obtusely tetragonal, densely short-pubescent with sordid-canescent subappressed hairs, glabrescent in age; twigs very slender, very densely short-pubescent with antrorsely curved sordid hairs; nodes not ampliate, sometimes annulate; principal internodes 0.5--4.5 cm. long; leaf-scars subcircular, borne on large, very divergent and prominent corky sterigmata; leaves ternate; petioles very slender, 1--2 cm. long, densely short-pubescent like the twigs; blades thin-chartaceous, brittle when dry and rather uniformly gray-green on both surfaces, broadly elliptic or elliptic-ovate, 2.2--6.5 cm. long, 1.5--4.5 cm. wide, rounded or obtuse at the apex, entire, broad-

ly rounded to a shortly acuminate base, more or less densely puberulent above, more or less densely puberulent or short-pubescent and impressed-punctate beneath; midrib slender, flat above, prominulous beneath; secondaries very slender, 4--6 per side, arcuate-ascending, flat above, subprominulous beneath; veinlet reticulation rather sparse, mostly very obscure or indiscernible above, rather obscure or slightly subprominulous beneath; inflorescence terminal, composed of 2--6 whorls of rather few-flowered cymes mostly about 3 cm. long; peduncle much abbreviated, indistinguishable from the twigs; sympodia abbreviated, mostly 5--10 mm. long, densely appressed-puberulent; cyme-branches slender, 1--2 cm. long, densely appressed-puberulent; pedicels filiform, 1--2 mm. long, densely sordid-puberulent; bractlets narrow-elliptic or linear, 2--4 mm. long, densely brownish-puberulent; calyx narrow-campanulate, about 3 mm. long and 2 mm. wide, rather densely puberulent with twisted antrorsely subappressed sordid hairs, its rim very shortly 4-denticulate; corolla hypocrateriform, its tube 8--9 mm. long, nigrescent in drying, very minutely pulverulent on the outside, its limb suberect, the lobes 2--3 mm. long, rounded at the apex, glabrous; stamens and pistil exserted to about 2 cm.; fruiting-calyx shallowly patelliform, 10--13 mm. wide, more or less irregularly puberulent, its rim shallowly and irregularly lobed or merely sinuate; fruit drupaceous, nigrescent in drying and subglobose, 8--10 mm. long and wide, much wrinkled in drying, glabrate.

The type of this puzzling species was collected from material cultivated in the Botanical Garden at Buitenzorg, Java, during or before 1916, and is sheet no. 20766 in the Herbarium Bogoriense. The file number of the cultivated plant is Hort. Bog. XV. L.11. The plants at Buitenzorg were received as and cultivated as "Clerodendron glaucum Wall." and it may well be that this nomen nudum of Wallich (ex Steud., Nomencl. Bot., ed. 2, 1: 383. 1840) is to be reduced to synonymy here. In 1919 the distinguished taxonomist, Reinier Cornelis Bakhuizen van den Brink, Sr., who has done such noteworthy and splendid revisionary work in this family and to whom the species is respectfully dedicated, regarded it as C. emirnense Bojer, native to Madagascar. In 1924 he decided that it was not that species, but was C. tomentosum (Vent.) R. Br., native to tropical Australia and New Guinea.

This plant is not C. emirnense, because that species, even in its var. diffusum (which has somewhat similar inflorescence) has smaller glabrous leaves. It is not C. tomentosum because in that species the calyx and fruiting-calyx are 5-fid and the corolla is smaller. It somewhat resembles C. aculeatum var. gracile Griseb. & Moldenke, which, however, has spinose stems and narrower leaves. Its ternate leaf arrangement reminds one

of C. molle H.B.K., C. margaritense Moldenke, and C. ternifolium var. mexiae Moldenke, but in all those the calyx-rim is deeply lobed and flaring. Similarly, C. hircinum Schau., C. glabrum var. ovale (Klotzsc) H. H. W. Pearson and var. pubescens Thomas, which it resembles in habit, have elongated calyx-lobes. In C. pyrifolium J. G. Baker and C. sakaleonense Moldenke the leaves are glabrous, as they are also in C.heterophyllum (Poir.) R. Br., some forms of which our plant resembles. It bears striking resemblance to C. rehmanni Gürke, but in that species the calyx is decidedly villous. C. perrieri var. laxicymosum Moldenke is similar, but has larger leaves and the pubescence on pedicels and calyx wide-spreading. It comes closest of all to C. premnoides Moldenke, of Madagascar, in which, however, the leaf-blades are thinner in texture, only sparsely strigillose beneath, the calyx and corolla smaller, and the corolla-tube plainly pilose on the outside.

CLERODENDRUM BRACTEATUM var. BÜNNEMEIJERI Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum subtus glabratis vel glabrescentibus, tubis corollae sparse strigilloso-pilosis, et lobis calycis perspicue ellipticis, marginibus recurvatis.

This variety differs from the typical form of the species in having the leaf-blades glabrate or glabrescent beneath, the corolla-tubes sparsely strigillose-pilose, and the calyx-lobes conspicuously elliptic (instead of ovate) and with recurved margins.

The type of the variety was collected by H. A. B. Bünnemeijer (no. 8869) -- in whose honor it is named -- at G. Koerintji, at an altitude of about 1770 m., on the west coast of Sumatra, on March 15, 1920, and is deposited in the herbarium of the Botanisch Museum at Utrecht.

CLERODENDRUM BUCHANANI f. ALBUM Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Oene Posthumus (no. 730) near Bangko, at an altitude of 180 m., Sumatra, on August 18, 1925, and is deposited in the Herbarium Bogoriense at Buitenzorg.

CLERODENDRUM BUCHANANI f. BREVIFLORUM Moldenke, f. nov.

Haec forma a forma typica speciei tubis corollae usque ad 1 cm. longis recedit.

This form differs from the typical form of the species in having its corolla-tubes only 1 cm. long or less during anthesis.

The type of this form was collected by Ilse Rensch-Maier (no. 294) at Sembaloen, Lombok, Lesser Sunda Islands, on April 7, 1927, and is deposited in the Herbarium Bogoriense at Buitenzorg.

CLERODENDRUM BUCHANANI var. GLABRUM (H. J. Lam) Moldenke, comb. nov.

Clerodendron blumeanum var. glabrum H. J. Lam, Verbenac. Malay Arch. 302. 1919.

CLERODENDRUM CERAMENSE Moldenke, sp. nov.

Arbor; ramulis densissime flavo-lanuginosis, pilis subadpressis antrorsis; petiolis crassiusculis densissime flavo-lanuginosis; laminis submembranaceis ovatis acuminatis integris, ad basin rotundatis vel subtruncatis, supra densiuscule breviterque pubescentibus, subtus perdensioribus; inflorescentiis paniculatis ad apicem ramulorum aggregatis ubique dense flavo-pubescentibus; calice profunde 5-lobato dense pubescente.

Tree, about 6 m. tall; branchlets medium-stoutish, obtusely tetragonal, very densely yellow-lanuginous with more or less subappressed antrorse hairs; nodes not annulate; principal internodes 4--8 cm. long; leaves decussate-opposite; petioles rather stout, 4--8.5 cm. long, very densely yellow-lanuginous with subappressed antrorse hairs; blades submembranous, dark green on both surfaces, ovate, 12--18 cm. long, 8.5--11 cm. wide, acuminate at the apex, entire, rounded or subtruncate at the base, rather densely short-pubescent above, much more densely so beneath; midrib stoutish, prominent beneath, mostly flat and densely pubescent above; secondaries slender, 5 or 6 per side, ascending, very slightly arcuate, mostly flat above and prominulous beneath; veinlet reticulation abundant, the tertiaries numerous and subparallel; inflorescence aggregated at the ends of the branchlets, paniculate, densely yellow-pubescent throughout; bracts numerous, elliptic, 1.4--2.8 cm. long, 5--10 mm. wide, densely yellowish-puberulent on both surfaces, stipitate, obtuse at the base, acuminate at the apex, not obscuring the flowers in any way; cymes densely many-flowered, several times dichotomous; calyx campanulate, about 1 cm. long or slightly less, very densely short-pubescent throughout with yellowish-brown hairs, its rim deeply 5-lobed, the lobes ovate, 4--6 mm. long, acuminate at the apex; corolla white, its tube very narrow, 2--3 cm. long, very sparsely puberulous-pilosulous on the outside, the limb 5-lobed, the lobes 5--7 mm. long, rounded at the apex, rather densely pilosulous on the outside; stamens and pistil exserted about 1.5 cm. from the corolla-mouth.

The type of this species was collected by Louis Martin Robert Rutten (no. 1865) at Vai-veti, Kawagebied, on western Ceram, on November 10, 1918, and is deposited in the Herbarium

Bogoriense at Buitenzorg. The species was originally identfied at Buitenzorg as C. cunninghamii and later as C. macrostegium. C. macrostegium, however, has very large and broad bracts which hide the flowers, and C. cunninghamii has narrower and longer calyxes. C. macrocalyx H. J. Lam differs at once in its much larger calyxes and C. lanuginosum Blume in its shorter corolla-tubes. The new species is perhaps most closely related to C. philippinense Elm., which also seems to have uniformly shorter corollas.

CLERODENDRUM DISCOLOR var. MACROCALYX Moldenke, var. nov.

Haec varietas a forma typica speciei recedit calicibus late campanulatis 7--9 mm. longis latisque, lobis arcte rubro-tinctis pubescentibus et foliis decussato-oppositis.

This variety differs from the typical form of the species in having its calyxes at time of anthesis broadly campanulate, 7--9 mm. long and wide, decidedly red-tinged on the lobes, pubescent, and the leaves decussate-opposite.

The type of the variety was collected by P. Quarré (no. 1872) at Mimanua, Belgian Congo, in August, 1929, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM DISCOLOR var. RUBRICALYX Moldenke, var. nov.

Haec varietas a forma typica speciei calicibus rubris 3--4 mm. longis, 4--6 mm. latis, pubescentibus recedit.

This variety differs from the typical form of the species in having decidedly red calyxes during and after anthesis, 3--4 mm. long, 4--6 mm. wide pubescent; the leaves are ternate.

The type of the variety was collected by Rossignol (no. 218) at Iurala, altitude 2000 m., Belgian Congo, on November 25, 1939, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM FAULKNERI Moldenke, sp. nov.

Frutex; ramis crassiusculis fistulosis griseis striatis glabris; ramulis fistulosis glabris nigrescentibus; petiolis obsoletis vel brevibus et alatis; laminis membranaceis oblanceolatis rotundatis vel subacutis serratis, ad basin longiter attenuatis, utrinque glabris; inflorescentiis terminalibus paniculatis anguste cylindraceis ubique glabris.

A large bush; branches rather stout, hollow, gray, striate, glabrous, the bark with a curious mesh-like texture under a hand-lens; branchlets slender or stout, hollow, often collapsing in drying, nigrescent in drying, glabrous; nodes not annulate; principal internodes 5--10 cm. long; leaves decussate-opposite, usually borne only on the young branchlets at time of anthesis; petioles obsolete or short and winged, usually merg-

ing so gradually into the lamina as to be difficult to distinguish; blades membranous, bright-green, lighter beneath, oblanceolate, 12--14 cm. long, 2.5--4 cm. wide, rounded or subacute at the apex, long-attenuate into the petiole at the base, shallowly serrate from about the middle to the apex with low rounded teeth, glabrous on both surfaces; midrib slender, flat above, prominulous beneath; secondaries very slender, 4--6 per side, arcuate-ascending, indistinctly anastomosing beneath, flat or obscure above, prominulous beneath; veinlet reticulation sparse, mostly obscure above, flat beneath; inflorescence terminal, a narrow-cylindric panicle composed of 5--10 pairs of dense fascicles of flowers; peduncles similar to the adjacent branchlet, mostly hollow, nigrescent in drying, glabrous, often very stout, 7--11 cm. long; sympodia similar to the peduncles in all respects, sometimes elongated to 7 cm. in fruit, glabrous, nigrescent, unbranched; pedicels filiform, about 5 mm. long, compressed, glabrous, issuing directly from the nodes of the inflorescence-axis, in fascicles of about ten; bractlets lanceolate, 7--12 mm. long, acuminate, glabrous; calyx campanulate, 5--6 mm. long, glabrous, deeply 4-lobed to about the middle, the lobes ovate-oblong, acute; corolla rich-purple and pale-green, strongly zygomorphic, about 1.5 cm. long; stamens long-exserted, about 2 cm. long, strongly arched; fruiting-calyx cupuliform or patelliform, only slightly incrassate, often reflexed or variously shriveled, about 1.5 cm. wide, glabrous, deeply triangular-lobed to the middle or beyond; fruit drupaceous, about 7 mm. long and 10 mm. wide, deeply 4-lobed or (by abortion) 2- or 3-lobed, glabrous, wrinkled, consisting of 4 (or by abortion 2 or 3) nutlets.

The type of this species was collected by H. Faulkner (Kew 115; drawing 536), moderately common in open forest and plantation, Namagoa Estate, Lugela to Mocuba, Quelimane district, Portuguese East Africa, in December, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CLERODENDRUM KIBWESENSE Moldenke, sp. nov.

Frutex; ramulis obscurissime tetragonis pulverulo-puberulis; petiolis gracilibus piloso-pubescentibus; laminis membranaceis ellipticis rotundatis et brevissime apiculatis integris vel subintegris, ad basin acutis, utrinque densiuscule breviterque pubescentibus; inflorescentiis terminalibus paniculatis.

Shrub to 3 m. tall; branchlets slender, very obscurely tetragonal, very lightly pulverulent-puberulous, more densely so on the youngest parts; principal internodes 2--6 cm. long; nodes only faintly annulate or not annulate; leaves decussate-opposite; petioles very slender, 1--1.5 cm. long, pilose-pubescent with brownish hairs; blades membranous, somewhat lighter beneath, brunnescent in drying, elliptic, 4--6 cm. long, 1.5--3 cm. wide, rounded to a very slight apiculation at the apex, a-

cute at the base, entire or subentire, rather densely short-pubescent on both surfaces; midrib slender, prominent beneath; secondaries filiform, few, mostly about 4 per side, distant, arcuate-ascending, flat above, very slightly subprominulous beneath; veinlet reticulation abundant but rather obscure on both surfaces; inflorescence terminal, paniculate, consisting of 1 or 2 pairs of lateral and a terminal cyme; peduncle slender, obscurely tetragonal, very finely puberulous, 2.5--4 cm. long; sympodia and inflorescence-branches very slender, often stramineous, sulcate or compressed, microscopically puberulous or glabrescent; pedicels filiform, about 1 mm. long, microscopically puberulous; calyx campanulate, about 2 mm. long, microscopically puberulous or glabrate, its rim deeply 5-lobed, the lobes about as long as the tube; corolla very small, about 4 mm. long; fruiting-calyx broadly campanulate, about 3 mm. long and 4 mm. wide, minutely puberulous, its lobes ovate, erect-spreading, acute.

The type of this species was collected by Georg Scheffler (no. 62) on a sunny thick bush steppe, on red laterite soil, at Kibwesi, Ukambani, at an altitude of about 1000 m., Tanganyika Territory, on January 28, 1906, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. The plant has much of the aspect of a Premna, but was placed by Berthold Thomas in "Clerodendrum cfr. Sektio Microcalyx".

CLERODENDRUM LANUGINOSUM var. ADPRESSIPILUM Moldenke, var. nov.

Haec varietas a forma typica speciei pilis calicis arcte adpressis recedit.

This variety differs from the typical form of the species only in having the dense pubescence closely appressed to the calyx.

The type of the variety was collected by Adolph Daniel Edward Elmer (no. 13559) at Cabadbaran, Mount Urdaneta, province of Agusan, Mindanao, Philippine Islands, in August, 1912, and is deposited in the Herbarium Bogoriense at Buitenzorg.

CLERODENDRUM LEPARENSE Moldenke, sp. nov.

Arbor alta; petiolis immaturis densissime flavo-tomentoso-pubescentibus; laminis immaturis chartaceis ellipticis longe apiculatis integris, ad basin obtusis, supra parciuscule pilosulis, subtus densiuscule flavo-puberulis; inflorescentiis ut videtur axillaribus vel forsitan terminaliter aggregatis, cymis trifloris; calice tubuloso-campanulato dense puberulo-piloso.

Tall tree; only the very small leaves from directly beneath the inflorescence known, these have their petioles 8--11 mm. long, very densely yellow tomentose-pubescent, the blades chartaceous, elliptic, 1.7--4 cm. long, 7--14 mm. wide, entire, obtuse at the base, long-apiculate at the apex, rather sparsely pilosulous on the upper surface (more densely so on the midrib),

rather densely yellow-puberulous beneath, especially on the midrib, the apiculum densely yellowish-puberulent; inflorescence apparently axillary, surpassing the subtending leaves, possibly aggregated in a dense terminal cluster, each cyme apparently 3-flowered, borne on a stout medullose peduncle which is 3--5 cm. long and densely yellowish-short-pubescent, the 3 branches 1 cm. long, the pedicels about 1 cm. long, exactly similar to the inflorescence-branches in texture, color, and pubescence; calyx tubular-campanulate, 13--15 mm. long, 6--8 mm. wide, nigrescent, densely puberulent-pilose, its rim 5-lobed, the lobes ovate, 4--5 mm. long, gradually attenuate to the apex.

The type was collected by H. A. B. Bünnemeijer (no. 2414) on Lepar, near Banka, Molucca Islands, on December 12, 1917, and is deposited in the Herbarium Bogoriense at Buitenzorg. Bakhuizen van den Brink, in his revision of the group in 1920, annotated this specimen as C. lanuginosum Blume, from which it differs widely. In fact, with the material so fragmentary it is difficult to be certain of the taxonomic disposition of the plant. It is to be hoped that a new expedition to this island may bring forth more complete material.

CLERODENDRUM LEPRIEURI Moldenke, sp. nov.

Frutex; ramulis gracilibus obscure tetragonis dense ferrugineo- vel fulvo-villosis; petiolis dense ferrugineo-villosis; laminis tenuiter chartaceis ovato-ellipticis acuminatis integris, ad basin rotundatis vel cordatis, supra parciuscule longeque pilosis, subtus densissime ferrugineo-tomentosis.

Shrubby; branchlets slender, very obscurely tetragonal, densely villous with ferruginous or fulvous hairs, more densely so on the younger parts; principal internodes 1.8--3.5 cm. long; nodes not annulate; leaves decussate-opposite; petioles medium-slender, densely ferruginous-villous, 3--10 mm. long, borne on stiff spine-like sterigmata 2--6 mm. long; blades thin-chartaceous, bright-green above, lighter beneath, ovate-elliptic, 3--8 cm. long, 2--4.3 cm. wide, acuminate at the apex, entire, rounded or cordate at the base, rather sparsely long-pilose above, very densely ferruginous-tomentose beneath; midrib slender, flat or subimpressed above, prominulous beneath; secondaries slender, 6--8 per side, arcuate-ascending, flat or subimpressed above, prominulous beneath, anastomosing near the margins; veinlet reticulation rather abundant, obscure above, hidden by the tomentum beneath; inflorescence terminal, capitate or subcapitate, densely many-flowered, about 2 cm. long and 2--3 cm. wide; peduncles and inflorescence-branches abbreviated, densely ferruginous-villous; pedicels 1 mm. long or obsolete, ferruginous-villous; bractlets linear or filiform, 5 mm. long or longer, villous; calyx campanulate, about 3 mm. long, nigrescent, sparsely villous, its rim with 4 elongate-

filiform lobes about 3 mm. long, villous; corolla about 1 cm. long, its limb about 5 mm. wide.

The type of this species was collected by F. R. Leprieur in Gambia in about 1830, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

CLERODENDRUM LONGIFLORUM var. PUBESCENS Moldenke, nom. nov.

Clerodendron longituba Valet., Bull. Dep. Agric. Indes Neerl. 10: 52. 1907 [not Clerodendron longitubum De Wild. & Th. Dur., Compt. Rend. Soc. Roy. Bot. Belg. 39: 74. 1900].

CLERODENDRUM MYRICOIDES var. CHARTACEUM Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum parvioribus plerumque 1.5--5 cm. longis et 1--2.5 cm. latis, subtus in venis majoribus floccoso-tomentellis, chartaceis et firmioribus, marginibus saepe subrevolutis, cymis paucifloris sed in axillis superioribus numerosissimis.

This variety differs from the typical form of the species in having its leaf-blades smaller, mostly 1.5--5 cm. long and 1--2.5 cm. wide, floccose-tomentellous on the larger venation beneath, chartaceous and in general firmer in texture, with the margins often subrevolute, and the cymes few-flowered but very abundant in the upper axils of numerous twigs and branchlets.

The type of the variety was collected by Edgar Alexander Yearns (no. 1101) in the vicinity of Thika, Uganda, at an altitude of about 1350 m., on September 6 or 7, 1909, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CLERODENDRUM PHYLLOMEGA var. MYRMECOPHILUM (Ridl.) Moldenke, comb. nov.

Clerodendron myrmecophila Ridl., Journ. Bot. 33: 42. 1895.

CLERODENDRUM SERRATUM var. AMPLEXIFOLIUM Moldenke, var. nov.

Haec varietas a forma typica speciei foliis sessilibus, ad basin plusminusve amplexicaulibus, saepe ternatis recedit.

This variety differs from the typical form of the species in having its leaves sessile, more or less amplexicaul-clasping at the base, and often ternate.

The type of this variety was collected by Augustine Henry (no. 10077a) at Mengtse, Yünnan, China, and is deposited in the herbarium of the New York Botanical Garden. The flowers are described as white by the collector, blooming at the end of August. The bracts at the base of the inflorescence-branches are often much enlarged and the panicle-branches much elongated and large-bracted. The collector records the common name "ma-to-lo."

CLERODENDRUM SPECIOSISSIMUM f. ALBUM Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in

having its corollas white.

The type of the form was collected by Reinier Cornelis Bakhuizen van den Brink, Jr. (no. 3608) in the "Wildernis" at Buitenzorg, Batavia, Java, at an altitude of 250 m., on March 15, 1925, and is deposited in the Herbarium Bogoriense at Buitenzorg.

CLERODENDRUM SUMATRANUM Moldenke, sp. nov.

Arbor vel frutex; ramis ramulisque gracilibus densiuscule brunneo-pubescentibus glabrescentibus obtuse tetragonis sulcatis; petiolis gracillimis dense brunneo-pubescemtibus; laminis tenuissime membranaceis fragilibus elliptico-obovatis vel ellipticis acuminatis integris, ad basin acutis, utrinque dense puberulis; inflorescentiis terminalibus ubique dense breviterque puberulis vel breviter pubescentibus.

Tree or shrub; branches and branchlets slender, rather densely pubescent with brownish hair, glabrescent in age, obtusely tetragonal, mostly sulcate between the angles; nodes not annulate; principal internodes 3--13 cm. long; leaves decussate-opposite; petioles very slender, 1--8 cm. long, densely brown-pubescent; blades very thin-membranous, fragile, often brunnescent in drying, elliptic-obovate or elliptic, 10--23 cm. long, 4.5--7 cm. wide, entire, acuminate at the apex, acute at the base, densely puberulent on both surfaces; midrib rather slender, flat above, prominent beneath; secondaries very slender, 4--6 per side, arcuate-ascending, rather irregular; tertiaries rather conspicuous beneath but not prominent; veinlets sparse, irregular, flat on both surfaces; inflorescence terminal, composed of 7--9 cymes, densely brown-puberulent or short-pubescent throughout;peduncles obtusely tetragonal and sulcate like the branchlets, 3--5 cm. long, densely brown-pubescent; sympodia 1.5--3.5 cm. long, similar in all respects to the peduncle; bracts foliaceous, elliptic, 1.5--10 cm. long, 0.5--2.4 cm. wide, stipitate, resembling the leaves in all respects but smaller, sometimes considerably reduced, a pair beneath each pair of cymes; pedicels filiform, 5--13 mm. long, densely spreading-pubescent or villous with brown many-celled hairs; calyx campanulate, densely brown-pubescent or villosulous with many-celled hairs like the pedicels, 5-fid almost to the base, the segments narrow-lanceolate, 7--8 mm. long, usually less than 1 mm. wide, attenuate at the apex; corolla hypocrateriform, white, the tube very narrowly cylindric, 1.7--2 cm. long, densely spreading-villous on the outside like the calyx, its limb 5-fid, the segments oblanceolate, about 7 mm. long, 1.6--2 mm. wide, obtuse at the apex, densely spreading-villous on the back; stamens usually exserted about 6 mm. from the corolla-mouth, glabrous; anthers elliptic, about 2 mm. long, opening by longitudinal slits; pistil exserted about 1 cm. from the corolla-mouth, glabrous.

The type of this species was collected by Cornelia Nicolaas Abraham de Voogd (no. 595) at Kepahiang, Benkoelen Reservation, Sumatra, on February 26, 1931, and is deposited in the Herbarium Bogoriense at Buitenzorg.

FARADAYA DIMORPHA var. CAULIFLORA Moldenke, var. nov.

Haec varietas a forma typica speciei inflorescentiis cauliflorís recedit.

This variety differs from the typical form of the species in havings its inflorescences cauliflorous rather than terminal and axillary.

The type of the variety was collected by Leonard John Brass (no. 7427) at Oroville Camp, 30 miles above D'Albertis Junction on the Fly River, Papua, in August, 1936, and is deposited in the Rijksherbarium at Leiden. The collector describes the plant as a large canopy liana with white malodorous flowers.

FARADAYA NEO-EBUDICA var. DEGENERI Moldenke, var. nov.

Haec varietas a forma typica speciei recedit pedunculis ramisque inflorescentiae pedicellisque calyceque glaberrimis et laminis foliorum regulariter angusto-ellipticis.

This variety differs from the typical form of the species in having its peduncles, inflorescence-branches, pedicels, and calyx completely glabrous and its leaf-blades more regularly narrow-elliptic.

The type of the variety was collected by Otto Degener and Emilio Ordonez (no. 13762) in the forest at an altitude of 30--30 m. at the Suva Pumping Station, Naitasiri province, Viti Levu, Fiji Islands, on December 15, 1940, and is deposited in the Britton Herbarium at the New York Botanical Garden.

FARADAYA NEO-EBUDICA var. PUBERULENTA (Moldenke) Moldenke, comb. nov.

Faradaya vitiensis var. puberulenta Moldenke, Phytologia 3: 60--61. 1949.

FARADAYA OVALIFOLIA var. GLABRA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit pedunculis ramisque inflorescentiae pedicellisque calyceque glaberrimis, tubis corollae crassis ca. 6 cm. longis et 3--4 mm. latis, limbo corollae 2.5 cm. lato, et laminis foliorum angusto-ellipticis firmioribus.

This variety differs from the typical form of the species in having its peduncles, inflorescence-branches, pedicels, and calyx completely glabrous, the corolla-tube heavy-textured, about 6 cm. long and 3--4 mm. wide, the corolla-limb 2.5 cm. wide, and the leaf-blades more narrowly elliptic and firmer in texture.

The type of this variety was collected by John Wynn Gilles-

pie (no. 3513) in the vicinity of Nasinu, at an altitude of 150 m., nine miles from Suva, Naitasiri province, Viti Levu, Fiji Islands, on October 24, 1927, and is deposited in the Britton Herbarium at the New York Botanical Garden.

FARADAYA SALOMONENSIS (Bakh.) Moldenke, comb. nov.
Faradaya amicorum var. salomonensis Bakh., Journ. Arnold Arb. 16: 71--72. 1935.

GMELINA MISOOLENSIS Moldenke, sp. nov.
Arbor; ramis ramulisque crassiusculis glabratis; petiolis graciusculis glabris nigrescentibus; foliis coriaceis utrinque pernitidis ellipticis integris rotundatis vel obtusis saepe subrevolutis, ad basin acuminatis, utrinque glaberrimis;inflorescentiis racemoso-paniculatis ubique brunnescentibus vel nigrescentibus glabris.

Tree to 12 m. tall; trunk to 12 cm. in diameter; branches and branchlets rather stout, glabrate, often white- or gray-flecked; principal internodes 1--7 cm. long; nodes not annulate; leaves decussate-opposite; petioles rather slender, nigrescent in drying, 1.5--2.5 cm. long, glabrous, flattened above; blades coriaceous, bright-green and very shiny on both surfaces, elliptic, 5.5--12 cm. long, 3--6 cm. wide, rounded or obtuse at the apex, entire, often somewhat revolute in drying, acuminate at the base, very smooth on both surfaces; midrib rather coarse, flat above, very prominent beneath; secondaries very slender, 4--6 per side, arcuate-ascending, anastomosing in many loops several mm. from the margins beneath, flat above, prominulous beneath; veinlet reticulation sparse, flat above, very slightly subprominulous beneath on the larger parts only; inflorescence racemose-paniculate, terminating short axillary twigs, 9--18 cm. long, 2--3 cm. wide, brunnescent or nigrescent throighout in drying; peduncles slender, 2--3.5 cm. long, glabrous; rachis similar to the peduncle, greatly elongated, composed of 5--10 sympodia, strict, glabrous; pedicels very slender, about 2 mm. long, glabrous; flowers not seen; fruiting-calyx campanulate, about 3 mm. long and 5 mm. wide, nigrescent, glabrous, truncate, split to the base into 2 subequal truncate quadrate lobes when mature; fruit drupaceous, obovate, green when young, red when ripe, about 12 mm. long and 6 mm. wide (when immature).

The type of this very distinct species was collected by Didit Rudolf Pleyte at Fakal, Misool Island, near New Guinea, on September 30, 1948, and is deposited in the Herbarium Bogoriense at Buitenzorg.

GMELINA PALAWENSIS var. NOVOGUINEENSIS Moldenke, var. nov.
Haec varietas a forma typica speciei recedit laminis foliorum firme coriaceis ellipticis, ad basin rotundatis et glandis

maximis orchidaceis ornatis.

This variety differs from the typical form of the species in having its leaf-blades firmly coriaceous, elliptic, rounded at the base, and marked at the very base with two very large and prominent orchidaceous glands.

The type of this variety was collected at Morobe, Morobe district, Northeastern New Guinea, and is number N.G.F. 2922 of the Herbarium of the Department of Forests, Lae, New Guinea, deposited in the Herbarium Bogoriense at Buitenzorg.

HYACINTHUS ORIENTALIS f. PLENIFLORUS Moldenke, f. nov.

Haec forma a forma typica speciei floribus plenis recedit.

This form differs from the typical form of the species in having "doubled" flowers.

The type of the form was collected by H. N. Moldenke (no. 3131) from cultivated material at Watchung, Somerset Co., New Jersey, on March 30, 1927, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CNIDOSCOLUS TEPIQUENSIS (Costantin & Gallaud) Moldenke, comb. nov.

Jatropha tepiquensis Costantin & Gallaud, Rev. Gén. de Bot. 18: 391. 1906.

LANTANA LEPRIEURI Moldenke, sp. nov.

Frutex; ramulis gracilibus obtuse tetragonis apicem versus parce hirsutulis, pilis interdum glanduliferis; foliis parvis; petiolis gracilibus hispidulo-pubescentibus; laminis chartaceis rigidis perfragilibus ovatis acutis vel obtusis regulariter serratis, ad basin acutis vel acuminatis, supra breviter hispidulis (pilis ad basin bulbosis), subtus plusminusve dense puberulo-pilosis.

Shrub; branchlets slender, obtusely tetragonal, sparsely hirsutulous toward the apex, glabrescent in age, the younger portions also with very short gland-tipped hairs interspersed among the longer sharp-pointed ones; principal internodes 1.5--4 cm. long; nodes annulate; leaves decussate-opposite, small; petioles very slender, 2--5 mm. long, hispidulous-pubescent; blades chartaceous, stiff, very brittle, gray-green, ovate, 1.5--2.7 cm. long, 1.2--2 cm. wide, acute or obtuse at the apex, regularly serrate, acute or acuminate at the base, short-hispidulous above with bulbous-based hairs, more or less densely puberulent-pilose beneath; midrib slender, impressed above, prominulous beneath; secondaries very slender, impressed above, prominulous beneath, about 5 per side, arcuate-ascending, not anastomosing, not entering the teeth, usually bifurcate at the end and each branch ending in a sinus; veinlet reticulation very abundant and conspicuous, impressed above, prominent beneath; inflorescence axillary, opposite, solitary in each axil,

shorter than or subequaling the subtending leaf, about 2 cm. long; peduncles slender, 11--12 mm. long when mature, pilose; flowers not seen.

The type of this species was collected by F. R. Leprieur from cultivated material in Senegal in 1830 and is deposited in the Reichenbach filius herbarium (sheet no. 127800) at the Naturhistorisches Museum in Vienna.

LATHYRUS ODORATUS f. PLENIFLORUS Moldenke, f. nov.

Haec forma a forma typica speciei corollis plenis recedit.

This form differs from the typical form of the species in having its corollas "doubled".

The type of the form was collected by H. N. Moldenke (no. 14540) in greenhouse cultivation at the Bronx, Bronx Co., New York, on May 1, 1943, and is deposited in the Britton Herbarium at the New York Botanical Garden.

LIPPIA CONTROVERSA var. BREVIPEDUNCULATA Moldenke, var. nov.

Haec varietas a forma typica speciei pedunculis usque ad 1 cm. longis recedit.

This variety differs from the typical form of the species in having the peduncles under mature heads only 1 cm. long or less.

The type of the variety was collected by Edward Johnston Alexander (no. 192) on a riverbank at Nizanda, Oaxaca, Mexico, and is deposited in the Britton Herbarium at the New York Botanical Garden.

PAEPALANTHUS PUNGENS var. BREVIFOLIUS Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis 1--4 cm. longis in statu juvenili densissime villosis et pedunculis 6--8 cm. longis.

This variety differs from the typical form of the species in having its leaves only 1--4 cm. long and very densely villous when young and the peduncles only 6--8 cm. long.

The type of the variety was collected by Erik Leonard Ekman (no. 2341, in part) in "charrasco" near Río Piloto, Sierra de Nipe, Oriente, Cuba, on July 30, 1914, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

PHYLA LANCEOLATA f. AHLESII Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis et bracteolis viridibus recedit.

This form differs from the typical form of the species in having white (not pink) corollas and green (not purple) bractlets.

The type of the form was collected by Harry E. Ahles (no. 2560) in a pasture four miles south of Beaverville, Iroquois Co., Illinois, on August 5, 1950, and is deposited in the her-

barium of the University of Illinois at Urbana. The collector states that approximately fifty percent of the material of this species at this locality was of this form, but he has not seen it anywhere else in his considerable collecting experience.

TEIJSMANNIODENDRON HOLOPHYLLUM var. PUBESCENS Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis subtus densiuscule ferrugineo-pubescentibus.

This variety differs from the typical form of the species in having the lower leaf-surfaces rather densely ferruginous-pubescent, especially on the larger venation; the leaf-blades, also, seem to be more conspicuously bullate.

The type of the variety was collected by C. J. van der Zwaan (no. 609) at Berouw, Borneo, on October 25, 1927, and is deposited in the Herbarium Bogoriense at Buitenzorg.

TEIJSMANNIODENDRON SIMPLICIFOLIUM var. KOSTERMANSI Moldenke, var. nov.

Haec varietas a forma typica speciei petiolis et apicibus ramulorum dense ferrugineo-hirsutis recedit.

This variety differs from the typical form of the species in having its petioles and the tips of the branchlets densely ferruginous-hirsute, the hairs eventually wearing off.

The type of the variety was collected by C. J. van der Zwaan (no. 1074) at Berouw Betemoean, southeastern Borneo, on May 28, 1934, and is deposited in the Herbarium Bogoriense at Buitenzorg. Dr. Kostermans in Reinwardtia 1: 96 (1951) suggested that this plant might represent even a new species related to T. simplicifolium.

TEIJSMANNIODENDRON KOSTERMANSI Moldenke, sp. nov.

Arbor; ramulis gracilibus ferrugineo-pubescentibus glabrescentibus; nodis tumidis annulatis valde articulatis; foliis trifoliolatis; petiolis ferrugineo-pubescentibus, supra valde canaliculatis; petiolulis crassis ferrugineo-pubescentibus, ad basin ampliatis, supra canaliculatis; laminis subcoriaceis obovato-oblongis breviter acuminatis integris, ad basin acutis vel cuneatis, supra glabris, subtus dense ferrugineo-pubescentibus.

Tree; branchlets slender, rusty-pubescent when young, glabrescent in age; dead bark smooth, gray, 0.5 mm. thick; living bark 7 mm. thick, yellow in cross-section; sapwood white; heartwood lacking; principal internodes 6--10 cm. long; nodes swollen, annulate, very distinctly articulated; leaves 3-foliolate; petioles medium-stoutish, 3--5.5 cm. long, rusty-pubescent, deeply canaliculate above; petiolules stout, 1--2 cm. long, rusty-pubescent, widened at the base, canaliculate above; leaflets subcoriaceous, light-green on both surfaces, obovate-oblong, 8--20 cm. long, 3--10 cm. wide, short-acuminate at the

apex (the acumination itself obtuse), entire, acute or cuneate at the base, smooth and dull gray above in drying, very densely pubescent beneath with rust-colored hairs; midrib flat above and strongly prominent beneath; secondaries slender, 4--7 per side, flat and obscure above, prominent beneath, arcuate-ascending, not anastomosing; veinlet reticulation indiscernible above, the larger portions prominulous beneath, abundant; flowers and fruit unknown.

The type of this species was collected by Lot Obi (no. 75) near Matara Djaän, at an altitude of 100 m., Puruktjau subdivision, southern Borneo, on October 20, 1926, and is deposited in the Herbarium Bogoriense at Buitenzorg.

TEIJSMANNIODENDRON UNIFOLIOLATUM (Merr.) Moldenke, comb. nov.

Vitex unifoliolata Merr., Philipp. Journ. Sci. 20: 438--439. 1922.

VERBENA CLAVATA var. CASMENSIS Moldenke, var. nov.

Haec varietas a forma typica speciei foliis plerumque in siccitate nigrescentibus ca. 3 mm. latis duntaxat leviter revolutis, pilis utrinque brevibus irregulariter patentibus contortis, recedit.

This variety differs from the typical form of the species in having its leaves mostly nigrescent in drying, about 3 mm. wide, with short irregularly spreading and twisted hairs on both surfaces, only very slightly revolute.

The type of the variety was collected by Ramon Ferreyra (no. 8031) on a sandy hillside at Lomas de Casma, province of Santa, Ancash, at an altitude of 250--300 m., Peru, on September 9, 1950, and is deposited in the United States National Herbarium at Washington. It is described by the collector as suffrutescent, with fragrant lilac flowers. Its leaves resemble those of V. trifida H.B.K. in width and color, but the spreading, rather than closely appressed, pubescence distinguishes our plant from this species and from the typical form of V. clavata at once.

VITEX AGELAEIFOLIA var. RUFULA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit petiolis petiolulisque pedunculisque rhachideque inflorescentiae pedicellisque bracteolisque densiuscule rufo-puberulis vel breviter pubescentibus, pilis multicellulosis.

This variety differs from the typical form of the species in having its petioles, petiolules, peduncles, inflorescence-rachis, pedicels, and bractlets rather densely rufous-puberulent or short-pubescent with wide-spreading many-celled hairs.

The type of the variety was collected by Overlaet (no. 1263) in the gallery forest at Kapanga, Belgian Congo, in March, 1934, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

VITEX AGNUS-CASTUS var. PSEUDO-NEGUNDO f. ALBIFLORA Moldenke, f. nov.

Haec forma a forma typica speciei et varietatis corollis albis recedit.

This form differs from the typical form of the variety and species in having white corollas.

The type of the form was collected by John Edward Dinsmore (no. 172f) near water at Jesr-ul-Ghajir, at an altitude of 160 m., Dead Sea, Israel, on September 24, 1921, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

VITEX ALTMANNI Moldenke, sp. nov.

Arbor vel frutex; ramis crassiusculis griseis obtuse tetragonis minute puberulis deinde glabrescentibus; sarmentis graciusculis puberulis; foliis trifoliolatis; petiolis gracilibus compressis nigrescentibus puberulis; foliolis sessilibus brunnescentibus ellipticis vel obovato-ellipticis supra glabris, subtus parce pilosulis, rotundatis vel breviter acuminatis.

Tree or shrub; branches rather stout, gray, obtusely tetragonal, sometimes sulcate, minutely puberulous on the younger parts and at the nodes, glabrescent in age; twigs much more slender, puberulent; nodes annulate; principal internodes 1.5--13 cm. long; leaves decussate-opposite, trifoliolate; petioles slender, 1.5--5 cm. long, compressed, nigrescent in drying, puberulous; leaflets 3, chartaceous, sessile or practically so, dark-green above, lighter beneath, brunnescent in drying, elliptic or obovate-elliptic, glabrous above, sparsely pilosulous beneath, more densely so along the midrib and larger venation, rounded or abruptly short-acuminate at the apex in cuspidate fashion, the central one 6.5--12.5 cm. long, 3.5--6.5 cm. wide, sometimes with a puberulent petiolule 1--2 mm. long, the lateral ones often very much smaller; midrib slender, flat above, prominulous beneath; secondaries slender, 7--10 per side, rather close and uniform, ascending, arcuate only toward the margins, flat above, prominulous beneath, anastomosing in loops near the margins; veinlet reticulation very abundant, mostly rather conspicuous and slightly subprominulous above (on mature leaves) and beneath; flowers and fruit not seen.

The type of this species was collected by Hendrik Altmann (no. 577) at Cheribon, Java, on December 8, 1940, and is deposited in the Herbarium Bogoriense at Buitenzorg. The leaves remind one somewhat of some forms of V. pinnata L.

VITEX BUDDINGII Moldenke, sp. nov.

Arbor; ramulis tetragonis nigrescentibus densiuscule fulvo-tomentellis; foliis 5-foliolatis; petiolis dense cinereo- vel fulvo-puberulis; petiolulis densiuscule puberulis; laminis immaturis membranaceis nigrescentibus anguste ellipticis plus-

minusve crenulatis, ad apicem basinque acutis, utrinque dense lepidotis, supra glabrescentibus, subtus plusminusve puberulis; inflorescentiis terminalibus paniculatis ubique densiuscule fulvo-tomentellis.

Tree, 25--28 m. tall, 16--21 m. to the lowest branch; trunk diameter at breast height 45--50 cm., at first branch 31--35 cm.; branchlets tetragonal, nigrescent in drying, rather densely fulvous-tomentellous; principal internodes apparently abbreviated; nodes annulate; leaves decussate-opposite, 5-foliolate in palmate fashion; petioles slender or stout, often collapsing and flattened in drying, 7.5--13 cm. long (immature), densely puberulent with cinereous or fulvous hair; petiolules slender, 2--7 mm. long (immature), rather densely puberulent; immature blades membranous, nigrescent in drying, somewhat lighter beneath, narrow-elliptic, approximately equal in size, 4.5--7 cm. long, 1.5--2.1 cm. wide, more or less crenulate-margined, acute at the apex and base, densely lepidote on both surfaces, more or less puberulent beneath, especially on the larger venation, glabrescent above; midrib slender, prominent beneath; secondaries very slender, numerous, close together, 15--18 per side, divergent-ascending, not arcuate, not anastomosing, prominulous beneath, indiscernible above; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, paniculate, rather densely fulvous-tomentellous throughout, densely many-flowered, apparently to about 15 cm. long and 4 cm. wide; peduncles to about 3 cm. long, puberulent with fulvous hairs, nigrescent; sympodia and inflorescence-branches densely fulvous-tomentellous, often compressed; bractlets lanceolate, 1--3 mm. long, often recurved, glabrate and nigrescent above, densely fulvous-tomentellous beneath, densely ciliate-margined; pedicels slender, about 1 mm. long, densely fulvous-tomentellous; calyx campanulate, about 2 mm. long, densely fulvous-tomentellous, its rim 4-apiculate; corolla and fruit not seen.

The type of this species was collected by L. F. Ch. Budding (no. 227) -- in whose honor it is named -- at Melawi, western Borneo, at an altitude of 180 m., on March 3, 1939, and is deposited in the Herbarium Bogoriense at Buitenzorg. The species is apparently related to V. urceolata C. B. Clarke and V. erioclona H. J. Lam, as is obvious from the type of inflorescence.

VITEX DUBOISII Moldenke, sp. nov.

Frutex; ramis gracillimis medullosis minutissime pilosulis vel glabrescentibus nigrescentibus; petiolis gracillimis glabris; foliolis 5 membranaceis utrinque glabris vel subglabris oblanceolatis longe acuminatis integris, ad basin attenuato-cuneatis; petiolulis subfiliformibus glabris; inflorescentiis supra-axillaribus cymosis; pedunculis filiformibus sparsissime pilosulis vel glabrescentibus compressis nigrescentibus.

Shrub; branches very slender, medullose, very minutely pil-

osulous or glabrescent, nigrescent in drying, compressed at the nodes on young parts; nodes not annulate; principal internodes 4--7.5 cm. long; leaves decussate-opposite, palmately compound; petiole very slender, 4.5--11cm. long, glabrous; petiolules subfiliform, 1--6 mm. long, glabrous; leaflets 5, membranous, often very thinly so, rather uniformly green on both surfaces or somewhat lighter beneath, glabrous or subglabrous on both surfaces, the 2 basal ones much smaller than the rest, the central one oblanceolate, 7.5--13 cm. long, 2.5--4 cm. wide, long-acuminate at the apex, attenuate-cuneate at the base, entire; midrib very slender, flat above, prominulous beneath; secondaries filiform, 6 or 7 per side, arcuate-ascending, plainly anastomosing 1--1.5 mm. from the margins, flat above, prominulous beneath; veinlet reticulation very irregular and fine, obscure or indiscernible above, flat beneath; inflorescence supra-axillary, very much shorter than the subtending petiole, cymose; peduncles filiform, 10--17 mm. long, very sparsely pilosulous or glabrescent, compressed, nigrescent in drying; cymes rather dense, small, many-flowered, their filiform branches compressed and minutely pilosulous or glabrescent; bractlets filiform, 4--5 mm. long; pedicels very short, to 1 mm. long, strigillose; calyx campanulate, about 2 mm. long and wide, strigillose, its rim subtruncate in bud, during anthesis deeply 5-toothed, the teeth lanceolate, about 1 mm. long; corolla densely pubescent on the outside, less than 1 cm. long.

The type of this species was collected by L. Dubois (no. 608) at Bo. Kutu, Ekota territory, Tshuapa district, Belgian Congo, in September, 1934, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. A common name for the plant is "liseta".

VITEX GLABRATA var. POILANEI Moldenke, var. nov.

Haec varietas a forma typica speciei laminis foliolorum subtus valde strigillosis recedit.

This variety differs from the typical form of the species in having the lower surface of its leaflet-blades decidedly strigillose even when mature.

The type of the variety was collected by Eugène Poilane (no. 40829) near Bien Loa, Cochinchina, French Indochina, on May 25, 1919, and is deposited in the Herbarium Bogoriense at Buitenzorg.

VITEX IRAQUENSIS Moldenke, sp. nov.

Frutex vel arbor; ramis gracilibus fistulosis ubique glabris; petiolis gracilibus glabris canaliculatis; foliolis 3--7 membranaceis utrinque glabris oblanceolatis breviter acuminatis vel cuspidatis integris, ad basin longe attenuatis vel cuneatis; inflorescentiis axillaribus cymosis; pedunculis glabris; cymis laxissime bifurcatis paucifloris ubique glabris.

Shrub or tree; branches slender, fistulose, glabrous or practically so throughout, the younger parts compressed and brunnescent in drying; nodes annulate; principal internodes 3.3--8 cm. long or longer; leaves decussate-opposite, palmately compound, with 3--7 leaflets; petioles slender, 3.5--15.5 cm. long, glabrous, canaliculate, club-shaped at the apex; leaflets membranous, dark-green above, lighter green beneath, varying in size from largest central one to smallest basal ones, glabrous on both surfaces, the central one oblanceolate, 6--14 cm. long, short-acuminate or cuspidate at the apex, entire, long-attenuate or cuneate at the base, borne on a glabrous petiolule 1--2 cm. long; lateral leaflets smaller and borne on shorter petiolules; midrib very slender, often undate in drying, flat above, very prominent beneath; secondaries very slender, 6--10 per side, arcuate-spreading, not anastomosing, flat above, prominulous beneath; veinlet reticulation rather sparse and inconspicuous on both surfaces; inflorescence axillary, cymose, much shorter than the subtending mature petioles; peduncles slender, compressed, 4--5 cm. long, nigrescent, glabrous; cymes very loosely bifurcate, rather few-flowered, completely glabrous throughout, nigrescent; bractlets linear, 2--3 mm. long, glabrous; pedicels slender, 1--2 mm. long; calyx campanulate, about 2 mm. long and wide, glabrous, nigrescent, the margin subtruncate, minutely 5-apiculate; corolla zygomorphic, pilosulous outside, its tube sharply curvate or genuflexuous, about 5 mm. long, the lobes small.

The type of this species was collected by Yusuf Lazar near Bagdad, Iraq, in July, 1918, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VITEX LEBRUNI Moldenke, sp. nov.

Frutex; ramis atrobrunneis cinereo-pilosulis; petiolis minute strigillosis glabrescentibus anguste canaliculatis; foliolis 3 vel 5 sessilibus vel subsessilibus utrinque glabris anguste ellipticis acuminatis integris, ad basin acutis vel cuneatis; inflorescentiis axillaribus cymosis paucifloris ubique strigillosis; pedunculis filiformibus; bracteolis filiformibus.

Shrub, about 5 m. tall; branches slender, dark-brown, cinereous-pilosulous on the younger parts; nodes not annulate; principal internodes very variable, 1--7.5 cm. long; leaves palmately compound, decussate-opposite; petioles very slender or medium-stout, 4--8.5 cm. long, minutely strigillose, glabrescent in age, narrowly canaliculate above, somewhat ampliate or club-shaped at the apex; leaflets 3 or 5, sessile or subsessile, glabrous on both surfaces, uniformly dark-green on both surfaces or somewhat lighter beneath, the central one somewhat larger than the rest, narrow-elliptic, 8--13 cm. long, 1.3--3.3 cm. wide, acuminate at the apex, entire, acute or cuneate at the base; midrib slender, flat above, prominulous beneath; sec-

ondaries filiform, about 5 per side, distant, arcuate-ascending or spreading, anastomosing near the margins, flat or obscure above, prominulous beneath; veinlet reticulation very sparse, plane or obscure above; inflorescence axillary, shorter than the subtending petiole, cymose, few-flowered, strigillose throughout; peduncle filiform, about 1 cm. long; bractlets filiform, about 3 mm. long; pedicels 1--1.5 mm. long, strigillose; calyx campanulate, about 2 mm. long and wide, strigillose, its rim subtruncate, short-denticulate; corolla rose-ochraceous, very densely strigose-pubescent outside, about 1 cm. long; fruit oblong, yellow-orange, shiny.

The type of this species was collected by Jean Lebrun (no. 5303) -- in whose honor it is named -- in a forest at 1282 m. altitude between Walikole and Koleke, Belgian Congo, in March, 1932, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

VITEX MADIENSIS var. GLABERRIMA Moldenke, var. nov.

Haec varietas a forma typica speciei foliis glaberrimis recedit.

This variety differs from the typical form of the species in having its leaves, as well as all other parts, completely glabrous.

The type of the variety was collected by Pittery (no. 819) in the neighborhood of Bambesa, Belgian Congo, in 1936, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

VITEX SCANDENS Moldenke, sp. nov.

Frutex scandens; ramulis graciusculis rotundatis multistriatis glabris; petiolis gracilibus glabrus; foliolis 5 sessilibus membranaceis ellipticis utrinque glabris breviter acuminatis integris, ad basin acuminate attenuatis; inflorescentiis subterminalibus paniculatis; pedunculis glabris.

Liana; branchlets rather slender, round in cross-section, many-striate, glabrous; nodes not annulate; principal internodes 2--4 cm. long; leaves decussate-opposite, 5-foliolate; petioles slender, 6--10 cm. long, glabrous; leaflets sessile, membranous, dark-green above, lighter beneath, elliptic, glabrous on both surfaces, short-acuminate at the apex, entire, acuminately attenuate at the base, the central ones 11--15 cm. long and 4.3--5.6 cm. wide, the lateral ones slightly smaller; midrib slender, flat above, prominent beneath; secondaries filiform, 11--15 per side, flat above, subprominulous beneath, widely spreading, arcuate only near the margins, not anastomosing; veinlet reticulation mostly indiscernible above, the larger parts somewhat subprominulous beneath in drying; inflorescence apparently subterminal, paniculate, about 15 cm. long and 4 cm. wide; peduncle slender, similar to the branchlets in col-

or and texture, about 5 cm. long; sympodia similar, several, elongate to 4 cm. at base, glabrous, striate, nigrescent; panicle-branches very slender, 1.5--2.7 cm. long, glabrous or very minutelypplverulent, cymosely branched; pedicels filiform, about 2 mm. long, minutely pulverulent-lepidote; bractlets linear, about 1 mm. long, lepidote; calyx campanulate, about 3 mm. long and wide, glabrous or minutely scattered-lepidote, nigrescent in drying, its rim deeply 4-toothed; corolla rose, about 1 cm. long in bud, densely incanous-puberulent on the outside; fruit not seen.

The type of this remarkable species with such a decided bignoniaceous aspect was collected by Willem Marius Docters van Leeuwen-Reijnvaan (no. 10703) at Expedition Bivouac in the Nassau Mountains, Dutch New Guinea, in October, 1926, and is deposited in the Herbarium Bogoriense at Buitenzorg.

VITEX VENULOSA Moldenke, sp. nov.

Arbor; ramis crassis medullosis valde tetragonis dense adpresso-tomentellis, pilis ochraceis; petiolis elongatis crassis densissime adpresso-tomentellis; foliolis 5 firme chartaceis nigrescentibus supra glabrescentibus subtus densissime ochraceo-tomentellis ellipticis vel late ellipticis acutis vel breviter acuminatis integris, ad basin acutis vel rotundatis; inflorescentiis axillaribus cymosis dense ochraceo-puberulis.

Tree; branches heavy, medullose, very decidedly tetragonal, densely appressed-tomentellous with ochraceous hairs, often somewhat ampliate and more compressed at the nodes; nodes annulate; principal internodes 2--6 cm. long; leaves decussate-opposite, palmately compound, composed of 5 leaflets; petioles elongate, stout when mature, 5.5--18 cm. long, very densely appressed-tomentellous or puberulent with ochraceous hairs, club-like at the apex; leaflets rather firmly chartaceous, bright-green above, nigrescent in drying, lighter beneath, microscopically puberulous or glabrescent above, very densely tomentellous with cinereous-ochraceous hairs beneath, elliptic or broad-elliptic, acute or short-acuminate at the apex, entire, acute or rounded at the base, rarely subacuminate, the central one 7--18 cm. long, 3.3--7.5 cm. wide, the basal ones much smaller; petiolules stout, 4--15 mm. long, densely puberulent; midrib rather stout, flat above, very prominent beneath; secondaries very numerous and close, 17--20 per side, spreading-ascending, parallel, not arcuate except at the very margins where they are incompletely anastomosing, flat above, prominent beneath; veinlet reticulation very abundant, flat and obscure above but very conspicuous to the smallest parts beneath and decidedly prominulous there, the tertiaries subparallel, at right angles to and connecting the secondaries; inflorescence axillary, cymose, shorter than the subtending leaves; peduncles stout, about the same diameter as the subtending petiole, 4.5--

11.5 cm. long, densely ochraceous-puberulent; cymes many times bifurcate, the branches wide-spreading, loosely or densely many-flowered, densely ochraceous-puberulent throughout, the branches rather conspicuously flattened and sulcate, conspicuously annulate at the nodes; bractlets linear, 3--15 mm. long, densely puberulent; pedicels very slender, much abbreviated, usually 1 mm. long or less, densely ochraceous- or cinereous-puberulent or short-pubescent; calyx campanulate, about 2.5 mm. long and wide, densely short-pubescent with antrorse ochraceous hairs, its rim subtruncate, subentire or minutely apiculate; corolla violet, about 8 mm. long, its tube about 5 mm. long, densely short-pubescent with cinereous hairs outside; fruiting-calyx cupuliform, about 5 mm. long and 8 mm. wide, densely short-pubescent with cinereous hairs, truncate and subentire or minutely denticulate; fruit drupaceous, subglobose, about 1 cm. long and wide, glabrous, shiny.

The type of this species was collected by Jean Lebrun (no. 5878) in the forest at Lumuna, Belgian Congo, in August, 1932, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

VITEX VESTITA var. SIAMICA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliolis 2.5--8 cm. longis, 1--3.5 cm. latis, plusminusve serratis, subtus in venis breviter pubescentibus.

This variety differs from the typical form of the species in having its leaflets only 2.5--8 cm. long and 1--3.5 cm. wide at time of anthesis, more or less serrate along the margins, and the short pubescence confined to the venation only beneath.

The type of the variety was collected by Kasin (no. 346) on a rock at Tripagodas, about 40 km. north of Wagka, on the Burmese border, Thailand, on May 14, 1946, and is deposited in the Herbarium Bogoriense at Buitenzorg.

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THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND ERIOCAULACEAE. SUPPLEMENT 8

Harold N. Moldenke

Since the publication of the previous supplement 11,000 additional specimens of these groups have been studied and annotated by me. These specimens are deposited in the United States National Herbarium at Washington, the Britton Herbarium at the New York Botanical Garden, the Herbarium Bogoriense at Buiten-

zorg, the Government Herbarium at Salisbury (Southern Rhodesia), and the herbaria of the Naturhistoriska Riksmuseum at Stockholm, the University of Illinois at Urbana, the Jardin Botanique de l'Etat at Brussels, the Naturhistorisches Museum at Vienna, the Melbourne Botanic Garden at South Yarra, the Botanisch Museum at Utrecht, and the Rijksherbarium at Leiden. These specimens have brought to light 152 new county or parish records, 240 state, department, or province records, and 626 new country or island records not previously listed. Numerous corrections in orthography, accredition, and validity or nonvalidity have also had to be made to my original 1949 booklet on this subject, a new edition of which will soon be forthcoming.

UNITED STATES OF AMERICA:

Massachusetts:

Eriocaulon parkeri B. L. Robinson [Essex County]

New Jersey:

Verbena urticifolia var. leiocarpa Perry & Fernald [Warren County]

Pennsylvania:

x Verbena engelmannii Moldenke [Union County]

Maryland:

Eriocaulon parkeri B. L. Robinson [Baltimore County]

Virginia:

Eriocaulon decangulare L. [James City County]

Lachnocaulon anceps (Walt.) Morong [King and Queen & Southampton Counties]

North Carolina:

Verbena officinalis L. [Buncombe County]

Verbena stricta Vent. [Onslow County]

South Carolina:

Eriocaulon decangulare L. [Berkeley County]

Georgia:

Clerodendrum bungei Steud. [Glynn County]

Phyla lanceolata (Michx.) Greene [Early & Seminole Counties]

Verbena litoralis H.B.K. [Decatur & Glynn Counties]

Verbena scabra Vahl [Dougherty & Lee Counties]

Florida:

Clerodendrum fragrans var. pleniflorum Schau. [Orange County]

Clerodendrum speciosissimum Van Geert [Brevard County]

Lantana involucrata var. odorata (L.) Moldenke [Monroe County]

Illinois:

Phyla lanceolata (Michx.) Greene [Bureau, Christian, Clay, Clinton, Coles, Crawford, DeKalb, Douglas, Effingham, Fayette, Ford, Hardin, Jefferson, Lawrence, Logan, Piatt,

Pulaski, Richland, Wayne, & Will Counties]
Phyla lanceolata f. ahlesii Moldenke [Iroquois County]*
Verbena bracteata Lag. & Rodr. [Alexander, Carroll, DeKalb, Jo Daviess, Lake, Lee, Livingston, Macon, Richland, Sangamon, & Whiteside Counties]
Verbena canadensis (L.) Britton [Adams, Champaign, Lawrence, & Vermilion Counties]
x Verbena engelmannii Moldenke [Champaign, Crawford, Hardin, Iroquois, & Vermilion Counties]
Verbena hastata L. [Crawford, DeKalb, Douglas, Effingham, Franklin, Jackson, Jefferson, Lee, Livingston, Logan, Ogle, Piatt, Stephenson, Union, Wayne, & Whiteside Counties]
Verbena hastata f. rosea Cheney [Champaign County]
x Verbena illicita Moldenke [Mason, Sangamon, Vermilion, & Whiteside Counties]
x Verbena moechina Moldenke [Adams County]
Verbena peruviana (L.) Britton [Kankakee County]
x Verbena rydbergii Moldenke [Bureau & Vermilion Counties]
Verbena simplex Lehm. [Champaign, Christian, Hardin, Marshall, Pope, & Putnam Counties]
Verbena stricta Vent. [Carroll, Douglas, Jasper, Jo Daviess, Logan, Ogle, Vermilion, Whiteside, & Woodford Counties]
Verbena stricta f. albiflora Wadmond [Sangamon County]
Verbena stricta f. roseiflora Benke [Marshall County]
Verbena urticifolia L. [Cass, Cumberland, DeKalb, Douglas, Effingham, Fayette, Iroquois, Jefferson, Jo Daviess, Lee, Logan, Piatt, Putnam, Sangamon, Union, Wayne, Whiteside, & Woodford (not "Woodfred") Counties]
Verbena urticifolia var. leiocarpa Perry & Fernald [McLean County]

Indiana:
Phyla lanceolata (Michx.) Greene [Ripley County]
Verbena hastata L. [Parke County]
Verbena simplex Lehm. [Washington County]
Verbena urticifolia L. [Fountain, Switzerland, & Washington Counties]
Verbena urticifolia var. leiocarpa Perry & Fernald [Delaware County]

Iowa:
Verbena canadensis (L.) Britton [Story County]

Kentucky:
Phyla lanceolata (Michx.) Greene [McCracken County]

Michigan:
Verbena hastata L. [Houghton County]

Minnesota:
Verbena urticifolia var. leiocarpa Perry & Fernald [Saint

Louis County]
Missouri:
Verbena canadensis (L.) Britton [Jasper & Saint Francois Counties]
Arkansas:
Verbena canadensis (L.) Britton [Sharp County]
Verbena simplex Lehm. [Fulton & Randolph Counties]
Verbena stricta Vent. [Marion & Randolph Counties]
Wyoming:
Verbena stricta Vent. [Laramie County]
Texas:
Vitex agnus-castus var. caerulea Rehd. [Dallas County]
MEXICO:
Bouchea prismatica var. longirostra Grenz. [Guerrero]
Citharexylum mocinni D. Don [Nayarit]
Citharexylum standleyi var. mexicanum Moldenke [Colima]*
Lantana trifolia L. [Tabasco]
Lippia controversa Moldenke [Chiapas]
Lippia controversa var. brevipedunculata Moldenke [Oaxaca]*
Lippia pinetorum Moldenke -- to be deleted
Phyla nodiflora var. rosea (D. Don) Moldenke [Hidalgo]
Stachytarpheta angustifolia (Mill.) Vahl [Tabasco]
GUATEMALA:
Lippia pinetorum Moldenke -- to be deleted
COSTA RICA:
Aegiphila panamensis Moldenke [Limón]
Citharexylum viride Moldenke [Cartago]
Vitex cooperi Standl. [Alajuela]
CUBA:
Clerodendrum aculeatum (L.) Schlecht. [Oriente]
Eriocaulon sigmoideum C. Wright -- delete the "*"
Paepalanthus lamarckii Kunth [Las Villas]
Stachytarpheta incana var. angustibracteata Moldenke [Havana]
ISLA DE PINOS:
Eriocaulon sigmoideum C. Wright
HISPANIOLA:
Clerodendrum buchanani (Roxb.) Walp. [Haiti]
Paepalanthus tuerckheimii Ruhl. [Haiti]
Syngonanthus umbellatus (Lam.) Ruhl. [Dominican Republic]
ANTIGUA:
Clerodendrum buchanani (Roxb.) Walp.
Clerodendrum speciosissimum Van Geert -- to be deleted
GUADELOUPE:
Clerodendrum buchanani (Roxb.) Walp.
Clerodendrum speciosissimum Van Geert -- to be deleted

DOMINICA:
Clerodendrum buchanani (Roxb.) Walp.
Clerodendrum speciosissimum Van Geert -- to be deleted
MARTINIQUE:
Clerodendrum buchanani (Roxb.) Walp.
Clerodendrum speciosissimum Van Geert -- to be deleted
COLOMBIA:
Lantana camara L. [Chocó]
Lantana cujabensis Schau. [Nariño]
Lantana maxima Hayek [Cundinamarca, Nariño, & Santander]
Lantana trifolia f. hirsuta Moldenke [Tolima]
Paepalanthus muscosus Körn. [Santander]
VENEZUELA:
Eriocaulon guyanense Körn. is the correct orthography
Lantana maxima Hayek [Bolívar]
Paepalanthus formosus Moldenke [Amazonas]*
Paepalanthus kunhardtii Moldenke [Amazonas]*
Paepalanthus perplexans var. murdacki Moldenke [Amazonas]*
Syngonanthus albopulvinatus Moldenke [Amazonas]*
Syngonanthus alleni var. parvus Moldenke [Amazonas]*
Syngonanthus cowani Moldenke [Amazonas]*
Syngonanthus flavipes Moldenke [Amazonas]*
Syngonanthus humboldtii var. elongatus Moldenke [Amazonas]*
Syngonanthus humboldtii var. macrocephalus Moldenke [Amazonas]*
Syngonanthus humboldtii var. orinocensis Moldenke [Amazonas]*
Syngonanthus phelpsae Moldenke [Amazonas]*
Syngonanthus phelpsae var. elongatus Moldenke [Amazonas]*
Syngonanthus yapacanensis Moldenke [Amazonas]*
BRITISH GUIANA:
Eriocaulon guyanense Körn. is the correct orthography
SURINAM:
Lantana glutinosa Poepp.
Syngonanthus glandulosus Gleason
FRENCH GUIANA:
Eriocaulon guyanense Körn. is the correct orthography
ECUADOR:
Lippia alba (Mill.) N. E. Br. [Bolívar]
PERU:
Aloysia virgata var. elliptica (Briq.) Moldenke [Cuzco]
Citharexylum herrerae Mansf. [Apurimac]
Duranta mutisii L. f. [Apurimac & Cuzco]
Eriocaulon microcephalum H.B.K. [Huanuco]
Lantana fiebrigii Hayek [Ancachs & Cuzco]
Lantana reptans Hayek [Libertad]

Lantana trifolia f. oppositifolia Moldenke [San Martín]
Lippia ferruginea H.B.K. [Apurimac]
Verbena clavata var. casmensis Moldenke [Ancachs]*
Verbena diffusa Willd. [Ayacucho]
Vitex pseudolea Rusby [San Martín]

BRAZIL:

Aegiphila lanceolata Moldenke [Guaporé]
Aloysia virgata (Ruíz & Pav.) A. L. Juss. [Santa Catharina]
Amasonia campestris (Aubl.) Moldenke [Amapá]
Eriocaulon angustifolium Körn. [Goyaz]
Eriocaulon kunthii Körn. [Rio Grande do Sul]
Eriocaulon magnificum Ruhl. [Rio Grande do Sul]
Eriocaulon modestum Kunth [Paraná]
Eriocaulon obtusum Ruhl. [Goyaz, Mattogrosso, & Minas Geraes]
Eriocaulon paraguayense Körn. [São Paulo]
Eriocaulon stramineum Körn. [Maranhão]
Lantana camara var. angustifolia Moldenke [Minas Geraes & Rio de Janeiro]
Lantana trifolia f. oppositifolia Moldenke [Pará]
Leiothrix argyroderma Ruhl. [Rio de Janeiro]
Leiothrix flavescens (Bong.) Ruhl. [Santa Catharina]
Lippia microphylla Cham. [Maranhão]
Lippia nana Schau. [Goyaz]
Lippia rotundifolia Cham. [Goyaz]
Lippia vernonioides Cham. [Maranhão & Pará]
Paepalanthus caldensis Malme [Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catharina, & São Paulo]
Paepalanthus capillaceus var. proliferus Gleason [Amazonas]
Paepalanthus elongatus var. helichrysoides (Kunth) Ruhl. [Rio de Janeiro]
Paepalanthus elongatus var. pubescens Alv. Silv. [Goyaz]
Paepalanthus henriquei Alv. Silv. & Ruhl. [Santa Catharina]
Paepalanthus lamarckii Kunth [Mattogrosso]
Paepalanthus macrotrichus Alv. Silv. [Rio de Janeiro]
Paepalanthus plantagineus (Bong.) Körn. [Bahia]
Paepalanthus polytrichoides Kunth [Amapá]
Paepalanthus pseudotortilis Ruhl. [Rio de Janeiro]
Paepalanthus pubescens Körn. [São Paulo]
Paepalanthus ruhlandii Alv. Silv. -- to be deleted
Paepalanthus sessiliflorus Mart. [Maranhão]
Paepalanthus standleyi Moldenke — to be deleted
Paepalanthus striatus Ruhl. [Minas Geraes]
Paepalanthus subtilis Miq. [Maranhão]
Paepalanthus viridis Körn. [Pernambuco]

Petrea bracteata Steud. [Guaporé]
Petrea duckei Moldenke [Amapá]
Petrea riparia Moldenke [Amapá]
Syngonanthus caulescens (Poir.) Ruhl. [Pará]
Syngonanthus gracilis var. amazonicus Ruhl. [Goyaz & Maranhão]
Syngonanthus gracilis var. hirtellus (Steud.) Ruhl. [Maranhão]
Syngonanthus simplex (Miq.) Ruhl. [Goyaz & Maranhão]
Syngonanthus tricostatus Gleason [Maranhão]
Syngonanthus vaupesanus Moldenke [Goyaz]
Vitex polygama var. dusenii Moldenke [Minas Geraes]
Vitex triflora Vahl [Amapá]

MARAJO ISLAND:
Eriocaulon stramineum Körn.

BOLIVIA:
Lantana aristata var. cabrerae Moldenke [Santa Cruz]
Lantana balansae Briq. [Sucre]
Verbena cochabambensis Moldenke [Sucre]
Vitex pseudolea Rusby -- delete the "*"

PARAGUAY:
Paepalanthus planifolius (Bong.) Körn.

ARGENTINA:
Aloysia catamarcensis Moldenke [Salta]
Aloysia fiebrigii (Hayek) Moldenke [Jujuy]
Aloysia schulziana Moldenke [Jujuy]
Aloysia sellowii (Briq.) Moldenke [Tucumán]
Junellia rosulata Moldenke [Santa Cruz]
Lantana fiebrigii Hayek [Salta]
Verbena chilensis Moldenke [Neuquen]

JUGOSLAVIA:
Verbena officinalis L. [Bosnia, Dalmatia, & Slovenia]

FRENCH WEST AFRICA:
Vitex pseudochrysocarpa Pieper [French Soudan]

ANGLO-EGYPTIAN SUDAN:
Clerodendrum rotundifolium Oliv.

SENEGAL:
Clerodendrum leprieuri Moldenke

GAMBIA:
Clerodendrum leprieuri Moldenke

SIERRA LEONE:
Eriocaulon sierraleonense Moldenke — to be deleted

LIBERIA:
Vitex congolensis De Wild. & Th. Dur.
Vitex rufa A. Chev. -- to be deleted

IVORY COAST:

Vitex rufa A. Chev. -- add "*"

GOLD COAST:

Clerodendrum capitatum var. cephalanthum (Oliv.) J.G.Baker

NORTHERN NIGERIA:

Vitex pseudochrysocarpa Pieper -- delete the "*"

CAMEROONS:

Vitex doniana var. parvifolia (Engl.) Moldenke -- delete the "*"

Vitex grandifolia var. bipindensis (Gürke) Pieper -- add "*"

Vitex micrantha Gürke

Vitex yaundensis Gürke -- delete the "*"

Vitex zenkeri Gürke -- delete the "*"

SPANISH GUINEA:

Vitex agelaeifolia Mildbr. -- delete the "*"

SAINT THOME:

Clerodendrum buchanani var. fallax (Lindl.) Bakh.

Clerodendrum speciosissimum Van Geert -- to be deleted

BELGIAN CONGO:

Clerodendrum caesium Gürke

Clerodendrum capitatum var. cephalanthum (Oliv.) J.G. Baker

Clerodendrum discolor var. dümmeri Thomas

Clerodendrum discolor var. kilimandscharense Thomas

Clerodendrum discolor var. macrocalyx Moldenke*

Clerodendrum discolor var. oppositifolium Thomas

Clerodendrum discolor var. pluriflorum Gürke

Clerodendrum discolor var. rubricalyx Moldenke

Clerodendrum milne-redheadi Moldenke

Clerodendrum myricoides var. chartaceum Moldenke

Clerodendrum myricoides var. grosseserratum Gürke

Clerodendrum prittwitzii Thomas

Premna matadiensis var. parvifolia Moldenke -- delete the "*"

Vitex agelaeifolia Mildbr.

Vitex doniana var. parvifolia (Engl.) Moldenke

Vitex duboisii Moldenke*

Vitex ferruginea Schum. & Thonn.

Vitex lebruni Moldenke*

Vitex lokundjensis Pieper

Vitex madiensis var. baumii Pieper

Vitex madiensis var. glaberrima Moldenke*

Vitex oxycuspis J. G. Baker

Vitex payos (Lour.) Merr.

Vitex payos var. glabrescens (Pieper) Moldenke

Vitex pseudochrysocarpa Pieper

Vitex robynsi De Wild. -- delete the "*"

Vitex thyrsiflora J. G. Baker

Vitex venulosa Moldenke*
Vitex yaundensis Gürke
Vitex zenkeri Gürke
UGANDA:
Clerodendrum myricoides var. chartaceum Moldenke
TANGANYIKA TERRITORY:
Clerodendrum discolor var. crenatum Thomas
Clerodendrum discolor var. rubricalyx Moldenke
Clerodendrum kibwesense Moldenke*
Vitex grandifolia var. bipindensis (Gürke) Pieper -- to be deleted
Vitex welwitschii Gürke
KENYA:
Clerodendrum discolor var. dümmeri Thomas
Clerodendrum myricoides var. chartaceum Moldenke
Clerodendrum ugandense Prain
ANGOLA:
Vitex madiensis var. baumii Pieper -- delete the "*"
Vitex payos (Lour.) Merr.
NORTHERN RHODESIA:
Clerodendrum cabrae De Wild.
Clerodendrum caesium Gürke
Clerodendrum capitatum var. rhodesiense Moldenke -- to be deleted
Clerodendrum frutectorum S. Moore
Clerodendrum milne-redheadi Moldenke -- delete the "*"
Vitex chrysocarpa Planch.
Vitex doniana var. parvifolia (Engl.) Moldenke
Vitex payos (Lour.) Merr.
Vitex robynsi De Wild.
BRITISH NYASALAND PROTECTORATE:
Clerodendrum rotundifolium Oliv.
Clerodendrum swynnertonii S. Moore
PORTUGUESE EAST AFRICA:
Clerodendrum discolor var. oppositifolium Thomas [Quilimane]
Clerodendrum faulkneri Moldenke [Quilimane]*
Clerodendrum fischeri Gürke [Quilimane]
Clerodendrum incisum Klotzsch [Quilimane]
Clerodendrum lanceolatum Gürke [Quilimane]
Priva cordifolia var. flabelliformis Moldenke [Quilimane]
BECHUANALAND PROTECTORATE:
Chascanum pumilum E. Mey.
Lippia scaberrima Sond.
UNION OF SOUTH AFRICA:
Lippia scaberrima Sond. -- delete the "*"

Verbena litoralis H.B.K. [Transvaal]
Vitex zeyheri Sond. [Cape of Good Hope]

COMORO ISLANDS:
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Anjouan & Grand Comoro]
Clerodendrum speciosissimum Van Geert -- to be deleted

MADAGASCAR:
Vitex trifolia var. heterophylla (Mak.) Moldenke

MASCARENE ISLANDS:
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted
Vitex trifolia var. heterophylla (Mak.) Moldenke [Mauritius]

ISRAEL:
Vitex agnus-castus var. pseudo-negundo f. albiflora Moldenke*

LEBANON:
Vitex agnus-castus var. pseudo-negundo (Hausskn.) Bornm.

IRAQ:
Vitex grandifolia var. bipindensis (Gürke) Pieper -- to be deleted
Vitex iraquensis Moldenke*

PAKISTAN:
Clerodendrum colebrokianum Walp. is the correct orthography
Clerodendrum hastatum (Roxb.) Walp. is the correct orthography
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted

INDIA:
Clerodendrum bracteatum Wall. [Khasi States]
Clerodendrum colebrokianum Walp. is the correct orthography; add Khasi States
Clerodendrum hastatum (Roxb.) Wall. is the correct orthography; add Khasi States
Clerodendrum serratum var. dentatum H. J. Lam [Coimbatore, Madras, & Sikkim]
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted
Clerodendrum urticifolium (Roxb.) Wall.
Clerodendrum villosum Blume
Vitex negundo L. [Khasi States]
Vitex negundo var. intermedia (P'ei) Moldenke [United Provinces]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Madras]

BURMA:
Clerodendrum colebrokianum Walp. is the correct orthography
Clerodendrum macrostegium Schau. [Upper Burma]
Clerodendrum serratum (L.) Moon [Southern Shan States]

Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted
Vitex pinnata L. [Tenasserim]
Vitex trifolia L. [Tenasserim]

ANDAMAN ISLANDS:
Clerodendrum inerme (L.) Gaertn. [South Andaman]
Vitex trifolia L.

SABANG:
Clerodendrum calamitosum L.

CEYLON:
Clerodendrum serratum var. dentatum H. J. Lam
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted

CHINA:
Callicarpa bodinieri var. lyi (Léveillé) Rehd. [Hunan]
Callicarpa dichotoma (Lour.) K. Koch [Hunan]
Callicarpa pilosissima var. henryi Yamamoto [Kwangtung]
Callicarpa rubella var. hemsleyana Diels -- delete the "*"
Clerodendrum canescens Wall. [Hunan]
Clerodendrum colebrokianum Walp. is the correct orthography
Clerodendrum japonicum (Thunb.) Sweet [Hunan]
Clerodendrum kaempferi var. album (P'ei) Moldenke -- delete the "*"
Clerodendrum serratum var. amplexifolium Moldenke [Kwangsi, Kweichow, & Yünnan]
Clerodendrum trichotomum var. ferrugineum Nakai [Kwangtung & Shantung]
Clerodendrum urticifolium (Roxb.) Wall. [Kwangsi & Kwangtung]
Vitex negundo var. cannabifolia (Sieb. & Zucc.) Hand.-Mazz. [Hunan]
Vitex quinata var. puberula (H. J. Lam) Moldenke [Kwangtung]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Kwangtung]

FORMOSA:
Callicarpa pilosissima var. henryi Yamamoto -- delete the "*"

JAPAN:
Callicarpa japonica Thunb. [Hiradosima & Kiushiu]
Callicarpa japonica var. rhombifolia H. J. Lam [Jesso]
Callicarpa mollis Sieb. & Zucc. [Hiradosima]
Vitex trifolia var. simplicifolia Cham. [Kiushiu]

HONGKONG:
Callicarpa brevipes (Benth.) Hance
Callicarpa japonica var. angustata Rehd.
Callicarpa rubella var. hemsleyana Diels

HAINAN ISLAND:
Callicarpa erythrosticta M. & C.*

Clerodendrum intermedium Cham.
Clerodendrum urticifolium (Roxb.) Wall.
Vitex trifolia var. heterophylla (Mak.) Moldenke

FRENCH INDO-CHINA:
Callicarpa brevipes (Benth.) Hance -- to be deleted
Callicarpa brevipes f. annamensis Moldenke [Annam]*
Clerodendrum colebrokianum Walp. is the correct orthography
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted
Congea peteloti Moldenke [Cochinchina]
Gmelina asiatica L. [Cochinchina]
Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm. [Cochinchina]
Vitex glabrata var. poilanei Moldenke [Cambodia & Cochinchina]
Vitex peduncularis Wall. [Cochinchina]
Vitex pinnata var. alata Moldenke [Cambodia]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Cochinchina]

PFU KWOK ISLAND:
Vitex trifolia var. simplicifolia Cham.

KOH CHANG ISLAND:
Vitex vestita Wall.

THAILAND:
Clerodendrum colebrokianum Walp. is the correct orthography
Clerodendrum fragrans (Vent.) R. Br.
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted
Clerodendrum viscosum Vent.
Congea vestita Griffith
Stachytarpheta jamaicensis (L.) Vahl
Vitex negundo var. cannabifolia (Sieb. & Zucc.) Hand.-Mazz.
Vitex trifolia var. heterophylla (Mak.) Moldenke
Vitex tripinnata (Lour.) Merr.
Vitex vestita var. siamica Moldenke*

FEDERATED MALAY STATES:
Callicarpa maingayi King & Gamble [Pahang]
Clerodendrum citrinum Ridl. is the correct orthography
Clerodendrum colebrokianum Walp. is the correct orthography
Clerodendrum deflexum Wall. [Johore, Negri Sembilan, & Perak]
Clerodendrum indicum (L.) Kuntze [Kedah]
Clerodendrum inerme (L.) Gaertn. [Pahang]
Clerodendrum laevifolium Blume [Kelantan, Kuala Trengganu, & Pahang]
Clerodendrum myrmecophila Ridl. -- to be deleted
Clerodendrum nutans var. penduliflorum (Wall.) Bakh. [Kedah & Pahang]

Clerodendrum paniculatum L. [Pahang]
Clerodendrum phyllomega var. myrmecophilum (Ridl.) Moldenke [Johore & Selangor]
Clerodendrum serratum (L.) Moon [Pahang & Perak]
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted
Clerodendrum umbratile King & Gamble [Pahang]
Clerodendrum villosum Blume [Johore]
Congea tomentosa var. azurea (Wall.) C. B. Clarke [Kedah]
Congea vestita Griffith [Kedah]
Petraeovitex scortechini King & Gamble [Selangor]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Kuala Trengganu]

STRAITS SETTLEMENTS:
Clerodendrum bethunianum Lowe [Penang]
Clerodendrum colebrokianum Walp. is the correct orthography
Clerodendrum inerme (L.) Gaertn. [Singapore]
Clerodendrum laevifolium Blume [Singapore & Wellesley]
Clerodendrum phyllomega var. myrmecophilum (Ridl.) Moldenke [Singapore]
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted

PHILIPPINE ISLANDS:
Callicarpa elegans Hayek [Leyte]
Callicarpa formosana var. glabrescens Moldenke [Luzon, Mindanao, & Mindoro]*
Callicarpa longipetiolata var. glabrescens Moldenke [Luzon]*
Callicarpa magna var. lilacina Elm. -- to be deleted
Callicarpa merrillii Moldenke [Negros]
Clerodendrum bethunianum Lowe is the correct orthography; add Jolo
Clerodendrum brachyanthum Schau. [Camiguin]
Clerodendrum fragrans var. pleniflorum Schau. [Luzon]
Clerodendrum inerme (L.) Gaertn. [Batan & Leyte]
Clerodendrum kaempferi (Jacq.) Sieb. [Negros]
Clerodendrum lanuginosum Blume [Jolo, Leyte, Luzon, & Tawitawi]
Clerodendrum lanuginosum var. adpressipilum Moldenke [Mindanao]*
Clerodendrum macrocalyx H. J. Lam [Sulu]
Clerodendrum minahassae Teijsm. & Binn. -- to be deleted
Clerodendrum minahassae var. brevitubulosum H. J. Lam [Basilan, Busuanga, Leyte, Malamaui, Mindanao, Palawan, & Sulu]
Clerodendrum philippinum Schau. [Jolo & Luzon]*
Clerodendrum puberulum Merr. -- delete the "*"

Clerodendrum quadriloculare (Blanco) Merr. [Mindanao]
Clerodendrum trichotomum var. ferrugineum Nakai [Batan]
Clerodendrum vanoverberghii Merr. [Benguet]
Clerodendrum viscosum Vent. [Palawan & Paragua]
Stachytarpheta jamaicensis (L.) Vahl [Leyte]
Stachytarpheta urticaefolia (Salisb.) Sims [Leyte]
Vitex parviflora A. L. Juss. [Negros]
Vitex parviflora f. sterilis H. J. Lam [Basilan, Bohol, Luzon, Mindanao, & Panay]*
Vitex quinata var. puberula (H. J. Lam) Moldenke [Luzon]
Vitex trifolia var. bicolor (Willd.) Moldenke [Masbate]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Palawan & Panay]

MARIANNA ISLANDS:
Callicarpa erioclona Schau. [Tinian]
Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum inerme (L.) Gaertn. [Tinian]
Vitex trifolia var. bicolor (Willd.) Moldenke [Guam]

CAROLINE ISLANDS:
Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum buchanani (Roxb.) Walp. -- to be deleted
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Corol, Pelew Islands, & Yap]
Clerodendrum inerme (L.) Gaertn. [Yap]
Vitex trifolia var. bicolor (Willd.) Moldenke [Yap]

RIOUW ARCHIPELAGO:
Clerodendrum buchanani (Roxb.) Walp. [Toedjoej]
Clerodendrum deflexum Wall. [Bintan, Doerian, Dompak, Karimon, Papan, & Riouw]
Clerodendrum fragrans var. pleniflorum Schau. [Bakong & Bintan]
Clerodendrum inerme (L.) Gaertn. [Bintan & Doerian]
Clerodendrum laevifolium Blume [Doengoeran & Toedjoej]
Clerodendrum serratum (L.) Moon [Bintan]
Clerodendrum villosum Blume [Bakong, Bintan, Papan, & Riouw]

LINGGA ARCHIPELAGO:
Clerodendrum buchanani (Roxb.) Walp. [Lingga]
Clerodendrum deflexum Wall. [Lingga, Redjai, & Temiang]
Clerodendrum fragrans var. pleniflorum Schau. [Singkep]
Clerodendrum inerme (L.) Gaertn. [Lingga, Sebangka, & Singkep]
Clerodendrum laevifolium var. pubiflorum Bakh. [Singkep]
Clerodendrum phyllomega var. myrmecophilum (Ridl.) Bakh. [Sebangka & Singkep]
Clerodendrum villosum Blume [Lingga & Singkep]

SIMALUR ISLAND:

Clerodendrum inerme (L.) Gaertn.

NIAS ISLAND:

Clerodendrum paniculatum L.

TEBINGTINGGI:

Clerodendrum calamitosum L.

SUMATRA:

Callicarpa inaequalis Teijsm. & Binn.

Clerodendrum bethunianum Lowe

Clerodendrum blumeanum Schau. -- to be deleted

Clerodendrum bracteatum Wall. -- to be deleted

Clerodendrum bracteatum var. bünnemeijeri Moldenke*

Clerodendrum bracteatum var. sumatranum Ridl. -- delete the "*"

Clerodendrum buchanani (Roxb.) Walp.

Clerodendrum buchanani f. album Moldenke

Clerodendrum colebrokianum Walp. is the correct orthography

Clerodendrum colebrokianum var. forbesii King & Gamble is the correct orthography

Clerodendrum microcalyx Ridl. -- to be deleted

Clerodendrum phyllomega var. myrmecophilum (Ridl.) Moldenke

Clerodendrum ridleyi King & Gamble

Clerodendrum scopiferum Miq.

Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted

Clerodendrum singalense Miq.

Clerodendrum speciosissimum Van Geert

Clerodendrum sumatranum Moldenke*

Clerodendrum urticifolium (Roxb.) Wall.

Clerodendrum villosum Blume

Clerodendrum viscosum Vent.

Vitex negundo var. intermedia (P'ei) Moldenke

Vitex trifolia var. bicolor (Willd.) Moldenke

MADURA ISLAND:

Clerodendrum calamitosum L.

Clerodendrum inerme (L.) Gaertn.

Clerodendrum serratum (L.) Moon

Vitex trifolia var. bicolor (Willd.) Moldenke

Vitex trifolia var. heterophylla (Mak.) Moldenke

BAWEAN ISLAND:

Avicennia marina (Forsk.) Vierh.

Clerodendrum calamitosum L.

Clerodendrum kaempferi (Jacq.) Sieb.

Clerodendrum serratum (L.) Moon

Garretia cymarioides (Lam & Meeuse) Meeuse -- to be deleted

Garretia siamensis Fletcher

Lantana camara var. aculeata (L.) Moldenke
Vitex trifolia var. heterophylla (Mak.) Moldenke

NASSAU ISLANDS:
Clerodendrum buchanani (Roxb.) Walp. [Pagi]

MENTAWI ISLANDS:
Clerodendrum buchanani (Roxb.) Walp. [Bata, Batu, Pini, Siberut, & Sipora]
Clerodendrum fragrans (Vent.) R. Br. [Batu]
Clerodendrum inerme (L.) Gaertn. [Batu]
Clerodendrum paniculatum L. [Batu]
Clerodendrum phyllomega var. myrmecophilum (Ridl.) Bakh. [Batu & Siberut]
Vitex trifolia L. [Batu]
Vitex trifolia var. bicolor (Willd.) Moldenke [Pini]

VERLATEN ISLAND:
Clerodendrum inerme (L.) Gaertn.
Vitex trifolia var. bicolor (Willd.) Moldenke

KRAKATOA:
Clerodendrum disparifolium Blume
Clerodendrum inerme (L.) Gaertn.
Vitex trifolia var. bicolor (Willd.) Moldenke

JAVA:
Callicarpa inaequalis Teijsm. & Binn. -- delete the "*"
Clerodendrum bethunianum Lowe is the correct orthography
Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum fragrans (Vent.) R. Br.
Clerodendrum japonicum (Thunb.) Sweet
Clerodendrum laevifolium var. pubiflorum Bakh.
Clerodendrum macradenium Miq. -- to be deleted
Clerodendrum macrostegium Schau.
Clerodendrum myrmecophila Ridl. -- to be deleted
Clerodendrum phyllomega var. myrmecophilum (Ridl.) Moldenke
Clerodendrum rumphianum De Vriese & Teysm. is the correct orthography
Clerodendrum serratum var. dentatum H. J. Lam
Clerodendrum serratum var. wallichi C. B. Clarke -- to be deleted
Clerodendrum speciosissimum f. album Moldenke*
Clerodendrum thomsonae Balf. f.
Clerodendrum urticifolium (Roxb.) Wall.
Clerodendrum viscosum Vent.
Vitex altmanni Moldenke
Vitex negundo L.
Vitex negundo var. cannabifolia (Sieb. & Zucc.) Hand.-Mazz.
Vitex negundo var. intermedia (P'ei) Moldenke

MAS BESAR:
Vitex trifolia var. bicolor (Willd.) Moldenke
BOKOR:
Vitex trifolia var. bicolor (Willd.) Moldenke
NORDWACHTER:
Vitex trifolia var. bicolor (Willd.) Moldenke
BATAVIA BAY ISLANDS:
Clerodendrum inerme (L.) Gaertn. [Amsterdam, Dapoer, Edam, Haarlem, Klein Kombuis, & Lang]
Vitex trifolia var. bicolor (Willd.) Moldenke [Edam]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Klein Kombuis]
BANTAM BAY ISLANDS:
Clerodendrum inerme (L.) Gaertn. [Babi]
DUIZEND ISLANDS:
Clerodendrum inerme (L.) Gaertn. [Paniki]
KAMBANGAN:
Clerodendrum disparifolium Blume
Clerodendrum serratum (L.) Moon
LABUAN ISLAND:
Clerodendrum phyllomega var. myrmecophilum (Ridl.) Moldenke
JAMBONGAN:
Vitex trifolia var. heterophylla (Mak.) Moldenke
ANAMBAS ISLANDS:
Clerodendrum buchanani (Roxb.) Walp. [Siantan]
Clerodendrum inerme (L.) Gaertn. [Sedanau & Temaja]
BRITISH NORTH BORNEO:
Callicarpa involucrata Merr. -- delete the "*"
Callicarpa kinabaluensis Bakh.*
Clerodendrum bethunianum Lowe is the correct orthography
Clerodendrum haematolasium H. Hallier
Clerodendrum phyllomega Steud.
Faradaya matthewsii Merr. -- to be deleted
Faradaya papuana Scheff.
Teijsmanniodendron hollrungii (Warb.) Kosterm.
Vitex parviflora A. L. Juss.
SARAWAK:
Callicarpa havilandii (King & Gamble) H. J. Lam -- delete the "*"
Clerodendrum bethunianum Lowe is the correct orthography
Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum buruanum f. lindawianum (Lauterb.) Bakh.
Clerodendrum fragrans var. pleniflorum Schau.
Clerodendrum laevifolium var. pubiflorum Bakh.
Lantana trifolia L.
Teijsmanniodendron simplicifolium Merr.

Teijsmanniodendron unifoliolatum (Merr.) Moldenke*

BORNEO:

Callicarpa havilandii (King & Gamble) H. J. Lam

Callicarpa involucrata Merr.

Callicarpa japonica var. rhombifolia H. J. Lam -- delete the "*"

Callicarpa kinabaluensis Bakh. -- to be deleted

Clerodendrum barba-felis H. Hallier

Clerodendrum bethunianum Lowe is the correct orthography

Clerodendrum blumeanum Schau. -- to be deleted

Clerodendrum buruanum Miq.

Clerodendrum haematolasium H. Hallier -- delete the "*"

Clerodendrum indicum (L.) Kuntze

Clerodendrum ingratum K. Schum. & Lauterb.

Clerodendrum kaempferi var. album (P'ei) Moldenke

Clerodendrum lanuginosum Blume

Clerodendrum myrmecophila Ridl. -- to be deleted

Clerodendrum phyllomega var. myrmecophilum (Ridl.) Moldenke

Clerodendrum ridleyi King & Gamble

Clerodendrum scopiferum Miq.

Lantana camara L.

Petraeovitex scortechini King & Gamble

Teijsmanniodendron holophyllum var. pubescens Moldenke

Teijsmanniodendron pteropodum var. auriculatum Kosterm. -- to be deleted

Teijsmanniodendron simplicifolium var. kostermansi Moldenke*

Vitex buddingii Moldenke*

Vitex trifolia L.

Vitex urceolata C. B. Clarke

KARIMATA ARCHIPELAGO:

Clerodendrum fragrans var. pleniflorum Schau.

Clerodendrum inerme (L.) Gaertn. [Karimata]

Clerodendrum phyllomega Steud. [Penebangan]

Vitex pinnata L. [Karimata]

LAOET:

Clerodendrum singalense Miq.

TALAUT ISLANDS:

Clerodendrum bethunianum Lowe [Talaut]

Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Karakalang & Miangas]

Clerodendrum inerme (L.) Gaertn. [Karakalang]

Clerodendrum kaempferi (Jacq.) Sieb. [Karakalang]

Clerodendrum minahassae Teijsm. & Binn. [Salebaboe]

Faradaya splendida F. Muell. [Karakalong]

CELEBES:

Callicarpa inaequalis Teijsm. & Binn.
Clerodendrum brachyanthum Schau.
Clerodendrum buchanani var. fallax (Lindl.) Bakh.
Clerodendrum buchanani var. glabrum (H. J. Lam) Moldenke
Clerodendrum buruanum f. lindawianum (Lauterb.) Bakh.
Clerodendrum calamitosum L.
Clerodendrum fragrans (Vent.) R. Br.
Clerodendrum fragrans f. corymbosum Lam. & Bakh.*
Clerodendrum fragrans var. pleniflorum Schau.
Clerodendrum japonicum (Thunb.) Sweet
Clerodendrum minahassae var. brevitubulosum H. J. Lam
Clerodendrum puberulum Merr.
Clerodendrum riedelii Oliv. -- to be deleted
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted
Clerodendrum umbellatum var. speciosum (Dombrain) Moldenke
Clerodendrum urticifolium (Roxb.) Wall.
Vitex trifolia var. heterophylla (Mak.) Moldenke

TUKANG-BESI ISLANDS:
Clerodendrum blumeanum Schau. -- to be deleted

KANGEAN ARCHIPELAGO:
Clerodendrum buchanani (Roxb.) Walp. [Kangean]
Clerodendrum inerme (L.) Gaertn. [Bangko, Kangean, Kamboerit, Paliat, Saboenting, Saoebi, Saseel, & Sepapan]
Clerodendrum ingratum K. Schum. & Lauterb. [Kangean, Sepandjang, & Sepapan]
Clerodendrum laevifolium Blume [Paliat]
Clerodendrum urticifolium (Roxb.) Wall. [Kangean]
Vitex altmanni Moldenke [Kangean]
Vitex trifolia var. bicolor (Willd.) Moldenke [Kangean, Paliat, Saboenting, Saoebi, Saseel, Sepangjang, & Sepapan]

SUNDA ISLANDS:
Clerodendrum serratum (L.) Moon [Merak]

SALAJAR ISLANDS:
Callicarpa candicans (Burm. f.) Hochr. [Salajar]
Callicarpa longifolia Lam. [Kalao-Toa]
Clerodendrum buchanani (Roxb.) Walp. [Kalao-Toa & Tana Djampeja]
Clerodendrum inerme (L.) Gaertn. [Tana Djampeja]
Gmelina elliptica J. E. Sm. [Salajar]
Lantana camara L. [Salajar]
Vitex parviflora A. L. Juss. [kalao-Toa & Salajar]
Vitex pinnata L. [Salajar]
Vitex trifolia L. [Salajar]
Vitex trifolia var. simplicifolia Cham. [Salajar]

LESSER SUNDA ISLANDS:

Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum blumeanum var. glabrum H. J. Lam -- to be deleted
Clerodendrum bracteatum var. sumatranum Ridl. [Timor]
Clerodendrum buchanani (Roxb.) Walp. [Banka, Lepar, & Timor]
Clerodendrum buchanani f. breviflorum Moldenke [Lombok]*
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Bali, Flores, & Timor]
Clerodendrum buchanani var. glabrum (H. J. Lam) Moldenke [Bali, Flores, Lombok, & Wetar]
Clerodendrum buruanum Miq. [Flores]
Clerodendrum calamitosum L. [Bali & Banka]
Clerodendrum colebrokianum Walp. [Timor]
Clerodendrum deflexum Wall. [Banka & Mendanau]
Clerodendrum disparifolium Blume [Banka]
Clerodendrum fragrans var. pleniflorum Schau. [Bali & Banka]
Clerodendrum hettae H. Hallier [Soemba]
Clerodendrum inerme (L.) Gaertn. [Bali, Banka, Sebesi, & Sumbawa]
Clerodendrum laevifolium Blume [Banka]
Clerodendrum leparensis Moldenke [Lepar]*
Clerodendrum longifolium var. pubescens Moldenke [Lombok, Soemba, & Timor]
Clerodendrum longitubum Val. -- to be deleted
Clerodendrum minahassae Teijsm. & Binn. [Soemba]
Clerodendrum pulchrum Fawc. -- to be deleted
Clerodendrum serratum var. timorense Bakh. [Flores & Timor]*
Clerodendrum serratum var. wallichii C. B. Clarke -- to be deleted
Clerodendrum speciosissimum Van Geert [Soemba & Timor]
Clerodendrum villosum Blume [Billiton & Lepar]
Lantana camara L. [Lombok]
Lantana camara var. aculeata (L.) Moldenke [Sumbawa]
Stachytarpheta jamaicensis (L.) Vahl [Kisar]
Stachytarpheta urticaefolia (Salisb.) Sims [Lombok]
Vitex negundo L. [Billiton & Soemba]
Vitex negundo var. intermedia (P'ei) Moldenke [Banka]
Vitex parviflora A. L. Juss. [Roti & Semaoe]
Vitex trifolia L. [Sunbawa]
Vitex trifolia var. bicolor (Willd.) Moldenke [Bali]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Banka, Flores, Lombok, Sumbawa, & Timor]
Vitex trifolia var. simplicifolia Cham. [Kisar & Savoe]

MOLUCCA ISLANDS:

Avicennia marina var. rumphiana (H. Hallier) Bakh. [Morotai]

Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum blumeanum var. glabrum H. J. Lam -- to be deleted
Clerodendrum brachyanthum Schau. [Mangole & Soelabesi]
Clerodendrum buchanani (Roxb.) Walp. [Amboina, Ceram, Mangole, Sanana, Taliaboe, & Tanimber Islands]
Clerodendrum buchanani f. album Moldenke [Ceram]
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Amboina, Boano, Ceram, Key Islands, Morotai, & Ternate]
Clerodendrum buchanani var. glabrum (H. J. Lam) Moldenke [Amboina & Buru]
Clerodendrum buruanum Miq. [Amboina]
Clerodendrum calamitosum L. [Amboina & Ternate]
Clerodendrum ceramense Moldenke [Ceram]*
Clerodendrum fragrans var. pleniflorum Schau. [Ternate]
Clerodendrum indicum (L.) Kuntze [Ternate]
Clerodendrum inerme (L.) Gaertn. [Halmahera, Key Islands, Sanana, & Tanimber Islands]
Clerodendrum lanuginosum Blume [Halmahera, Morotai, & Obi]
Clerodendrum minahassae Teijsm. & Binn. [Taliaboe]
Clerodendrum rumphianum De Vriese & Teysm. is the correct orthography; add Sanana
Clerodendrum sahelangii Koord. [Ceram, Groot Kei, Key Islands, Morotai, & Tanimber Islands]
Clerodendrum spectabile Moldenke -- to be deleted
Faradaya dimorpha Pulle [Ceram & Mysole]
Gmelina lepidota Scheff. [Morotai]
Gmelina moluccana (Blume) Backer [Morotai]
Lantana camara L. [Tanimber Islands]
Stachytarpheta urticaefolia (Salisb.) Sims [Morotai]
Teijsmanniodendron ahernianum (Merr.) Bakh. [Ternate]
Teijsmanniodendron bogoriense Koord. [Ternate]
Teijsmanniodendron hollrungii (Warb.) Kosterm. [Mangole]
Vitex cofassus f. anomala Moldenke [Tanimber Islands]
Vitex trifolia var. bicolor (Willd.) Moldenke [Bisa, Buru, Ceram, Morotai, Obi, Sula, Taliaboe, & Tanimber Islands]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Amboina]

FISHERMAN ISLAND:
Clerodendrum floribundum R. Br.

NEW GUINEA:
Avicennia marina var. rumphiana (H. Hallier) Bakh. [Japen Island]
Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum brassii Beer & Lam [Japen Island]
Clerodendrum buchanani (Roxb.) Walp. [Papua]
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Dutch New

Guinea & Northeastern New Guinea]
Clerodendrum buruanum Miq. [Japen Island]
Clerodendrum buruanum f. lindawianum (Lauterb.) Bakh. -- delete the "*"; add Papua
Clerodendrum floribundum R. Br. [Papua]
Clerodendrum inerme (L.) Gaertn. [Northeastern New Guinea & Papua]
Clerodendrum longiflorum var. pubescens Moldenke [Dutch New Guinea]
Clerodendrum longitubum Val. -- to be deleted
Clerodendrum magnificum Warb. [Japen Island]
Clerodendrum porphyrocalyx var. dentatum H. J. Lam [Dutch New Guinea & Northeastern New Guinea]*
Clerodendrum rumphianum De Vriese & Teysm. [Papua]
Clerodendrum sahelangii Koord. [Dutch New Guinea]
Clerodendrum tracyanum (F. Muell.) F. Muell. [Dutch New Guinea & Japen Island]
Clerodendrum tomentosum (Vent.) R. Br. [Papua]
Eriocaulon brevipedunculatum Merr. [Northeastern New Guinea]
Eriocaulon echinulatum Mart. [Papua]
Faradaya albertisii F. Muell. [Papua]
Faradaya dimorpha Pulle [Japen Island & Papua; delete the "*"
Faradaya dimorpha var. cauliflora Moldenke [Papua]*
Faradaya papuana Scheff. [Dutch New Guinea, Northeastern New Guinea, & Papua]
Faradaya splendida F. Muell. [Japen Island]
Faradaya ternifolia F. Muell. [Papua]
Gmelina palawensis var. novoguineënsis Moldenke [Northeastern New Guinea]*
Stachytarpheta urticaefolia (Salisb.) Sims [Dutch New Guinea]
Teijsmanniodendron ahernianum (Merr.) Bakh. [Dutch New Guinea]
Teijsmanniodendron bogoriense Koord. [Biak Island & Dutch New Guinea]
Teijsmanniodendron hollrungii (Warb.) Kosterm. [Japen Island]
Teijsmanniodendron novo-guineense (Kaneh. & Hatus.) Kosterm. [Dutch New Guinea]
Vitex scandens Moldenke [Dutch New Guinea]*
Vitex trifolia var. bicolor (Willd.) Moldenke [Japen Island, Northeastern New Guinea, & Papua]

SAIBAI ISLAND:
Clerodendrum inerme (L.) Gaertn.
Clerodendrum magnificum Warb.

AROE ISLANDS:
Avicennia eucalyptifolia Zipp. [Wamer]
Clerodendrum buchanani (Roxb.) Walp. [Kobroör]
Clerodendrum inerme (L.) Gaertn. [Kobroör]

Clerodendrum longiflorum var. pubescens Moldenke [Trangan]
Faradaya splendida F. Muell.
Stachytarpheta urticaefolia (Salisb.) Sims [Wamar]
Vitex cofassus Reinw. [Kobroör & Trangan]
LOUISIDADE ARCHIPELAGO:
Vitex trifolia var. bicolor (Willd.) Moldenke [Rossell]
KRAKA ISLAND:
Avicennia eucalyptifolia Zipp.
MISOOL ISLAND:
Clerodendrum buchanani var. fallax (Lindl.) Bakh.
Gmelina dalrympleana var. schlechteri (H. J. Lam) Moldenke
Gmelina misoolensis Moldenke*
Lantana camara L.
Teijsmanniodendron hollrungii (Warb.) Kosterm.
MANSINAMA ISLAND:
Callicarpa erioclona Schau.
Clerodendrum buchanani (Roxb.) Walp. -- to be deleted
Clerodendrum buchanani var. fallax (Lindl.) Bakh.
Clerodendrum papuanum Scheff. -- to be deleted
Faradaya papuana Scheff.
HAWAIIAN ISLANDS:
Vitex trifolia var. bicolor (Willd.) Moldenke [Oahu]
BISMARK ARCHIPELAGO:
Callicarpa peekelii Markgraf -- to be deleted
Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum buchanani (Roxb.) Walp. -- to be deleted
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [New Britain]
Faradaya peekelii (Markgraf) Moldenke [New Ireland]*
SOLOMON ISLANDS:
Clerodendrum buchanani (Roxb.) Walp. -- to be deleted
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Bougainville, San Cristoval, & Ysabel]
Clerodendrum buruanum f. lindawianum (Lauterb.) Bakh. [Bougainville, Guadalcanal, Malaita, San Cristoval, & Ysabel]
Clerodendrum inerme (L.) Gaertn. [Bougainville & Guadalcanal]
Faradaya amicorum var. salomonensis Bakh. -- to be deleted
Faradaya salomonensis (Bakh.) Moldenke [Guadalcanal, San Cristoval, & Ysabel]*
Vitex trifolia var. bicolor (Willd.) Moldenke [Guadalcanal]
NEW HEBRIDES:
Clerodendrum buchanani var. glabrum (H. J. Lam) Moldenke [Espiritu Santo]
Faradaya neo-ebudica Guillaum. -- delete the "*"
TONGA ISLANDS:
Faradaya amicorum (Seem.) Seem. -- to be deleted

Faradaya neo-ebudica Guillaum. [Eua]
Vitex trifolia var. bicolor (Willd.) Moldenke [Tingabatu]

FIJI ISLANDS:
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Kandavu & Viti Levu]
Clerodendrum speciosissimum Van Geert -- to be deleted
Faradaya neo-ebudica Guillaum. [Kandavu & Viti Levu]
Faradaya neo-ebudica var. degeneri Moldenke [Viti Levu]*
Faradaya neo-ebudica var. puberulenta (Moldenke) Moldenke [Vanua Levu & Viti Levu]*
Faradaya ovalifolia var. glabra Moldenke [Viti Levu]*
Faradaya vitiensis var. puberulenta Moldenke -- to be deleted
Vitex trifolia var. heterophylla (Mak.) Moldenke [Viti Levu]

SAMOAN ISLANDS:
Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum buchanani (Roxb.) Walp. -- to be deleted
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Ofu & Tau]
Clerodendrum inerme (L.) Gaertn. [Savaii & Upolu]
Clerodendrum speciosissimum Van Geert -- to be deleted
Faradaya amicorum (Seem.) Seem. [Tau, Tutuila, & Upolu]*
Faradaya savaiiensis Rech. -- to be deleted

AUSTRALIA:
Clerodendrum tomentosum (Vent.) R. Br. -- delete the "*"
Faradaya papuana Scheff. [Queensland]
Stachytarpheta jamaicensis (L.) Vahl [Queensland]
Stachytarpheta urticaefolia (Salisb.) Sims [Queensland]
Vitex trifolia var. bicolor (Willd.) Moldenke [Western Australia]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Queensland]

PALM ISLAND:
Clerodendrum inerme (L.) Gaertn.

NEW ZEALAND:
Avicennia marina var. resinifera (Forst.) Bakh. [North Island]

TUAMOTO ISLANDS:
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Makatea]
Clerodendrum speciosissimum Van Geert -- to be deleted

CULTIVATED:
Aloysia lycioides Cham. [Uruguay]
Callicarpa americana L. [Java]
Callicarpa dichotoma (Lour.) K. Koch [Java]
Callicarpa japonica var. rhombifolia H. J. Lam [Java]
Clerodendrum bakhuizeni Moldenke [Java]*
Clerodendrum bethunianum Lowe is the correct orthography
Clerodendrum blumeanum Schau. -- to be deleted
Clerodendrum buchanani (Roxb.) Walp. [Antigua, Guadeloupe, Java, & Martinique]

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PUCCINIA POTENTILLARUM *

Bernard Boivin

Division of Botany and Plant Pathology
Department of Agriculture
Ottawa

All the specimens cited below are preserved in the Herbarium of the Division of Botany and Plant Pathology, Department of Agriculture, Ottawa, Canada, except those marked (SWC) which are to be found in the Herbarium of the Experimental Station at Swift Current in Saskatchewan.

I - Comarum (L.) Boivin

POTENTILLA L. subgenus Comarum (L.) stat. n., Comarum L., Sp. pl. 1:502. 1753 et Gen. Pl. ed. 5, 1754.

POTENTILLA PALUSTRIS (L.) Scop. f. GLANDULOSA Gunnarsson; P. palustris (L.) Scop. var. villosa (Pers.) Lehm. (Vide Rhodora 16:5-11. 1914).

This variation, more glandular and with leaves velvety above, occurs in Canada from the Maritime Provinces to British Columbia. It seems to be an ecological variant and does not appear to present a distinct geographical range, neither in Canada nor in the range of the species as a whole.

II - Sibbaldiopsis (Rydb.) Boivin

POTENTILLA L. subgenus Sibbaldiopsis (Rydb.) stat. n., Sibbaldiopsis Rydberg, Mem. Dep. Bot. Col. U. 2:187, 1897.

III - Potentilla

POTENTILLA BIPINNATIFIDA Douglas. Appears to be related to P. multifida L. at least as much as to P. Pensylvanica L. to which it is often subordinated as a variety.

Specimens examined from Manitoba, Saskatchewan, Alberta and Mackenzie.

POTENTILLA CONCINNA Rich. var. dissecta (Watson) stat. n.; Potentilla nivea L. var. dissecta Watson, Proc. Am. Ac. 8:559. 1873; Potentilla concinna Rich. var. divisa Rydb; Bull. Torrey Club 23:431. 1896 (nomen illegitimum); Potentilla divisa Rydb. N. Am. Fl. 22:330. 1908. Does not seem to differ from the typical phase except by its more deeply divided leaf-

lets.

Specimens examined from Saskatchewan (Cypress Hills).

POTENTILLA GRACILIS Douglas var. ctenophora (Rydb.) stat. n., Potentilla flabelliformis Lehm. var. ctenophora Rydb., Bull. Torr. Club. 24:7. 1897.

Phase with leaflets pectinati-partite to pectinate.

Specimens examined from Saskatchewan and Alberta.

POTENTILLA GRACILIS Douglas var. filipes (Rydb.) stat. n.; P. filipes Rydb., Bull. Torr. Club 28:174-5. 1901; P. pulcherrima Douglas var. filipes (Rydb.) Th. Wolf, Bibl. Bot. 16, 71:209. 1908; P. camporum Rydb., N. Am. Fl. 22:319. 1908.

Plant smaller with leaflets white tomentose below.

Specimens examined from Saskatchewan and Alberta.

POTENTILLA HIPPIANA Lehm. var. HIPPIANA. New to Ontario:

Ontario: C.E. Garton 1219, Thunder Bay District, Sibley Peninsula, Surprise Lake, Silver Islet, dry stony soil, July 27, 1950 (DAO).

POTENTILLA HIPPIANA Lehm. var. argyrea (Rydb.) stat. n., Potentilla argyrea Rydberg, N. Am. Fl. 22:341. 1908.

Differs from var. hippiana only by its leaflets white tomentose above.

Specimens examined from Saskatchewan and Alberta.

POTENTILLA MULTIFIDA L. Range extension and new to the Gray's Manual range:

Ontario, Thunder Bay: C.E. Garton 1218, Sibley Peninsula, Surprise Lake, Silver Islet, dry stony ridge, July 27, 1950 (DAO).

POTENTILLA PENSYLVANICA L. var. PENSYLVANICA; P. pectinata Raf., Aut. Bot. 164. 1840, nec P. pectinata Auctorum.

As a synonym of his P. pectinata, Rafinesque gave P. pensylvanica L. The name thus created by Rafinesque is therefore illegitimate and should fall into the synonymy of P. pensylvanica L.

Specimens examined from Manitoba, Saskatchewan, Alberta, British Columbia, Mackenzie and Yukon.

POTENTILLA PENSYLVANICA L. var. arida var. n.; Potentilla strigosa Rydberg, pro parte (typ. excl.), nec verosimiliter P. strigosa Pallas nomen, nec P. pensylvanica L. var. strigosa Pursh, Fl. Am. Sept. 1:356. 1814. Pubescentia densior, eglandulosa vel glandulositate saepius obscura, petiolorum pilis patentibus saepius 1-2-(3) mm, caulinum saepius sicut petiolorum. Planta saepius erectior et brevior, nonnunquam tamen alta vel basa decumbens. Typus: Boivin & Gillett 8910, Saskatchewan, district de Maple Creek, 3 milles à l'ouest de Gull Lake, dunes fixées, 15 août 1951 (DAO type).

Ontario, Kenora: W.N. Denike 662, Ingolf.

Manitoba, Brandon: H. Marshall 33, Brandon, dry hills; Lisgar: H. Groh, Morden, July, 1921; H. Groh, La Riviere, plains, June 18, 1932; H. Groh, Aweme, plains, June 9, 1932; Neepawa: Boivin & Breitung 6516, Sydney, sand dunes lightly covered with aspen and oak; Senn & Gordon 3140, Carberry, dry sandy hillside; Boivin & Breitung 6592; Lyleton, natural prairie; J.L. Bolton, Lyleton, open prairie, July 8, 1937 (SWC).

Saskatchewan: S.J. Neville, Cottonwood; Assiniboia: Boivin & Dore 7959, southeast of Hitchcock, dry Bouteloua prairie; Boivin & Dore 8027, Roche Percee, at top of dry slope; Humboldt: H.A. Senn 2964, 2956, Watrous, dry prairie; Kindersley: L. Jenkins 679, Hoosier; Mackenzie: J.S. Rowe 240, Preeceville, sandy grassy ridge; A.J. Breitung 732, Hudson Bay Junction, dry sandy soil; Maple Creek: Frankton 293, Robsart, dry coulee; Senn, Tisdale & Budd 2444, Robsart, dry prairie; Senn, Tisdale & Budd 2359, Cypress Hills Park, dry areas; A.J. Breitung 5008, 5700, 5701, 4437, Cypress Hills, prairie; Coupland & Budd 25, 26, Maple Creek; A.C. Budd 29, 30, Cypress Hills Park; J.B. Campbell, Maple Creek, prairie, June 10, 1939 (SWC); Melfort: A.J. Breitung 407, McKague, gravel pit; A.J. Breitung 291, McKague, along road; Melville: Russell & Russell S3702, Elbourne, open prairie; Lake Centre: W. Shevkenek 119, Qu'Appelle Valley, hillsides; Boivin & Dore 7688, Spy Hill, Agassiz coulée, top of south-facing scarp; North Battleford: B. Boivin 6922, Flat Valley, sommet de l'écorre le long de la rivière Beaver; Boivin & Breitung 6753, Radisson, prairie; Prince Albert: Senn, Groh & Russell 2906, Macdowall, dry sandy woodland; Boivin & Breitung 6120, Nisbet Provincial Forest, sandy Jack Pine woods; Qu' Appelle: Boivin & Gillett 8457, Wolseley, écorre d' un ruisseau; Russell & Russell S4522, Pilot Butte, July 5, 1945; Rosthern: Russell & Russell, Dana, dry hillside, July 3, 1936; Senn, Groh & Russell 2752, Dana, dry hillside; Senn, Groh & Russell 2810,

St. Louis, dry sandy plain; Saskatoon: R.C. Russell S2969, Pike Lake, sandy prairie; W.P. Fraser 17, 18, Saskatoon, low ground by dry slough (SWC); Boivin & Russell & Breitung 6715, Pile Lake, sandy soil; Swift Current: C. Frankton 174, Webb, range; A.J. Breitung 3956, 3976, 4017, 4033, 5780, Swift Current, dry prairie; A.C. Budd, Swift Current, June 10, 1934 (SWC); A.C. Budd 28, 62, Swift Current; A.C. Budd 34, 35, 37, 43, 150, Chaplin; A.C. Budd 39, Courval; A.C. Budd 27, Lorryford; A.C. Budd 44, Courval (DAO, SWC); A.C. Budd 33, Leiman; A.C. Budd 36, Valjean; Weyburn: W. Shevkenek 178, Big Muddy Valley; Boivin & Dore 7954, Macoun, dry embankment; Boivin & Dore 7848, Weyburn, dry hillside; Wood Mountain: Boivin & Gillett 8687, Bengough, coulée Hudson, prairie aride; Boivin & Gillett 8743, Bengough, affleurement de grès; J.L. Bolton, Bengough, open prairie, July 17, 1938; Yorkton: R.S. Russell S2922, Punnichy, open prairie on dry soil; Russell & Russell S4814, Copeland, hill on prairie; L.T. Carmichael 164, Yorkton; W. Shevkenek, Theodore, sandy soil; C. Shaw 51a, Yorkton, prairie.

Alberta, Acadia: A.H. Brinkman 5169, 5215, Craigymle, grassland; Lethbridge: C. Frankton 224, Lethbridge, hills; Macleod: E.H. Moss 715, Macleod, prairie gravelly soil; E.H. Moss 338, Castle River, river flats; E.H. Moss 243, Pincher, prairie, sandy loam; E.W. Tisdale 38, Pincher Creek; Medicine Hat: A.C. Budd 32, Cypress Hills, West Block, bench (DAO, SWC); Tisdale & Coupland 161, Medicine Hat; Peace River: L. Jenkins 186, 731(c), 350, Beaverlodge, dry places of open woods; E.H. Moss 7435, Prestville, dry slope; E.H. Moss 7501, Spirit River, native grassland; Vegreville: G.H. Turner 25, Fort Saskatchewan, open prairie.

British Columbia, Cariboo: E.H. Moss 8167, Fort St. John, dry steep slope of creek valley.

North Dakota, Ward: Boivin & Dore 8064, Bowbells, dry hillside.

South Dakota: O. Tollefson 2, Custer State Park.

New Mexico: Heller & Heller 3795, Santa Fe Canon.

Pursh's description of var. strigosa reads as follows: "cano-pubescens; foliis pectinato-dentatis margine revolutis, floribus corymbosis". This description does not seem to apply to this plant. The description of the pubescence in particular would seem to apply to a plant similar to P. bipinnatifida Douglas.

POTENTILLA PENSYLVANICA L. var. GLABRATA (Hooker) Watson. Range extension and apparently new to Ontario:

Ontario, Thunder Bay: C.E. Garton 1694, Hardwick Township, Sanstone Lake Road at Junction of Roundtable Lake Road, gravelly bank, 29 Aug., 1951 (DAO).

POTENTILLA PENSYLVANICA L. var. litoralis (Rydberg) stat. n., Potentilla litoralis Rydberg, Bull. Torr. Bot. Club 23:264. 1896, nec Anserina litoralis Rydberg, N. Am. Fl. 22: 354. 1908, nec Potentilla litoralis (Rydb.) Fedde, Just. Bot. Jahr. 36,2:488. 1910; Potentilla pectinata Raf., Aut. Bot. 164. 1848 pro parte, typo excl., Potentilla pectinata Auctorum.

This entity does not appear to be sufficiently distinct to warrant retention at specific rank.

Specimens examined from Nova Scotia (Atlantic coast), Quebec (coast of Saint Lawrence Gulf), Ontario (Thunder Bay District), and Manitoba (Hudson Bay coast).

POTENTILLA RECTA L. var. OBSCURA (Nestler) Koch. Locally naturalized in Canada.

Specimens examined from Ontario (Sibley Peninsula, Beausoleil and Manitoulin Islands, Brussels, Wiarton and Oakville) and Saskatchewan (Caron).

POTENTILLA RECTA L. var. PILOSA (W.) Led. Locally naturalized in Canada in the vicinity of Kingston and Preston (Ontario).

POTENTILLA RECTA L. var. SULPHUREA (Lam. & DC.) Peyr. Introduced from Europe and abundantly naturalized in the more southern parts of Eastern Canada. It is the commoner of our three varieties and is easily distinguished by its middle and lower stem leaves which commonly have 7 leaflets in var. sulphurea and only 5 in the other two varieties.

Specimens examined from Nova Scotia, Quebec, Ontario, Saskatchewan (Swift Current) and British Columbia (Kimberley and Bridesville).

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THE SOUTH AMERICAN SPECIES OF MANILKARA

Joseph V. Monachino

It is not intended here to review the papers already published on Manilkara, except for those on the South American species. Studies on the North American species will be mentioned briefly.

In recent times only Charles Gilly and Arthur Cronquist have been the principal students of the North American Sapotaceae. Refer to the papers by Cronquist for a clear exposition and summary.

Charles Gilly, in March, 1943, made two bold proposals regarding Manilkara. He declared Achras and Manilkara congeneric, and presented a very novel interpretation of their flower morphology. Achras and Manilkara had been widely separated by many botanists, the flowers of typical Achras and typical Manilkara being quite different, so that it took remarkable courage to expound their union. H. Pittier, in describing Achras chicle almost a quarter of a century previously, had noted that if the dorsal appendages of the corolla had been present the species would have been a perfect Mimusops, that is, Manilkara. Pierre and Urban (1904, p. 163) stated that Manilkara has the ensemble of characters of Achras, and greater resemblance to it than to Mimusops. Grisebach (Fl. Brit. W. Ind. 399. 1861) placed his Sapota sideroxylon, which is a Manilkara, in Sect. Achras next to S. achras; but he gave a too broad circumscription to Sapota (included Microphalis), and at the same time recognized Mimusops, including Manilkara, as distinct from Sapota. Other botanists had indirectly suggested close alliance between Achras and Manilkara, but no one before Gilly pursued the matter to a definite conclusion.

If Gilly's understanding of the flower morphology of Manilkara is proven correct, it will probably be the one most outstanding contribution to the taxonomy of the Sapotaceae. The Manilkara flower has (1) a "corolla," tubular below, segmented above, the stamens attached to the upper part of the tube opposite to the somewhat modified segments, and (2) biserrate free "sepals." In Gilly's interpretation, the "corolla" is entirely staminodial, while the inner "sepals" are petals. Obviously, such a configuration departs widely from that of a Chrysophyllum perianth, which consists simply of calyx and unappendaged gamopetalous corolla with epipetalous stamens opposite the corolla-lobes.

In 1943, Gilly hinted at vascularization study not fully completed to support his ingenious contention. He has not yet presented concrete evidence either from anatomy or analogy.

The species treated by Gilly in Tropical Woods for March, 1943, were only those of Achras relationship. The 12 species and 2 varieties accepted by Gilly were reduced to 4 species by Cronquist (1945), who recognized for North America but 13 species of Manilkara, including Achras, Muriea and Shaferodendron.

Regarding the South American Manilkara, Flora Brasiliensis

covered 9 species, of which 4 were fully illustrated. The studies by A. Ducke are incomparably the most important. Ducke has been the best source of original knowledge in the group. My revision has been made possible largely by Ducke's help and also by the aid received from Dr. H. N. Moldenke.

In "As Maçarandubas Amazônicas" Ducke treated 16 species. He presented descriptions, field notes and observations, and a key to the species.

Now is not the time, nor will it be for many years in the future, when studies in most groups of Sapotaceae can hope to approximate completeness. Taxonomically, the family is too much in flux. Of the many new species being discovered some fall into generic boundaries already too tenuous, thus suggesting union of genera; and still others, if in quantity, may show a sufficiently marked nuclear concentration of species to make it preferable to reinstate these genera, notwithstanding the overlapping boundaries. It is not expected that when all the taxa of Sapotaceae are known, an unbroken continuum of microspecies will reduce the family to a single genus, but certainly many genera will merge. Most recent authors separate Manilkara from Mimusops, on good grounds. Superficially there is greater difference in the flower structure of typical Achras and Manilkara than between Manilkara and Mimusops. Discovery of Mimusops in America would contribute much to its re-embracing Manilkara. A greater possibility is that intermediates may be found in the Old World, where both genera grow.

Generic revaluation may be a thing of the future, but additional knowledge to the species of Manilkara is gained almost daily. Dr. Ducke is actively continuing studies in the Brazilian Manilkara. On this very day I am in receipt of critical material obtained by Ducke. The present paper, then, should be considered an interim and provisional one, intended more to help future studies than settle many current problems.

One of the largest collections of South American Sapotaceae was made about 1940-1942 (-1946 ?) under the auspices of the Chicle Development Company. The material of Manilkara collected on this project has been removed from The New York Botanical Garden to an undesignated place and is not available for study. Specimens in this collection were named in the herbarium as new species by Gilly. Most of these and other cheironyms remain unpublished.

Mimusops reticulata Huber ex Ducke, Bol. Mus. Goeldi (1913) 7:174 is a nomen nudum. In a discussion of the flora of the municipality of Obidos, Pará, Brazil, Ducke wrote that this shrub (with fruits very sweet and tasty) is perhaps the most common and certainly the most characteristic there, not encountered elsewhere. This invalid name has not been identified.

Manilkara is a member of the Mimusopeae. See Dubard for a world synopsis of the group and good schematic illustrations of the flowers. The genera of this tribe by far the best represented are Manilkara and Mimusops. While Mimusops is confined to the Old World, Manilkara is found in about equal ratios in both hemispheres. In America it is found in Florida and the West Indies to extratropical South America. Achras, wholly American, is confined to the northern part of the range; this

alone might suggest a distinct generic status for Achras, albeit a weak one. There is, no doubt, transition between Achras and Manilkara, but transition alone does not always justify synonymy. If it did, it would be necessary to unite families, genera and species of plants by the scores.

Elbert L. Little, Jr. (Rhodora 49:289-293. 1947; Ballots for Proposed Amendments to the International Rules of Botanical Nomenclature etc., 6361. 1948) proposed Achras L. emend. Loefl. ex L. for conservation against Manilkara, if necessary. The following arguments might be presented against his proposal. All species of Achras have already been transferred to Manilkara; there are some 50 names in the latter still not appended to Achras. There is little likelihood that many new species of Achras will be described. On the contrary, novelties in Manilkara will continue to be published even if Achras is conserved, as some botanists will not agree to their equivalency. Others, confirmed believers in the synonymous link of the two, will snatch the new names for transfer. The recombination will be done automatically by some, without profound consideration of the botany of Achras and its position in the Mimusopeae as a whole. In addition to the early confusion regarding Achras, approximately 20 names already published in this genus belong to species of Calocarpum, Pouteria, Dipholis, Bumelia, etc. Although "Achras zapota" is more familiar in texts and to commercial persons, it is botanically less precise than Manilkara zapotilla; real taxonomic contributions to the Achras complex have been made only comparatively recently by Pittier, Gilly, Cronquist, and others.

Dr. Little suggested that Achras zapota L. (1753) be considered emended, and argued for its retention under Article 50 of the International Rules, which states that an alteration of the diagnostic characters of a group does not warrant a change in name. The original description of Achras L. (Gen. Pl., ed. 5) was based completely on "Sapota Plum. 4." Plumier's figure and Linnaeus' description contain no recognizable element of Manilkara zapotilla. In Species Plantarum, Linnaeus presents seven citations under Achras zapota, not one of which, apparently, refers to M. zapotilla. In fact, two citations (Sloan. jam. and Pluk. alm.) rather definitely suggest Calocarpum sapota (= C. mammosum). Article 50 is not definite on the subject, but it seems that it intended no extension of the meaning of "alteration" to include complete change, a wholly new definition of a group containing not one of the original elements.

Up to at least 1950, Ducke was not fully convinced of a distinct generic separation of Manilkara from Mimusops. However, in "As Maçarandubas Amazônicas" he used Manilkara in designating the species. Previously, he published new species under Mimusops, and later, in 1942, he proposed M. longiciliata and M. siqueiraei under both genera simultaneously, e.g., "Manilkara longiciliata Ducke, sp. nov. vel Mimusops longiciliata Ducke, sp. nov." This form of publication has been regarded as invalid under Article 37 of the International Rules, because the names were "proposed provisionally in anticipation of the eventual acceptance" of one or the other; because neither one was "definitely accepted by the author."

I do not regard Ducke's usage a serious breach of the Rules.

It may truly be that Ducke proposed the alternate name in anticipation of its possible eventual acceptance, but one can assume otherwise, that Ducke definitely, not provisionally, accepted both binomials, as both were and would be equally worthy of acceptance. Under some circumstances the species is better referred to Mimusops and in other instances to Manilkara, the preference being sometimes reversed for the sake of convenience, not for botanical reasons. There is nothing in Ducke's usage to preclude "definite acceptance" of both names. Or, to use a different argument, Ducke's "vel" may be interpreted as "indication of taxonomic doubt," which, according to the changes made at the 7th Int. Cong. at Stockholm, does not apply to the provision concerning definite acceptance. In the present stage of knowledge of generic delimitations in the Sapotaceae, certain species fall into two genera with almost equally good reasons. Publication of alternate names simultaneously by the same author, in such instances, is more commendable than publication of new combinations at different times by the same or different authors.

In respect to separation of Mimusops and Manilkara see Dubard (1915), Eyma (1936), Lam (1941), Cronquist (1946), and Ducke (1950). Pierre and Urban suggested in 1904 that Manilkara is a distinct genus.

Manilkara falls in Mimusops sect. Ternaria A.DC. (1844), and Mimusops subgen. Manilkara (Adanson) Pierre & Urban (1904). Manilkara sect. Eumanilkara Dubard (1915) was elevated to a subgenus by Gilly (1943). M. zapotilla was placed in Sapota sect. Achras A.DC. in Prodromus. The Achras group was trisected by Gilly into subgenera Manilkariopsis, Nispero and Euachras. Some species have the filaments and staminodes united below into a very short tube (Synarrhena Fisch. & Mey., 1841). The indumentum is an important diagnostic character but is quickly lost. Its base color is rusty or rufous becoming greyish with age. The leaf-blades are oblanceolate or obovate to subelliptic; more or less cuneate at the base; rounded or emarginate to slightly narrowed or short-acuminate at the apex; the midrib is usually raised on the upperside. The pedicels elongate in fruit, sometimes greatly. The sepals are variously pubescent outside and often are hairy also along the margins within; the inner sepals are slightly different from the outer in shape (more oblong), texture (thinner), and have lighter colored indumentum. The corolla-tube in most species of Eumanilkara is approximately one mm. long; the lobes are narrowed at base into somewhat of a claw. The staminodes are, within certain limits, highly variable in size, shape and lobing, and unless broadly interpreted may lead to error. For an example of variation in sapotaceous staminodes see Lam (1925), Planchonella obovata, fig. 58. Flower size is also variable; the measurements given in the following descriptions of species are all approximate. Manilkara bidentata, and perhaps some other species, comprise numerous forms, and may prove to be "species complexes." Many indubiously distinct taxa are closely allied and difficult to distinguish in the herbarium. M. subsericea of South America and M. angolensis of Africa present an instance of two species that simulate each other.

In the northern range of our area there are three species belonging to the section Achras. These extend to North America and are treated by Cronquist (1945). Their relationship to other North American species has not been studied by me.

In South America the species are found in the eastern part of the continent. The center of concentration of Eumanilkara is in the hylaea of the Amazon.

Species of Manilkara and Mimusops have been cultivated in the New World since early times. Aublet's Achras balata in 1775 was based on an introduced species, Mimusops commersonii, found in botanic gardens in the Antilles, Guiana and Brazil (Chevalier). The type-species of Manilkara, the Asiatic M. kauki, was introduced in Jamaica and Guiana; naturalized in Saint Vincent (Grisebach, Fl. Br. W. Ind., p. 400. 1861). Mimusops elengi has been introduced in the West Indies; its cultivation in Brazil is mentioned by Martius (Flora 22 Beibl. 4. 1839) and Barbosa Rodrigues. It was collected in the Trinidad Botanical Garden (Rusby, Apr. 1836) and in the wild land in the Botanic Garden, Georgetown, British Guiana (A.S.Hitchcock 16545, low ground of Jungle, Oct. 1919). M. zapotilla may be found anywhere in the tropics. Campos Porto lists the following species cultivated in the Jardim Botanico do Rio de Janeiro: M. bidentata, from Rio Branco, M. huberi and M. amazonica from Belém do Pará. In addition to the species already mentioned, the U. S. Dept. Agr., Bureau of Plant Industry, lists receipt of seeds of Mimusops zeyheri (1920 and 1925).

ARTIFICIAL KEY TO SOUTH AMERICAN SPECIES OF MANILKARA

1. Appendages of corolla-lobes free to summit of tube, flowers usually several to many in the axil, sepals less than 7 mm. long (except M. longifolia), corolla-tube less than 2 mm. long, staminodes less than 2.5 mm. long (excluding long filamentous tips in some), ovary glabrous (except M. elata, M. excelsa, M. pubicarpa).(Eumanilkara).....2.
   2. Leaf blades at maturity densely appressed-pubescent beneath (see also M. bidentata, M. longiciliata).....3.
      3. Pedicels shorter than or little surpassing subtending petiole.....4.
         4. Reticulation of veinlets very striking on underside of leaves, indumentum chiefly ocher-yellow, covered by a vernicose coating, blades large, 7.5 - 27 cm. long, ovary pubescent...1. M. elata
         4. Reticulation not striking.....5.
            5. Blades moderate-sized or small, 4 - 15 cm. long, pubescence beneath of linear trichomes, staminodes over 1.5 mm. long, deeply cut.....6.
               6. Calyx less than 3 mm. diam., closely appressed scurfy-pubescent; Pará, Maranhão.....2. M. paraensis

6. Calyx over 3 mm. diam., tomentose with subspreading hairs, lateral nerves on underside of blades slightly elevated.....7.
7. Leaf-blades obovate, broadly cuneate at base, staminodes sharply bifid, 0.5 mm. broad, young leaves densely rufous-tomentose as well as strigulose; Ceará-Bahia.....3. M. duckei
7. Leaf-blades oblanceolate, gradually tapering at base, staminodes irregularly multifid, 0.8 - 1 mm. broad, young leaves stigulose only; Rio de Janeiro, Espirito Santo.....4. M. bella
5. Blades very large, 15 - 26 cm. long, minutely squamulose-vernicose beneath, staminodes very short, 0.7 mm. long.....19. M. sp.
3. Pedicels clearly longer than subtending petiole, indumentum on underside of leaf an evanescent argenteous pellicule, staminodes 1.7 - 2.6 mm. long, irregularly laciniate.....5. M. subsericea
2. Leaf-blades at maturity glabrous or sparsely pubescent.....8.
8. Pedicels clearly longer than subtending petiole; Pará-south.....9.
9. Innovations and young leaves glabrous or appressed puberulent.....10.
10. Fascicles many flowered (3-numerous), staminodes 1.5 mm. or longer, deeply cut. (Glabrous form of M. subsericea ?).....6. M. floribunda
10. Fascicles few flowered (3 - 1, rarely more), staminodes 0.3 - 0.9 mm. long, entire or lightly denticulate, corolla-lobes pubescent...9. M. triflora
9. Innovations and young leaves densely rufous fuzzy-tomentose, lateral nerves on underside of blades not elevated.....11.
11. Underside of older leaves with some appressed hairs persisting..10. M. rufula
11. Underside of leaves quickly becoming completely glabrous.....11. M. dardanoi
8. Pedicels shorter than or about equal to subtending petiole, staminodes over 1 mm. long; chiefly Pará - north.....12.
12. Ovary pubescent, staminodes normally without filamentous elongations.....13.
13. Innovations, young leaves and sepals rufous-tomentose, hairs spreading; Pará.....12. M. excelsa

13. Innovations, young leaves and sepals puberulent, hairs appressed; British Guiana.....13. M. pubicarpa
12. Ovary glabrous, indumentum on leaves appressed.....14.
14. Lacinae of staminodes with thread-like extensions.....15.
15. Leaf-blades thick, obovate, broad, 4.5 - 8 cm. broad, underside appearing glabrous but perhaps appressed furfuraceous overlaid with resin...14. M. longiciliata
15. Leaf-blades thin, oblanceolate to elliptic-oblong, narrow, 2.5 - 5 cm. broad, glabrous; wide distribution.....15. M. inundata
14. Lacinae of staminodes without thread-like elongations.....16.
16. Sepals less than 6 mm. long.....17.
17. Outer sepals sparsely minutely appressed squamulous, pedicels glabrous, reticulation on underside of leaves minutely prominulous under a lens.....16. M. surinamensis
17. Outer sepals densely tomentulose, pedicels tomentulose on upper part.....18.
18. Lateral nerves slightly raised on underside of leaves.....19.
19. Blades not conspicuously cuneate, oblanceolate to subelliptic; wide distribution.....17. M. bidentata (M. siqueiraei)
19. Blades very conspicuously cuneate at base, obovate; Venezuela.....18. M. williamsii
18. Lateral nerves not elevated; southern Brazil.....7. M. salzmanni
16. Sepals 10 mm. long, leaves 13 - 34 cm. long; southern Brazil.....8. M. longifolia
1. Appendages united to corolla-lobes or apparently absent, sepals 7 - 9 mm. long, corolla-tube over 2 mm. long, staminodes petaloid, over 2.5 mm. long, ovary pubescent, pedicels about equal to length of petiole, leaves chartaceous to subcoriaceous; northern Colombia and Venezuela. (Achras or Euachras).....20.
20. Flowers 2 - 5 in the axil, corolla-tube 2 - 2.4 mm. long, leaves subvernicose beneath, appressed scurfy-pubescent when young, corolla-lobes unappendaged.....20. M. calcicola
20. Flowers 1 in the axil, corolla-tube 4 - 5 mm. long, leaves rufous-tomentose when young.....21.

21. Corolla-lobes and appendages free 1/3 - 2/3 their length.....21. M. meridionalis
21. Corolla-lobes entire or dendiculate at apex.....22. M. zapotilla

1. MANILKARA ELATA (Fr. Allem. ex Miq.) Monachino, comb. nov.
Mimusops ? elata Allem. ex Miq., in Mart. Fl. Bras. 7:42. 1863. Non M. elata Allemão, 1866.
Mimusops Huberi Ducke, Arch. Jard. Bot. Rio de Janeiro 2:14. 1918.
Manilkara Huberi A. Chev., Rev. Bot. Appl. & Agr. Trop. 12:276, 351. 1932; Standl., Trop. Woods 33:19. 1933.

Tree 30 - 40 m. or up to 50 m., petioles 2.5 - 5 cm. long, blades elliptic to suboblanceolate, 7.5 - 27 cm. long, (2.5-)5 - 12 cm. broad, underside densely covered with yellow-brown, ocher-yellow or paler, appressed tomentum overlaid by a transparent waxy coat, delicately striolate with many lateral nerves, the reticulation forming a characteristic fine network of usually brown veinlets contrasted against a lighter background. Pedicels 1.5 - 2.3(-3) cm. long, tomentulose-scurfy, sepals 4.3 - 5 mm. long, corolla-segments 3 - 3.3 mm. long, staminodes 1.8 mm. long, 0.8 - 0.9 mm. broad, sharply bifid, filaments 2 mm. long, anthers 1.3 mm. long, ovary appressed-tomentulose.

Type.- Erroneous locality given in the original description: "silvas prov. Sebastianopolitanae et Bahiensis: M." Data on photo of Martius plant at Herb. Regium Monacense: "silvas prov. Bahiensis, etc. e.g. ad Ferradas. Martius 1819 ?" In 1819, Martius traveled in both Pará and Bahia (Fl. Bras. 1:60). Type of M. huberi: "silvis primaevis haud vel rarius inundatis civitatis Pará; ad viam ferream inter Belém et Brangança prope Castanhal (Herb. Amaz. Mus. Paraensis 3.279) et prope Santa Izabel (10.177); ad flumen Guamá prope Ourem (4.067); in regione fluvii Trombetas inter flumina Cuminá-mirim et Arir-amba (7.976, 11.460, 11.910, 14.965)."

Illust.- (M. huberi).- Ducke (1918, p. 14, fl. analysis; pl. 2A, photo fl. br. Also 1922, p. 239, b, as "M. rufula" by error).

Distrib.- "Upland rain forest through Pará, up to eastern half of Amazonas and northern Matto Grosso; Dutch and British Guiana, and Venezuela" (Ducke 1942). A. J. Sampaio told Chevalier verbally that M. huberi is a good producer of balata, and that in the Obidos-Tumuc-Humac region (expedition Rondon) it is the most frequent and tallest tree, as abundant in the forest area of the river as on the chain of Tumuc-Humac Mts.

This species was called Mimusops elata by Huber. Ducke, apparently giving weight to locality cited and credit given to Allemão in Flora Brasiliensis, judged the Allemão collection from Ceará (M. bella Monachino) typified M. elata. He identified the Pará material as M. huberi, a view that has been followed by Eyma and others.

I base my rather novel concept on study of the type. A small leaf segment of M. huberi, Ducke 140, Parintins, Lago Uaicurapá, was sent to Dr. K. Suessenguth to compare with the type of M. elata at Munich. Professor Suessenguth (letter of

Nov. 2, 1951) wrote:

"We have compared the fragment of Mimusops huberi sent by you with our type of M. elata. An exact identification, naturally, is not possible with respect to the small material. The network, in the whole, is just the same; probably in M. elata, the anastomoses are a little more distinct. M. huberi possesses a tomentum consisting of minute needle-shaped yellowish brown hairs enclosed in a dense cover of wax. Just the same cover is found in M. elata, but the hairs are more hyaline and therefore the undersurface of leaves seems to be glabrous. We cannot decide how far that difference of colour is of systematical importance. We return the fragment of M. huberi and add such one of M. elata's type. If it seems necessary, you can get that type on loan, too."

The leaf segment of the type sent by Suessenguth is approximately 21 x 17 mm. It is indistinguishable from M. huberi. The greyish color phase of the indumentum in M. elata type is frequently found in M. huberi (e.g., C.Wilgress Anderson 9, British Guiana). The photo of the Martius type (Field Mus. and Gray Herb.) shows the characteristic reticulation of veinlets.

The original description in Fl. Bras. (leaves "multinervio-striulatis...venulis distinctis" etc.) agrees with the Martius type at Munich. It was based on sterile material. An oversized juvenile leaf of M. bella (M. elata sensu Ducke) sent to me by Ducke bore no resemblance to M. huberi (true M. elata). Ducke, who knows both M. huberi and M. bella in the field, stressed that the leaves of the two are always and unmistakably distinguishable from each other.

There is no other known South American species with leaves resembling those of M. elata. If there were any southern Brazil species with such characteristic leaves, it would probably have commanded attention by now.

The leaf character of M. elata, however, can be duplicated in other species. Manilkara excisa (Urban) Gilly ex Cronquist, of Jamaica in the West Indies, has leaf indumentum and venation remarkably like in M. elata, although the flowers of the two species are very different. I choose to believe that actually the type of M. elata was collected in Northern Brazil, rather than assume that a species with leaves like it remains unrediscovered in Southern Brazil.

To select the Allemão collection as the type would be in disregard of the indubious Martius type at Munich and the original description which agrees in all particulars with the Martius type. Allemão's M. elata may be regarded as a later homonym. His description should not be interpreted as an emendation of Miquel's species. "Mimusops elata Fr. Allemão in litt. ad Martium" was cited by Miquel probably due to some misinterpretation; in any event, the citation is ambiguous. Allemão noted regarding his Massaranduba that it was found in all the forests of Brazil from Pará to Santa Catharina.

Ducke (1950, p. 233) refers to "Manilkara elata (Fr. All.) Chev." The combination was not located in works by Chevalier. It was not formally proposed by Ducke.

M. elata is the true Massaranduba of Pará. The wood is

said to be excellent and used for civil and naval construction (Pará: R.C.Monteiro da Costa 319, Capucho 367).

Acknowledgment is made to Prof. Dr. K. Suessenguth, to whom we owe the clarification of M. elata.

2. MANILKARA PARAENSIS (Huber) Standl., Trop. Woods 34:41. 1933.
Mimusops paraensis Huber, Bol. Mus. Goeldi 4:435. 1904.
M. paraensis var. discolor Huber, and var. densiflora Huber, loc. cit.

Petioles 1 - 1.5 cm. long, blades small, 4.5 - 10(-14) cm. long, 1.5 - 3(-5) cm. broad, rounded to little narrowed or short-acuminate at apex, tapering at base, dull above, underside yellow or greyish ferrugineous with dense closely appressed scurfy indumentum, lateral nerves hardly raised below, reticulation obscure. Pedicels 8 - 10 mm. long, scurfy, sepals 3.3 - 4 mm. long, corolla-segments 3.3 mm. long, staminodes 3 mm. long, deeply bifid, laciniae very slender, filaments 2.2 mm. long, anthers 1.5 mm. long, ovary glabrous.

Type.- Huber cited "Furo do Arrozal" for var. densiflora (first var.) and "diversos exemplares da estrada de ferro de Bragança et do rio Capim" for var. discolor; he did not indicate the typical variety. Ducke (1950, p. 242) cited "rio Capim, tipo da espécie, Huber, Herb. Mus. Pará 855 b; arrozal, perto de Belém, Herb. Mus. Pará 4.015 (tipo da var. discolor Hub.)." Fragment of 4015, photo and fragment of Aliverto 3280 (Castanhal, Belém-Bragança, 1903) at N.Y.B.G.

Distrib.- Pará, northeastern Maranhão; swampy forests.

The seeds of Mimusops maparajuba Huber belong to M. paraensis, according to Ducke (1950, p. 236).

Ducke (1922, p. 238) refers to the two varieties as forms and states that they are found on the same individual. In Tropical Woods, he (1942, p. 22) cited "Manilkara paraensis (Huber) Chev."; I was unable to find this combination in publications by Chevalier.

3. MANILKARA DUCKEI Monachino, sp. nov.

Arbor, petiolis 1 - 2 cm. longis, laminis obovatis usque ad oblongo-obovatis ca. 5 - 9 cm. longis, 3 - 5 cm. latis, ad basin cuneatis, ad apicem emarginatis vel obtusis, in statu juvenili subtus atrorufotomentosis, postquam rufo-sericeis denique parce griseo-sericeis, costa supra impressa; pedicellis ca. 1 cm. longis rufo-tomentosis; appendicibus loborum corollas ca. 2 mm. longis ad apicem obscure denticulatis; staminodeis ca. 1.5 - 2 mm. longis, 0.5 mm. latis, argute bifidis.

Type.- Dárdano de A. Lima 49-168, Serra Negra, 8-2-1949, deposited at The New York Botanical Garden. Other specimens examined: Ducke 1428, Ceará (leaves and flower fragments); Ducke 2028, Ceará, parte occidentale do planalto da Serra de Baturité (leaves); R.deLemos Fróes 20091, Bahia, Ibyquara, região da Sincorá, Feb. 24, 1943, árvore, 10 m., sem látex, frutos amarelos (leafy branch with young fruits).

This species is the "M. rufula" in the sense of Ducke (1918, p. 15. 1950, p. 234, 242). Ducke informs me that a collection by F. Allemão from Ceará, labelled M. elata, is this plant. M. elata of Allemão (1866, p. 45) is in part this plant (Ducke, 1918, p. 15).

Illust.- Ducke (1918, p. 13, under M. elata; 1922, p. 239, a, under M. huberi. Flower analysis).

Distrib.- Ceará, Pernambuco, Bahia.

Closely allied to M. bella. Differs in leaf-shape, indumentum and staminodial lobing. See distinctions given by Ducke in works cited above. The long petioles, the elevated lateral nerves and minutely prominulous reticulation on the underside of the leaves readily separate it from true M. rufula; the close appressed indumentum is much more persistent and of longer hairs than in M. rufula.

4. MANILKARA BELLA Monachino, sp. nov.

Arbor, foliis versus apicem ramorum confertis, petiolis 1 - 3.5 cm. longis, laminis oblanceolatis usque ad basin gradatim angustatis 6 - 13.5(-17) cm. longis, 2 - 5 cm. latis, subtus sericeis, costa supra elevata. Pedicellis ca. 1.5 cm. longis fulvo-tomentosis; appendicibus loborum corollae ad apicem valde denticulatis; staminodeis ca. 2 mm. longis, 0.8 - 1 mm. latis, irregulariter multifidis.

Type.- Glaziou Herb. 12071, Rio de Janeiro, 1880, deposited at The New York Botanical Garden.

It is "M. elata" in the sense of Ducke (1918, p. 13, etc.). Ducke (letter of Dec. 6, 1951) wrote that a specimen of F. Allemão, named M. elata, is preserved at the Jardim Botanico of Rio and that Glaziou 12071, which he saw in the Museu Nacional, is certainly conspecific. Ducke (1918, p. 15) noted that M. elata of Allemão in Trabalhos da Comm. Scient., 1866, is M. rufula Miq., exclusive of the description of the leaves and illustration of the fruiting branch. A photo (Field Mus., Gray Herb.) of Allemão's floriferous collection at Paris resembles our plant; no collection data appeared on the photo.

Illust.- Ducke (1918, p. 15, fl. analysis, as M. rufula. 1922, p. 239, c, same, as M. elata). Allemão (1866, t. 2, see remarks above). Saldanha da Gama (1872, t. 5, same as previous). Pinto's "Mimusops excelsa Allem." (Diccion. Bot. Brasil, fig. 24. 1873) probably refers to the present species.

Dist.- Rio de Janeiro and Espirito Santo (Ducke, 1950. p. 233). In his letter to me (Jan. 1, 1952), Ducke wrote that it grows in the sub-tropical forests of Rio, from 600 to 700 m. upwards.

Ducke (1918, p. 13) makes reference to juvenile leaves of this species. Through the kindness of Dr. Brade he sent me one young leaf and part of another of Ducke 17625, Serra de Friburgo, Estado do Rio de Janeiro, July 1915. Petiole 2 - 3 cm. long, blade 15 cm. long, 5.9 - 6.5 cm. broad, oblanceolate, acuminate at base, appressed hairs beneath greyish or pale brown, midrib raised above, lateral nerves little if at all raised below, reticulation of veinlets not manifest below.

The leaves of M. bella, both in the adult and juvenile state, are altogether different from those of the type of M. elata (a fragment sent to me by K. Suessenguth of Munich). The leaves of M. elata type are like those of M. huberi. The leaf venation of M. huberi and M. bella ("M. elata" of Ducke) is constantly and entirely different (Ducke, letter of Dec. 6, 1951). M. bella is closest related with M. duckei.

The specific epithet is an herbarium name used by Gilly.

5. MANILKARA SUBSERICEA (Mart.) Dubard, Ann. Mus. Col. Marseille, ser. 3, 3:22. 1915.
Mimusops subsericea Mart., Flora, 22, Beiblatt 1:3. 1839.
Synarrhena subsericea Fisch. & Mey., Bull. Sc. Acad. Petersb. 8:255. 1841.
Mimusops subsericea var. acmanthera Miq., in Mart. Fl. Bras. 7:43 bis. 1863.

Small tree, petioles 3 - 10(-16) mm. long, blades (3-)4 - 10(-13) cm. long, 2-4(-6.5) cm. broad, underside with a metallic silky-argenteous (or faintly amber) pellicule consisting of closely appressed flattened hairs, this thin indumentum mostly deciduous, remaining in protected places or in patches on some leaves, lateral nerves very slightly raised on the underside. Pedicels longer than subtending petiole, 0.7 - 1.5 cm. long, sparsely appressed strigulose-puberulent on upper part, sepals 3.3 - 5 mm. long, the indumentum of the outer sepals comparatively greyish, corolla-tube 0.5 - 1.3 mm. long, segments 2.7 - 2.8 mm. long, staminodes 1.7 - 2.6 mm. long, irregularly laciniate, base of staminodes and filaments united into a short tube up to 1 mm. high, filaments 1.5 - 2 mm. long, anthers 1.8 mm. long, ovary glabrous, cells six.

Type.- "Montis Corcovado sylvis et alibi in Prov. Sebastianopolitana...Mart. infra. No. 487." Isotype at N.Y.B.G. Type of var. acmanthera: "Brasilia orientali: Sellow."

Illust.- Miquel (1856, t. 16).

Distrib.- Rio de Janeiro, Bahia. "Morros e restingas do Rio de Janeiro e litoral de São Paulo" (Ducke 1950, p. 234).

Fischer and Meyer (1841, p. 255) presented an elaborate description of M. subsericea, of which they saw a cultivated plant, as well as dried specimens. They wrote that the species bloomed for the first time in 1840 in the botanic garden. The flowers had the odor of Pittosporum tobira, ochroleucus corolla with cuculate lobes enfolding the anthers. This species and M. floribunda are cited by Fischer and Meyer for their new genus Synarrhena.

Raunkiaer (1890, p. 2) refers to a variety with apices of the staminodes profoundly 4 - 6-fid.

M. subsericea resembles the African M. angolensis (Engl.) Lecomte ex Pellegr.

Two sterile branches on a sheet in the Torrey Herbarium (N.Y.B.G.) labelled "Bumelia retusa. Secund Spreng. West Indies. M. Perrin" suggest Manilkara angolensis. Reasons for believing that Perrin collected in Africa are presented in Lloydia (1945) 8:313.

The title page of The N. Y. Bot. Gd. copy of Martius' Herbarium Florae Brasiliensis bears the year of publication 1837. However, M. floribunda, appearing on page 179, was published at a later date. On p. 168 of this book reference is made to Eupatorium martiusii DC. Prodr. 7:269, which was published in 1838; this page therefore appeared in print 1838 or later.

6. MANILKARA FLORIBUNDA (Mart.) Dubard, Ann. Mus. Col. Marseille, ser. 3, 3:22. 1915.
Mimusops floribunda Mart., Flora, Beiblatt 1:3. 1839.
Synarrhena floribunda Fisch. & Mey., Bull. Sc. Acad. Petersb. 8:256. 1841.

Petioles short, 3 - 6 mm. long, blades elliptic or obovate-

elliptic, 3.5 - 6.5 cm. long, 2 - 3 cm. broad, glabrous or when young thinly and sparsely sericeous appressed lepidote, nerves distinct beneath; pedicels surpassing petiole, staminodes and filaments about equal length, briefly connate at base, ovary 6-celled. (Compiled from description, illustration and photo of type.)

Type.- "Crecit arenosis, ad Oceani littus, e.g. prope Cabo frio," Rio de Janeiro, Herb. Mart. 488. (Type photo at Field Mus., Gray Herb.)

Illust.- Miquel (1856, t. 17).

Martius observed that this species is perhaps a variety of M. subsericea. Ducke (1950, p. 236, 244) stated that it is with great probability a glabrous leaved M. subsericea. At Rio he saw material, from the maritime restingas near the city, with subglabrous leaves forming transitions to the common form with leaves sericeous beneath.

7. MANILKARA SALZMANNI (A.DC.) H. J. Lam, Blumea 4:356. 1941.
Mimusops Salzmanni A.DC., Prodr. 8:205. 1844.
M. Salzmanni β. mucronata A.DC., loc. cit.

Petioles 1.2 - 2.5 cm. long, blades coriaceous, 9.5 - 13 cm. long, 4 - 5.7 cm. broad, glabrous, when young with sparse scattered appressed hairs, lateral nerves not raised beneath, reticulation sometimes impressed. Pedicels deflexed, 1 cm. long, sparsely hairy, sepals 4 - 4.3 mm. long, rufous-tomentose, corolla-segments 3 - 3.3 mm. long, staminodes shorter or longer than filaments, 1.7 - 2.2 mm. long, 2 -3 laciniate to 0.8 mm., filaments 1.7 - 2.5 mm. long, anthers 1.5 mm. long, ovary glabrous.

Type.- "prope Bahiam in sabulosis maritimus (Salzm. ! Blanch. ! coll. lign. n. 218)." Photo of the Geneva specimen of Salzmann 7503 at Field Mus. Type of β. mucronata: "prov. Bahiensi (Blanch. ! n. 3171)." Isotype of β. mucronata at Field Mus. ("Bahia, partie méridionale").

Distrib.- Pernambuco, Bahia and Espirito Santo (Ducke 1950, p. 236, 238, 239). Riedel 401 is from Rio de Janeiro, "silv. maritimas pr. Ilheos, Sept. 1826."

Riedel 401 has petioles up to 2.5 cm. long, blades up to 13 cm. long, 6 cm. broad; staminodes longer than the filaments, almost reaching height of anthers, Lima 49-366, from Dois Irmãos, has short petioles, 5 - 9 mm. long, blades 4 - 6 cm. long, 1.6 - 2.4 cm. broad, midrib raised on upperside; pedicel longer than petiole, staminodes and filaments free, ovary 10-celled. Another collection from Recife (Lima 49-315) has leaves up to 9 cm. long and 4.5 cm. broad. Froes 20035 and 20071, from Bahia, have relatively short petioles, 8 - 12 mm. long (sterile branches, leaves near ends of twigs); midrib raised on upper side of blade. The midrib in Blanchet 3171 is slightly or not raised on the leaf upperside; staminodes and filaments are united at base for a short distance to varying degrees. Ducke states that trees from Mata dos Morros de Dois Irmãos, in the suburbs of Recife, are taller and have smaller, narrower leaves than those of the littoral.

According to Ducke (1950, p. 244), Glaziou 11158, syntype of M. glaziovii, belongs here; M. salzmanni is cultivated in Quinta de S. Cristovão, Rio de Janeiro.

I am doubtful how to interpret the leaf varieties in M. salzmanni, length of petioles, size of blades, and depressed or elevated midrib on the leaf upperside. It is not impossible that some of the material belongs to M. floribunda and the two species intergrade.

8. MANILKARA LONGIFOLIA (A.DC.) Dubard, Ann. Mus. Col. Marseille, ser. 3, 3:22. 1915.

Mimusops longifolia A.DC., Prodr. 8:205. 1844.

Branchlets robust, petioles 2.5 - 6 cm. long, blades coriaceous, large, 18 - 34 cm. long, 5 - 6.5 cm. broad, glabrous except for loose evanescent tomentum on midrib of underside, lateral nerves depressed, reticulation depressed. Pedicels 4 cm. long, rufous tomentose with spreading hairs, flowers large, calyx 8 mm. across, sepals 10 mm. long, corolla-tube 1.6 - 1.7 mm. long, segments 5.5 - 6.7 mm. long, irregularly dentate-erose, staminodes broad, 1.6 mm. broad, 2 mm. long, bifid, laciniae 0.8 mm. long, deeply cut, filaments 3.3 mm. long, anthers 2.7 mm. long, ovary glabrous.

Type.- "circa Bahiam (Blanch. ! n. 3172). v. in h. Boiss." "Partie meridionale...1840" (photo of Geneva specimen of Blanchet 3172A, Field Mus.). Isotypes at Field Mus. and Gray Herb.

Illust.- Miquel (1856, t. 15).

Distrib.- "sul da Bahia e norte do Espirito Santo" (Ducke, 1950, p. 33).

H.M.Curran 102 (U.S.N.H., det. doubtful), from Rio Grongogy, is a stump sprout; stem slender, pubescent toward apex, petioles less than 1.5 cm. long, blades with acumen 1 cm. long, glabrous, veins on underside raised.

9. MANILKARA TRIFLORA (Fr. Allem.) Monachino, comb. nov.

Mimusops triflora Fr. Allem., Trab. Comm. Sc. Expl. Secção Bot. Rio de Janeiro 1:50, t. 13. 1866.

Mimusops Glaziovii Raunkiaer ex Warming, Vidensk. Meddel. Naturh. Foren. 863, t. 1, fig. 1, 2. 1889.- pro parte, Glaziou 11157, fide Ducke (1950, p. 244).

Mimusops cearensis Huber, Bull. Herb. Boiss., ser. 2, 1:320. 1901.

Small tree, petioles 5 - 10 mm. long, blades small, 4 - 10 cm. long, 1.5 - 5.5 cm. broad, glabrous or midrib on underside sparsely brownish scurfy, lateral nerves not or hardly raised on underside, reticulation very faint under a lens. Pedicels few in each fascicle, 1 - 3 or rarely more, reflexed or spreading, surpassing subtending petiole, 1 - 1.5 cm. long, appressed-puberulent to almost glabrous in age, sepals 3 - 4.2 mm. long, fulvous squamulous, corolla-lobes 3 - 3.3 mm. long, pubescent, appendages shorter, staminodes deltoid, very short, much shorter than filaments, 0.3 - 0.9 mm. long, acute at apex, little if at all denticulate, filaments 1.5 - 1.7 mm. long, anthers 1.3 - 1.5 mm. long, ovary glabrous.

Type.- "habitat in arenosis prope mare," Ceará. "Typo de Freire Allemão no Museu Nacional" (Ducke 1918, p. 16). Syntypes of M. glaziovii; "Glaziou no. 11157 et 11158," Rio de Janeiro. (Photo of 11158 at Field Mus.). Type of M. cearensis: "hab. endroits bas entre Fortaleza et Bemfica, parmi les autres arbustes (26)," Ceará, Sept. and Oct. 1897.

Distrib.- Ceará, Piauhy, Maranhão, Pará. Frequent in almost pure sand of dunes, in low plateaux and margins of marshy grounds the length of the Atlantic (Ducke 1950, p. 238). Cultivated at Museu Paraense (seed received from Piauhy) and in Quinta de S. Cristovão, Rio de Janeiro.

Ducke (1950, p. 235, 238) credits Chevalier with transfer of the species to Manilkara: "Manilkara triflora (Fr. All.) Chev. = Mimusops cearensis Hub." I was unable to locate the combination in the works of Chevalier. The latter did not propose or submit the name to Ducke; the new combination in Ducke's revision was mentioned merely incidentally.

10. MANILKARA RUFULA (Miq.) H. Lam, Blumea 4:356. 1941.
Mimusops rufula Miq., in Mart. Fl. Bras. 7:44. 1856.

Very much like M. dardanoi, which is possibly a variety of this. See below for differences.

Type.- "Prov. Piauhiensi: Gardner n. 2910. Pl. Hamadrayas." Isotype at Gray Herb.: "Pernambuco." Two photos and leaf fragment at Field Mus.

M. rufula in the sense of Ducke is M. bella.

11. MANILKARA DARDANOI Ducke, An. Bras. Econ. Florestal 3(3): 243. 1950.

Leaves crowded toward ends of branchlets, petioles 0.5 - 1 cm. long, blades coriaceous, obovate, 6 - 9 cm. long, 2.5 - 4 cm. broad, when young densely rufous-tomentose on underside with spreading crisped hairs (up to 0.2 mm. long), becoming glabrous except for some hairs occasionally persistent along midrib on upperside, midrib elevated or flattened on upperside, lateral nerves not raised. Pedicels surpassing subtending petiole, 1 - 1.3 cm. long, densely rufous-tomentose with spreading hairs, sepals 4.3 - 4.7 mm. long, corolla-segments 2.9 - 4.3 mm. long, staminodes broad, about equal to filaments in length, 1.3 - 1.7 mm. long, 2 - 3-plurifid at apex, base of staminodes and filaments united into a short tube (0.5 mm. high), filaments 1.2 - 1.8 mm. long, anthers 1 mm. long, ovary glabrous, 6-celled, fruit brilliant scarlet and somewhat fusiform.

Type.- "loco alto (Estrada da Aldeia) prope urbem Recife (Pernambuco), in relictis silvae, specimina florifera et sterile cum foliis novellis 24-VII-1950 legit Dárdano A. Lima (15.599)." Type tree was destroyed.

I have examined authenticated M. dardanoi, Ducke & Lima 8 and Ducke 8-X-1951 from Recife. The leaves differ from those of the Gray Herbarium isotype of M. rufula in the more rapid and complete loss of indumentum on the underside. Some hairs become grey and persist on the leaf undersurface of M. rufula isotype and the depressed reticulation of veinlets presents more of a blistered appearance to the leaf surface. The tomentum in M. dardanoi consists of slightly more spreading and crisped hairs; the pedicels are somewhat thicker. Corollas were lacking in the M. rufula examined. M. dardanoi and M. rufula are alike in their short petioles, the unraised lateral nerves, and in the character of indumentum on the sepals.

12. MANILKARA EXCELSA (Ducke) Standl., Trop. Woods 34:41. 1933. Mimusops excelsa Ducke, Arch. Jard. Bot. Rio de Janeiro 3:235. 1922.

Petioles 1.5 - 2 cm. long, tomentose, blades thin, elliptic, 10 cm. long, 2.5 - 3.5 cm. broad, usually acuminate at apex, matured leaves rufous-tomentose along midrib on underside, hairs spreading, crisped, grey-pilose along midrib on upperside, lateral nerves somewhat clear on underside, reticulation fine. Pedicels shorter than petiole, sepals 5 mm. long, rufous tomentose with spreading hairs, corolla-segments 3 mm. long, staminodes 1.8 mm. long, bifid to 0.8 mm., laciniae acute, staminodes and filaments united at base into tube 0.8 mm. long, filaments 1.3 mm. long, inflexed at tip, anthers 1.5 mm. long, ovary appressed pubescent.

Type.- "Frequentissima ad medium Tapajóz in silvis ripariis, specimina prope S. Luiz 1. A. Ducke, florifera 26-8-1916 n. 16.380, fructifera 8-12-1915 n. 15.863," Pará. Lectotype selected by me: Ducke 16380. Isotype at U.S.N.H. Ducke 15863 and 16380 "na beira da cachoeira Maranhãozinho" (Ducke 1950, p. 242).

Distrib.- Pará, middle course of Rio Tapajóz, chiefly along the cataracts in not too deeply flooded forests.

Leaf shape, tomentum and venation of M. excelsa somewhat recall M. zapotilla. Attains great size almost equal to that of M. huberi (Ducke 1950, p. 242).

13. MANILKARA PUBICARPA Monachino, sp. nov.

Arbor, petiolis 1.8 - 3.5 cm. longis, laminis glabris (7-)9 - 14.5 cm. longis, (3.5-)5 - 7 cm. latis, reticulo nervarum debili; pedicellis 2.5 - 2.7 cm. longis parce puberulis, sepalis 4 - 4.7 mm. longis extus rubiginoso-tomentosis, lobis perianthii ca. 4 mm. longis, filamentis 2 mm. longis, antheris 1.7 mm. longis, staminodiis filamentos paullo excedentibus, ad apicem bidentatis, ovario dense pubescenti.

Stem glabrescent, the young growth and buds rusty puberulent, petioles slightly puberulent, more densely so near base, blades chartaceous or at least relatively thin, paler beneath, oblong-elliptic, broadly cuneate at base, the apex a little narrowed, obtuse or acutish, sometimes slightly folded along midrib. Flowers white, 5 - 2 in each axil, pedicels spreading, straight or slightly curved, slender, gradually slightly broadened toward apex, ca. 0.7 mm. across at base, 1.3 mm. at apex, minutely sparsely puberulent, sepals reflexed or spreading at anthesis, ovate-oblong, or inner ones oblong, obtuse at apex, minutely rusty appressed tomentulose outside, slightly puberulent near margins within, corolla-tube ca. 0.7 mm. long, corolla-lobes ca. 3.5 mm. long, appendages 4.3 mm. long, staminodes 0.8 mm. broad, 2 mm. long, oblongish, sharply bidentate at apex, laciniae 0.5 - 0.8 mm. long, filaments ca. 2 mm. long, anthers 1.7 mm. long, ovary and base of style densely pubescent with appressed hairs, ovules 6.

Known only from Type.- Wilson-Browne 450 (Record No. 5860), British Guiana, Wabuwak, Kanuku Mts., 2000 feet, "Bastard Balata," tall tree of rain forest, white latex; deposited at The New York Botanical Garden.

Whereas the ovaries are pubescent in 12 out of the 13 spec-

ies (the exception is M. bidentata) of North America treated by Cronquist, those of the great majority of South America (exclusive of the Achras group) are glabrous.

14. MANILKARA LONGICILIATA Ducke (vel Mimusops longiciliata Ducke), Trop. Woods 71:22. 1942.
Manilkara longiciliata Ducke, An. Bras. Ec. Florestal 3(3):235, 239. 1950.

Petioles 1.5 - 3.5 cm. long, blades obovate, large, 7 - 14 cm. long, 4.5 - 8 cm. broad, underside with closely appressed furfuraceous indumentum overlaid with resin or appearing glabrous (close scurf on midrib), lateral nerves more or less raised on underside, reticulation not clear (in young leaves intricate and fine, veinlets slightly raised). Pedicels 2 cm. long, pale scurfy-tomentulose, sepals 5 - 5.7 mm. long, corolla-segments 4.5 mm. long, staminodes 3 mm. long, profoundly bilobed, tips thread-like, base of staminodes and filaments united into a short tube, filaments 2.2 mm. long, anthers 1.5 mm. long, ovary glabrous.

Type.- "Esperança ad ostium fluminis Javary in civitate Amazonas, loco alto in relictis silvae. Mense Februario 1942 fructificabat, Maio florebat. Ducke 941." Lectotype selected by me: Ducke 941, flowering specimen collected in May. Isotype at N.Y.B.G.

Distrib.- Brazil (Amazonas, Solimões and Rio Negro), terra firme.

15. MANILKARA INUNDATA (Ducke) Ducke, Trop. Woods 71:22. 1942.
Mimusops inundata Ducke, Archiv. Inst. Biol. Veg. Rio de Janeiro 4:58. 1938.

Petioles 1.5 - 3.5 cm. long, blades thin, elliptic-oblong to oblanceolate, 7 - 16 cm. long, 2.5 - 5 cm. broad, glabrous, lateral nerves faint, reticulation obscure on the underside, fine and very slightly elevated under a lens. Pedicels 1.5 - 2 cm. long, loosely tomentulose, sepals 4.7 mm. long, tomentulose, corolla-segments 6 mm. long, staminodes 3.3 mm. long, profoundly bifid, tips thread-like, base of staminodes and filaments united in a tube 0.6 - 0.8 mm. long, filaments 1.8 mm. long, anthers 2 mm. long, ovary glabrous.

Type.- "Frequens in regione fluminis Madeira inferius prope Humaytá, silva periodice inundabili inter fluvium et lacum Paraiso, 26-6-1936, leg. A. Ducke, H.J.B.R. 34.979 et Ducke 216." Lectotype selected by me Ducke 216 (isotype at N.Y.B.G.)

Distrib.- Brazil (Amazonas, Matto Grosso, São Paulo de Olivenca), Bolivia (flowering material, H.H.Rusby 729, Junction of Rivers Beni and Madre de Dios, Aug. 1886; cited as M. surinamensis by Britton in 1893, and annotated by Gilly in 1942 as a new species named in honor of Rusby), Peru (fruiting material, det. doubtful, Tessmann 5455a, Yarina Cocha; fr.-pedicels very long, up to 3.5 cm.), Colombia (specimens lacking corollas collected in 1945-6 by Schultes & Black in Amazonas appear to belong here). "Várzea forest, seldom in upland forest on moist and fertile clay loam" (Ducke).

As a footnote in the original description of Mimusops inundata in 1938, Ducke wrote: "ce nom devra être remplacé por Manilkara inundata Ducke, dans le cas où Manilkara sera maintenu comme genre." Some would hold this as nomen provisorium.

16. MANILKARA SURINAMENSIS (Miq.) Dubard, Ann. Mus. Col. Marseille, ser. 3, 3:22. 1915.
Mimusops surinamensis Miq., in Mart. Fl. Bras. 7:43. 1863.
Mimusops amazonica Huber, Bol. Mus. Goeldi 4:433. 1904.
Mimusops Maparajuba Huber, op. cit. 434. - excl. seeds, fide Ducke (1950, p. 236).
Manilkara amazonica Chev., Rev. Bot. Appl. & Agr. Trop. 12:276. 1932; Standl., Trop. Woods 34:41. 1933.

Petioles 1.3 - 3 cm. long, blades 6 - 11.5 cm. long, 2.5 - 5.7 cm. broad, glabrous, lateral nerves raised on underside and reticulation minutely but clearly prominulous (in old coriaceous leaves character sometimes obscured by minutely bullate surface). Pedicels spreading, 12 mm. long, glabrous, flowers usually small, sepals 2.7 - 5.5 mm. long, the outer with a sparse minute appressed squamulae, corolla-tube 0.5 - 1 mm. long, segments 2.3 - 4.3 mm. long, staminodes 1 - 2.3 mm. long, lightly 2 - 3 dentate to deeply laciniate, filaments 1.5 - 2 mm. long, anthers 0.7 - 1.6 mm. long, ovary glabrous.

Type.- "Habitat ad flumina Cassiquiari, Vasiva et Pacimoni: Spruce n. 3351 et 3319. In terra Surinamensi: Hostmann n. 739 et 739a." Lectotype selected by me: Spruce 3351 (isotype at N.Y.B.G.). Type of M. amazonica: "temos especimens provenientes das matas da estrada de ferro de Bragança." Possibly J.Bouby 2572 (sterile specimen with young fruit, and photo at N.Y.B.G.). Ducke (1950, p. 236) wrote that the type is Herb. Mus. Pará 2527, not collected by Huber, with sparse flowers for past anthesis; in the hortus of Museu Paraense there are 4 trees left by Huber with the name M. amazonica, but only one belongs truly to this species, the three others representing M. siqueiraei. Ducke's citation of number 2527 may be an error for 2572. Type of M. maparajuba: "achei esta especie no rio Capim," Pará. Photo of Huber 855, Rio Capim, Acari-uçaña, 27-VI-1897, "Maparajuba," at N.Y.B.G.

Distrib.- Brazil (Amazonas, Pará, Maranhão), Venezuela, probably Colombia. Exclusively on sandy soil, upland rain forests and in varzea forests; prefers terra firme, but occurs in inundated places; found along rivers with clear or "preta" (black) water, not in várzea inundated by muddy or "branca" (white) water; the most frequent species of the Amazon area (Ducke, reference to M. amazonica).

Eyma (1936, p. 208) wrote that Hostmann 739 in the Utrecht Herbarium has not a single corolla and the sheet of Hostmann 739a in Paris is not much better. These specimens are determined as M. bidentata by him. Ducke (1950, p. 240) rejected the Hostmann collections from M. surinamensis. A photo of 739a at Field Museum (ex Mus. Bot. Hauniense) looks like M. bidentata. The original description of M. surinamensis agrees with the Spruce plant.

A good example of variation in the staminodes of this species can be observed in Ducke 189 from Amazonas. The staminodes are either very shallowly dentate or deeply bifid. As many as 3 quite different staminodes can be found in the same flower. The same staminode was observed to have one of the two lobes 0.4 mm. and the other 2.0 mm. long.

Ducke examined a Spruce Cassiquiari isotype and knows typi-

cal M. surinamensis in the field. He is also intimate with typical M. amazonica.

He maintains the two species distinct; in his letter to me (Nov. 19, 1951), he wrote that M. surinamensis, certainly affinitive with M. amazonica, has usually larger leaves, more indumentum, and narrowly bifid staminodes. Ducke has seen hundreds of M. amazonica cut for chicle but never for balata.

17. MANILKARA BIDENTATA (A.DC.) Chev., Rev. Bot. & Agr. 12:270. 1932.

Mimusops bidentata A.DC., Prodr. 8:204. 1844.

Synonymy by Cronquist (1945, p. 553) includes the following: M. sieberi, M. riedleana, M. nitida, M. dariensis. Mimusops balata of Pierre and Manilkara balata of Dubard, and other authors, belong here. Mimusops pierreana Baillon (published as synonym of M. balata). ?Sapota mulleri Blume ex Bleekrod (Eyma: type, fruiting material, at Rb. Leiden. Chevalier. Engler. Pierre). Achras balata Aublet is the Old World Mimusops commersonii Engler, according to Chevalier (1922, p. 267); however, Pierre and Urban (1904, p. 165) stated that specimens of Achras balata Aublet in the Jussieu herbarium resemble exactly those of Richard's, type of M. bidentata A.DC.

Petioles 2 - 4.5 cm. long, blades large, 8 - 29 cm. long, 3.5 - 10 cm. broad, undersides scurfy, puberulent or apparently glabrous and vernicose (different varieties ?) midrib on upperside raised or hardly so, lateral nerves raised on lower side, reticulation obscure or faintly prominulous (clear in young leaves). Pedicels shorter than or about equal to subtending petiole, slightly puberulent, sepals 5 mm. long, scurfy, corolla-segments 3.5 - 4.6 mm. long, staminodes very variable (different varieties ?), shorter than filaments, 1 - 1.4 mm. long, apex acute, with 1 or 2 lateral teeth or irregularly cleft or dentate to different depths, filaments 2 mm. long, anthers 1.8 mm. long, ovary glabrous.

Type.- "in Guayana gallica...v. in h. Deless." "Typifiée par un échantillon de Louis-Claude Richard récolte à la Guyane française en 1781" (Chevalier 1922, p. 270).

Illust.- Chevalier (1922, t. 8, photo "cotype de l'Herbier du Museum." T. 9, photo "No. 221. Jeaune d'oeuf," with notes by Aublet; named M. bidentata var. schomburgkii by Pierre. P. 353, t. 10, A & B, micro. trans. & long. sect. wood). Engler (1904, p. 61, fig. 12, A-E, var. muelleri. F-N, var. schomburgkii). Engler (1891, as M. balata Gaertn., shows entire staminodes). Spoon (1927, fig. 1, "Bolletrie in oerwould bij de Avanavero-vallen, Suriname," photo full length tree by A. Pulle. Fig. 2, photo trunk by G. Stahel. Fig. 3, anatomical. P. 4, 5 & 6, hab. & micro., as M. globosa.) Pfeiffer (1926, anatomical, as M. surinamensis).

Distrib.- West Indies (Cronquist), Guianas, Venezuela, Brazil (Amazonas, Pará). According to Ducke, in Brazil observed only on hill and mountain forests in extreme northeastern Amazonas and probably exists in the extreme north of Pará; mountains of Rio Branco. "Altos R. Erepecurú, Curuá, Maicurú e Parú" (P. Le Cointe, Arvores e Plantas Uteis, p. 49. 1934).

M. bidentata is a very important balata and timber tree. The literature concerning it is much greater than indicated

above. Taxonomic understanding regarding it, however, is in greater confusion than it is for any other species in the genus. At least 8 varieties have been proposed. Eyma prefers to exclude vars. sieberi and melinonis from M. bidentata.

Ducke (letter of Oct. 20, 1951) writes that a specimen of Ule's collection from Roraima, distributed as M. bidentata is certainly another species. Ducke (1938, p. 57) stated that Ule 8728, Rio Cuquenan, vic. Mt. Roraima, has very hard, absolutely glabrous leaves, tomentose flowers, sepals externally covered with a layer of glutinous resin. I have not seen Ule 8728. A collection from British Guiana (For.Dept.Brit.Gui.F. 2717, Record No. 5516, 90 mls. Bartica-Potaro Road, 25 Oct. 1947, Dicumbe-Eperua forest on white sand) is a strongly resiniferous form or variety of M. bidentata, with rigid glabrous leaves. The outer sepals appear glabrous, perhaps because of the close coating of resin. The staminodes are obovate, 2-4 short-toothed at each side of the terminal cusp. This tree is called "Black Balata" and said to have plentiful latex which does not coagulate. Tutin 202 from Surinam and Sagot 836 from French Guiana resemble it, and perhaps so does Hostmann 739a (photo at Field Mus.), which was cited by Miquel in the original description of M. surinamensis. Froes 1920 from Maranhao is somewhat intermediate between it and M. siqueiraei. "Black Balata" is applied to M. huberi, an altogether different species, while M. bidentata is called "true or commercial balata."

If the sort with coriaceous vernicose glabrous leaves represents a variety, its name must await study of the whole M. bidentata complex throughout its vast distribution. The type of M. bidentata was described as hairy: "foliis...subtus pilis minimis adpressis obscure velutinis." Ducke (letter of March 30, 1952) suggested that the bidentata complex be separated into two groups, "balata" trees and "chicle" trees. He does not suppose that the same species would yield both kinds of gum. He was informed at Manaus that the Venezuelan name "Bendare" used throughout the upper Rio Branco basin refers exclusively to chicle trees and never to balata trees. (However, Steyermark 60610, a sterile specimen from Ptaritepuí, Bolívar, Venezuela, is M. bidentata). I thought that a mass study of variation in a closed area such as Trinidad would add to clarifying the problem. R. S. Ayliffe, of the Forest Department in Trinidad, wrote (Feb. 21, 1952) that the study will not be an easy matter for "Manilkara bidentata is, of course, one of our first class trees. It is a very large tree and has been largely cut over in the past for its durable wood, so that it is scarce now."

H. W. Youngken examined microscopically very small leaf sections of M. bidentata, Fanshawe 200, F.C.Foote s.n., B.W. 4152, Schomburgk 780. He reported (letters of Feb. 14 & 27, 1952) that the so-called pubescence is an illusory one; it is largely due to waxy cuticular scales, granulations and low cuticular emergences.

17a. MANILKARA SIQUEIRAEI Ducke (vel Mimusops siqueiraei Ducke), Trop. Woods 71:24. 1942.

Flowers (Ducke 1241, Froes 20344) larger than those of M. bidentata; staminodes irregularly dentate. Leaves resemble those of the glabrous forms of M. bidentata; sepals 6 - 7 mm.

long, corolla-segments 5.3 - 5.7 mm. long, staminodes 1.8 - 2 mm. long, slightly shorter than filaments.

Type.- "specimina florifera lecta ad flumen Magoary prope Belém, 15-6-1942, D. 945."

Distrib.- Pará, Maranhão. Huber left 3 trees cultivated in Horto do Museu Paraense (Ducke, 1950, p. 235, 236).

Ducke (Jan. 1, 1952) wrote that M. bidentata, which yields the balata of superior quality, has except in very old age a tenuous sericeous indumentum on the lower surface of the leaves, never observed in M. siqueiraei. And again (letter of May 29, 1952) that the balata-yielding Manilkara of the Guianas and the Brazilian boundary is certainly a species independent from M. siqueiraei. All balateiros say it can be recognized by the pale, a bit silky, undersurface of the leaves. Ducke argues that M. bidentata grows exclusively on hills and mountains, according to all balateiros. M. siqueiraei (Ducke, 1950, p. 239) is found in Igapó, along rivers inundated by sometimes brackish water. It is different from the bidentata complex (letter Nov. 19, 1951) by its habitat in swamp land chiefly with brackish water in eastern Pará. The latex is not exploited for balata or chicle.

Very small leaf-sections of Ducke 1241, typical M. siqueiraei from Belém, and Maguire & Fanshawe 23506, a glabrous form of M. bidentata from British Guiana, were sent to Youngken for histological study. Dr. Youngken examined these tiny segments microscopically in surface and transverse sections and reported (Feb. 14, 1952): "There is no real significant difference histologically...I found no real difference between the stomatal apparatus."

M. siqueiraei belongs in, or in the neighborhood of, the M. bidentata complex; it is not placed in the synonymy of the latter on the authority of Ducke.

18. MANILKARA WILLIAMSII Standl., Field Mus. Pub. Bot. 22(3): 165. 1940.

Tree 20 - 30 meters or taller, petioles 2 - 3.5 cm. long, black, blades coriaceous, obovate, 8 - 12 cm. long, 4.5 - 7 cm. broad, rounded-emarginate at apex, markedly and sharply cuneate toward base, minutely puberulent beneath with very short appressed hairs, lateral nerves raised on underside, reticulation obscure. Flowers in bud only. Ovary glabrous, about 10-celled.

Type.- "Venezuela: Guayapo, Bajo Caura, Estado de Bolivar, alt. 100 meters, April 18, 1939, Llewelyn Williams 11860 (type in Herb. Field Mus.)." Isotype at N.Y.B.G.

Tree found in low ground that is not very wet, and also in high forests that are not flooded. Said to grow in abundance in the mountains of Nichare, Icuta, Tres Picos, below Salto de Para, and in the vicinity of Caño de Pablo and Erebato, above Salto. Latex abundant, sticky, the balata of commerce. Fruit has an edible pulp. Local name "purguo."

Except for the very striking cuneate leaf-base, this species has wholly the aspect of forms of M. bidentata. Its specific distinction from M. bidentata remains to be proven.

19. MANILKARA sp. indet. (Horto Rio de Janeiro culta).

Branchlets robust, grey, covered with minute appressed resinous squamulae, leaves with aspect of those of M. longifolia except for indumentum, petioles 2.5 - 3.5 cm. long, minutely squamulous like the branchlets, blades coriaceous, 15 - 26 cm. long, 5 - 9 cm. broad, greatly tapering at base, rounded-emarginate and slightly conduplicate at apex, underside closely invested with minute appressed resinous flakes, or subpulverulent gummy, lateral nerves faint. Pedicels reflexed or spreading, brown, 2.5 cm. long, viscid appressed puberulent, calyx 4.8 - 5 mm. across, sepals 5.3 mm. long, scurfy, acutish at apex, corolla-tube 2 mm. long, segments 4.8 - 5.5 mm. long, appendages shorter than lobes, acute, staminodes carnose, peg-like, much shorter than filaments, 0.7 mm. long, entire or shallowly bidentate, filaments 2.2 - 2.7 mm. long, anthers 3.3 mm. long, ovary glabrous, cells 10 - 12.

A.Ducke 2406, Horto Bot. Rio de Janeiro culta, X-1928, arbor parva flor. albidis, "Mimusops balata Gaertn." (U.S.N.H.; frag. at N.Y.B.G.). Also examined H.M.Curran 327, Bot. Gd., Rio de Janeiro, Nov. 1915, 30 ft. x 12 in., "Mimusops balata" (U.S.N.H., frag. at N.Y.B.G.)

This is nearest M. bidentata, of the known American species. I have not succeeded in identifying it with any of the Old World Sapotaceae. Ducke (letter of March 30, 1952) informed me that it seems to have been introduced by Barbosa Rodrigues from some botanical garden. Ducke has sent material to Sandwith and Eyma, but has not yet received an answer.

Barbosa Rodrigues (1893) listed the cultivation of "Mimusops balata Gaertn."

Material of South American Manilkara was borrowed from various institutions in the hope of discovering a collection of this species from wild plants, perhaps confused with M. longifolia. I shall leave the plant unnamed until its nativity is known.

20. MANILKARA CALCICOLA var. COLOMBIANA Gilly, Trop. Woods 73:17. 1943. - Placed in synonymy of M. chicle (Pitt.) Gilly by Cronquist (1945, p. 561).

Petioles 2 - 3.5 cm. long, subscurfy, blades (12-)14 - 18(-20) cm. long, 4.5 - 9 cm. broad, subvernicose beneath, glabrous at maturity or the scurfy indumentum vaguely detectable beneath the resin, lateral nerves somewhat raised on underside, reticulation not marked. Pedicels ca. 4 in each axil, 2 cm. long, sepals 7 - 8 mm. long, greyish-tomentose outside, corolla-tube 2 - 2.4 mm. long, lobes 5 - 6 mm. long, elliptic, entire, staminodes 2.8 - 4 mm. long, acute, irregularly erose or laciniate, filaments 2.7 mm. long, anthers of about equal length, ovary appressed tomentose.

Type.- "Colombia: Dept. Choco: Darien Country, Dawe 868 (N.Y. - type, U.S.)." Type of M. chicle: Pittier 8537, Guatemala, Izabel.

21. MANILKARA MERIDIONALIS Gilly, Trop. Woods 73:12. 1943. M. meridionalis var. caribbensis Gilly, op. cit. 13. - syn. fide Cronquist (1945, p. 560. Also M. tabogaensis Gilly and M. rojasii Gilly).

Similar to M. zapotilla. Appendages and lobes about 4 mm. long, united 1/3 - 2/3 their length, staminodes 2.5 - 6 mm. long.

Type.- "Costa Rica: Punta Arenas: Esparta, Feb. 1909, Biolley 17308 (NY photo & frag., US-Type)." Type of var. caribbensis: "Venezuela: Isle Margarita, El Valle, July 1901, Miller & Johnston 103 (Gray-Type, NY photo)."

Distrib.- Mexico to Colombia and Venezuela, introduced (?) in West Indies (Cronquist).

22. MANILKARA ZAPOTILLA (Jacq.) Gilly, Trop. Woods 73:20. 1943.
Achras zapota β zapotilla Jacq., Stirp. Amer. 57, t. 41. 1763.
Sapota Achras Miller, Gard. Dict., ed. 8. 1768.
Achras zapotilla Nutt., N. Am. Sylv. 3:28. 1849.
"Achras zapota L." of authors, not L. 1753.

For further synonymy see Gilly (1943, p. 20). Cronquist adds to the synonymy the following 4 Gilly species of Manilkara: calderonii, conzatii, gaumeri, breviloba.

Petioles 1.5 - 2.5 cm. long, blades 5 - 15 cm. long, 2 - 5 cm. broad, densely rufous-tomentose with spreading hairs when young, at maturity glabrous or tomentum remaining at base of petiole, sometimes also on midrib on underside, lateral nerves not prominent, reticulation minutely prominulous under lens. Pedicel solitary in the axil, 1.5 cm. long, rufous-tomentose with spreading hairs, sepals likewise woolly, 7 - 9 mm. long, corolla-tube and lobes about equal in length, appendages connate with the lobe forming single segments, entire or variously and irregularly denticulate at apex, staminodes about length of corolla-lobes, filaments inserted slightly below orifice of corolla-tube, 1.3 mm. long, anther 2 mm. long, ovary tomentose.

Type.- "Brown, jam. 2, p. 200: Sloan. hist. jam. 2, p. 171, t. 230; Plum. gen. 43, sapota fructu turbinato minori." "Description and figure in Browne's Civil and Natural History of Jamaica, p. 200, pl. 19" (Cronquist). Browne's description was under Achras I, The Sapodilla Tree; his illustration, fig. 3 of t. 19.

Illust.- There are a great many illustrations of this economically important tree. Curtis (Bot. Mag. 58, t. 3111, 3112, 1831). Descourtilz (Fl. Pitt. & Med. Antilles 4, t. 259. 1827). Roques (Pl. Usuell. Indig. & Exot. 2, t. 32. 1802). Engler (1891, fig. 72, 73). Miquel (1856, t. 22, 23). L. H. Bailey's Revised Ed. of Manual of Cultivated Plants (1949), p. 790, fig. 162, Aa, fruiting branch, is M. zapotilla, not Calocarpum sapota, as named.

Distrib.- Central America, Mexico, West Indies, Florida. Cultivated in all warm countries and sometimes escaped. South America: Colombia (Bolívar, vic. Turbaco, clearing, Killip & Smith 14484. Vallée du Magdalena & Mariquita, Triana 2605). Brazil (Ceará, Fortaleza, open woods, Drouet 2552).

Achras ferruginea Casar. and A. tchicomame Perr., referred to A. sapota by Index Kewensis, are not of Manilkara.

The literature on the plant is very extensive. If the taxon is a species-complex in the sense of Gilly there is little precision regarding the species treated.

SUMMARY

In the present revision of the South American species of Manilkara 3 new species are proposed: M. pubicarpa is based on a new collection from British Guiana, whereas M. bella and M. duckei are based on new interpretation of old collections from southern Brazil. M. elata is identified with M. huberi as a result of study of type material. The species treated number 23: 20 are of Eumanilkara (3 being doubtfully distinct) and 3 are of Achras. One of the Eumanilkara, cultivated at Rio de Janeiro, is described, but not named. A key, descriptions, synonymy, and references to literature are presented.

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THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND ERIOCAULACEAE. SUPPLEMENT 9

Harold N. Moldenke

Since the publication of the last previous installment of my supplements to this geographic distribution enumeration some 1375 additional specimens have come to hand and have been studied and annotated by me, bringing to 139,447 the total of specimens thus examined. This new material is from the following herbaria: Meisner Herbarium, Torrey Herbarium, and Britton Herbarium, all at the New York Botanical Garden, North Queensland Herbarium at Cairns, Botanisches Museum en Herbarium at Utrecht, Herbarium Bogoriense at Buitenzorg, United States National Herbarium at Washington, and the herbaria of the Melbourne Botanic Garden at Melbourne, the Naturhistoriska Riksmuseet at Stockholm, the Naturhistorisches Museum at Vienna, and the Estacion Experimental Agronomica at Santiago de las Vegas, Cuba. Study of this material has brought to light 2 new county records, 88 new state, province, or department records, and 157 new country or island records not hitherto listed by me. It has also revealed several corrections and emendations which must be made on the original list published by me in the year 1949.

UNITED STATES OF AMERICA:
  Texas:
    Verbena gooddingii Briq. [Brewster County]
  Oregon:
    Verbena bracteata Lag. & Rodr. [Deschutes County]
BRITISH HONDURAS:
  Tonina fluviatilis Aubl.
COSTA RICA:
  Tonina fluviatilis Aubl. [Limón & San José]
CUBA:
  Stachytarpheta cayennensis (L. C. Rich.) Vahl [Oriente]
  Syngonanthus lagopodioides (Griseb.) Ruhl. [Las Villas]
  Tonina fluviatilis Aubl. [Pinar del Río]
JAMAICA:
  Lantana camara f. parvifolia Moldenke
  Lantana fucata var. antillana Moldenke
GUADELOUPE:
  Lantana fucata Lindl. is to be deleted
  Lantana fucata var. antillana Moldenke
MARIE GALANTE:
  Lantana fucata Lindl. is to be deleted
  Lantana fucata var. antillana Moldenke
LOS SAINTES:
  Lantana fucata Lindl. is to be deleted

Lantana fucata var. antillana Moldenke
MARTINIQUE:
Lantana fucata var. antillana Moldenke
COLOMBIA:
Amasonia lasiocaulos Mart. & Schau. [Méta]
Bouchea prismatica (L.) Kuntze [Huila]
Citharexylum karstenii var. lanceolatum Moldenke [Huila]
Paepalanthus killipii Moldenke -- delete the asterisk
Priva lappulacea (L.) Pers. [Huila]
VENEZUELA:
Paepalanthus killipii Moldenke [Bolívar]
Syngonanthus umbellatus (Lam.) Ruhl. [Amazonas]
BRITISH GUIANA:
Syngonanthus huberi Ruhl.
ECUADOR:
Eriocaulon microcephalum H.B.K. [Tunguragua]
PERU:
Aloysia fiebrigii (Hayek) Moldenke [Ayacucho]
Lantana reptans Hayek [Huancavelica]
Petrea maynensis Huber [Huanuco]
Syngonanthus caulescens (Poir.) Ruhl. [Loreto]
BRAZIL:
Aegiphila salticola Moldenke -- delete the asterisk
Eriocaulon crassiscapum Bong. [Paraná]
Eriocaulon modestum f. viviparum Herzog [Paraná]
Eriocaulon sellowianum var. longifolium Moldenke [Paraná] -- delete the asterisk
Lantana moritziana Otto & Dietr. [Paraná]
Lantana radula Sw. [Paraná]
Paepalanthus caparoënsis Ruhl. [Espiritu Santo]
Paepalanthus catharinae Ruhl. [Paraná]
Paepalanthus planifolius var. conduplicatus Ruhl. [Paraná]
Syngonanthus densiflorus (Körn.) Ruhl. [Mattogrosso]
Syngonanthus fischerianus (Bong.) Ruhl. [Paraná]
Syngonanthus gracilis (Körn.) Ruhl. [Goyaz]
Syngonanthus gracilis var. amazonicus Ruhl. [Mattogrosso]
Syngonanthus gracilis var. aureus Ruhl. [Mattogrosso]
Syngonanthus gracilis var. glabriusculus Ruhl. [São Paulo]
Syngonanthus gracilis var. koernickeanus Ruhl. [Pará]
Syngonanthus helminthorrhizus (Mart.) Ruhl. -- delete the asterisk
Syngonanthus nitens (Bong.) Ruhl. [Goyaz, Mattogrosso, & Paraná] -- delete the asterisk
Syngonanthus nitens var. koernickei Ruhl. [Paraná] -- delete the asterisk
Syngonanthus nitens f. malmii Moldenke [Mattogrosso]*
Syngonanthus nitens f. pilosus Moldenke [Mattogrosso]*
Syngonanthus niveus var. rosulatus (Körn.) Moldenke [São

Paulo]
Syngonanthus ulei Ruhl. [Pará]
Verbena caniuensis Moldenke [Paraná]*
Verbena gracilescens (Cham.) Herter [Santa Catharina]
SÃO LUIZ:
Aegiphila salticola Moldenke
MARAJO ISLAND:
Syngonanthus caulescens (Poir.) Ruhl.
PARAGUAY:
Eriocaulon sellowianum var. longifolium Moldenke
Syngonanthus helminthorrhizus (Mart.) Ruhl.
Syngonanthus nitens (Bong.) Ruhl.
Syngonanthus nitens var. filiformis (Bong.) Ruhl.
Syngonanthus nitens var. koernickei Ruhl.
URUGUAY:
Syngonanthus caulescens (Poir.) Ruhl.
ARGENTINA:
Diostea juncea (Gill. & Hook.) Miers [Neuquen]
PAKISTAN:
Callicarpa brevipetiolata Merr. [East Bengal]
BHUTAN:
Callicarpa macrophylla Vahl
INDIA:
Callicarpa arborea Roxb. [Khasi States]
Callicarpa brevipetiolata Merr. [Khasi States & West Bengal]
Callicarpa candicans var. sumatrana (Miq.) Moldenke [West Bengal]
Callicarpa longifolia f. subglabrata Schau. [Assam, Khasi States, & United Provinces]
Callicarpa macrophylla Vahl [Khasi States]
Callicarpa vestita Wall. [Sikkim & West Bengal]
Nyctanthes arbor-tristis L. [Punjab, Travancore, United Provinces, & West Bengal]
BURMA:
Callicarpa arborea Roxb. [Tenasserim]
Callicarpa longifolia f. subglabrata Schau. [Tenasserim]
CHINA:
Callicarpa candicans var. sumatrana (Miq.) Moldenke [Kwangsi]
Callicarpa longipes Dunn [Kwangsi & Kweichow]
FORMOSA:
Callicarpa formosana f. angustata Moldenke
HAINAN ISLAND:
Callicarpa candicans var. sumatrana (Miq.) Moldenke
Callicarpa longifolia f. floccosa Schau.
Callicarpa longifolia f. subglabrata Schau.
FRENCH INDO-CHINA:
Callicarpa candicans var. sumatrana (Miq.) Moldenke [Annam, Cochinchina, & Laos]
Callicarpa erioclona Schau. [Cambodia]

Callicarpa longifolia f. floccosa Schau. [Annam]
Callicarpa longifolia f. subglabrata Schau. [Tonkin]
Eriocaulon henryanum Ruhl. [Annam]
Eriocaulon hookerianum Stapf [Annam]
Eriocaulon oryzetorum Mart. [Annam]

THAILAND:
Callicarpa candicans (Burm. f.) Hochr.
Dimetra craibiana Kerr*
Nyctanthes aculeata Craib*

FEDERATED MALAY STATES:
Callicarpa angustifolia King & Gamble [Kelantan]
Callicarpa candicans (Burm. f.) Hochr. [Johore]
Callicarpa longifolia f. floccosa Schau. [Johore, Kelantan, Pahang, & Perak]
Callicarpa pedunculata R. Br. [Pahang]

STRAITS SETTLEMENTS:
Callicarpa longifolia f. floccosa Schau. [Malacca]

PHILIPPINE ISLANDS:
Callicarpa arborea var. psilocalyx (H. J. Lam) Moldenke [Luzon]*
Callicarpa bicolor A. L. Juss. [Cebu, Luzon, Mindanao, Negros, & Panay]
Callicarpa caudata Maxim. [Ticao]
Callicarpa erioclona Schau. [Coron & Palawan]
Callicarpa formosana Rolfe [Batan]
Callicarpa formosana f. angustata Moldenke [Luzon]
Callicarpa longifolia f. floccosa Schau. [Catanduanes, Mindanao, & Tawitawi]
Callicarpa longifolia f. subglabrata Schau. [Mindanao & Tawitawi]

RIOUW ARCHIPELAGO:
Callicarpa longifolia f. floccosa Schau. [Bintan, Oedjan, Papan, Riouw, & Toedjoej]
Callicarpa longifolia f. subglabrata Schau.

LINGGA ARCHIPELAGO:
Callicarpa longifolia Lam. [Singkep]
Callicarpa longifolia f. floccosa Schau. [Lingga]

SIMALUR ISLAND:
Callicarpa longifolia f. floccosa Schau.

SUMATRA:
Callicarpa brevipetiolata Merr. -- delete the asterisk
Callicarpa candicans var. sumatrana (Miq.) Moldenke
Callicarpa longifolia f. floccosa Schau.
Callicarpa longifolia f. subglabrata Schau.
Callicarpa pilosissima Maxim.
Nyctanthes dentata Blume*

MADURA ISLAND:
Callicarpa candicans (Burm. f.) Hochr.

Callicarpa longifolia f. subglabrata Schau.
BAWEAN ISLAND:
Callicarpa candicans (Burm. f.) Hochr.
KARIMANDJAWA ISLANDS:
Callicarpa longifolia f. subglabrata Schau.
MANTAWI ISLANDS:
Callicarpa arborea Roxb. [Batu]
Callicarpa longifolia f. floccosa Schau. [Tello]
JAVA:
Callicarpa brevipetiolata Merr.
Callicarpa candicans var. sumatrana (Miq.) Moldenke
Callicarpa longifolia f. floccosa Schau.
Callicarpa longifolia f. subglabrata Schau.
Nyctanthes arbor-tristis L.
KAMBANGAN:
Callicarpa longifolia f. floccosa Schau.
BRITISH NORTH BORNEO:
Callicarpa kinabaluensis Bakh. & Heine is the correct orthography of this binomial]
Callicarpa longifolia f. subglabrata Schau.
SARAWAK:
Callicarpa longifolia Lam.
Callicarpa longifolia f. floccosa Schau.
Callicarpa longifolia f. subglabrata Schau.
BORNEO:
Callicarpa candicans (Burm. f.) Hochr.
Callicarpa kinabaluensis var. enderti Moldenke*
Callicarpa kinabaluensis var. tonsa Moldenke*
Callicarpa longifolia f. floccosa Schau.
Callicarpa longifolia f. subglabrata Schau.
Teijsmanniodendron kostermansi Moldenke*
TALAUT ISLANDS:
Callicarpa erioclona Schau. [Miangas]
Callicarpa pedunculata R. Br. [Nanoesa]
CELEBES:
Callicarpa bicolor A. L. Juss.
Callicarpa caudata Maxim.
Callicarpa longifolia f. floccosa Schau.
Callicarpa longifolia f. subglabrata Schau.
KANGEAN ARCHIPELAGO:
Callicarpa candicans (Burm. f.) Hochr. [Kangean, Paliat, Saboenting, Saoebi, Sepandjang, & Sepapan]
Callicarpa candicans var. sumatrana (Miq.) Moldenke [Kangean]
Callicarpa longifolia Lam. [Kangean]
Callicarpa longifolia f. subglabrata Schau. [Kangean]
SALAJAR ISLANDS:
Callicarpa longifolia f. floccosa Schau. [Salajar]
LESSER SUNDA ISLANDS:
Callicarpa angustifolia King & Gamble [Muntok]

Callicarpa candicans (Burm. f.) Hochr. [Soemba]
Callicarpa candicans f. laciniata Moldenke [Timor]*
Callicarpa caudata Maxim. [Timor]
Callicarpa longifolia Lam. [Bali]
Callicarpa longifolia f. floccosa Schau. [Banka & Timor]

MOLUCCA ISLANDS:
Callicarpa bicolor A. L. Juss. [Halmahera & Ternate]
Callicarpa caudata Maxim. [Halmahera, Morotai, Sanana, & Ternate]
Callicarpa longifolia f. floccosa Schau. [Buru, Ceram, & Sanana]
Callicarpa longifolia f. subglabrata Schau. [Tanimber Islands & Timor Laoet]
Callicarpa nigrescens Merr. [Sanana]
Callicarpa pedunculata R. Br. [Banda, Boano, Buru, Tanimber Islands, & Ternate]

NEW GUINEA:
Callicarpa caudata Maxim. [Dutch New Guinea]
Callicarpa longifolia f. floccosa Schau. [Dutch New Guinea & Papua]
Callicarpa longifolia f. subglabrata Schau. [Dutch New Guinea & Northeastern New Guinea]
Eriocaulon alatum H. Lecomte [Papua]
Eriocaulon brevipedunculatum Merr. [Dutch New Guinea]
Eriocaulon brevipedunculatum var. angustifolium Moldenke [Dutch New Guinea]*
Eriocaulon gracile var. puberulentum Moldenke [Papua]*
Eriocaulon leucogenes Ridl. [Northeastern New Guinea]

AROE ISLANDS:
Callicarpa longifolia f. floccosa Schau. [Kobroör]

SOLOMON ISLANDS:
Callicarpa pedunculata R. Br. [Guadalcanal]

AUSTRALIA:
Clerodendrum heterophyllum var. baueri Moldenke [Queensland]*

CULTIVATED:
Callicarpa arborea Roxb. [Java]
Callicarpa candicans var. sumatrana (Miq.) Moldenke [Java]
Callicarpa longifolia f. floccosa Schau. [India & Java]
Callicarpa macrophylla Vahl [Java]
Callicarpa nudiflora Hook. & Arn. [Java]
Lantana camara var. aculeata (L.) Moldenke [Uruguay]
Lantana camara var. flava (Medic.) Moldenke [Uruguay]
Lippia micromera var. helleri (Britton) Moldenke [Cuba]
Nyctanthes arbor-tristis L. [Brazil, Java, Straits Settlements, & Tobago]
Vitex trifolia var. simplicifolia Cham. [Queensland]

NOTES ON NEW AND NOTEWORTHY PLANTS. XIV

Harold N. Moldenke

ALLIUM TRICOCCUM f. PICTUM Moldenke, f. nov.

Haec forma a forma typica speciei petiolis et parte inferiore costae rubris recedit.

This form differs from the typical form of the species in having its petioles and the lower portion of the midrib deep-red.

The type of this form was collected by my good friend, Fred W. Oswald, in the low woodland west of Fifth Avenue, near the north end of the swamp known as "the old duck sanctuary", River Edge, Bergen County, New Jersey, on May 21, 1952, and is deposited in the Britton Herbarium at the New York Botanical Garden. The accompanying plate was drawn from the type flowering material collected on May 21st and leaves taken from the same plants on July 10, 1952.

APINUS KORAIENSIS (Sieb. & Zucc.) Moldenke, comb. nov.

Pinus koraiensis Sieb. & Zucc., Fl. Jap. 2: 28, pl. 116. 1842--1870.

CALLICARPA ARBOREA var. PSILOCALYX (H. J. Lam) Moldenke, comb. nov.

Callicarpa lanata var. psilocalyx H. J. Lam, Verbenac. Malay Arch. 81. 1919.

CALLICARPA CANDICANS f. LACINIATA Moldenke, f. nov.

Haec forma a forma typica speciei laminis foliorum laciniatis recedit.

This form differs from the typical form of the species in having the leaf-blades incised-laciniate along the margins.

The type of the form was collected by Maria Ernestine Walsh-Held (no. 474) at Nipol, Timor, on April 18, 1929, and is deposited in the Herbarium Bogoriense at Buitenzorg.

CALLICARPA CANDICANS var. SUMATRANA (Miq.) Moldenke, comb. nov.

Callicarpa sumatrana Miq., Fl. Ind. Bat. 2: 886. 1856.

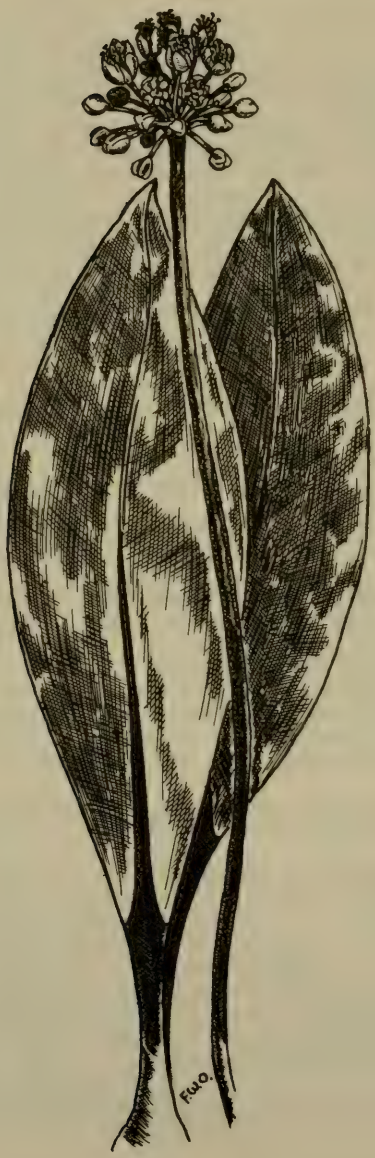
CALLICARPA FORMOSANA f. ANGUSTATA Moldenke, f. nov.

Haec forma a forma typica speciei laminis foliorum constanter lanceolatis recedit.

This form differs from the typical form of the species in having its leaf-blades uniformly lanceolate.

The type of the form was collected by Harley Harris Bartlett (no. 6082) at Taiheisan, Formosa, at an altitude of 3500 to 4000 feet, in September, 1936, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CALLICARPA KINABALUENSIS var. ENDERTI Moldenke, var. nov.



Allium tricoccum f. pictum Moldenke

Haec varietas a forma typica speciei recedit laminis foliorum subtus dense hirsutulis non tomentosis, pedunculis usque ad 1 cm. longis, cymis laxioribus, et floris fructibusque distincte pedicellatis.

This variety differs from the typical form of the species in having the lower leaf-surfaces densely hirsutulous but not matted-tomentose, the peduncles 1 cm. or less in length, and the cymes much more open, with the flowers and fruits distinctly pedicellate.

The type of the variety was collected by Frederik Hendrik Endert (no. 2913) at Long Temelen, northeastern Borneo, at an altitude of 200 meters, on August 26, 1925, and is deposited in the Herbarium Bogoriense at Buitenzorg.

CALLICARPA KINABALUENSIS var. TONSA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit ramis ramulisque petiolisque pedunculisque ramisque inflorescentiae laminisque foliorum utrinque fulvo-pubescentibus, pilis brevibus adpressis vel subadpressis et pedunculis usque ad 1 cm. longis patentibus.

This variety differs from the typical form of the species in having the pubescence on its branches, branchlets, petioles, peduncles, and inflorescence-branches, as well as on both leaf-surfaces, merely fulvous-pubescent with rather short appressed or subappressed hairs, and the peduncles 1 cm. or less in length, and more open and loose.

The type of this variety was collected by Frederik Hendrik Endert (no. 4489) at Kemvel, northeastern Borneo, at an altitude of 1800 meters, on October 22, 1925, and is deposited in the Herbarium Bogoriense at Buitenzorg.

CLERODENDRUM HETEROPHYLLUM var. BAUERI Moldenke, var. nov.

Haec varietas a forma typica speciei calyce distincte dentato, dentibus brevibus triangularibus, recedit.

This variety differs from the typical form of the species in having its calyx-rim distinctly toothed, the teeth short and triangular.

The variety is based on a series of drawings made from living material at Keppel Bay, Queensland, Australia, by Ferdinand Lucas Bauer between 1801 and 1803 and deposited in the herbarium of the Naturhistorisches Museum at Vienna, drawing 968a being regarded as the type. One of the drawings was submitted to the Royal Botanic Gardens, Kew, where Dr. R. Melville studied it. His report is that it does not match any material in the Kew herbarium nor any known Australian species. He thinks that the plant may have been a hybrid between "C. hemiderma" [=Glossocarya hemiderma] and C. floribundum. It seems more likely to me that it represents a variety of the very variable C. heterophyllum with whose broad-leaved typical form it agrees almost perfectly in all characters except the plainly short-toothed calyx-rim.

ERIOCAULON BREVIPEDUNCULATUM var. ANGUSTIFOLIUM Moldenke, var.

nov.

Haec varietas a forma typica speciei foliis angustioribus plerumque 0.5—1.5 mm. latis recedit.

This variety differs from the typical form of the species in having its leaves much narrower, usually only 0.5—1.5 mm. wide.

The type of the variety was collected by L. J. Brass (no. 9288) at the edge of pools in boggy grasslands, Lake Habbema, at an altitude of 3225 meters, Dutch New Guinea, in August, 1938, and is deposited in the Britton Herbarium at the New York Botanical Garden.

ERIOCAULON GRACILE var. PUBERULENTUM Moldenke, var. nov.

Haec varietas a forma typica speciei bracteis involucrantis dense puberulis recedit.

This variety differs from the typical form of the species in having the involucral bractlets densely puberulent.

The type of the variety was collected by L. J. Brass (no. 7822) on wet grass plains at Lake Daviumbu, Middle Fly River, Papua, New Guinea, in September, 1936, and is deposited in the Britton Herbarium at the New York Botanical Garden.

LANTANA FUCATA var. ANTILLANA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis parvis lanceolato-ovatis attenuato-acutis et bracteis floralibus infimis quam supremis plus elongatis ovato-lanceolatis attenuato-acutis.

This variety differs from the typical form of the species in its more uniformly small, lanceolate-ovate, attenuate-pointed leaves and in having the lowermost floral bracts more elongated than the upper ones, ovate-lanceolate, and attenuate-pointed, often twice as long as the upper ones.

The type of this variety was collected by Christopher Perraton (no. 12) in red dirt overlying limestone, forming the advancing edge of the bush invading commons and playing fields at Munro College, Saint Elizabeth, Jamaica, on March 15, 1952, and is deposited in the Britton Herbarium at the New York Botanical Garden

SABINA HORIZONTALIS f. DOUGLASII (Rehd.) Moldenke, comb. nov.

Juniperus horizontalis var. *douglasii* Rehd. in L. H. Bailey, Stand. Cycl. Hort. 3: 1729. 1915.

STROBUS LAMBERTIANA (Dougl.) Moldenke, comb. nov.

Pinus lambertiana Dougl., Trans. Linn. Soc. Lond. 15: 500. 1827.

STROBUS PARVIFLORA (Sieb. & Zucc.) Moldenke, comb. nov.

Pinus parviflora Sieb. & Zucc., Fl. Jap. 2: 27, pl. 115. 1842—1870.

VERBENA CANIUENSIS Moldenke, sp. nov.

Herba parva; caulis procumbentibus gracilibus parce strigillo-

sis; foliis oppositis; petiolis gracilibus valde elongatis strigillosis; laminis ovato-subrotundis rugosis crassiuscule dentatis utrinque parce strigillosis; inflorescentiis terminalibus spicatis dein elongatis; bracteolis lanceolatis strigillosis; calyce 2--3 mm. longo; corolla parvissima lilacina.

Small creeping herb; stems procumbent, tetragonal, rooting at the nodes, sparsely strigillose; principal internodes 2.5--4 cm. long, sometimes slightly arched; leaves decussate-opposite, numerous; petioles very slender, elongated, often as long as or longer than the blade, 1--2.5 cm. long, flattened-canaliculate above, sparsely strigillose; blades rather firmly chartaceous, rather uniformly green on both surfaces, ovate-subrotund, 1--2.5 cm. long and wide, acute at the base or slightly prolonged into the petiole, rounded at the apex, rather coarsely dentate along the margins except toward the very base, rugose above, sparsely strigillose on both surfaces, the teeth acute or rounded; midrib and the 4 or 5 secondaries about equal in diameter, very slender, impressed above, prominulous beneath, ascending, not arcuate; veinlet reticulation sparse and rather obscure; inflorescence terminal, spicate, slender, 7--13 cm. long, rather loosely many-flowered; peduncle very slender, 4--4.5 cm. long, sparsely strigillose with whitish ascending hairs like those on the stems, peduncles, and leaf-blades; rachis very slender, strigillose like the peduncle; bractlets lanceolate, about 2.5 mm. long, equaling or slightly shorter than the calyx, or only 1.5 mm. long and much shorter than the calyx, acuminate at the apex, sparsely strigillose; calyx cylindric, 2--3 mm. long, 5-ribbed, scarious between the ribs, strigillose with ascending whitish hairs on the ribs, 5-apiculate, the lowermost ones often short-pedicellate; corolla hypocrareriform, lilac, its tube very slender, equalling the calyx, its rim about 2 mm. wide.

The type of this interesting species was collected by Gert Hatschbach (no. 2560) in "terreno umido da mata ciliar", Rio Caniú, Palmeira, Paraná, Brazil, on November 11, 1951, and is deposited in the Britton Herbarium at the New York Botanical Garden.

STROBUS PEUCE (Griseb.) Moldenke, comb. nov.

Pinus peuce Griseb., Spicil. Fl. Rumel. 2: 349. 1845.

SYNGONANTHUS NITENS f. MALMII Moldenke, f. nov.

Haec forma a forma typica speciei recedit foliis arcte adpresso-pilosis, pilis albidis saepe reflexis.

This form differs from the typical form of the species in having the leaves closely appressed-pilose, the hairs whitish and often reflexed.

The type of the form was collected by Gustaf Oskar Andersson Malme (no. 1966a) at Santa Anna de Chapada, Mattogrosso, Brazil, on August 2, 1902, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

SYNGONANTHUS NITENS f. PILOSUS Moldenke, f. nov.

Haec forma a forma typica speciei foliis patenti-pilosis recedit.

This form differs from the typical form of the species in having its leaves spreading-pilose.

The type of the form was collected by Gustaf Oskar Andersson Malme (no. 1966) at Santa Anna de Chapada, Mattogrosso, Brazil, on July 18, 1902, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

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THE SELECTED WRITINGS OF A GREAT NATURALIST*

Harold N. Moldenke

In this time of great tension and stress, when we are being deluged from all sides by wars and rumors of wars — hot and cold -- and by frantic radio reports and scare newspaper headlines about the imminent extinction of the human race, when life has become well calculated to give stomach ulcers and nervous breakdowns to even the more placid individuals among us, it is increasingly important that our attention be directed periodically to the timeless philosophy of the great naturalists of our land. It is no accident that in recent years there has been a great revival of interest in the works of Audubon, Emerson, Whitman, Thoreau, and Burroughs. These men belong to that blessed company of spirits able properly to separate the transient ephemeral trivia of day-to-day existence which, because of our nearness to them, often seem so exaggeratedly large and important to us, from the eternal verities of the universe as seen in the natural world all about us and of which we are but such a small part.

How badly most of us need from time to time, at least, to escape from "the maddening crowd", from the hustle and bustle and rush of modern civilization, to the quiet solitudes of some sylvan temple, there to renew and refresh our souls in blessed communion with our Maker! When our daily newspapers keep repeating their seemingly never changing refrain of the chronicling of greed and hate and crime, it is a source of great comfort to be able to stand in some wayside thicket and observe the self-sacrificial devotion of mothers' love as demonstrated by a brown thrasher or ruby-throated hummingbird blindly attacking the supposed enemy hundreds of times her size menacing her babies, or of the worm-eating warbler feigning a broken wing and even rolling over and over down a hillside to distract one's attention from her nest.

Many of us have copies of John Burroughs' twenty-four published books, but with so much demand on our time, it becomes increasingly difficult to find leisure to read all that one would like to read. Miss Wiley has, therefore, done this and future

generations a great service in culling the very best from Burroughs' writings and placing it in one handy volume. Now there is no longer any excuse for us not to be acquainted with this great Hudson River naturalist. He it was who emphasized that "the most precious things of life are near at hand, without money and without price. Each of you has the whole wealth of the universe at your very door. One has only to sit down in the woods or fields or by the shore of the river or lake, and nearly everything of interest will come round to him -- the birds, the animals, the insects; and presently, after his eye has got accustomed to the place and to the light and shade, he will probably see some plant or flower that he has sought in vain for.....So, on a large scale, the student and lover of nature has this advantage over people who gad up and down the world seeking some novelty or excitement: he has only to stay at home and see the procession pass. The great globe swings around to him like a revolving showcase; the change of the seasons is like the passage of strange and new countries; the zones of the earth, with all their beauties and marvels, pass one's door and linger long in the passing."

Not only was he a great naturalist and philosopher, but a writer of unsurpassed charm and beauty who knew well how best to use the English language. Consider, for instance: "Unadulterated, unsweetened observations are what the real nature lover craves. No man can invent incidents and traits as interesting as the reality." Or, in speaking of the joy of walking: "A race that neglects or despises this primitive gift, that fears the touch of the soil, that has no footpaths.....that warns off the walker as a trespasser, that knows no way but the highway.....that forgets the stile, the footbridge, that even ignores the rights of the pedestrian in the public road, providing no escape for him but in the ditch or up the bank, is in a fair way to far more serious degeneracy." "The human body is a steed that goes freest and longest under a light rider, and the lightest of all riders is a cheerful heart.....The heaviest thing in the world is a heavy heart." "If I were to name the three most precious resources of life, I would say books, friends, and nature; and the greatest of these, at least the most constant and always at hand, is nature." "The born naturalist is one of the most lucky men in the world. Winter or summer, rain or shine, at home or abroad, walking or riding, his pleasures are always near at hand. The great book of nature is open before him and he has only to turn its leaves."

In speaking of the coming of spring: "A few days ago, not a bird, not a sound; everything rigid and severe; then in a day the barriers of winter give way, and spring comes like an inundation. ...The present season is always the mother of the next....Before nature closes her house in the fall, she makes ready for the spring opening....In March the door of the seasons first stands ajar a little; in April it is opened much wider; in May the windows go up also; and in June the walls are fairly taken down and the genial currents have free play everywhere.....Summer always comes in the person of June, with a bunch of daisies on her

breast and clover blossoms in her hands." It was he who described our bluebird as having "the sky-tinge on its back, the earth-tinge on its breast." Maples in the autumn gleam, he says, "like great bonfires along the hills"; animal hibernation in winter is a condition where "the fires of life [are] banked up and burning just enough to keep the spark over till spring."

He it was who spoke of "the bright constellations of the bloodroot" in the leafless woods; of the waterlily: "What a queenly flower, indeed, the type of unsullied purity and sweetness! Its root, like a black, corrugated, ugly reptile, clinging to the slime, but its flower in purity and whiteness like a star." The cambium layer of trees: "Generation and regeneration take place through this layer. I have called it the girdle of perpetual youth." Of the bee: "The honeybee goes forth from the hive in spring like the dove from Noah's ark, and it is not till after many days that she brings back the olive leaf, which in this case is a pellet of golden pollen upon each hip."

Listen to him describe winter in the Hudson River valley: Winter, "a severe artist! No longer the canvas and the pigments, but the marble and the chisel. When the nights are calm and the moon full, I go out to gaze upon the wonderful purity of the moonlight and snow. The air is full of latent fire, and the cold warms me -- after a different fashion from that of the kitchen stove. The world lies about me in a 'trance of snow'. The clouds are pearly and iridescent and seem the farthest possible removed from the condition of a storm -- the ghosts of clouds, the indwelling beauty freed of all dross. I see the hills, bulging with great drifts, lift themselves up cold and white against the sky, the black lines of fence here and there obliterated by the depths of the snow. Presently a fox barks away up next the mountains, and I imagine I can almost see him sitting there in his furs, upon the illuminated surface, and looking down in my direction. As I listen, one answers him from behind the woods in the valley. What a wild winter sound, wild and weird, up among the ghostly hills!" And, again: "the snow is a great telltale and blabs as effectually as it obliterates. I go into the woods and know all that has happened. I cross the fields, and if only a mouse has visited his neighbor the fact is chronicled."

"The preparations of a snowstorm are, as a rule, gentle and quiet; a marked hush pervades both the earth and the sky. The movements of the celestial forces are muffled, as if the snow already paved the way of their coming. There is no uproar, no clashing of arms, no blowing of wild trumpets. These soft, feathery, exquisite crystals are formed as if in the silence and privacy of the inner cloud chambers." But then the blizzard comes: "As the sun went down and darkness fell, the storm impulse reached its full. It became a wild conflagration of wind and snow; the world was wrapt in frost flame; it enveloped one and penetrated his lungs and caught away his breath like a blast from a burning city. How it whipped around and under every cover and searched out every crack and crevice, sifting under the shingles in the attic, darting its white tongues under the kitch-

en door, puffing its breath down the chimney, roaring through the woods, stalking like a sheeted ghost across the hills, bending in white and ever-changing forms above the fences, sweeping across the plains, whirling in eddies behind the buildings, or leaping spitefully up their walls -- in short, taking the world entirely to itself and giving a loose rein to its desire." "We love the sight of the brown and ruddy earth; it is the color of life, while a snow-covered plain is the face of death; yet snow is but the mask of the life-giving rain; it, too, is the friend of man -- the tender, sculpturesque, immaculate, warming, fertilizing snow."

And, again, listen to Burroughs: "Nature has but two forms, the cell and the crystal -- the crystal first, the cell last. All organic nature is built up of the cell; all inorganic, of the crystal. Cell upon cell rises the vegetable, rises the animal; crystal wedded to and compacted with crystal stretches the earth beneath them." Speaking of the passing of winter with the warm days of spring: "Like worn and unwashed linen appear the remains of that spotless robe with which he clothed the world as his bride."

Speaking of the unfolding fiddleheads of our ferns: "I know of nothing in vegetable nature that seems so really to be born as the ferns. They emerge from the ground rolled up, with a rudimentary and 'touch-me-not' look, and appear to need a maternal tongue to lick them into shape. The sun plays the wet nurse to them, and very soon they are out of that uncanny covering in which they come swathed, and take their places with other green things." And of the pine: "The pine is the tree of silence. Who was the Goddess of Silence? Look for her altars amid the pines -- silence above, silence below. Pass from deciduous woods into pine woods of a windy day, and you think the day has suddenly become calm.....The deciduous trees are inconstant friends that fail us when adverse winds do blow; but the pine and all its tribe look winter cheerily in the face, tossing the snow, masquerading in his arctic livery, in fact holding high carnival from fall to spring. The Norseman of the woods, lofty and aspiring, tree without bluster or noise, that sifts the howling storm into a fine spray of sound; symmetrical tree, tapering, columnar, shaped as in a lathe, the preordained mast of ships, the mother of colossal timbers; centralized, towering, patriarchal, coming down from the foreworld, counting centuries in thy rings and outlasting empires in thy decay."

Listen to Burroughs on bird songs: "The songbirds might all have been brooded and hatched in the human heart. They are typical of its highest aspirations, and nearly the whole gamut of human passion and emotion is expressed more or less fully in their varied songs.....there is the song of the hermit thrush for devoutness and religious serenity; that of the wood thrush for the musing, melodious thoughts of twilight; the song sparrow's for simple faith and trust, the bobolink's for hilarity and glee, the mourning dove's for hopeless sorrow, the vireo's for all-day and every-day contentment, and the nocturne of the

mockingbird for love. Then there are the plaintive singers, the soaring ecstatic singers, the confident singers, the gushing and voluble singers, the half-voiced, inarticulate singers. The note of the wood pewee is a human sigh; the chickadee has a call full of unspeakable tenderness and fidelity. There is pride in the song of the tanager, and vanity in that of the catbird. There is something distinctly human about the robin; his is the note of boyhood."

This is nature writing at its best, and Miss Wiley has given us 294 pages of it! Our thanks to Miss Wiley -- and our thanks to Mr. Jaques for the 17 completely appropriate full-page silhouette sketches and 11 vignettes scattered through the text. These completely capture the spirit of John Burroughs -- and that is high praise indeed!

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*"John Burroughs' America: selections from the writings of the Hudson River naturalist", edited and with an introduction by Farida A. Wiley; foreword by Julian Burroughs; illustrated by Francis Lee Jaques. i--xv, 1--304 pp., illustr. 1951.

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ADDITIONAL NOTES ON THE ERIOCAULACEAE. VIII

Harold N. Moldenke

PAEPALANTHUS ALSINOIDES var. MINIMUS Jennings

The Shafer collection cited below was distributed as Dupatya alsinoides.

Additional citations: CUBA: Pinar del Río: Carabia 996 (Cr, N); Shafer 10682 (Cm). ISLA DE PINOS: Britton, Britton, & Wilson 14144 (Cm); Carabia 1153 (Cr, N), 3994 (Cr, N), s.n. [León 17894] (N); León & Victorin 17894 (Ha), 18852 (Ha).

PAEPALANTHUS AMOENUS (Bong.) Körn.

Additional citations: BRAZIL: Minas Geraes: P. Clausen 16 (N, N), 267, in part (N); Mello Barreto 2491 [Herb. Jard. Bot. Bello Horiz. 4053] (N).

PAEPALANTHUS ANDICOLA Körn.

The species has been collected at altitudes of 2500 to 3500 meters, in anthesis in October.

Additional citations: ECUADOR: Loja: Steyermark 54409 (N), 54413 (N), 54441a (N).

PAEPALANTHUS ANDICOLA var. VILLOSUS Moldenke

Citations: COLOMBIA: Cundinamarca: Haught 5878 (N--type).

PAEPALANTHUS ARCHERI Moldenke

This species is known thus far only from an altitude of 1800 meters in the Cerra do Cipó, in anthesis in August.

Additional citations: BRAZIL: Minas Geraes: Archer 3677 (N--photo of type, W--1705663--type, Z--photo of type).

PAEPALANTHUS ARGENTEUS (Bong.) Körn.

Additional citations: BRAZIL: Minas Geraes: Sampaio 6845 [Herb. Jard. Bot. Belo Horiz. 12338] (Ja--47650, N).

PAEPALANTHUS ARGYROLINON Körn.

Additional citations: BRAZIL: Minas Geraes: G. Gardner 5260 (N--isotype).

PAEPALANTHUS ASPER Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Silveira 350 (Vi-15834--isotype).

PAEPALANTHUS ATER Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Silveira 329 (Vi-15843).

PAEPALANTHUS AUGUSTUS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Silveira 373 (Vi-15842--isotype).

PAEPALANTHUS BALANSAE Ruhl.

Original description: Engl., Das Pflanzenreich 4 (30): 151. 1903 -- not 1902, as sometimes stated.

PAEPALANTHUS BARBULATUS Herzog

This species, according to Luetzelburg, Estudo Botanico do Nordéste 3: 148 (1923), is known only from Serra des Almas and Alto Rio Bromado and Rio de Contas in central Bahia. It is said to be typical of the carrasco and rare in the campinas.

PAEPALANTHUS BARKLEYI Moldenke

Additional citations: COLOMBIA: Antioquia: F. A. Barkley 18A100 (N--type), 18A147 (N).

PAEPALANTHUS BIFIDUS (Schrad.) Kunth

A synonym is Eupaepalanthus schraderi Körn. ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 332 (1888). Specimens of this species have been variously mis-identified or distributed as P. bifidus Kunth, P. caulescens Kunth, P. schraderi Körn., Syngonanthus caulescens Ruhl., Eriocaulon congestum H.B.K., E. fasciculatum Lam., E. pygmaeum Mart., and E. villosum Salzm. According to Luetzelburg, Estudo Botanico do Nordéste 3: 148 (1923) it is typical of the "brejo" at Serra de Pintoba and Cachoeira Escura on the Rio Doce in Espiritu Santo. Miss Mexia collected it at an altitude of 1250 meters. It has been found both in dry soil and in open wet sand along forest roads and in and about villages.

It has been collected in anthesis in February, March, July, August, October, and December.

Additional citations: BRITISH GUIANA: De la Cruz 1700 (D—603537, N), 1750 (D—603566, N), 1849 (N), 2525 (N), 3435 (D—603773, N); H. A. Gleason 633 (N); Herb. Forest Dept. Br. Guian. F.905 [Rec. 3641] (N); A. S. Hitchcock 17075 (N); Jenman 5287 (C, Ka), 5805 (C), s.n. [Upper Demerara River, 1898] (N); Leng s.n. [Bartica, Oct. 4, 1922] (N); Maguire & Fanshawe 22974 (N), 23561 (N). BRAZIL: Alagoas: A. Lutz s.n. [Herb. Rio de Jan. 31186] (Ja). Amazonas: Schwacke III.286 [Herb. Rio de Jan. 47743] (Ja). Bahia: Martius 558 (M); Riedel s.n. [Bahia, 1859] (N); Salzmann s.n. (N). Minas Geraes: Mexia 5816 (Gg—286100). Pará: J. T. Baldwin 4021 (N); Spruce s.n. [Jul.—Aug. 1849] (N). Pernambuco: Pickel 734 (N). State undetermined: G. Gardner 1170 (N); Martius 555 [Villa St. Georgii Insulanorum] (N).

PAEPALANTHUS BOMBACINUS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Williams & Assis 6926 (F—photo, N, N—photo, Sg—photo, W—1932848, Z—photo).

PAEPALANTHUS BONGARDII Kunth

Additional citations: BRAZIL: São Paulo: Moldenke & Moldenke 19645 (N), 19655 (N).

PAEPALANTHUS BRACHYPHYLLUS Ruhl.

Additional citations: BRAZIL: Amazonas: Murca Pires 826 (N).

PAEPALANTHUS BRACHYPUS (Bong.) Kunth

Additional citations: BRAZIL: Minas Geraes: Riedel 1182 (M—isotype).

PAEPALANTHUS BRITTONI Moldenke

A synonym of this species is P. montanus (Britton) Moldenke, published in Rev. Sudam. Bot. 4: 17 (1937), which proves to be a homonym of P. montanus Alv. Silv., Fl. Montium 76 (1928).

The species has been collected along the wooded banks of creeks, blooming in July.

Additional citations: CUBA: Oriente: G. C. Bucher 81 (Rg), 15269 (Es); R. A. Howard 5760 (N), 5960 (N); León & Clément 20149 (Ha).

PAEPALANTHUS BROMELIOIDES Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto & Brade 1040 [Herb. Jard. Bot. Bello Horiz. 10723] (N).

PAEPALANTHUS BRYOIDES (Bong.) Kunth

The Mello Barreto specimen cited below was originally distributed as Syngonanthus rupestris (Gardn.) Ruhl. and later redetermined as Blastocaulon rupestre (Gardn.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 10129 (N); Riedel 1416 (T).

PAEPALANTHUS CACHAMBUENSIS Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: Williams & Assis 7489 (F--photo, N, N--photo, Sg--photo, W--1933025, Z--photo).

PAEPALANTHUS CAESPITITIUS Mart.
Additional citations: BRAZIL: Minas Geraes: Riedel 293 [Herb. Martius 1082] (M).

PAEPALANTHUS CALDENSIS Malme
A synonym is P. dusenii Ruhl. The species has been collected at an altitude of 1600 meters in São Paulo, blooming in March.
Additional citations: BRAZIL: Paraná: Stellfeld 1064 [Herb. Mus. Parana. 2044] (N). São Paulo: Eugenio Leite 3362 (N).

PAEPALANTHUS CAPANEMAE Alv. Silv.
The original description of this species was published by Löfgren in Archiv. Jard. Bot. Rio de Janeiro 2: 7--8 (1918). The type specimen is given as Herb. Rio de Jan. 6628 [Herb. Alv. Silveira 629], without any locality of collection being designated.

PAEPALANTHUS CAPAROËNSIS Ruhl.
This name is sometimes mis-spelled "P. capraoensis". The species has been collected in the campo above timberline at an altitude of 2425 meters.
Additional citations: BRAZIL: Espiritu Santo: Mexia 4022 (Gg--275578, N).

PAEPALANTHUS CAPILLACEUS Klotzsch
This species has been found at an altitude of 1500 meters in Bolívar, and Steyermark records for it the common name of "loit". Besides the collections cited below, the species is known also from British Guiana collections of R. Schomburgk and Sandwith.
Additional citations: VENEZUELA: Amazonas: Luetzelburg 21408 [Herb. Mus. Nac. Rio 47693] (Ja). Bolívar: Lasser 1798 (N, W--1901898); Steyermark 59453 (N), 60208 (N).

PAEPALANTHUS CAPILLACEUS var. PROLIFERUS Gleason
The variety has been found at altitudes of 1700 to 1800 meters on Mount Duida.
Additional citations: BRITISH GUIANA: Maguire & Fanshawe 23243 (N); G. H. H. Tate 263 (N). VENEZUELA: Amazonas: Steyermark 58138 (N); G. H. H. Tate 552 (N--type).

PAEPALANTHUS CARDONAE Moldenke
Additional citations: VENEZUELA: Bolívar: Cardona 2281 (F--photo of type, N--fragment of type, N--photo of type, W--1903498 --type, Z--photo of type).

PAEPALANTHUS CASTANEUS Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: Ule 2730 [Herb. Rio de Jan. 47740] (Ja, N).

PAEPALANTHUS CATHARINAE Ruhl.
Additional citations: BRAZIL: Rio Grande do Sul: Rambo 32432 (N), 35245 (N), 36782 (N). Santa Catharina: Rambo 30510 (N); Reitz 2388 (N), 2461 (N), 2535 (N).

PAEPALANTHUS CHLORONEMA Alv. Silv.
Additional citations: BRAZIL: Mattogrosso: J. G. Kuhlmann 1632 [Herb. Rio de Jan. 47661] (Ja, N).

PAEPALANTHUS CHLOROPHYLLUS Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: Silveira 563 [Herb. Marie-Victorin 15833] (Vi--isotype).

PAEPALANTHUS CLAUSSENIANUS Körn.
Additional citations: BRAZIL: Minas Geraes: B. da Costa 165 [Herb. Rio de Jan. 47721] (Ja).

PAEPALANTHUS COLOIDES Ruhl.
The Mexia collection cited below was originally distributed by Standley as Syngonanthus caulescens var. procerus. It was collected at 1260 meters altitude, and the common name "perpetua do campo" is recorded for it.
Additional citations: BRAZIL: Minas Geraes: Mexia 5733 (Gg--286182, N, N). State undetermined: G. Gardner 5246 (N).

PAEPALANTHUS COLUMBIENSIS Ruhl.
The Cardona 333 distributed under this name to some herbaria proves to be P. ensifolius (H.B.K.) Kunth. P. columbiensis has been collected at altitudes of 2500 to 3500 meters, in anthesis in March, June, August, and September, the flowers white. It grows on roadside banks, and common names recorded are "jeguey de páramo" and "piñuelita de páramo". The name has been incorrectly written "P. columbianus Ruhl." The Cuatrecasas 17841 collection has its peduncles extremely villous.
Additional citations: COLOMBIA: Boyacá: Cuatrecasas 10442 (W--1796504). Cauca: F. C. Lehmann 3578 (N--photo of isotype, W--936267--isotype, Z--photo of isotype). Cundinamarca: Cuatrecasas 9514 (N), 9528 (N), 9659 (W--1795907), 10473 (W--1796516); Cuatrecasas & Jaramillo 11969 (W--1850838); Garcia Barriga 11652 (W--1853681); Killip 34047 (Gg--313964, N); R. E. Schultes 3199 (N, Sm). Norte de Santander: Cuatrecasas & Garcia Barriga 10095 (W--1798728), 10206 (W--1799470); Cuatrecasas, Schultes, & Smith 12308 (W--1850948). Santander: Cuatrecasas & Garcia Barriga 9878 (W--1798456). Valle del Cauca: Cuatrecasas 17841 (N). Department undetermined: Mutis 1639 (W--1560090). VENEZUELA: Mérida: Sergent 15 (Ve). Trujillo: Jahn 1178 (Ve). State undetermined: Jahn

1307b [Páramo del Jabón] (Ve).

PAEPALANTHUS COMPACTUS Gardn.

Additional citations: BRAZIL: Minas Geraes: G. Gardner 5247 (M--isotype, N--isotype).

PAEPALANTHUS CONVEXUS Gleason

The species is known thus far only from Mount Duida and Mount Roraima. It was collected twice by Tate on Duida. It has been found at altitudes of 2255 to 2620 meters, flowering in September. The Phelps and Hitchcock collection, cited below, has its bracts more obtuse.

Additional citations: VENEZUELA: Amazonas: G. H. H. Tate 658 (N--type); Steyermark 58041 (F--1209395, N), 58351 (F--1209391, N). Bolívar: Phelps & Hitchcock 380a (N); Steyermark 58778 (N), 58876 (F--1209393, N).

PAEPALANTHUS CORYMBOIDES var. EPILOSUS Ruhl.

Additional citations: BRAZIL: Paraná: Hertel 46 [Herb. Mus. Parana. 2097] (N).

PAEPALANTHUS COUTOËNSIS Moldenke

This binomial is based on the P. barbulatus of Alv. Silv., Fl. Montium 211, pl. 139 & 140 (1928), not P. barbulatus Herzog in Fedde, Repert. 20: 83 (1924).

Additional citations: BRAZIL: Federal District: Brade 10984 [Herb. Rio de Jan. 26706] (Ja, N).

PAEPALANTHUS CRASSICAULIS Körn.

Ruhland on page 208 of his monograph cites this species from "Colombia: bei Chachapoyas, unfern der Stadt San Carlos (Fielding n. 1403)". Mr. E. P. Killip, in a letter to me dated November 20, 1945, says that this locality is undoubtedly in the department of Amazonas, Peru. The index to the American Geographic Society's map of the Americas (page 863) gives a San Carlos in that department. The Fielding referred to is evidently H. B. Fielding, who assembled a herbarium of 70,000 specimens although he never collected in Peru himself. An account of this herbarium is published in Journ. Bot. Hook., page 6, and on page 283 reference is made to 2000 specimens of Mathews' collection. Mathews lived for a long while at Chachapoyas, and I have seen many of his specimens bearing that name as the locality of collection, but without his own name as collector (although written in what we know to be his own handwriting). It is probable that the specimen cited by Ruhland has a label reading about as follows: "Chachapoyas: Herb. Fielding". The species is not included in Macbride's Flora of Peru and it is therefore of importance definitely to place it. Possibly other species referred to Colombia by various monographers do not really belong there.

The species has been collected at altitudes of from 2150 to 3430 meters, mostly in paramos or on bushy slopes, blooming in

May, June, August, and October. The common name "olivar" is recorded for it by Steyermark.

Additional citations: COLOMBIA: Boyacá: Cuatrecasas & Garcia Barriga 9747 (W--1798455). Cundinamarca: André 1001, in part [SE de Bogotá] (N), 1001, in part [Paramo de Chipaqué] (N); Cuatrecasas 5627 (N), 9424 (N); Ewan 16906 (N); Haught 5028 (N, W--1709677), 5599 (N), 5732 (N); Killip, Garcia Barriga, & Gutierrez Villegas 38039 (N); Pérez Arbeláez & Cuatrecasas 5627 (W--1774211); Rusby & Pennell 1280 (N). Norte de Santander: Linden 764 (Br). Department undetermined: Mutis 1638 (N--photo, W--1560089, Z--photo). VENEZUELA: Mérida: Steyermark 56265 (F--1205135, N), 56292 (F--1221908). PERU: Cajamarca: R. Ferreyra 826 (N).

PAEPALANTHUS CURURENSIS Moldenke

Citations: BRAZIL: Pará: Sioli s.n. [Herb. Inst. Agron. Norte 29159] (N--type).

PAEPALANTHUS CUSPIDATUS Alv. Silv.

The species has been collected in sand under boulders at an altitude of 1300 to 1500 meters.

Additional citations: BRAZIL: Minas Geraes: M. A. Chase 10432 (F--photo, N, N--photo, Si--photo, W--1495698, Z--photo).

PAEPALANTHUS DENSIFOLIUS Alv. Silv.

This species, originally published in Archiv. Jard. Bot. Rio de Janeiro 2: 7--8 (1918), is based on the following specimen: "ex Herb. do Jardim Bot. do Rio de Janeiro, loco non indicato lecta sub n. 6645; n. 630 in herb. Silveira."

PAEPALANTHUS DICHOTOMUS Klotzsch

The species has been collected at an altitude of 1065 meters, blooming in October.

Additional citations: VENEZUELA: Amazonas: Ule 8556 (N). Bolívar: Steyermark 59209 (N). BRITISH GUIANA: R. H. Schomburgk 676/899a (N, K), 899 (K). BRAZIL: Amazonas: Ule 8556, in part (W--1615063).

PAEPALANTHUS DISTICHOPHYLLUS Mart.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 9892 [Herb. Jard. Bot. Bello Horiz. 25479] (N).

PAEPALANTHUS DIVARICATUS (Bong.) Kunth

Additional citations: BRAZIL: Minas Geraes: L. Riedel 1048 (M--isotype).

PAEPALANTHUS DOMINGENSIS Ruhl.

The species has been collected at an altitude of 6200 feet, blooming in September.

Additional citations: HISPANIOLA: Dominican Republic: Howard

& Howard 9118 (N).

PAEPALANTHUS DUIDAE Gleason

The species is described by Steyermark as being terrestrial, growing at altitudes of 1820 to 2075 meters, in moist places on Mount Duida, with white flowering heads.

Additional citations: VENEZUELA: Amazonas: Steyermark 58319 (F--1205139, N), 58361 (F--1209394, N); G. H. H. Tate 456 (N--type).

PAEPALANTHUS ELATUS (Bong.) Körn.

Additional citations: BRAZIL: Minas Geraes: L. Riedel 1037 (T--isotype).

PAEPALANTHUS ELONGATUS (Bong.) Körn.

The species is described as inhabiting wet places in São Paulo. The Guillemin specimen cited below was distributed as "Eriaucolon elongatum Bong."

Additional citations: BRAZIL: Minas Geraes: B. Lutz 55 [Herb. Rio de Jan. 47738] (Ja). São Paulo: Guillemin s.n. [locis humidis a St. Paul. 1859] (Du).

PAEPALANTHUS ELONGATUS var. GRAMINIFOLIUS Herzog

This variety, according to Luetzelburg, Estudo Botanico do Nordéste 3: 148 (1923), has been found at Alto Rio de Contas and Minas do Rio de Contas in central Bahia and at Rio das Femeas in eastern Goyaz. It is said to be typical of the "carrasco" and frequent in the "brejo". The name appears in Luetzelburg's work as "f. graminifolia".

PAEPALANTHUS ELONGATUS var. HELICHRYSOIDES (Kunth) Ruhl.

The Martius collection cited below bears the following names as synonyms on its label: Eriocaulon stellare Guill., P. elongatus Körn., P. elongatus var. barbulata Körn., and P. elongatus var. ciliata Körn. The first of these names is synonymous with Paepalanthus stellaris (Guill.) Kunth, while P. elongatus var. barbulata is probably conspecific with typical P. elongatus and var. "ciliata" [=ciliatus] is probably distinct or may be the same as var. helichrysoides.

Additional citations: BRAZIL: Minas Geraes: Ule 2731 [Herb. Rio de Jan. 47741] (Ja). State undetermined: Herb. Martius 877 (M).

PAEPALANTHUS ELONGATUS var. PUBESCENS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 4721 [Herb. Jard. Bot. Bello Horiz. 17747] (N).

PAEPALANTHUS ENSIFOLIUS (H.B.K.) Kunth

Literature: R. Espinosa, Estud. Bot. Sur Ecuad. 1: 44, 72, 73, & 77. 1948; 2: 25. 1949.

Penland describes the species as growing from a long rhizome

in leafmold and moss, with dark-green leaves and white heads. Espinosa says "Forma rosetas sobre los prados de la parte inferior del páramo; cabezuela sobre largo pedúnculo; rosetas en socies, entre el herbetum de altura, o entre el fructicetum de las faldas." It has been collected at altitudes of from 2400 to 3300 meters, flowering in March, July, and August.

Additional citations: COLOMBIA: Magdalena: André 332, in part [Isla Brava] (N). Norte de Santander: Pérez Arbeláez s.n. [Maquén, Marzo 1930] (Gg--225663). VENEZUELA: Táchira: Cardona 333 (Ve, W--1459971). ECUADOR: Azuay: Camp E.402 (N); Wiggins 10822 (N, Ug). Carchi: André 332, in part [Huacabamba] (N). Loja: André 332, in part [Chuquiribamba] (N); R. Espinosa 192 (N), 880 (N); Penland & Summers 1144 (N); Steyermark 53744 (F--1205651). Province undetermined: Collector undesignated 35 (Q); Jameson s. n. [Southern provinces] (N).

PAEPALANTHUS ERIGERON Mart.

Additional citations: BRAZIL: Bahia: Blanchet 2601 (M--isotype); Schery 672 (N).

PAEPALANTHUS ESPINOSIANUS Moldenke

Literature: R. Espinosa, Bol. Inform. Cent. Nac. Quito 2 (11-12): 46--47. 1948; R. Espinosa, Estud. Bot. Sur Ecuad. 2: 25 (as "Espinasianus"). 1949.

Although in both the references cited above the name appears with "sp. nov." after it, the binomial was actually validly published by me in Phytologia 2: 228--229. 1947.

Citations: ECUADOR: Santiago-Zamora: Steyermark 54342 (N--type).

PAEPALANTHUS EXIGUUS (Bong.) Körn.

Additional citations: BRAZIL: Minas Geraes: Ule 2713 [Herb. Rio de Janeiro 47752] (Ja, N).

PAEPALANTHUS FALCIFOLIUS Körn.

The Gardner specimen cited below was previously mis-identified as P. polyanthus (Bong.) Kunth, while Ruhland cites Clausen 267 as P. conduplicatus Körn. The latter, however, may well be a case of several different things distributed under one number.

Additional citations: BRAZIL: Minas Geraes: P. Clausen 267, in part (N), 319 (N, N). State undetermined: G. Gardner 5248 (N); Herb. Jard. Bot. Brux. s.n. (Br); Linden 6 (Br), s.n. (Br).

PAEPALANTHUS FASCICULATUS (Rottb.) Körn.

The Herb. Limingani specimen cited below was previously misidentified as Eriocaulon caulescens Poir. and E. lamarckii Steud. The species has been collected at altitudes of 150 to 220 meters, in anthesis from December to March and in June and September.

Additional citations: COLOMBIA: Amazonas: R. E. Schultes 3943

(N). Méta: F. W. Pennell 1543 (N, W--1041807). Vaupés: Cuatrecasas 6757 (N), 6976 (N, N), 6999 (W--1774223); Perez Arbeláez & Cuatrecasas 6757 (N); R. E. Schultes 5837a (N). VENEZUELA: Amazonas: Luetzelburg 22455 [Herb. Rio de Janeiro 47675] (Ja); Holt & Blake 463 (N); Schultes & López 9287 (N); Steyermark 57729 (N); Ll. Williams 13960 [Herb. Nac. Venez. 18502] (Ve), 14939 (W--1878500). Bolívar: Ll. Williams 14939 [Herb. Nac. Venez. 18501] (Ve). BRITISH GUIANA: H. A. Gleason 25 (W--1190816); Maguire & Fanshaw 23001 (N), 23560 (N). SURINAM: Maguire & Stahel 23618 (N); Moldenke & Moldenke 19583 (Es, Lg, N, Sm). FRENCH GUIANA: Herb. Limingani s.n. (Du). BRAZIL: Amazonas: J. T. Baldwin 3222 (N), 3389 (N), 3467 (N), 3548 (N); Holt & Blake 575 (N); Luetzelburg 22471, in part [Herb. Rio de Jan. 47673] (Ja), 22501, in part [Herb. Rio de Jan. 47660] (Ja), 22604, in part [Herb. Rio de Jan. 47659] (Ja); R. E. Schultes 8720 (N), 9860 (N, Ug); Schultes & López 8780 (N), 9250 (N, Ug); Schultes & Murça Pires 9136 (N); Spruce s.n. [in vicinibus Barra, Dec.-Mart. 1850-51] (N). Pará: Spruce s.n. [in vicinibus Obidos, Dec. 1849] (N).

PAEPALANTHUS FASCICULATUS var. ICANENSIS Herzog
Additional citations: BRAZIL: Amazonas: Luetzelburg 22303 [Herb. Rio de Jan. 47695] (Ja--cotype, N--cotype), 22448 [Herb. Rio de Jan. 47694] (Ja--cotype, N--cotype), 22975 [Herb. Rio de Jan. 47683] (Ja).

PAEPALANTHUS FASCICULATUS f. RIGIDUS Herzog
Additional citations: BRAZIL: Amazonas: Luetzelburg 22244 [Herb. Rio de Jan. 47697] (Ja--isotype, N--isotype).

PAEPALANTHUS FASCICULATUS f. SPHAEROCEPHALUS Herzog
Additional citations: BRAZIL: Amazonas: Luetzelburg 22931 [Herb. Rio de Jan. 47698] (Ja--isotype, N--isotype).

PAEPALANTHUS FASCICULATUS f. TENELLUS Herzog
Additional citations: VENEZUELA: Amazonas: Luetzelburg 22978 [Herb. Rio de Jan. 47699] (Ja--isotype, N--isotype). SURINAM: Maguire 24677 (N). BRAZIL: Amazonas: Luetzelburg 21993 [Herb. Rio de Jan. 47680] (Ja).

PAEPALANTHUS FASCICULIFER Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: Silveira 590 [Herb. Marie-Victorin 15844] (Vi).

PAEPALANTHUS FERREYRAE Moldenke
Citations: PERU: Cajamarca: R. Ferreyra 809 (N--type).

PAEPALANTHUS FLACCIDUS (Bong.) Kunth
The species is said by Mrs. Chase to grow in wet sand in crevices of rock along tiny streamlets, probably dry at some

seasons, at an altitude of 1200 meters.

Additional citations: BRAZIL: Minas Geraes: M. A. Chase 10331 (W--1495685); Mello Barreto 9844 [Herb. Jard. Bot. Bello Horiz. 25340] (N); Ule 2718 [Herb. Rio de Jan. 47744] (Ja). São Paulo: W. Hoehne 1613 (N, Wh, Wh, Wh, Wh, Wh, Wh, Wh). State undetermined: G. Gardner 5244 (N); Martius 883 (T); L. Riedel 2291 (M).

PAEPALANTHUS FRATERNUS N. E. Br.

Additional citations: VENEZUELA: Bolívar: Steyermark 58849 (F--1209392, N), 58901 (N).

PAEPALANTHUS FREYREISSII (Thunb.) Körn.

A synonym is Eupaepalanthus freyreissii Körn. ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 321. 1888.

Additional citations: BRAZIL: Minas Geraes: Lauro s.n. [Herb. Rio de Jan. 47670] (Ja, N).

PAEPALANTHUS FUSCUS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Sampaio 6880 [Herb. Rio de Jan. 47647] (Ja, N).

PAEPALANTHUS GARDNERIANUS Walp.

A synonym is Cladocaulon brasiliense Gardn.

Additional citations: BRAZIL: Minas Geraes: G. Gardner 5250 (N--isotype).

PAEPALANTHUS GENICULATUS (Bong.) Kunth

Additional citations: BRAZIL: Minas Geraes: Sampaio 68 [Herb. Rio de Jan. 47649] (Ja), 6878 [Herb. Rio de Jan. 47651] (Ja, N).

PAEPALANTHUS GENTLEI Moldenke

Originally published in N. Am. Fl. 19: 40--41. 1937.

This very distinct species seems often to grow in company with P. lamarckii, for both species are intimately mixed on many sheets of the type collection. The P. lamarckii material, however, is by me regarded as Gentle 992a and the P. gentlei material as the true no. 992.

Additional citations: BRITISH HONDURAS: H. H. Bartlett 11874 (Mi); Gentle 992 (Ba--isotype, F--isotype, Gg--276712--isotype, I--isotype, Mb--isotype, Ml--isotype, N--isotype, N--isotype, N--isotype, N--type); O'Neill 8547 (I, Mi).

PAEPALANTHUS GLAZIOVII Ruhl.

Additional citations: BRAZIL: Minas Geraes: Glaziou 20016 (N--isotype).

PAEPALANTHUS GLEASONII Moldenke

This binomial is based on P. robustus Gleason, Bull. Torrey Bot. Club 58: 330 (1931), not P. robustus Alv. Silv., Flora e Serras Mineiras 53. 1908.

Additional citations: VENEZUELA: Bolívar: G. H. H. Tate 622 (N--type).

PAEPALANTHUS GYROTRICHUS Ruhl.

Additional citations: BRAZIL: Minas Geraes: Williams & Assis 6864 (N, W--1932829).

PAEPALANTHUS HERZOGII Moldenke

This species, according to Luetzelburg, Estudo Botanico do Nordéste 3: 149--150 (1923), is known from Serra Marsalina in central Bahia where it is said to be typical of the "carrasco".

PAEPALANTHUS HILAIREI Körn.

According to Luetzelburg, Estudo Botanico do Nordéste 3: 149 (1923), this species forms 20 percent of all the vegetation at Casa de Pedra, in central Bahia, and is known also from Campinas de Duro in eastern Goyaz. It is said to be typical of the "carrasco" and frequent in the "campinas".

The Martius collection cited below was distributed as Eriocaulon maximiliani Schrad. and the Mexia collection as P. polyanthus by Standley. The species is described by Mexia as a perennial herb 80 cm. tall or taller, with white flowers, abundant on streambanks.

Additional citations: BRAZIL: Bahia: Fróes 20114 (N). Minas Geraes: P. Clausen 14 (N, N); B. Lutz 44 [Herb. Rio de Jan. 47747] (Ja); Mello Barreto 4714 [Herb. Jard. Bot. Bello Horiz. 17542] (N); Mexia 5764 (Gg--286186, N); Williams & Assis 7381 (W--1932981). State undetermined: P. Clausen 267 (N, N), s.n. (N, N, N, N); Martius 897 (M).

PAEPALANTHUS HILAIREI var. MAXIMILIANI Ruhl.

This variety has been collected in anthesis in December and has been distributed as Eriocaulon maximiliani.

Additional citations: BRAZIL: State undetermined: Guillemin 223 [Lake Marica] (N).

PAEPALANTHUS HILAIREI var. PIAUHYENSIS Ruhl.

Synonym: Paepalanthus hilairei var. paiuhyensis Ruhl. ex Moldenke, Known Geogr. Distrib. Eriocaul. 49, sphalm. 1946.

Additional citations: BRAZIL: Piauhy: G. Gardner 2968 (M--isotype, N--isotype).

PAEPALANTHUS HISPIDISSIMUS Herzog

According to Luetzelburg, Estudo Botanico do Nordéste 3: 148 & 150 (1923), this species is found at Bom Jesus do Rio de Contas in central Bahia, and at Alto Rio Gurgueia, Brejo do Dorreio, and Parnaguá, in southern Piauhy. It is said to be frequent in the "carrasco" and typical of the "brejo".

PAEPALANTHUS HOMOMALLUS (Bong.) Mart.

Additional citations: BRAZIL: Minas Geraes: L. Riedel s.n. (T).

PAEPALANTHUS INCANUS (Bong.) Körn.

Additional citations: BRAZIL: Minas Geraes: Mexia 5748 (Gg--286185).

PAEPALANTHUS KARSTENII Ruhl.

Literature: R. Espinosa, Estud. Bot. Sur Ecuad. 1: 78. 1948; 2: 25. 1949.

Specimens of this species have been distributed as Eriocaulon microcephalum H.B.K. and under the name Dupatya karstenii (Ruhl.) Gleason. It has been collected on wet open paramos and open grassy paramos and limestone outcrops, at altitudes of from 2900 to 4300 meters, blooming in February, April to July, and September. It is said by Pennell and others to be a perennial herb forming dense mats, with white flowers; Killip and Smith say the heads are dark-gray. Sergent records the common name "Estrellita de páramo", while Espinosa describes the plant as "plantita que forma céspedes; pequeñas rosetas."

Additional citations: COLOMBIA: Boyacá: Cuatrecasas 1209 (W--1772914), 1501 (W--1773011), 1612 (W--1773067); Herb. Escuela Normal Superior s.n. [Nevado El Bocuy] (N). Cauca: H. Pittier 1105 (W--531303), s.n. [February, 1906] (W--531755, W--1114760). Cundinamarca: Appolinaire & Arthur 26 (N); Cuatrecasas 5553 (N, N), 9502 (N), 10455 (N); Haught 5619 (N); Killip & Ariste-Joseph 11957 (N); F. W. Pennell 2256 (N), 2685a (N). Putumayo: Cuatrecasas 11742 (W--1798479). Santander: Killip & Smith 19557 (N, W-1354766). Department undetermined: Mutis 2551 (W--1562693). VENEZUELA: Mérida: Sergent 51 (Ve, W--1778033). Táchira: Cardona 311 (Ve); Steyermark 57377 (N). ECUADOR: Loja: R. Espinosa 1026 (N). Province undetermined: André K.1738 [Tambo de Savanilla] (N). PERU: Cuzco: F. W. Pennell 13864 (D--642894).

PAEPALANTHUS KILLIPII Moldenke

The collectors describe this plant as having ashy-gray heads, growing in marshy land at an altitude of 1500 meters, Mesa de los Santos, blooming in December. They claim that it is related to P. lamarckii.

Additional citations: COLOMBIA: Santander: Killip & Smith 15299 (Gg--313974--isotype, N--isotype, N--photo of type, W--1351199--type, Z--photo of type).

PAEPALANTHUS KUPPERI Suesseng.

This species was originally published in Engl., Bot. Jahrb. 72: 293. It exists in microfilm at the Gray Herbarium and is too lengthy to copy easily. The type is said to have been collected on Chirripo Grande, Costa Rica. The west side of this mountain is in the province of Limón, while the east side is in San José. It is not known on which side the material was collected.

PAEPALANTHUS LAMARCKII Kunth

Corrected synonymy: Eriocaulon lamarckii (Kunth) Steud., Syn.

Pl. Cyp. 2: 276. 1855; Lasiolepis pilosa Böck., Flora 56: 90. 1873; Lasiolepsis pilosa Böck. apud Milne-Redhead, Kew Bull. 1948: 472, sphalm. 1948.

Illustrations: Lam., Encycl. Méth. 3: pl. 50, fig. 3. 1789.

This small and easily overlooked herb is said to be common locally on wet sandy soil of open savannas, in marshy places in lower portions of valleys, in marshes along rivers, in woods and savannas near sealevel, and among grasses near footpaths in its American area of distribution. In British Honduras it grows in company with P. gentlei and Syngonanthus bartlettii, and is intimately mixed with these and with several xyridaceous, cyperaceous, and juncaceous species on herbarium sheets. It is said to be "very rare" in British Honduras, but occurs rather abundantly in Venezuela and the Guianas. It grows at altitudes from near sealevel to 500 meters. Specimens have been distributed as "P. lamarckianus H.B.K." and Eriocaulon caesium Griseb.

Literature: Kunth, Enum. Pl. 3: 506. 1841; Lecomte, Journ. de Bot., sér. 2, 1: 136. 1908; Lecomte, Bull. Soc. Bot. France 55: 595. 1909; Malme, Phanerogamen 3: 3. 1933; Moldenke, Carnegie Inst. Wash. Publ. 522: 143—144. 1940; Milne-Redhead, Kew Bull. 1948: 472—473. 1948.

In Africa this species has been collected in moist sandy places near a roadside ditch, on poor sandy soil bare of other vegetation in rest-house compounds, on moist sand near the sea, in association with Utricularia, Polygala, and rushes where wet-season lagoons are drying up, in in sandy places in general. It has there been collected in flower in March, August, October, November, and December. In the New World it has been collected in flower in February, March, August, October, November, and December.

The specimen cited by Alvaro Silveira from "Marajo" is from Marajo Island, Pará, Brazil. The species has also been collected in Monagas, Venezuela (Las Botellas, Maturin).

Lecomte has described the remarkable structure of the calyx of the female flowers of this species and the resulting method of seed dispersal. Milne-Redhead notes that the detached calyxes, after the dispersal of the fruits, are quite conspicuous clinging to the heads of all the specimens he examined. He cites, in addition, Chevalier 20307 from French Guinea; Deighton 1441 and Adames 90 from Sierra Leone; Bequaert s.n. [Linder 1451] from Liberia; Lecomte F.30 from Gabun; and Fitzgerald 5213/2 from Mafia Island, Tanganyika. In a letter to me he states that P. J. Greenway also collected it on Mafia. He says "Whilst it is possible that the species has been introduced into Tropical Africa, it is, on the other hand, quite reasonable to suppose that it is a native. It is hoped that, when collectors pay more attention to the members of this interesting if insignificant family, the distribution of P. lamarckii may be shown to be a natural one."

The amazingly disjointed distribution of this species is very probably due to poor collecting. It brings to mind the known distribution of several other species which are inconspicuous and

therefore mostly overlooked by botanical collectors. Eriocaulon melanocephalum Kunth, for instance, is known from Cuba and then not again until Colombia, Venezuela, French Guiana, and Brazil. Tonina fluviatilis Aubl., another strictly aquatic plant, is known from Cuba, Nicaragua, Costa Rica, Trinidad, Colombia, Venezuela, British Guiana, Surinam, French Guiana, Brazil, and Peru. Ghinia spicata (Aubl.) Moldenke, a terrestrial weedy verbenaceous plant, is known from British Honduras and then not again until Venezuela, British Guiana, French Guiana, and Brazil.

Additional citations: BRITISH HONDURAS: H. H. Bartlett 11263 (Mi, Mi, N, N); Gentle 992a (Mi, N), 3780 (N, N); Schipp S.130 (F, N). PANAMA: Coclé: Hunter & Allen 365 (E--1120006); H. Pittier 4932 (W--715108). CUBA: Pinar del Río: Acuña 14903 (Es); Ekman 18121 [Herb. Roig 2771] (Es, Ha), 18135, in part (Es), s.n. [Herb. Est. Cent. Agron. 8345] (Es); León 17431 (N); Moldenke & Moldenke 19877 (Es, N); Moldenke, Moldenke, León, Alain, & Acuña 15270 (Es). Province undetermined: C. Wright 3742 (Pa). TRINIDAD: W. E. Broadway 2145 [Herb. Marie-Victorin 25156; Trin. Bot. Gard. Herb. 9701] (N, R, Vi), 4980 (N), s.n. [Trin. Bot. Gard. Herb. 4980] (R); Dannouse s.n. (R); Wright s.n. [8/1/34] (R). COLOMBIA: Arauca: Cuatrecasas 3896 (W--1773361). Magdalena: Haught 2241 (N). FRENCH GUIANA: Collector undesignated s.n. [Cayenne, 1844] (Du), s.n. [Cayenne, 1845] (Du). BRAZIL: Amazonas: Luetzelburg 20547 [Herb. Rio de Jan. 47701] (Ja), 20866 [Herb. Rio de Jan. 47690] (Ja). SIERRA LEONE: Adames s.n. [Deighton 4128] (N); Deighton 1440 (N).

PAEPALANTHUS LANCEOLATUS Körn.

Additional citations: BRAZIL: Minas Geraes: B. da Costa 138 [Herb. Rio de Jan. 47669] (Ja, N).

PAEPALANTHUS LEUCOBLEPHARUS Körn.

According to Luetzelburg, Estudo Botanico do Nordéste 3: 149 (1923), this species is known from 1700 meters elevations on the Serra de Itubira, in Bahia, Brazil.

PAEPALANTHUS LEUCOCYANEUS Tutin

Additional citations: BRITISH GUIANA: Maguire & Fanshawe 23264 (N). SURINAM: B. Maguire 24750 (N).

PAEPALANTHUS LILLIPUTIANUS Moldenke

Additional citations: BRITISH GUIANA: R. Giglioli s.n. [1931] (Fo--type, N--isotype).

PAEPALANTHUS LINDENII Ruhl.

Killip and Smith describe this as a cespitose herb growing in clumps at 2900 meters altitude, with grayish-white heads, blooming in March.

Additional citations: COLOMBIA: Boyacá: Linden 1318 (Br--iso-

type, N--fragment of isotype, N--photo of isotype, Z--photo of isotype). Norte de Santander: Killip & Smith 20621 (N).

PAEPALANTHUS LINGULATUS (Bong.) Kunth

The original publication, according to a letter to me from the Columbia University library, is Eriocaulon lingulatus Bong., Mém. Acad. Petersb., sér. 6, 1: 626. 1831. The species is listed there as No. 24, rather than No. 26, as sometimes stated. In herbaria the name is often mis-spelled "Eriocaulon ligulatus Bong."

PAEPALANTHUS LODICULOIDES Moldenke

This species is known thus far only from the high valley of Las Lagunillas, Nevado del Cocuy, altitude 4000 to 4300 meters, Boyacá, Colombia, blooming in September.

Additional citations: COLOMBIA: Boyacá: Cuatrecasas 1537 (N--fragment of type, N--photo of type, W--1773030--type, Z--photo of type).

PAEPALANTHUS LOXENSIS Moldenke

Literature: R. Espinosa, Bol. Inform. Cient. Nat. Quito 2 (11-12): 47--48. 1948; Estud. Bot. Sur Ecuad. 2: 25. 1949.

Citations: ECUADOR: Loja: Steyermark 54452 (N--type).

PAEPALANTHUS LÜTZELBURGII Herzog

According to Luetzelburg, Estudo Botanico do Nordéste 3: 138 & 150 (1923), this species has been found on the Serra dos Trez Irmaos, in central Bahia, where it is said to be typical of the "carrasco" and frequent in the "brejo". This author writes the binomial "P. luetzelburgii Herzog".

PAEPALANTHUS MACAHEENSIS Körn.

Additional citations: BRAZIL: Rio de Janeiro: Brade 9938 [Herb. Rio de Jan. 22406] (Ja), 11484 [Herb. Rio de Jan. 26713] (Ja), 11485 [Herb. Rio de Jan. 26714] (Ja); Moldenke & Moldenke 19613 (Mg, N, No, Ot, Pn, Sm).

PAEPALANTHUS MACROCEPHALUS (Bong.) Körn.

Additional citations: BRAZIL: State undetermined: G. Gardner 5280 (N).

PAEPALANTHUS MAGUIREI Moldenke

The species has been collected on rocks by waterfalls at an altitude of 1400 meters, by Hitchcock, blooming in March.

Additional citations: VENEZUELA: Amazonas: C. B. Hitchcock 25 (N).

PAEPALANTHUS MANICATUS V. A. Pouls.

Additional citations: BRAZIL: Minas Geraes: Ule 2724 [Herb. Rio de Jan. 47742] (Ja, N).

PAEPALANTHUS MERIDENSIS Klotzsch

The species has been collected at an altitude of 2500 meters, blooming in July.

Additional citations: VENEZUELA: Táchira: Steyermark 57201 (N).

PAEPALANTHUS MICROPHYLLUS (Guill.) Kunth

Additional citations: BRAZIL: Minas Geraes: Mello Barreto & Brade 1043 [Herb. Jard. Bot. Bello Horiz. 10729] (N).

PAEPALANTHUS MINUTULUS Mart.

A synonym is Eupaepalanthus minutulus Mart. ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 341. 1888.

Additional citations: BRAZIL: Minas Geraes: Mexia 5780 (Gg--286188).

PAEPALANTHUS MIRABILIS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Silveira 368 [Herb. Marie-Victorin 15832] (Vi--isotype).

PAEPALANTHUS MUSCOSUS Körn.

This species has been collected at altitudes of 3000 to 3800 meters, blooming in March. The Jahn collection cited below was compared by E. P. Killip with the type of the species in Berlin and found to be conspecific with it.

Additional citations: COLOMBIA: El Cauca: Cuatrecasas 19099 (N), 19119 (A). Norte de Santander: Linden 1330 (Br, N--photo, Z--photo). Santander: Linden 1326, in part [La Baja] (Br). Valle del Cauca: Cuatrecasas 20278 (W--1900706). VENEZUELA: Mérida: Jahn 1034 (N--fragment, N--photo, Ve, Z--photo). BOLIVIA: La Paz: R. S. Williams 842 (N, N). Province undetermined: Tate 382 [Cocopunco, Cordillera Real] (N). LOCALITY OF COLLECTION UNDESIGNATED: Collector undesignated s.n. (Br).

PAEPALANTHUS MYOCEPHALUS (Mart.) Körn.

Synonyms: Paepalanthus myocephalus var. major Körn. in Mart., Fl. Bras. 3 (1); P. myriocephalus Mart., in herb.; P. myocephalus Mart., in herb.

Literature: F. C. Hoehne, Relat. Anual Inst. Bot. S. Paulo 1945: 39. 1945.

According to Luetzelburg, Estudo Botanico do Nordéste 3: 148 & 150 (1923), this species is known from São Bento, in eastern Bahia, where it is said to be typical of the "brejo". It has been collected on rocks and in wet places between rocks, flowering and fruiting in March, July, and September.

Additional citations: BRAZIL: Bahia: Glocker 333 (W--1420860); Luschnath 34 [Herb. Martius 559] (C--cotype). Pernambuco: G. Gardner s.n. [III.1837] (M); Pickel 135 (N), s.n. [Tapera, Sept. 1929] (N). State undetermined: Herb. A. Gray s.n. (T).

PAEPALANTHUS NEOCALDENSIS Moldenke

This binomial is based on the P. caldensis Alv. Silv., Fl. Montium 186, pl. 120. 1928, not P. caldensis Malme, Bihang till K. Sv. Vet. Akad. Handl. 27, Afd. 3, no. 11: 29, pl. 2, fig. 3. 1901.

PAEPALANTHUS NEOPULVINATUS Moldenke

This binomial is based on P. pulvinatus Alv. Silv., Fl. Montium 37: pl. 18. 1928, not P. pulvinatus N. E. Br. in Thiselton-Dyer, Fl. Trop. Afr. 8: 263. 1902.

PAEPALANTHUS NIGRESCENS Alv. Silv.

The original publication of this binomial is in Alv. Silv., Fl. Serras Mineiras 62 (1908), but in the same author's Fl. Montium he later mis-spells the name "P. negregens".

PAEPALANTHUS OERSTEDIANUS Körn.

A synonym is Eupaepalanthus oerstedianus Körn. ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 327. 1888.

Additional citations: BRAZIL: São Paulo: Moldenke & Moldenke 19635 (Es, Lg, Mg, N, Ot, Sm). State undetermined: L. Riedel 1777 [Serra da Cutatao] (M—cotype).

PAEPALANTHUS OVATUS Körn.

According to Luetzelburg, Estudo Botanico do Nordéste 3: 148 & 150 (1923), this species grows at 2300 meters elevation in the Serra dos Orgaos at Acú, as well as at Casa de Pedra and Serra de Sincorá in central Bahia. It is said to be typical of the "carrasco" and frequent in the Organ Mountains.

Additional citations: BRAZIL: State undetermined: G. Gardner 5901 (N—isotype).

PAEPALANTHUS OYAPOCKENSIS Herzog

Additional citations: BRAZIL: Pará: Luetzelburg 20225 [Herb. Rio de Jan. 47717] (Ja, N), 20331 [Herb. Rio de Jan. 47713] (Ja, N), 21249 [Herb. Rio de Jan. 47716] (Ja, N).

PAEPALANTHUS PALLIDUS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Costa Serra s.n. [Herb. Silveira 458; Herb. Marie-Victorin 15840] (Vi—isotype); Ule s.n. [Herb. Rio de Jan. 47755] (Ja, N).

PAEPALANTHUS PARAMENSIS Moldenke

The type of this cespitose herb was collected on the Páramo del Hatico, en route from Toledo to Pamplona, at an altitude of about 2900 meters, Norte de Santander, blooming in March. Killip claims that the species is related to P. meridensis Klotzsch, but he compared it with the type of that species in Berlin and finds that they are not conspecific.

Additional citations: COLOMBIA: Boyacá-Santander boundary: Cuatrecasas 10417 (W—1850835). Magdalena: Carriker 11 (W—1833470). Norte de Santander: Killip & Smith 20622 (N—isotype,

N--photo of type, W--1355646--type, Z--photo of type).

PAEPALANTHUS PAUPER Moldenke
This species has been collected at an altitude of 200 meters, blooming in August.
Additional citations: VENEZUELA: Amazonas: Steyermark 57806 (N).

PAEPALANTHUS PAUPERRIMUS Herzog
Additional citations: BRAZIL: Amazonas: Luetzelburg 20757 [Herb. Rio de Jan. 47692] (Ja--isotype, N--isotype).

PAEPALANTHUS PEDUNCULATUS (Bong.) Ruhl.
The Gardner 5284 collection cited below is the type collection of P. falcatus Körn., which is a synonym of this species.
Additional citations: BRAZIL: Minas Geraes: B. da Costa 159 [Herb. Rio de Jan. 47720] (Ja); G. Gardner 5284 [Macbride photos 25167] (Kr--photo, N--photo). State undetermined: G. Gardner 5254 (N).

PAEPALANTHUS PERPLEXANS Moldenke
Citations: VENEZUELA: Bolívar: Steyermark 59748 (N--type).

PAEPALANTHUS PERPUSILLUS Kunth
Additional citations: BRAZIL: Amazonas: Spruce s.n. [in vicinibus Barra, Dec.-Mart. 1850-51] (N).

PAEPALANTHUS PETRAEUS Körn.
Killip describes the species as cespitose, with smooth leaves. It has been collected at altitudes of 2620 to 3500 meters, blooming in March, May, and June.
Additional citations: COLOMBIA: Antioquia: Daniel 1701 (W--1743949). Boyacá: Cuatrecasas 10352 (W--1850827). Cundinamarca: Cuatrecasas 5010 (N), 9642 (W--1795904); Haught 5775 (N); Killip 34148 (N). Department undetermined: Linden 1302 (Br--isotype, N-fragment of isotype, N--fragment of isotype, N--photo of isotype, W--1473226--isotype, Z--photo of isotype).

PAEPALANTHUS PILIFER (Bong.) Kunth
Additional citations: BRAZIL: Minas Geraes: L. Riedel s.n. [Serra da Lapa] (M--isotype).

PAEPALANTHUS PILOSUS (H.B.K.) Kunth
It is now evident to me that P. dendroides (H.B.K.) Kunth is a synonym of this species. F. L. Herrera, Sinopsis de la Flora del Cuzco 1: 170 (1941) cites P. pilosus from Puno, Amazonas, and Huánuco, as well as from Cuzco, Peru. It has been collected in moist sphagnum, wet open places, dry grassy paramos, base of mountains, and dry rocky gneissitic-granitic slopes, forming mats, at altitudes of 2285 to 4000 meters, blooming in March, April, and September.

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[1]A FLORISTIC STUDY OF BIG TREES OF THE MIDWEST

Kendall Laughlin
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The list of big trees near the end of this article, List 1, shows in the order of their size the diameter, circumference and location of the largest individual of each species or hybrid of forest trees that I have found in the area enclosed within the following line:

> Beginning at Benton Harbor, Mich., thence thru Niles, Mich., South Bend, Plymouth, Kokomo and Indianapolis to Jeffersonville, Ind., thence down the Ohio and Mississippi Rivers to the southeast corner of Arkansas, thence west along the southern border of Arkansas to eastern Oklahoma and north thru eastern Oklahoma and Kansas to northwestern Missouri, thence east to Fort Madison, Iowa, thence up the Mississippi River to the northwest corner of Illinois, thence east to Beloit, Wis., thence ENE via the C.M.St.P.& P. Railroad to Racine, Wis.

Where both the diameter and the circumference are shown in List 1, these measurements were taken at 54 inches above the ground, but where only the diameter is shown it was measured at about 62 inches above the ground or beneath the lowest limb, whichever was less.

The data in List 1 up to the double vertical rule relate to the individual trees listed in the first column. The data in the last column, headed "RANGE," relate to the species shown opposite in the first column.

List 2 shows the rates of growth of large individual forest trees, arranged in plant order. The average annual increment of circumference was arrived at by dividing the difference between the last measurement and the first measurement by the growing years elapsing between the two measurements. A growing year is the period between the last killing frost of spring and the first killing frost of fall, according to the Weather Bureau's records, and the nearest tenth of a growing season was used in the computations where measurements were made during the growing season.

A study of List 1 shows that 86% of the trees occur in colonies and only 14% occur singly; i.e., one in a woodland.

Perhaps the most important result flowing from this study is the rating of the woodlands. By adding together the diameters of the trees shown in List 1 in each continuous woodland (portions of which are often subdivided by name for convenience of reference), such total is treated in this paper as a measure of the magnitude of the timber in each of such tracts. The results for the fifteen highest ranking tracts are shown in the following Woodland Table:

RANK	TRACT	TOTAL OF DIAMETERS	TOTAL NUMBER OF SPECIES AND HYBRIDS	RATIO Genera/Species
1	Big Oak Tree State Park, Mo.	588½	34	68%
2	Turkey Run.....	413½	60	60%
3	Dardanelle, Ark.....	273	10	80%
4	Glenwood, Ark.....	208	62	66%
5	Mountain Fork, Okla.....	185½	34	79%
6	Cox Woods.....	176	37	73%
7	Hot Springs, Ark.....	160	56	64%
8	Indiana Dunes.....	136	71	49%
9	Forest Park.....	128½	30	53%
10	Chechupinqua.....	105½	61	43%
11	Morton Grove, Ill.....	95	45	40%
12	Grandview, Ill.....	94	29	69%
13	Apple River.....	92	44	55%
14	Camp Ground Road Woods.....	82	40	50%
15	Funk's Grove, Ill.....	78	30	73%

The data shown in the last two columns above have no bearing on the method used in rating the various tracts but they are included because of their interest to botanists.

It is obvious that the number of species in a woodland has no bearing on its rank, reflecting the magnitude of the timber. Woodlands having a large number of species and woodlands having a small number are scattered thruout the list.

In the Woodland Table, the average number of species and hybrids is 43 and the average ratio genera/species is 61%. In eleven cases out of the fifteen (73%) either a below average number of species is accompanied by an above average percentage or an above average number of species is accompanied by a below average percentage. Therefore it usually appears that where the number of species is small the number of genera is relatively large, and where the number of species is large the number of genera is relatively small.

The combination of a small number of species and a relatively large number of genera occurs in Woodlands 1, 3, 5, 6, 12 and 15. Big Oak Tree State Park of Missouri and Funk's Grove are the nearest approaches to climax forests in the list. It is evident that a concomitant condition of climax forests is the occurrence of a relatively large number of genera. The probable explanation is that in the long course of evolution the process of natural selection has had more of an effect in reducing the number of species in the existing genera than in reducing the number of genera.

In Woodlands 2, 8, 10, 11 and 13 the number of species is large and the number of genera is relatively small. 8, 10 and 11 are in the Chicago region, whose flora is characterized by an excessive development of species of Rosaceae and Salix, resulting in relatively few genera for the many species.

DESCRIPTIONS OF THE FIFTEEN WOODLANDS

BIG OAK TREE STATE PARK, MO.

Foremost and tallest of the woodlands of the Midwest is the Big Oak Tree State Park of Missouri, located 22 miles south of Charleston and 1½ miles northeast of the Mississippi River. Its geographical position is unique in that it is within fifty miles of

four other states. It is 37 miles southwest of Cairo, Ill., 8 miles northwest of Hickman, Ky., 10 miles north of the northern border of Tennessee, and 47 miles northeast of the northeast corner of Arkansas.

Nineteen of the 34 species in this park exceed 3 feet in diameter. Baldcypresses, Bur Oaks, American Elms and Swamp Chestnut Oaks exceed 6 feet; Silver Maples and Eastern Cottonwoods exceed 5 feet; Rock Elms, Pecans, Shellbark Hickories, Pin Oaks and Cherrybark Oaks exceed 4 feet; and Shumard Oaks, Green Ashes, Overcup Oaks, Swamp Red Oaks, Thornless Honeylocusts, Quercus mutabilis, Sweetgums, Black Willows and Sycamores exceed 3 feet.

Following are the measured heights of a few of the park champions: Bur Oak, 143 ft.; Quercus mutabilis, 143 ft. (carrying a greater height in proportion to its girth than any other American Oak); Shellbark Hickory, 128 ft.; Cherrybark Oak, 122 ft.; Swamp Red Oak, 104 ft.; Swamp Cottonwood, 63 ft.; Swamp-Privet, 32 ft.; Planertree, 31 ft.; Possumhaw, 20 ft. These trees are things to marvel at. Nowhere else east of the Pacific Coast states do trees grow to such lofty heights.

An excess of precipitation in this locality favors tree growth. At New Madrid, Mo., 13 miles west, the average annual precipitation is 51 inches, while at Cairo it is 41 inches and at Memphis it is 48 inches.

The nucleus of the park was 80 acres in the northeast corner, which was purchased by the state from the Southern Hardware Co. for $8.000 for the purpose of saving the big Bur Oak, third in List 1. H. S. Roberts donated 120 acres; Mrs. W. C. Bryant, Sr., 40 acres; and Mrs. Carl Mitchell, 40 acres. The remainder of the thousand acre tract was purchased from the owners. The park was presented to the State Park Board in March 1938. Credit must be given to Gov. Lloyd C. Stark (who insisted upon a thousand acre park), Mr. Elgin Davis of East Prairie and other citizens of Mississippi County for their timely efforts in devising ways and means for the state to acquire the original tract. The state now owns 1007 acres, of which 440 acres are in Section 14, 40 acres are in Section 11, 480 acres are in Section 10 and 40 acres are in Section 3.

Missourians may well be proud of this magnificent remnant of Mississippi River bottomland timber. The park is bordered by closely cultivated fields, sharply contrasting with the primeval forest a step beyond. But a botanist cannot help wishing that the area to the north to Black Bayou and east to the county highway had also been preserved, for the entire area was covered with superlative timber and there must have been tree monarchs of a size unknown today outside this area.

TURKEY RUN

Turkey Run State Park of Indiana, comprising 1520 acres, is located on Sugar Creek in northeastern Parke County 4 miles north of Marshall. In a channel carved in postglacial time, Sugar Creek passes here thru a resistant formation of red sandstone, the erosion of which has produced rugged scenery.

The big trees are scattered thru the creek gorge, the slopes of side canyons and the uplands. The largest tree is an American Elm 15'7" in circumference.

This tract was homesteaded by Salmon Lusk in 1826, whose

holdings later aggregated nearly 1400 acres. Salmon Lusk operated a grist mill on the creek until it was washed out in 1847. His son, John, a bachelor, jealously guarded his trees from the rapacity of lumbermen. After John Lusk's death in 1915 at the age of 75 it was necessary to divide the property among numerous heirs. In 1916 288 acres of big timber of the Lusk tract was sold at an auction to the Hoosier Veneer Co. for $30,200.

Thru prodigious efforts and publicity Richard Lieber, pioneer conservationist, aided by Mrs. Juliet V. Strauss, procured sufficient state funds to buy the tract for the state. And so, thru the devotion of John Lusk to his trees and the dogged persistence of Mr. Lieber and Mrs. Strauss this prime timberland, the first in Indiana's state park system, was preserved from destruction.

DARDANELLE, ARK.

Dardanelle, the city of big trees, is located on the south bank of the Arkansas River about halfway between Little Rock and Fort Smith. The Oaks are apparently remnants of big Oak timber in the high Arkansas Valley.

The Cottonwood, 101 feet high, the fourth tree in List 1, is on the west side of Arkansas Highway 27 south of town. It is an extraordinary tree because the species is rare to the southward.

The Southern Red Oak (Quercus falcata Michaux) is one of several large specimens of the species on the grounds of the grammar school.

The White Oak, located about 100 feet east of Front Street, is known as "The Arkansas Council Oak" and is honored by a bronze marker erected by the Daughters of the American Revolution of Arkansas with the following inscription:

"Upon this spot, under the Council Oak, acting Governor Robert Crittenden and Chief Black Fox, tribe spokesman, met in council April 1820 and made the treaty which gave to Arkansas all of the Cherokee land south of the Arkansas River."

The Black Oak is growing in the yard of a residence on Front Street.

GLENWOOD, ARK.

The town of Glenwood, Ark. is located on the Caddo River just above the point where it emerges from the Cossatot Mountains onto the Athens Plateau. Most of the big trees are located in the river valley, which was traversed by Hernando De Soto in 1541, above and below U.S. Highway 70 and on Burnham Mountain.

Forty-one genera of trees are represented, which is a much greater number than in any other woodland.

The growth factor here is evidently the average annual precipitation of 57 inches, which is the greatest in the entire area covered by this survey.

The big trees of Glenwood are owned by Robert Newcomb of Conway, Ark., Patrick T. Hayes of Crestwood, Ill., and others.

MOUNTAIN FORK, OKLA.

Located half a mile west of Mountain Fork River, half a mile north of U.S. Highway 70 and 2 miles west of Eagletown, McCurtain County, Oklahoma, this tract is noted for the presence of a gigantic Baldcypress, the largest and oldest tree in the entire area covered by this survey. It is advertised to be two thousand years old, which may be an underestimate. The existence of this

remarkable tree, growing on relatively dry ground at the northwestern limit of the range of the species, verifies the dendrologists' contention that the Baldcypress makes its best growth on dry land; it grows in water only to escape the competition of other species.

This tract was formerly the seat of government of the Choctaw Nation. The owner, Robert Stiles, lives in the former mansion of the Choctaw Nation's native governor.

COX WOODS

Cox Woods, comprising 200 acres, is located 2 miles southeast of Paoli, Ind. between U.S. Highway 150 and Indiana Highway 37. The northern part is bottomland bordering on Lick Creek and contains fine specimens of Black Maple. The southern part is hilly with the exception of a portion in a small tributary valley. The hill soil is a red clay, which is deeply eroded in the absence of trees. In the southern part there are comparatively large specimens of Northern Red Oak, Chinkapin Oak, Tuliptree, Black Walnut, White Ash, Beech, Blackgum and Flowering Dogwood. The largest tree is a White Oak with a diameter of 4'10" and a circumference of 14'7". Photographs show the most intense competition, with closely spaced spindling saplings shooting upward to the light.

There seems to be nothing particularly favorable about the soil or the climate to produce such a dense growth of large trees, so that credit must be given to the Cox family and, latterly, the U.S. Forest Service for the excellent state of preservation of this tract.

The south 150 acres was purchased in 1942 from the Wood-Mosaic Co. for $24,150, which was raised by public subscription thru the efforts of the Paoli Meridian Club and the Pioneer Mothers of Indiana Society, aided by the American Forestry Association's publicity. The north 50 acres, known as the Jeff Cox tract, bordering on Lick Creek, was purchased in about 1945 for $1800, half of which was raised by public subscription thru the efforts of the Paoli Meridian Club and the other half appropriated by the U.S. Forest Service.

Cox Woods is now embodied in the Hoosier National Forest.

HOT SPRINGS, ARK.

Here are the town of Hot Springs and the Hot Springs National Park, established in 1832. The diverse topography and the protection afforded in this oldest of our national parks have produced many unusual trees of valley and mountain types.

Outstanding is the magnificent Tilia nuda in Whittington Park, 114 feet high, the tallest Basswood in the United States.

INDIANA DUNES

The Indiana Dunes State Park, comprising 2182 acres, is located at Tremont, Porter County, Indiana, between Lake Michigan and the Chicago South Shore & South Bend Railroad. It is exactly three miles wide from east to west and has a frontage of 3.3 miles on the lake. High moving sand dunes border the lake and reach a maximum height of 193 feet above the lake. Where vegetation has been able to get a foothold, the sand hills (particularly their south slope) support a growth of Black Oak, Witch-Hazel, Sassafras and Chokecherry, with Smooth Basswood on the summits of the dunes. The steep north slope of the dunes, facing the lake, provides a haven for the survival of the boreal conifers, while at the same time the

dunes encourage the growth of southern species on the lowlands by cutting off the cold north winds. The area south of the dunes, comprising more than half the total area of the park, is nearly level. A considerable area in the eastern half is a swamp, much of which is treeless. The humus that has accumulated on the sand left by the ice sheet and the persistently high humidity have encouraged the growth of a diversity of flora unequaled elsewhere in the Midwest. It is interesting to note, in this vast ligneous display, the boreal relicts, viz: White and Jack Pines, Common Juniper, Paper and Gray Birches and Speckled Alder; and the southern invaders, viz: Pin Oak, Sycamore and Pawpaw.

The trees are not conspicuously large, but it is an outstanding fact that all the small species of endemic trees attain phenomenal size in this particular tract. The largest tree is an American Elm 3'2" in diameter. A Smooth Basswood is 3 feet in diameter. Eastern Cottonwoods, White Oaks, Northern Red Oaks, Black Ashes, White Ashes, White Pines, Black Oaks, Tuliptrees, Blackgums, Red Maples, Swamp White Oaks, Pin Oaks, Beeches and Bitternut Hickories exceed 2 feet in diameter.

The total number of species, 71, shown in the Woodland Table on page 154, is greater than in any other woodland of similar size in the Midwest. This number includes the species in Dune Acres, adjoining the state park on the west. Sixty-nine of these species are in the state park. The two additional species in Dune Acres are Betula lutea and Quercus ellipsoidalis.

The acquisition of the state park in 1925 was financed by legislative appropriations and contributions by private individuals and interests. Being located near a thickly populated area and offering diversified recreational attractions, it is the most heavily patronized of the Indiana state parks.

FOREST PARK

Forest Park, comprising 1375 acres, is located on the western border of St. Louis, Mo. The River Des Peres, now largely enclosed in a sewer, flows thru the northern and eastern parts.

The Swamp White Oaks in the river valley in the northeastern part of the park are notably large. The White Oak is conspicuous in the uplands of the eastern part, but in the western part the Black Oak and the Shingle Oak are very common. In the vicinity of the Art Museum there are an extraordinary number of specimens of Quercus bushii (marilandica × velutina) and one large specimen of Quercus runcinata (borealis × imbricaria). Aside from the establishment of the many hybrid Oaks, the upland forest appears to be of youthful age.

An act was passed by the Missouri Legislature in 1872 authorizing the purchase by the City of St. Louis of a thousand or more acres of land for a public park. As the result of the opposition of property owners, the Missouri Supreme Court declared the act unconstitutional. In 1874 another bill meeting the objections was approved by the Legislature. This law gave the County Court of St. Louis discretionary power in the purchase of grounds. In pursuance of this authority appraisers were appointed to fix the value of the lands, which were then owned mainly by C. P. Chouteau, John Cabanne, William Forsyth and Thomas Skinker. The Forest Park tract, comprising 1371 acres, was purchased by the city under condemnation

proceedings for $799,995, the value fixed by the appraisers.

The outdoor Municipal Theater, Jewel Box, Art Museum, Jefferson Memorial and Zoo are in this park, which was also the site of the Louisiana Purchase Exposition of 1904.

CHECHUPINQUA

The Chechupinqua tract extends along the Des Plaines River from Belmont Avenue to Devon Avenue and includes interesting types of woods spreading over the level drift plain for nearly a mile east of the river. It includes the Chechupinqua Woods, Schiller Woods and Robinsons Woods of the Cook County Forest Preserves.

With a representation of 61 species, Chechupinqua presents an excellent cross section of the flora of the Chicago region and a superb test for the taxonomist. There are six species of Willows and five species of Oaks. The Rosaceae are found in great variety and numbers. The Hawthorn forests, composed of the arborescent species crus-galli, arduennae, punctata, disperma, macrosperma pentandra, tortilis, pedicellata, mollis, gemmosa and calpodendron, reach their most expansive development here. The shrubby Hawthorns grow in dense thickets, the medium trees form dark canopies with interwoven branches, and the large species grow in open fashion. The variable Quercus ellipsoidalis, appearing in five forms, is very common. The largest specimen, which has a circumference of 7'4", has acorns identical with Q. coccinea tuberculata except for their darker color and should be regarded as a hybrid if the Scarlet Oak were in the region. The European species Salix fragilis, Salix alba vitellina, Rhamnus cathartica and Rhamnus frangula are thoroly naturalized; Populus alba and Morus alba are also adventive. The Ashes are very numerous and the Green, Red and White Ashes reach a large size. The largest tree is the A.F.A. champion Green Ash, on the north bank of the Des Plaines River in Robinsons Woods, which has a diameter of 3'6", a circumference of 12'3", a spread of 75' and a height of 62'. Part of the Chechupinqua Woods is of the nature of a park forest, composed of Oaks, Elms, Ashes and some Red and Silver Maples.

Chechupinqua includes half a section given to Claude La Framboise and two sections of land given to Chief Chechupinqua of the Potawatomi, Ottawa and Chippewa Nations in a treaty made by the Federal Government with those nations in 1833. This gift to Chief Chechupinqua, whose English name was Alexander Robinson, was a reward for the aid he gave to survivors of the Fort Dearborn Massacre. Chief Chechupinqua died in 1872 at the age of 110 years and is buried in the Robinson family cemetery in Robinsons Woods. His descendants still live in Robinsons Woods.

MORTON GROVE, ILL.

This tract consists of a strip of timber bordering the North Branch of the Chicago River and extending from Oakton Street to Lake Avenue. It comprises the Miami Woods, St. Paul Woods, Linne Woods, Northwestern Golf Course, Harms Woods and Glenview Memorial Woods of the Cook County Forest Preserves.

This timber is rather impressive. American and Slippery Elms, Silver Maples, Crack Willows, Eastern Cottonwoods, Swamp White and Northern Pin Oaks, White Ashes and Smooth Basswoods reach a diameter of 3 feet or more. The largest tree is an American Elm with a circumference of 18'10" in the St. Paul Woods.

In aboriginal days this tract supported a population of five thousand Potawatomi Indians.

GRANDVIEW, ILL.

The rank of this tract is the result of the presence of a huge American Elm, the second largest tree in the entire area covered by this survey and the largest tree in Illinois, which has an average diameter of 7'10", a circumference of 24'8", a spread of 92' and a height of 82'. It is on the south side of the Paris-Vandalia Road half a mile southwest of Grandview, Edgar County, Illinois, in a pasture owned by Minnie S. Snyder. The locality is a terminal moraine of the Early Wisconsin ice sheet.

In stagecoach days the driver had standing instructions to blow his horn when he passed this "big Elm tree" as a signal to the hostler in the tavern at Grandview to have a change of horses ready. This tavern was a favorite resort of Abraham Lincoln's when he was practising as a circuit lawyer, traveling on horseback; and the cabin where his father, Tom, spent his late years was only 22 miles distant on the Vandalia Road.

In the preparation of the data in the last two columns of the Woodland Table on page 154 and the range column of List 1, the species in Foley Woods, 3 miles east of Grandview, were included along with those at Grandview.

APPLE RIVER

Apple River Canyon State Park, comprising 157 acres, is located at the confluence of Apple River and its South Fork in Jo Daviess County in the northwest corner of Illinois. Below the confluence the river flows thru a canyon about 150 feet wide lined with vertical or steep walls 100 feet or more high. The state acquired the park in 1932.

In the operation of the two sawmills in the early day settlement of Millville, which was located at the confluence, all merchantable timber was stripped from the area of the park. The trees in List 1 are a Boxelder (beside the old stagecoach barn--evidently passed up by the early timber cutters as valueless), a Bigtooth Aspen, a Quaking Aspen and a Bebb Willow, all in the park; and a Butternut, on the east side of the river about 300 feet south of the park on Charles Foster's property. It is very unfortunate that all the virgin timber of value was destroyed because this insular area was not touched by the ice sheets of the Pleistocene period and served as a center of dispersion of plant life after the glacial retreat; there were probably Oaks, Hickories and Rock Elms of formidable size.

Apple River was named for the many Crab Apples on its banks, conspicuous in bloom in the early spring; but today scarcely a single Crab Apple can be found in the park.

CAMP GROUND ROAD WOODS, ILL.

The Camp Ground Road Woods of the Cook County Preserves lies east of the Des Plaines River between Oakton Street and Algonquin Road (Illinois Highway 62). The area east of the river is a level drift plain.

The species are those commonly found in woods along the Des Plaines River. The largest tree is a Crack Willow with a circumference of 13', a spread of 81' and a height of 47'. The other trees in List 1 are a Glossy Buckthorn, another European invader;

and a Downy Hawthorn, which has a circumference of 7'7", a spread of 49' and a height of 29' and is probably the largest Hawthorn in the world. All three are A.F.A. champions.

FUNK'S GROVE, ILL.

Funk's Grove, which was settled by Isaac Funk[2] in 1823, is located 9 miles southwest of Bloomington, Ill. on the G.M.& O. Railroad and U.S. Highway 66. An unbelievable gem of magnificent virgin timber, Funk's Grove, like other Illinois prairie groves, has developed its own specialties. Here Blue Ashes, Slippery Elms and Bur Oaks attain an extraordinary size.

The Blue Ashes of Funk's Grove surpass any of their kind found elsewhere in the United States. The A.F.A. champion Blue Ash, owned by S. D. Funk, has a diameter of 3'3", a circumference of 10'3" and a height of 116'. It is the tallest known Ash of any species.

The largest tree is a Bur Oak with a diameter of 4'8" and a circumference of 14'6".

In addition to the three species mentioned above, American Elms, White Oaks, Northern Red Oaks, Eastern Cottonwoods and White Ashes attain a diameter of 3 feet or more.

It is hoped that the Funk Household Trust, representing numerous members of the Funk family that own subdivided proportions of the timber, and Thad Stubblefield will continue to protect this tract from cutting as successfully as they have done in the past; for commercial exploitation of this superb timber would be a disaster of the first magnitude.

COMMENTS ON THE RANGES

A hyphen in the "RANGE" column of List 1 means that the intervening numbers are included as well as the end numbers.

Ulmus americana is the most widely distributed species, being found in all fifteen woodlands. *Quercus alba* and *Prunus serotina* are found everywhere except in the Big Oak Tree State Park. *Fraxinus americana*, *Quercus borealis*, *Acer negundo*, *Morus rubra* and *Carya cordiformis* are found in twelve of the fifteen woodlands. It is curious to observe that *Fraxinus americana* and *Quercus borealis* have exactly the same distribution, but the champion trees are located three states apart.

The general range of *Quercus velutina* extends thruout this region, but this species avoids certain areas. It is found thruout Indiana. Its absence from Woodlands 10, 11, 13, 14 and 15 indicates that it is absent from most of the northern half of Illinois. Its absence from No. 1 indicates that it is absent from the Mississippi River bottoms.

Nine taxa, indicated by blanks, do not show up in any of the fifteen woodlands. They are taxa of more or less limited distribution. *Quercus coccinea* is found in the Ozark hills of southern Illinois, the uplands of southeastern Missouri and Crowley's Ridge of Arkansas. *Tilia palmeri* is the common Basswood of western Missouri and Kansas. *Magnolia acuminata* is said to be found in Crowley's Ridge in Missouri. The other six taxa are almost or entirely confined to the localities where their champions are shown.

COMMENTS ON LIST 2

Stems of trees shrink in drouth. Measurements taken during the dry summer and fall of 1952 were less in some cases than previous measurements.

The table shows wide differences in some cases in the growth rates of different trees of the same taxon. In the case of Prunus pensylvanica, the difference in the growth rates of Nos. 71 and 72 is the result of open growth versus forest growth. Nos. 58, 63, 65 and 69 are growing within fifty feet of each other in the Chechupinqua Woods; the locality is a crowded, overmature Rose forest in a state of stagnation, and consequently the growth rates are negligible or nearly so.

The average growth rate of the Salicaceae, Nos. 4 to 9, is .85"/yr.

It is well known that there are great differences in the growth rates of the white Oaks and the bristle-tipped Oaks. The average growth rate of the Lepidobalanus Oaks, Nos. 19 to 30, is .42"/yr.; that of the Erythrobalanus Oaks, Nos. 31 to 45, is 1.17"/yr. These figures are equivalent to a ratio of 279 to 100.

The slow growth rate of Quercus macrocarpa, which is the largest species of Oak in Illinois and Missouri, is noteworthy. The ages of many of the trees must be measured in hundreds of years. My estimate of the age of the A.F.A. champion in List 1, based on a growth rate of .4"/yr., is 643 years.

Following the general principle that species attaining a large size at maturity grow faster than small species, Crataegus mollis is the largest and fastest growing of the Hawthorns. Next in the order of their growth rates come the Punctatae, Coccineae, Macracanthae and Crus-galli groups of Crataegus.

Of the species that attain a diameter of 3 feet or more, Tilia americana is the slowest grower. The measured growth of No. 82, in the Black Partridge Woods of Cook County, Illinois, indicates that it is 800 years old.

SUMMARY

1. In a dendrological survey listing the largest individual of each species of forest tree found in an area of the Midwest equivalent to about five states, the big trees are found to be widely scattered but they have a strong tendency to be concentrated in groups scattered thruout the region. 86% are found in colonies and 14% occur singly.

2. The total of the diameters of the listed big trees in each woodland is regarded as a measure of the magnitude of the timber. When the woodlands are rated according to the total of such diameters in each woodland, it is found that of the fifteen highest rated ones three are in Indiana, six are in Illinois, two are in Missouri, three are in Arkansas and one is in Oklahoma.

3. Nineteen percent of the listed big trees are in the Big Oak Tree State Park of Missouri and the Indiana Dunes, woodlands of widely different characteristics.

4. It is usually the case that where the number of species in a woodland is small the number of genera is relatively large, and where the number of species is large the number of genera is relatively small.

5. Ulmus americana, Quercus alba and Prunus serotina are the most generally distributed species.

6. The fastest growing taxon is Quercus shumardii Buckley.

7. Individual specimens of Pinus banksiana, Crataegus disperma, Crataegus pedicellata and Tilia americana showed no measurable growth for a period of five years or more.

8. The Erythrobalanus Oaks grow nearly three times as fast as the Lepidobalanus Oaks and faster than the Salicaceae.

9. Species attaining a small size at maturity grow more slowly than large species.

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[1]The author's previous article in this field was published in the May 1947 issue of "The American Midland Naturalist."

[2]"Funk of Funk's Grove," by Helen M. Cavanagh: Pantagraph Printing Co., Bloomington, Ill.

LIST 1
LIST OF BIG TREES

SPECIES	DIAMETER Ft.	DIAMETER In.	CIRCUMFERENCE Ft.	CIRCUMFERENCE In.	LOCATION	(1) NO.	(2) RANGE
Taxodium distichum.....	9	5	29	7	Mountain Fork, Oklahoma.....	...	1,5
Ulmus americana.....	7	10	24	8	Southwest of Grandview, Illinois.....	...	1-15
*Quercus macrocarpa.....	6	9	21	4	Big Oak Tree State Park, Missouri.....	...	1,2,9-15
Populus deltoides.....	6	9	21	2	Dardanelle, Arkansas.....	...	1-3,8-11,13-15
Quercus falcata.....	6	4	20	0	Grammar school, Dardanelle, Arkansas..	...	1,3-5,7
Quercus prinus.....	6	1	19	1	Big Oak Tree State Park, Missouri.....	28	1
Quercus alba.....	5	8	17	9	Dardanelle, Arkansas.....	21	2-15
Acer saccharinum.....	5	7	17	6	Big Oak Tree State Park, Missouri.....	79	1,2,5,8-11,14,15
Platanus occidentalis...	4	9½	..	..	Turkey Run State Park, Indiana.....	...	1-9,12,15
Salix alba.....	4	9	14	10	Thatcher Woods, Cook Co., Illinois....	...	10,11,14
Juglans nigra.....	4	8	14	0	Turkey Run State Park, Indiana.....	...	2,4,6,7,9-15
Pinus taeda.....	4	5	14	0	Wilcoxon Forest, Ashley Co., Arkansas.	...	4
Quercus shumardii.....	4	5	14	0	Glenwood, Arkansas.....	33	1,4,5,7
Gleditsia triacanthos...	4	5	13	10	Loose Park, Kansas City, Missouri.....	73	1,2,4-6,9,12,15
Ulmus thomasi.....	4	4	13	7	Big Oak Tree State Park, Missouri.....	...	1,13
Carya illinoensis.....	4	2	13	2	Big Oak Tree State Park, Missouri.....	...	1
*Salix fragilis.....	4	2	13	0	Camp Ground Road Woods, Cook Co., Ill.	...	10,11,13,14
Quercus palustris.....	4	2	12	9	Big Oak Tree State Park, Missouri.....	31	1,8,12
Liriodendron tulipifera.	4	1	13	6	Turkey Run State Park, Indiana.....	...	2,6,8
*Carya laciniosa.....	4	1	12	9	Big Oak Tree State Park, Missouri.....	13	1,2,11,12
Quercus velutina.....	4	0	13	7	Dardanelle, Arkansas.....	...	2-4,6-9,12
Fraxinus americana.....	4	0	..	..	Cox Woods, Paoli, Indiana.....	...	2,4,6-15
Quercus nigra.....	3	11	12	4	Mountain Fork, Oklahoma.....	...	5
Quercus borealis.....	3	11	11	3	Westheight Manor Park,Kansas City,Kan.	...	2,4,6-15
Celtis occidentalis.....	3	10	13	5	Shawnee Mission State Park, Kansas....	...	2,6,9-15
Quercus muehlenbergii...	3	10	12	2	Brownfield Woods, Urbana, Illinois....	29	2,4-7,9,12,13
Quercus lyrata.....	3	8	11	4	Big Oak Tree State Park, Missouri.....	24	1
Tilia americana.....	3	8	10	3	Black Partridge Woods, Cook Co., Ill..	82	2,6,8-15
Fagus grandifolia.....	3	7	11	0	Cox Woods, Paoli, Indiana.....	...	2,6,8,12
*Fraxinus pennsylvanica lanceolata	3	6	12	3	Robinsons Woods, Cook Co., Illinois...	92	1,2,4-6,8,10,11, 14,15

Pinus strobus	3	6	11	0	White Pines State Park, Illinois	...	8,13
Liquidambar styraciflua	3	6	..	..	Glenwood, Arkansas	...	1,3-5,7
*Quercus mutabilis	3	5	10	6	Big Oak Tree State Park, Missouri	32	1
Acer saccharum	3	5	..	..	Cox Woods, Paoli, Indiana	..	2,6,8,10-15
Quercus bicolor	3	4½	10	11	Forest Park, St. Louis, Missouri	..	8-11
Salix nigra	3	4	9	8	Big Oak Tree State Park, Missouri	..	1-5,8-11,13,14
Ulmus fulva	3	3	10	7	Funk's Grove, Illinois	..	2,4,6-11,13-15
*Fraxinus quadrangulata	3	3	10	3	Funk's Grove, Illinois	..	2,15
*Tilia nuda	3	2	9	9	Whittington Park, Hot Springs, Arkansas	84	7
*Acer rubrum tridens	3	2	9	6	Warren Woods, Three Oaks, Michigan	..	4,5,7
Celtis laevigata	3	2	9	4	Army & Navy General Hospital, Hot Springs, Arkansas	53	1,3-5,7
*Quercus runcinata	3	1	9	2	Heathwood Park, Kansas City, Kansas	44	9
Prunus serotina	3	1	..	..	Turkey Run State Park, Indiana	..	2-15
*Quercus ellipsoidalis	3	0	9	7	Linne Woods, Cook Co., Illinois	..	8,10,11,13,14
Quercus phellos	2	11½	8	6	Glenwood, Arkansas	..	4,7
Acer nigrum	*2	11	9	2	Turkey Run State Park, Indiana	77	2,6,13
	2	11	9	2	Cox Woods, Paoli, Indiana	78	
Quercus stellata	2	11	8	9	Carondelet Park, St. Louis, Missouri	..	4,7,9
Quercus imbricaria	2	10	..	..	6603 E. 17th St., Kansas City, Missouri	..	9
Carya glabra	2	9	..	..	Turkey Run State Park, Indiana	..	2,12
Acer negundo	2	9	8	8	Apple River Canyon State Park, Illinois	..	1,2,4-7,9-11,13-15
Betula nigra	2	8	..	..	Glenwood, Arkansas	..	4,5
Nyssa sylvatica	2	8	8	5	Warren Woods, Three Oaks, Michigan	..	2,4-8
*Quercus bushii	2	8	8	4	Forest Park, St. Louis, Missouri	..	9
Carya ovata	2	7	8	4	Turkey Run State Park, Indiana	..	2,6,8-15
Sassafras albidum	2	7	8	1	Turkey Run State Park, Indiana	..	2,4,6-8,12
*Fraxinus nigra	2	6	7	3	Dunes State Park, Indiana	..	2,8,10,11,13,14
Pinus echinata	2	5	..	..	North Mt., Hot Springs, Arkansas	..	4,5,7
	2	5	..	..	Mine Creek, Ouachita Nat. Forest, Ark.	..	
Quercus marilandica	2	5	7	8	Forest Park, St. Louis, Missouri	..	7,9
Morus rubra	2	5	7	7	Mt.Washington Cemetery, Jackson Co., Mo.	..	1,2,4-10,12,13,15
*Crataegus mollis	2	5	7	7	Camp Ground Road Woods, Cook Co., Ill.	..	1,10,11,14,15
*Tilia palmeri	2	5	7	7	Scarritt Point, Kansas City, Missouri	85	.....
Tsuga canadensis	2	4	..	..	Turkey Run State Park, Indiana	..	2
Carya ovalis	2	4	7	8	Turkey Run State Park, Indiana	..	2,12
Quercus coccinea	2	3	7	2	Giant City State Park, Illinois	..	.....
Juglans cinerea	2	3	7	1	Apple River Canyon, Jo Daviess Co., Ill.	...	2,6,8,10,11,13
*Quercus bebbiana	2	3	7	0	Swope Park, Kansas City, Missouri	22	.....

*(1) (2) For explanation, see page 168.

LIST 1--Continued
LIST OF BIG TREES

SPECIES	DIAMETER Ft.	DIAMETER In.	CIRCUMFERENCE Ft.	CIRCUMFERENCE In.	LOCATION	(1) NO.	(2) RANGE
Carya tomentosa.....	2	3	6	11	Forest Park, St. Louis, Missouri.....	14	4,7,9
Betula lutea.....	2	3	6	9	Dune Acres, Indiana.....	...	8
Carya cordiformis.....	2	2	6	9	Miami Woods East, Cook Co., Illinois..	...	2,4-8,10-15
*Carya texana arkansana..	2	2	6	9	Rose Inn, Crossett, Arkansas.....	...	4,7,9
Gymnocladus dioicus.....	2	2	..	..	Mt.Washington Cemetery,Jackson Co.,Mo.	...	2,12,15
Diospyros virginiana....	2	2	..	..	Carondelet Park, St. Louis, Missouri..	...	1,4,5,7
Ulmus alata.....	2	1½	..	..	Mountain Fork, Oklahoma.....	...	4,5,7
Aesculus glabra.....	2	0	6	5	Turkey Run State Park, Indiana.....	...	2,6
Castanea ozarkensis.....	2	0	6	2	Roaring River State Park, Missouri....	...	4,7
*Ulmus serotina.....	2	0	6	1	Glenwood, Arkansas.....	50	4,7
Robinia pseudoacacia....	2	0	..	..	Shades State Park, Indiana.....	...	4,7
Juniperus virginiana....	1	11	6	0	White Pines State Park, Illinois.....	...	2,4-8,13
*Salix amygdaloides.....	1	9	5	10	Black Partridge Woods, Cook Co., Ill..	...	8,10
Populus tacamahaca.....	1	7	5	1	Dunes Park, Illinois.....	9	8,10,13
*Crataegus punctata aurea	1	6	5	0	Billy Caldwells Reserve, Chicago, Ill.	61	10
Ostrya virginiana.....	1	5	4	6	Miami Woods East, Cook Co., Illinois..	...	2,4-8,10,11,13-15
Populus grandidentata...	1	4	4	7	Apple River Canyon State Park,Illinois	...	8,10,13
Maclura pomifera.....	1	4	..	..	Swope Park, Kansas City, Missouri.....	...	4,5,9
*Populus heterophylla....	1	3½	4	2	Big Oak Tree State Park, Missouri.....	...	1
Magnolia acuminata.....	1	3	..	..	Buffalo River State Park, Arkansas....	...	.....
*Malus ioensis.....	1	3	4	1	Morton Arboretum, Lisle, Illinois.....	...	8,10,11,14
Cercis canadensis.....	1	3	3	9	Hot Springs National Park, Arkansas...	74	1,2,4-7,12,15
Ilex opaca.....	1	3	..	..	MacArthur Park, Little Rock, Arkansas.	...	4
Carpinus caroliniana....	1	2	3	11	Big Spring State Park, Missouri.....	...	1,2,4-8,10,12,13
Pinus banksiana.....	1	1	3	6	Dunes State Park, Indiana.....	1	8
Populus tremuloides.....	1	0	..	..	Apple River Canyon State Park,Illinois	...	8,10,13
Morus alba.....	1	0	..	..	Chechupinqua Woods, Cook Co., Illinois	...	10,14
*Salix longipes wardi....	..	11	2	11	Caddo River, Glenwood, Arkansas.....	...	4,7
*Salix discolor eriocephala	..	11	2	10	Chechupinqua Woods, Cook Co., Illinois	7	10
*Bumelia lanuginosa.....	..	10	2	8	Meramec State Park, Missouri.....	...	4,7

Prunus pensylvanica.....	..	10	2	7	Chechupinqua Woods, Cook Co., Illinois	...	8,10
Betula papyrifera.....	..	10	2	5	Dunes State Park, Indiana.....	...	8
Thuja occidentalis.....	..	9	..	..	Starved Rock State Park, Illinois.....	...	.....
Magnolia tripetala.....	..	9	2	4	Eastern border of Hot Springs National Park, Arkansas	...	7
Amelanchier arborea.....	..	9	..	..	Dunes State Park, Indiana.....	...	2,4,6-8,10
Cornus florida.....	..	9	..	..	Cox Woods, Paoli, Indiana.....	..	2,4,6-8
	..	9	..	..	West Mt., Hot Springs, Arkansas.....	..	
Crataegus viridis.....	..	8	..	..	Big Oak Tree State Park, Missouri.....	...	1
*Crataegus crus-galli....	..	8	2	6	Turnbull Woods West, Glencoe, Illinois	...	8,10,11
Crataegus pruinosa.....	..	8	..	..	Turnbull Woods East, Glencoe, Illinois	...	8,11
*Planera aquatica.....	..	8	2	1	Big Oak Tree State Park, Missouri.....	...	1,5
Asimina triloba.....	..	8	2	1	Hot Springs National Park, Arkansas...	56	1,2,4,6-8,12,15
Rhamnus cathartica.....	..	7½	3	0	Robinsons Woods, Cook Co., Illinois...	...	10,11,14
*Prunus lanata.....	..	7½	1	11	Bard Spring, Polk Co., Arkansas.....	...	2,4,10,11,13,14
*Crataegus pedicellata...	..	7	2	6	Glenview Memorial Woods, Cook Co.,Ill.	64	8,10,11,14
Ptelea trifoliata.....	..	7	..	..	Starved Rock, Illinois.....	..	2,4,8,10,14,15
*Rhus vernix.....	..	7	1	9	Dune Acres, Indiana.....	..	8
*Crataegus disperma.....	..	6	2	5	Schiller Woods, Cook Co., Illinois....	62	10
*Crataegus calpodendron..	..	6	2	0	Morton Arboretum, Lisle, Illinois.....	70	8,10,11,14
*Crataegus macrosperma pentandra	..	6	1	11	Schiller Woods, Cook Co., Illinois....	..	10
Crataegus arduennae.....	..	6	1	10	Swope Park, Kansas City, Missouri.....	60	10
Viburnum lentago.....	..	6	1	9	Dunes State Park, Indiana.....	94	2,6,8,10,11,14
*Forestiera acuminata....	..	6	1	8	Big Oak Tree State Park, Missouri.....	...	1
*Cephalanthus occidentalis	..	6	1	8	South of Lisle, Illinois.....	93	1,4,5,7,8,11
*Alnus rugosa americana..	..	6	1	7	Dunes State Park, Indiana.....	18	8
*Malus lancifolia.....	..	6	1	7	Mt. Washington Cemetery Woods, Jackson Co., Missouri	..	.....
*Prunus virginiana.....	..	6	1	7	White Pines State Park, Illinois.....	..	8,10,11,13,14
*Acer leucoderme.....	..	6	1	7	Sixmile Creek, Polk Co., Ouachita National Forest, Arkansas	..	.....
*Viburnum rufidulum.....	..	6	1	4	Bennett Spring State Park, Dallas Co., Missouri	..	4,7
Rhus typhina.....	..	5	1	4	Dunes State Park, Indiana.....	..	8,13
*Vaccinium arboreum.....	..	5	1	4	Burnham Mt., Glenwood, Arkansas.....	..	4,7
Hamamelis virginiana....	..	5	1	3	Dunes State Park, Indiana.....	57	2,4,7,8,10,13
*Crataegus tortilis.....	..	5	1	3	Glenview Memorial Woods, Cook Co.,Ill.	..	10,11

*(1)(2) For explanation, see page 168.

LIST 1--Concluded
LIST OF BIG TREES

SPECIES	DIAMETER Ft.	DIAMETER In.	CIRCUMFERENCE Ft.	CIRCUMFERENCE In.	LOCATION	(1) NO.	(2) RANGE
*Malus coronaria.....	..	4	1	2	Dunes State Park, Indiana.....	...	2,8
*Rhus copallina.....	..	4	1	2	Dunes State Park, Indiana.....	75	4,5,7,8
*Euonymus atropurpureus..	..	4	1	2	Turkey Run State Park, Indiana.....	76	2,10,12,13,15
*Crataegus leucantha.....	..	4	1	2	Glenview Memorial Woods, Cook Co.,Ill.	..	11
*Crataegus gemmosa.....	..	4	1	1	Chechupinqua Woods, Cook Co., Illinois	68	10,11,14
Betula populifolia.....	..	4	1	1	Dunes State Park, Indiana.....	...	8
*Alnus serrulata.....	..	4	1	1	Hot Springs National Park, Arkansas...	...	4,5,7
*Ilex decidua.....	..	4	1	1	Big Oak Tree State Park, Missouri.....	...	1,4,5,7
*Cornus drummondi.....	..	4	1	1	Mt.Washington Cemetery,Jackson Co.,Mo.	...	1,2,15
Cornus alternifolia.....	..	4	1	0	Black Partridge Woods, Cook Co., Ill..	...	2,8,13
*Salix interior.....	..	4	1	0	Schiller Woods, Cook Co., Illinois....	...	2,8,10,11,13,14
Salix bebbiana.....	..	4	..	..	Apple River Canyon State Park,Illinois	...	8,13
Quercus prinoides.....	..	4	1	0	Swope Park, Kansas City, Missouri.....	30	.....
Prunus americana.....	..	4	..	..	West Mt., Hot Springs, Arkansas.....	...	4,7
Viburnum prunifolium....	..	4	..	11	Black Partridge Woods, Cook Co., Ill..	...	8,10,13
*Juniperus communis.....	..	3	..	10	Dunes State Park, Indiana.....	2	2,8
Celtis pumila georgiana.	..	3	..	..	North Mt., Hot Springs, Arkansas.....	...	7
Crataegus chrysocarpa...	..	3	..	..	Riverside Woods, Cook Co., Illinois...	...	.....
Prunus umbellata.....	..	3	..	..	Hot Springs Mt., Arkansas.....	...	7
Zanthoxylum americanum..	..	3	..	9	White Pines State Park, Illinois.....	...	6,8,10,13-15
Rhus glabra.....	..	3	..	9	Chechupinqua Woods, Cook Co., Illinois	...	4,6,10,11,13,14
Catalpa bignonioides....	..	3	..	..	Glenwood, Arkansas.....	...	4
*Sambucus canadensis.....	..	3	..	9	Dunes State Park, Indiana.....	96	2,8-10,13
Rhamnus caroliniana.....	..	3	..	..	Roaring River State Park, Missouri....	...	4
*Rhamnus frangula.....	..	3	..	8	Camp Ground Road Woods, Cook Co., Ill.	...	10,11,14
Crataegus marshallii....	..	2½	..	..	Glenwood, Arkansas.....	...	4,7

*Recognized by the American Forestry Association as the largest of its kind in the United States.
(1) The number in this column is the number assigned to the same tree in List 2.
(2) The numbers refer to the woodlands numbered according to their rank in the Table on page 154.

LIST 2
RATES OF GROWTH OF LARGE FOREST TREES

No.	TAXON	CIRCUMFERENCE Ft.	CIRCUMFERENCE In.	AVERAGE ANNUAL INCREMENT OF CIRCUMFERENCE Inches	LENGTH OF RECORD Growing Years	LOCATION County	LOCATION State
1	Pinus banksiana.....	3	6	0	6	Porter.....	Ind.
2	*Juniperus communis.....	0	10	.125	8	Porter.....	Ind.
3	Juniperus virginiana...	5	10	.5	10	Pike.....	Ark.
4	Salix nigra.....	8	8	1.7	3	Pike.....	Ark.
5	Salix amygdaloides.....	4	6	0	2	Porter.....	Ind.
6	Salix fragilis.....	11	11	1.0	5	Cook.....	Ill.
7	*Salix discolor eriocephala	2	10	1.0	4	Cook.....	Ill.
8	#Populus deltoides.....	13	0	1.0	2	Cook.....	Ill.
9	Populus tacamahaca.....	5	1	.4	5.7	Lake.....	Ill.
10	Juglans cinerea.....	6	0	.4	11	Cook.....	Ill.
11	Carya cordiformis.....	6	8	.7	9.1	Jackson.....	Mo.
12	Carya laciniosa.....	6	11	.3	10.2	Jackson.....	Mo.
13	*Carya laciniosa.....	12	9	.3	7.7	Mississippi..	Mo.
14	Carya tomentosa.....	6	11	1.0	2	St.Louis City	Mo.
15	Carya texana arkansana.	5	3	.2	10	Garland.....	Ark.
16	Ostrya virginiana.....	4	0	.19	10.7	Cook.....	Ill.
17	Ostrya virginiana.....	4	4	.4	5.7	Cook.....	Ill.
18	*Alnus rugosa americana.	1	7	.2	4.3	Porter.....	Ind.
19	Quercus alba.....	10	1	.4	8.5	Cook.....	Ill.
20	Quercus alba.....	10	10	.5	7.3	Cook.....	Ill.
21	Quercus alba.....	17	9	.6	5	Yell.....	Ark.
22	*Quercus bebbiana.....	7	0	.6	7	Jackson.....	Mo.
23	Quercus stellata.....	8	2	.2	10	Garland.....	Ark.
24	Quercus lyrata.....	11	4	.5	2	Mississippi..	Mo.
25	Quercus macrocarpa.....	11	11	.4	10.2	Jackson.....	Mo.
26	Quercus macrocarpa.....	13	1	.19	5.2	Champaign....	Ill.
27	Quercus bicolor.....	9	9	.5	4.1	Cook.....	Ill.
28	Quercus prinus.....	19	1	.5	2	Mississippi..	Mo.
29	Quercus muehlenbergii..	12	2	.4	5.2	Champaign....	Ill.
30	Quercus prinoides.....	1	0	.2	10	Jackson.....	Mo.
31	Quercus palustris.....	12	9	1.32	7.7	Mississippi..	Mo.
32	*Quercus mutabilis.....	10	6	1.5	2	Mississippi..	Mo.
33	Quercus shumardii Buckley	14	0	1.9	10	Pike.....	Ark.
34	Quercus shumardii schneckii	9	10	1.5	2	Wyandotte....	Kan.

*#For explanation, see page 171.

LIST 2--Continued
RATES OF GROWTH OF LARGE FOREST TREES

No.	TAXON	CIRCUMFERENCE Ft.	CIRCUMFERENCE In.	AVERAGE ANNUAL INCREMENT OF CIRCUMFERENCE Inches	LENGTH OF RECORD Growing Years	LOCATION County	LOCATION State
35	Quercus ellipsoidalis..	10	5	1.0	11	Cook.....	Ill.
36	Quercus ellipsoidalis..	10	5	.8	8.6	Lake.....	Ill.
37	*Quercus velutina missouriensis	6	1	1.0	8	Jackson.....	Mo.
38	*Quercus falcata pagodaefolia	11	3	1.6	5	Mississippi..	Mo.
39	Quercus marilandica....	6	3	1.0	2	St.Louis City	Mo.
40	Quercus bushii.....	5	5	.6	7	Jackson.....	Mo.
41	Quercus bushii.....	5	7	.75	4	Jackson.....	Mo.
42	Quercus bushii.....	7	5	1.0	2	St.Louis City	Mo.
43	Quercus imbricaria.....	7	3	1.2	10.2	Jackson.....	Mo.
44	*Quercus runcinata.....	9	2	1.4	7.4	Wyandotte....	Kan.
45	#Quercus leana.....	4	3	1.0	2	Jackson.....	Mo.
46	Ulmus fulva.....	9	9	.6	4.2	Cook.....	Ill.
47	Ulmus americana.....	12	7	.10	10	Jackson.....	Mo.
48	Ulmus americana.....	12	5	1.5	2	Cook.....	Ill.
49	Ulmus thomasi.....	10	8	.4	10.2	Jackson.....	Mo.
50	*Ulmus serotina.....	6	1	.2	10	Pike.....	Ark.
51	Ulmus serotina.....	5	7	.4	10	Garland.....	Ark.
52	#Celtis occidentalis....	11	10	1.0	4	Jackson.....	Mo.
53	Celtis laevigata.....	9	4	1.5	10	Garland.....	Ark.
54	Morus rubra.....	6	8	1.0	6.1	Jackson.....	Mo.
55	Magnolia tripetala.....	2	0	0	4	Garland.....	Ark.
56	Asimina triloba.....	2	1	.2	10	Garland.....	Ark.
57	Hamamelis virginiana...	1	3	.2	4.3	Porter.....	Ind.
58	Malus ioensis.....	1	10	.14	11	Cook.....	Ill.
59	Malus ioensis.....	2	6	.2	9	Jackson.....	Mo.
60	Crataegus arduennae....	1	10	.11	9.3	Jackson.....	Mo.
61	*Crataegus punctata aurea	5	0	.3	11	Cook.....	Ill.
62	*Crataegus disperma.....	2	5	.13	7.7	Cook.....	Ill.
63	Crataegus disperma.....	2	0	0	10.8	Cook.....	Ill.
64	*Crataegus pedicellata..	2	6	.3	6.2	Cook.....	Ill.
65	Crataegus pedicellata..	2	0	0	10	Cook.....	Ill.
66	Crataegus mollis.....	6	6	.7	8.6	Du Page.....	Ill.
67	Crataegus mollis.....	4	7	.5	8.1	Jackson.....	Mo.
68	*Crataegus gemmosa.....	1	1	.03	2	Cook.....	Ill.
69	Crataegus calpodendron.	1	2	.09	10.8	Cook.....	Ill.

*#For explanation, see page 171.

LIST 2--Concluded
RATES OF GROWTH OF LARGE FOREST TREES

No.	TAXON	CIRCUMFERENCE Ft.	CIRCUMFERENCE In.	AVERAGE ANNUAL INCREMENT OF CIRCUMFERENCE Inches	LENGTH OF RECORD Growing Years	LOCATION County	LOCATION State
70	*Crataegus calpodendron.	2	0	.15	6.5	Du Page.....	Ill.
71	Prunus pensylvanica....	2	3	.8	11	Cook.....	Ill.
72	#Prunus pensylvanica....	2	8	.3	3	Porter.....	Ind.
73	Gleditsia triacanthos..	13	10	1.6	3.2	Jackson.....	Mo.
74	Cercis canadensis.....	3	9	.7	3	Garland.....	Ark.
75	*Rhus copallina.....	1	2	.5	2	Porter.....	Ind.
76	*Euonymus atropurpureus.	1	2	.3	6	Parke.....	Ind.
77	*Acer nigrum.....	9	2	.14	7	Parke.....	Ind.
78	Acer nigrum.....	9	2	.2	5	Orange.....	Ind.
79	Acer saccharinum.....	17	6	.5	2	Mississippi..	Mo.
80	Acer negundo.....	7	2	.8	10.6	Cook.....	Ill.
81	Rhamnus frangula.....	0	7	0	2.7	Cook.....	Ill.
82	Tilia americana.....	10	3	.15	6.5	Cook.....	Ill.
83	Tilia americana.....	9	4	0	10.5	Cook.....	Ill.
84	*Tilia nuda.....	9	9	.3	3	Garland.....	Ark.
85	*Tilia palmeri.....	7	7	.4	10	Jackson.....	Mo.
86	#Tilia caroliniana..... rhoophila	7	5	.6	7	Pike.....	Ark.
87	Nyssa sylvatica.....	7	4	0	3	Garland.....	Ark.
88	Bumelia lanuginosa.....	2	4	.5	4	Garland.....	Ark.
89	Fraxinus pennsylvanica	8	0	.7	9.6	Cook.....	Ill.
*90	Marshall	8	11	.6	8.8	Cook.....	Ill.
91		8	5	.4	6.8	Cook.....	Ill.
92	*Fraxinus pennsylvanica lanceolata	12	3	.6	7.2	Cook.....	Ill.
93	*Cephalanthus occidentalis	1	8	.4	4.9	Du Page.....	Ill.
94	Viburnum lentago.....	1	9	.2	10	Porter.....	Ind.
95	Viburnum prunifolium...	0	10	.10	10	Jackson.....	Mo.
96	*Sambucus canadensis....	0	9	0	2	Porter.....	Ind.

*Recognized by the American Forestry Association as the largest of its kind in the United States.

#This tree is now dead.

MONOECISM IN JUNIPERUS SCOPULORUM

P. J. van Melle

It seems appropriate here to correct a "slip of the typewriter" and to offer an emendation of a statement in my paper in PHYTOLOGIA, vol. 4, no. 1, of March 1952, pages 34, lines 12, 13 and 14, as follows: for "dioecious", read monoecious, and to the American species known to contain monoecious elements, add J. scopulorum.

Through the courtesy of Dr. J. F. Brenckle, of Mellette, South Dakota, I received lately a clearly monoecious specimen of J. scopulorum (Brenckle 52010), collected by him in November 1952 in a gulch along Highway 14/16 between Wall and Wasta, S.D., north of the Badlands and east of the Black Hills, where the species occurs freely on steep, ungrazed slopes of barrancas, together with more or less pure J. virginiana and various intermediates between the two species. In July 1949 I collected in several of the gulches in this same area, but since staminate cones were not in evidence at that time, monoecism could not then be ascertained.

The Brenckle specimen contains numerous male cones as well as several berries. The fruit is all of 1952 inception -- still immature, globose or nearly so. It is not until in the second summer that the fruit of J. scopulorum develops its distinctive form: usually broader than long, and truncate at the apex. The leaves on the ultimate branchlets in the specimen are not or only slightly overlapped, and the dorsal gland is at least as long as the leaf-scar above it.

The Brenckle specimen is the first evidence I have seen of monoecism in J. scopulorum. I know of no reference to it in literature, and there is none among the J. scopulorum sheets in the New York Botanical Garden herbarium.

In the paper cited above I expressed the thought that (among the heterophyllous Junipers) monoecious materials are indicative of comparatively primitive elements, and the areas where they occur of centers of origin. From that viewpoint the geography of monoecious elements should yield useful data for the study of distribution histories. While for a species with so wide a dioecious distribution as J. scopulorum a considerable number of monoecious collections would be necessary to constitute an adequate concept of a center of origin, every such collection that comes into view contributes toward it. The Brenckle collection, then, points in the general direction of the Black Hills.

Incidentally, in July 1949 I found J. scopulorum abundant in Weston Co., Wyo., and also in Pennington Co., S.D., to the east of the Black Hills. But in a day's travel I found no trace of it within the forest reserves of the Hills in Custer and Pennington Counties, where, apparently, it had been eradicated.

NOTES ON NEW AND NOTEWORTHY PLANTS. XV

Harold N. Moldenke

Continued work in the herbarium of the New York Botanical Garden has brought to light the following new entities and has revealed the necessity for the following new nomenclatural combinations. Most of the material of this paper was presented by me, on invitation, at the Sección de Botánica of the Congreso Cientifico Mexicano held in connection with the Fourth Centenary celebration of the University of Mexico in Mexico City in September of 1951. Plans of the congress to have the proceedings published have been delayed, and so it has seemed desirable to publish the material here.

AEGIPHILA CUNEATA var. HIRSUTISSIMA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum supra parce hirsutis subtus praesertim in costa et venis secundariis densiore hirsutis, margine perspicue longeque ciliato, in statu juvenile utrinque densissime longeque hirsutis, petiolis pedunculisque ramulisque densissime longeque hirsutis.

This variety differs from the typical form of the species in having the leaf-blades scattered-hirsute above, more densely so beneath, especially on the midrib and secondaries, conspicuously long-ciliate along the margins, densely long-hirsute on both surfaces when young, the petioles, peduncles, and branchlets very densely long-hirsute with brown hairs 4--5 mm. long standing at right angles.

The type of this variety was collected by Ellsworth Paine Killip and Albert Charles Smith (no. 29040) in woods at Yurimagua on the lower Río Huallaga, Loreto, Peru, at an altitude of about 135 m., between August 22 and September 9, 1929, and is deposited in the Britton Herbarium at the New York Botanical Garden.

AEGIPHILA BOGOTENSIS var. AEQUINOCTIALIS Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis in statu juvenile minute puberulis, in statu senile utrinque glabrescentibus, et calicibus sub anthesin minute puberulis.

This variety differs from the typical form of the species in having the leaves only minutely puberulent when very young, quickly becoming glabrous on both surfaces, and the calyx merely minutely puberulent at time of anthesis.

The type was collected by W. H. Camp (no. E.5193) 3 km. north of Sevilla de Oro, at an altitude of 8000 to 9000 feet, Azuay, Ecuador, on August 31, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden.

AEGIPHILA PURPURASCENS Moldenke, sp. nov.

Arbor; ramis crassis obtuse tetragonis densiuscule brunneo-

puberulis lenticellatis medullosis; ramulis sarmentisque gracilioribus densissime glanduloso-tomentosis purpureis; foliis oppositis vel approximatis; petiolis crassiusculis dense purpureo-tomentosis glandulosis; laminis firme membranaceis ellipticis acuminatis integris, ad basin acutis, supra pilosis vel glabrescentibus, subtus dense glanduloso-tomentellis (pilis in statu juvenile purpureis); inflorescentiis axillaribus cymosis paucifloris; bracteolis linearibus purpureo-pubescentibus; calyce campanulato 4-lobato, purpureo plusminusve glanduloso-puberulo.

Tree, to 4 m. tall; branches stout, obtusely tetragonal, rather densely brown-puberulent, less so in age, rather conspicuously lenticellate, medullose; branches and twigs more slender, very densely glandular-tomentellous, decidedly purplish when fresh; nodes not annulate; principal internodes 3--6 cm. long; leaves decussate-opposite or approximate; petioles rather stout, 1--2.5 cm. long, densely purplish-tomentellous and glandulose; blades firmly membranous, dark-green above, pale-green beneath, mostly elliptic, 8--17 cm. long, 4--8.3 cm. wide, acuminate at the apex, entire, acute at the base, pilose above when young, much less so (with widely scattered hairs) or glabrescent when mature, densely glandulose-tomentellous beneath with purplish hairs when young, not quite so densely tomentellous and not purplish when mature; midrib rather heavy, usually sharply elevated and more persistently pilose-pubescent above, very prominent and very densely glandulose-tomentellous beneath; secondaries 6 or 7 per side, arcuate-ascending, usually plane above, prominent beneath, arcuately joined at the margins; veinlet reticulation rather conspicuous on both surfaces, plane above, prominulent beneath; inflorescence axillary, cymose, solitary in the leaf-axils toward the tips of the branchlets, subequaling the petiole in anthesis, few-flowered; peduncles slender, 1--1.5 cm. long, very densely glandulose-tomentellous and purplish, its branches and the very slender pedicels (1--4 mm. long) also very densely purplish-tomentellous and glandular; bractlets linear, 2--5 mm. long, purplish-pubescent; calyx campanulate, its tube about 3 mm. long, purple, more or less glandular-pubescent especially toward the base, its rim 4-lobed, the lobes short-triangular, equal, widely divergent, purple, more or less puberulent; corolla infundibular, the tube slender, about 11 mm. long, deep-magenta except at the very base, glabrous, its limb 4-lobed, the lobes ovate, subacute, about 4 mm. long, deep-magenta on the back, glabrous; stamens 4, inserted on the corolla-tube, included; anthers swollen on the back; pistil solitary, capillary, included, glabrous; stigma deeply bifid; ovary 4-celled, with a single axile ovule in each cell; fruit drupaceous, fleshy, deep wine-red or dark-purplish when fresh, almost nigrescent, subglobose, about 1 cm. in diameter, glabrous, 4-seeded; fruiting-calyx subpatelliform, much indurated, about 1--1.5 cm. wide, glabrescent, shiny, venose, irregularly broadly 4-lobed, the margins scarious and often erose.

The type of this distinct species was collected by W. H. Camp (no. E.4338) in the Eastern Cordillera about 1--8 km. north of

the village of Sevilla de Oro, at an altitude of 8000 to 9000 feet, Azuay, Ecuador, between July 27 and August 12, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species appears to be related to the rare A. mortoni Moldenke of Cuzco, Peru.

CALENDULA OFFICINALIS f. PLENIFLORA Moldenke, f. nov.

Haec forma a forma typica speciei capitulis plusminusve toto ligulatis recedit.

This form differs from the typical form of the species in having its flower-heads almost completely ligulate.

The type of the form was collected by H. N. Moldenke (no. 4142) in outdoor cultivation at Watchung, Somerset County, New Jersey, on September 10, 1928, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CALLISTEPHUS CHINENSIS f. PLENIFLORUS Moldenke, f. nov.

Haec forma a forma typica speciei capitulis plusminusve toto ligulatis recedit.

This form differs from the typical form of the species in having its flower-heads almost completely ligulate, existing in numerous horticultural races.

The type of the form was collected by H. N. Moldenke (no. 6128) in outdoor cultivation at Watchung, Somerset County, New Jersey, on August 2, 1931, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CENTAUREA CYANUS f. PLENIFLORA Moldenke, f. nov.

Haec forma a forma typica speciei capitulis plusminusve toto ligulatis recedit.

This form differs from the typical form of the species in having its flower-heads almost completely ligulate.

The type of the form was collected by H. N. Moldenke (no. 4094) in outdoor cultivation at Watchung, Somerset County, New Jersey, on August 12, 1928, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CITHAREXYLUM MONTANUM var. CHIMBORAZENSE Moldenke, var. nov.

Haec varietas a forma typica speciei inflorescentiis laxissime paucifloris recedit.

This variety differs from the typical form of the species in having its inflorescences very loosely few-flowered.

The type of the variety was collected by Wendel Holmes Camp (no. E.3455) in moist forested valleys in the afternoon-fog belt, Cañon of the Río Chanchan, about 5 km. north of Huigra, at an altitude of 5000 to 6500 feet, Chimborazo, Ecuador, between May 19 and 28, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden.

CLERODENDRUM CHEVALIERI Moldenke, nom. nov.

Clerodendron velutinum A. Chev., Etudes Fl. Afr. Cent. Franc.

1: 245, hyponym. 1913, not Clerodendrum velutinum Thomas in Engl., Bot. Jahrb. 68: 99. 1936.

CLERODENDRUM CHEVALIERI var. SUBINTEGRUM (A. Chev.) Moldenke, comb. nov.

Clerodendron velutinum var. subintegrum A. Chev., Etudes Fl. Afr. Cent. Franc. 1: 246, hyponym. 1913.

CLERODENDRUM FUSCUM var. ATTENUATUM Moldenke, var. nov.

Haec varietas a forma typica speciei recedit calyce sub anthesin 2.3--3 cm. longo fere ad basin fisso, lobis ovatis longe attenuatis, apice filiformi-subulato.

This variety differs from the typical form of the species in having its calyx during anthesis 2.3--3 cm. long, split almost to the base, the lobes ovate and long-attenuate into a filiform-subulate apex.

The type of this variety was collected by A. Corbisier-Baland (no. 1609) at Eala, Belgian Congo, on July 7, 1932, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM FUSCUM var. LANCEOLATUM Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum regulariter lanceolatis 5--7 cm. longis et 1.6--3.2 cm. latis.

This variety differs from the typical form of the species in having its leaf-blades regularly lanceolate, 5--7 cm. long and 1.6--3.2 cm. wide.

The type of the variety was collected by André Dewulf (no. 755) in a savanna at Bas Uele, Belgian Congo, on March 10, 1935, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM SPLENDENS var. PUBERULENTUM Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum subtus minute puberulis, pedicellis calyceque puberulis, et petiolis saepe elongatis.

This variety differs from the typical form of the species in having the leaf-blades minutely puberulent beneath, the pedicels and calyx puberulent, and the petioles often elongated.

The type of the variety was collected by V. Goossens (no. 1049) at Ganda Sundi, altitude 350 m., Belgian Congo, on July 7, 1913, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM SPLENDENS var. PUBESCENS Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum subtus omnino pubescentibus et pedicellis calyceque puberulis.

This variety differs from the typical form of the species in having the leaf-blades decidedly pubescent beneath and the pedicels and calyx puberulent.

The type of the variety was collected by Dr. Schouteden, Mme. Schouteden-Wery, and Dr. Poma (no. 47) at Banana, Belgian Congo,

on August 4, 1920, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM TANGANYIKENSE var. BEQUAERTI (De Wild.) Moldenke, comb. nov.

Clerodendron bequaerti De Wild. in Fedde, Repert. 13: 144. 1914.

CLERODENDRUM TANGANYIKENSE var. DUBIUM (De Wild.) Moldenke, comb. nov.

Clerodendron dubium De Wild. in Fedde, Repert. 13: 144. 1914.

CLERODENDRUM TANGANYIKENSE var. MICROCALYX Moldenke, var. nov.

Haec varietas a forma typica speciei recedit calyce sub anthesin 2--4 mm. longo.

This variety differs from the typical form of the species in having its calyx during anthesis only 2--4 mm. long.

The type of the variety was collected by my good friend and colleague, Prof. Dr. Walter Robyns (no. 1577) on a shrubby savanna on a hill at Munsama Ferme, Belgian Congo, on March 8, 1926, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM TRIPLINERVE var. GRANDIFLORUM Moldenke, var. nov.

Haec varietas a forma typica speciei recedit limbo corollae ca. 8 mm. diametro.

This variety differs from the typical form of the species in having its corolla-limb about 8 mm. in diameter.

The type of the variety was collected by P. Quarré (no. 7768) between Pirard and Kilubi, Belgian Congo, at an altitude of 980 m., in March, 1946, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM UMBELLATUM var. CENTRALE (A. Chev.) Moldenke, comb. nov.

Clerodendron scandens var. centrale A. Chev., Etudes Fl. Afr. Cent. Franc. 1: 245, hyponym. 1913.

CLERODENDRUM UMBELLATUM var. CONGENSE (Engl.) Moldenke, comb. nov.

Clerodendron congense Engl., Bot. Jahrb. 8: 65. 1887.

ERIOCAULON ALLEIZETTEI Moldenke, sp. nov.

Herba parva acaulescens; foliis rosulatis filiformibus brunnescentibus non fenestratis glabris, ad apicem subulato-setaceis; vaginis glabris indistincte fenestratis, laminis brevibus scariosis; pedunculis plerumque numerosis 80--100 filiformibus brunnescentibus 2-costatis complanatis glabris; capitulis obconicis nigris usque ad 3 mm. latis; bracteolis involucri nigris elliptico-lanceolatis obtusis glabris.

Small acaulescent herb; leaves rosulate, filiform, brunnescent, 1.2--2.5 cm. long, less than 0.5 mm. wide, not fenestrate,

glabrous, subulate-setaceous at the apex; sheaths narrow-cylindric, 6--14 mm. long, not twisted, glabrous, indistinctly fenestrate, obliquely split at the apex, the blades short, scarious; peduncles mostly numerous, often 80--100 on well developed plants, fewer on depauperate ones, filiform, brunnescent, 1.5--3 cm. long, 2-costate, flattened, glabrous; heads obconic, black, to 3 mm. wide; involucral bractlets black, elliptic-lanceolate, about 2 mm. long and 1 mm. wide, rather blunt at the apex, glabrous; receptacle glabrous; receptacular bractlets black, lanceolate, about 2 mm. long and 0.5--0.7 mm. wide, subacute at the apex, glabrous; staminate florets: sepals 3, black, separate, narrowly elliptic, slightly falcate, about 1.3 mm. long and 0.2 mm. wide, attenuate-acute at the apex, glabrous; petals 3, united into a white glabrous tube about 0.8 mm. long, the free terminal portions very minute, linear, white; stamens 6; anthers yellow; pistillate florets: sepals 3, separate, linear-filiform, blackish, about 1 mm. long, glabrous; petals apparently absent; style white, slender, about 0.5 mm. long, glabrous, without appendages; stigmas 3, elongate, erect-spreading, 0.5--1 mm. long; ovary oblate, stramineous, about 0.5 mm. long and 0.7 mm. wide, glabrous, 3-sulcate, 3-celled, 3-ovulate.

The type of this species was collected by Ch. d'Alleizette (no. 124m) -- in whose honor it is named -- at Nansinana, Madagascar, in May, 1905, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

GMELINA DALRYMPLEANA var. SCHLECHTERI (H. J. Lam) Moldenke, comb. nov.

Gmelina schlechteri H. J. Lam, Verb. Malay Arch. 226. 1919.

GMELINA ELLIPTICA f. LOBATA (Gaertn.) Moldenke, comb. nov.

Gmelina lobata Gaertn., De Fruct. et Sem. 1: 268, pl. 56, fig. 5.1788.

GMELINA SALOMONENSIS f. GLABRESCENS Moldenke, f. nov.

Haec forma a forma typica speciei recedit ramulis pedunculisque pedicellisque laminisque foliorum subtus glabris vel subglabris.

This form differs from the typical form of the species in having the branchlets, peduncles, inflorescence-branches, pedicels, and lower leaf-surfaces glabrous or subglabrous.

The type of the form was collected by S. F. Kajewski (no. 2228) on the seashore at Buin, Karngu, Bougainville Island, Solomon Islands, on October 10, 1930, and is deposited in the Herbarium Bogoriense at Buitenzorg under the number 21336.

GMELINA SESSILIS var. PAPUANA (Bakh.) Moldenke, comb. nov.

Gmelina papuana Bakh., Journ. Arnold Arb. 10: 71, pl. 16 & 17. 1929.

GMELINA SESSILIS var. RAMIFLORA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit inflorescentiis

perspicue ramosis, ramis 3--4.5 cm. longis, pedicellis crassis pubescentibus ca. 2 mm. longis valde bracteatis.

This variety differs from the typical form of the species in having conspicuously branched inflorescences, the branches 3--4.5 cm. long, the individual flowers on stout pubescent pedicels about 2 mm. long, conspicuously bracteate.

The type of the variety was collected by Ebertus Meijer Drees (no. 371) at Bernhard Bivak, Hollandia, Dutch New Guinea, on July 26, 1938, and is no. 21332 in the Herbarium Bogoriense at Buitenzorg.

LANTANA CAMARA var. ANGUSTIFOLIA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum plerumque valde angustioribus et plus elongatis ovato-lanceolatis, ad basin cuneatis, ad apicem attenuato-acutis, plerumque plus minute crenulatis, et corollis semper rubellis, ad faucem flavis.

This variety differs from the typical form of the species in having its leaves generally much narrower and more elongated, ovate-lanceolate, cuneate at the base, attenuate-acute at the apex, mostly more minutely crenulate along the margins, and the corollas always pink, with a yellow throat.

The type of the variety was collected by Cornelis Andries Backer (no. 16071) at Pekalongan, Java, on September 14, 1914, and is sheet no. 21517 in the Herbarium Bogoriense at Buitenzorg.

LANTANA TRIFOLIA f. ALBICARPA Moldenke, f. nov.

Haec forma a forma hirsuta recedit corollis fructibusque albis.

This form differs from f. hirsuta in having its corollas and fruit white.

The type of the form was collected by Cornelis Andries Backer (no. 5795a) at Kalapa Noenggal, near Batavia, Java, on December 19, 1912, and is sheet no. 21727 in the Herbarium Bogoriense at Buitenzorg.

LANTANA TRIFOLIA f. OPPOSITIFOLIA Moldenke, f. nov.

Haec forma a forma hirsuta recedit foliis decussato-oppositis.

This form differs from f. hirsuta in having its leaves merely decussate-opposite.

The type of the form was collected by Cornelis Andries Backer near Batavia, Java, in November, 1906, and is sheet no. 21771 in the Herbarium Bogoriense at Buitenzorg.

LIPPIA WILMSII var. SCABERRIMA (Moldenke) Moldenke, comb. nov.

Lippia africana var. scaberrima Moldenke, Phytologia 3: 38--39. 1948.

LIPPIA WILMSII var. SESSILIS (Moldenke) Moldenke, comb. nov.

Lippia africana var. sessilis Moldenke, Phytologia 3: 271. 1950.

LIPPIA WILMSII var. VILLOSA (Moldenke) Moldenke, comb. nov.
Lippia africana var. villosa Moldenke, Phytologia 2: 469—470. 1948.

PHYLA NODIFLORA f. SPATHULATA Moldenke, f. nov.
Haec forma a forma typica speciei recedit foliis omnino spathulatis.
This form differs from the typical form of the species in having its leaves in general decidedly spatulate when mature, the upper half of the blade often abruptly and widely ampliate, coarsely dentate, the lower half cuneiform and entire, the venation mostly more or less prominent beneath.
The type of the form was collected by Cornelis Andries Backer at Batavia, Java, in 1902, and is sheet no. 21889 in the Herbarium Bogoriense at Buitenzorg.

x POPULUS STOUTII Moldenke, nom. nov.
Populus trichocarpa Hook. x P. nigra L. ex Rehd., Man. Cult. Trees & Shrubs, ed. 2, 77. 1940.

x POPULUS STOUTII var. ANDOVERENSIS Moldenke, nom. nov.
Populus trichocarpa Hook. x P. nigra var. betulifolia (Pursh) Torr. ex Rehd., Man. Cult. Trees & Shrubs, ed. 2, 77. 1940.

PREMNA CONGOLENSIS Moldenke, sp. nov.
Frutex vel arbor; ramis ramulisque graciusculis lenticellatis minute puberulis deinde glabrescentibus; petiolis gracillimis minute puberulis; laminis membranaceis supra brunnescentibus ellipticis longe acuminatis, ad basin rotundatis vel subcordatis, ad marginem crasse irregulariter dentatis, utrinque minutissime pilosulis; inflorescentiis terminalibus corymbiformibus laxe multifloris.
Shrub or tree; branches and branchlets rather slender, almost round in cross-section, lenticellate-dotted, minutely puberulous on the younger parts, glabrescent in age; nodes usually annulate; principal internodes 1.5--3 cm. long; leaf-scars large and divergently prominent, borne on 1--2 mm. long sterigmata; leaves decussate-opposite; petioles very slender, 1--2 cm. long, flattened and slightly sulcate above, minutely puberulous; blades membranous, brunnescent above in drying, much lighter and not brunnescent beneath, elliptic, 8.5--10.5 cm. long, 3--5.5 cm. wide, long-acuminate at the apex, rounded or very slightly subcordate at the base, coarsely and irregularly dentate along the margins at and above the middle with divergent sharply triangular teeth, very minutely (microscopically) pilosulous-puberulent with scattered hairs on both surfaces or only beneath; midrib slender, flat above, prominulous beneath; secondaries slender, about 4 per side, arcuate-ascending, flat above, prominulous beneath; veinlet reticulation rather abundant, mostly indiscernible above but plainly visible or even conspicuous (but not at all elevated) beneath; inflorescence terminal, corymbiform, about 6 cm. long and 7.5--8 cm. wide, loosely many-flowered; ped-

uncles similar to the branchlets in all respects, about 2 cm. long, minutely puberulous; cyme-branches yellowish, flattened, puberulent; bracts often 1 or 2 at the apex of the peduncle, foliaceous, suborbicular or ovate, about 2 cm. long and 1.5 cm. wide, very minutely and obscurely pilosulous or glabrescent; bractlets linear, a pair at each furcation of the corymb, 2--7 mm. long, puberulent; pedicels filiform, mostly less than 1 mm. long, puberulous; calyx campanulate, about 2 mm. long and 1 mm. wide, puberulous, its rim minutely 5-toothed; corolla greenish-white, its tube about 4 mm. long, minutely puberulous only at the apex outside, the limb very small.

The type of this species was collected by Dacrémont (no. 361 bis) at Matadi, Belgian Congo, on December 20, 1892, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

PREMNA CONGOLENSIS var. INTEGRIFOLIA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum integerrimis.

This variety differs from the typical form of the species in having entire-margined leaf-blades.

The type of the variety was collected by J. Gillet (no. 4022) at Moanda, Belgian Congo, in 1907, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

PREMNA MATADIENSIS var. PARVIFOLIA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit foliis minoribus, laminis oblongo-ellipticis 2.2--5.3 cm. longis, 1.4--3.2 cm. latis, crasse dentatis, subtus dense pilosis, petiolis sarmentisque juvenilibus puberulenti-pilosis.

This variety differs from the typical form of the species in having much smaller leaves, the blades oblong-elliptic, 2.2--5.3 cm. long, 1.4--3.2 cm. wide, coarsely dentate except at the base, scattered-pilosulous on the venation above, more densely pilose beneath, rather densely puberulent-pilose on the petioles and young twigs.

The type of the variety was collected by Frederic Wellens (No. 1015) at Banana, Belgian Congo, in January, 1924, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

PREMNA QUADRIFOLIA var. SUBGLABRA Moldenke, var. nov.

Haec varietas a forma typica speciei recedit ramis ramulisque petiolisque laminisque foliorum utrinque subglabrescentibus.

This variety differs from the typical form of the species in having its branches, branchlets, petioles, and both leaf-surfaces subglabrescent.

The type of the variety was collected by Edouard Piere Luja (no. 119) at the cataracts of Yumba, Belgian Congo, on December 16, 1898, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

STACHYTARPHETA URTICAEFOLIA f. ALBIFLORA Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Benedictus Hubertus Danser (no. 6655) at Tjiandjoer along the roadside near Soekaboemi, Res. Priangan, Java, on May 30, 1927, and is deposited in the Herbarium Bogoriense at Buitenzorg.

SYNGONANTHUS YACUAMBENSIS Moldenke, sp. nov.

Herba acaulescens usque ad 12 cm. alta; foliis rosulatis graminoideis rigidiusculis erectis numerosis dense confertis, ad apicem acutis vel mucronatis, 5--7-nervatis, basin versus subfenestratis, utrinque glabris; vaginis arcte adpressis subcontortis glabris vel ubique parce pilosis striatis, ad apicem oblique fissis; pedunculis erectis rigidis 4--10 cm. longis, 3-costatis densiuscule albido-strigosis et apicem versus dense patenteque glanduloso-pilosis; capitulis albis hemisphaericis usque ad 9 mm. diametro.

Acaulescent herb to 12 cm. tall; leaves rosulate, grass-like, 3--4 cm. long, widest at the base, about 3 mm. wide at the midpoint, rather rigid and erect, numerous, densely clustered, acute or mucronate at the apex, 5--7-nerved, slightly fenestrate beneath, glabrous on both surfaces except for the hidden densely lanate base; sheaths rather closely appressed, about 3 cm. long, slightly twisted, glabrous except for the very base or sparsely scattered-pilose throughout, striate, obliquely split at the apex, the blade erect, about 6 mm. long, attenuate-acuminate; peduncles several, erect, rigid, 4--10 cm. long, 3-costate, rather densely strigose with whitish antrorse hairs and also densely spreading-pilose toward the apex with gland-tipped hairs and sparsely so lower down; heads white, hemispheric, to 9 mm. wide; involucral bractlets pale-stramineous, obovate, about 3 mm. long and 1.5 mm. wide, acute at the apex, glabrous, shiny; receptacle densely long-villous with white hairs; receptacular bractlets hyaline, elliptic or oblanceolate, about 3 mm. long and 0.9 mm. wide, attenuate-acute at the apex, concave-navicular, glabrous; staminate florets: sepals 3, united only at the very base, hyaline, firm, erect, elliptic, about 3 mm. long and 0.6 mm. wide, attenuate-acute at the apex, glabrous; petals 3, united into an infundibular stramineous tube about 2 mm. long, glabrous; stamens 3; pistillate florets: sepals 3, free and separate, hyaline, elliptic, about 3 mm. long and 0.9 mm. wide, attenuate-acute at the apex, glabrous; petals 3, oblanceolate-spatulate, connate at the middle, hyaline, about 1.5 mm. long and 0.2 mm. wide, obtuse and subcucullate at the apex, sparsely long-villous on the back; pistil about 0.8 mm. long, glabrous; ovary 3-celled.

The type of this species was collected by F. Prieto (no. P. 197) in swampy areas between Oña and the Río Yacuambi on the Eastern Cordillera, Azuay, Ecuador, between September 10 and 19, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA DEMISSA Moldenke, sp. nov.

Herba perennis prostrata; caulibus ramisque numerosis gracilibus acutiuscule tetragonis decumbentibus vel adscendentibus minute strigillosis vel glabratis; internodiis valde abbreviatis; foliis oppositis subsessilibus vel breviter petiolatis chartaceis ellipticis 5--14 cm. longis, 2--7 mm. latis, acutis incisodentatis, ad basin cuneato-angustatis, supra plusminusve albostrigosis, subtus ad marginem et in venis albo-pilosis vel substrigosis; inflorescentiis terminalibus spicatis laxe multifloris erectis.

Prostrate perennial herb with heavy woody roots and many stems issuing from the crown; stems and branches numerous, slender, rather acutely tetragonal, decumbent or ascending, minutely strigillose with tiny widely scattered hairs or glabrate; nodes annulate, often marked with a band of denser, whitish, spreading hairs; principal internodes much abbreviated, to 2 cm. long, usually much less; leaves decussate-opposite, subsessile or short-petiolate; petioles filiform, about 1 mm. long, white-pilose on the margins with sharp-pointed ascending hairs; blades chartaceous, rather uniformly dull-green on both surfaces, elliptic in outline, 5--14 mm. long, 2--7 mm. wide, incised-dentate from the widest part to the acute apex, cuneately narrowed to the base, more or less sparsely white-strigose above, white-pilose or substrigose along the venation and margins beneath; midrib and the 2 or 3 pairs of ascending secondaries usually subimpressed above and prominulous beneath; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, spicate, elongate, loosely many-flowered, 2--10.5 cm. long, erect; peduncles filiform, 5--7 mm. long, glabrate or very minutely scattered-pilosulous; rachis filiform, glabrous or very minutely and obscurely scattered-pilosulous; flowers imbricate during anthesis only; calyx cylindric, about 2 mm. long, strigillose on the ribs; corolla very small, deep-blue, hypocrateriform, its narrow-cylindric tube about 2 mm. long, its limb 1--1.5 mm. wide; fruiting-calyx somewhat divergent, not imbricate, not enlarged, minutely strigillose; cocci 4, about 1.8 mm. long.

The type of this species was collected by W. H. Camp (no. E.2510) in the Parroquia Luis Cordero near the village of San Marcos, 5--8 km. northeast of Azogues, Cañar, Ecuador, on April 1, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector notes that the plant is sometimes used as a fever cure, and is called "verbena echada".

VITEX MEGAPOTAMICA f. ALBIFLORA Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Raulino Reitz (no. 3226) in capoeirão at Brusque, altitude 50 m., Santa Catharina, Brazil, on December 4, 1949, and is deposited in the Britton Herbarium at the New York Botanical Garden. Albino forms are being found in many species of this genus.

VERBENA PHLOGIFLORA f. ALBA Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Raulino Reitz (no. 3443) on the campo at Cambajuva, São Joaquim, alt. 1200 m., Santa Catharina, Brazil, between January 23 and 29, 1950, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VITEX PINNATA f. ANOMALA Moldenke, f. nov.

Haec forma a forma typica speciei recedit foliis plerumque 1-foliolatis, saepe 2-foliolatis.

This form differs from the typical form of the species in having the leaves mostly 1-foliolate, sometimes 2-foliolate, even when mature.

The type of the form was collected by H. A. B. Bünnemeijer (no. 1362) on Muntok, Banka, on October 10, 1917, and is sheet no. 25007 in the Herbarium Bogoriense at Buitenzorg.

THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND ERIOCAULACEAE. SUPPLEMENT 6

Harold N. Moldenke

Since the publication of my booklet entitled "The known geographic distribution of the members of the Verbenaceae, Avicenniaceae, Stilbaceae, Symphoremaceae, and Eriocaulaceae" in 1949 (1) much new information on this subject has come to light and has been published by me in periodic supplements (2). Since the publication of the last of these supplements almost 8000 additional specimens of these groups have been examined by me from the herbaria of the Jardin Botanique de l'Etat at Brussels, the Naturhistoriska Riksmuseum at Stockholm, the Estacion Experimental Agronomica at Santiago de las Vegas, Cuba, the Illinois State Museum at Springfield, the Botany Department of the College of Agriculture at Davis, California, the Muséum National d'Histoire Naturelle at Paris, the Melbourne Botanic Garden at South Yarra, the British Museum (Natural History) at London, and the New York Botanical Garden, and from the Rijksherbarium at Leiden, the Museum en Herbarium at Utrecht, the Herbarium Bogoriense at Buitenzorg, the Erik Wall herbarium at Stockholm, and the Meisner herbarium at New York. This splendid material has brought to light 98 additional county records, 167 state, province, or department records, and 419 island, country, or colony records which are listed for the first time on the following

pages. Numerous corrections of previous records are also noted here. In my original work an asterisk (*) indicated a species or other taxonomic entity endemic to the island, country, or colony under which it was listed. Additional collections have in many cases revealed the presence of this taxon in other geographic or political areas. Such cases are indicated on the following pages, where, as in other supplements, it is stated that the asterisk is to be deleted from the original entry.

Most of the material in this paper was presented by me, on invitation, at the Sección Botánica of the Congreso Cientifico Mexicano held in connection with the Fourth Centenary of the University of Mexico at Mexico City in September, 1951. Delay in publication by the Congress of its proceedings has made it desirable to publish the material here.

UNITED STATES OF AMERICA:

New York:

Verbena canadensis (L.) Britton [Suffolk County]

Illinois:

Phyla lanceolata (Michx.) Greene [Cumberland, Fulton, Henry, Macoupin, Massac, McLean, Monroe, Pope, Randolph, Saint Clair, Union, & White Counties]

Verbena bracteata Lag. & Rodr. [Bureau, Iroquois, McLean, Monroe, Morgan, & Randolph Counties]

Verbena canadensis (L.) Britton [Cumberland & Shelby Counties]

x Verbena engelmannii Moldenke [Sangamon County]

Verbena hastata L. [Brown, Clay, Cumberland, Edwards, Henry, Iroquois, LaSalle, Lawrence, Marion, McLean, Montgomery, Moultrie, Pulaski, Saline, Sangamon, White, & Winnebago Counties]

x Verbena illicita Moldenke [Fulton County]

x Verbena moechina Moldenke [Winnebago County]

x Verbena perriana Moldenke [Monroe County]

x Verbena rydbergii Moldenke [DeKalb, Fulton, Sangamon, & Winnebago Counties]

Verbena simplex Lehm. [Boone, Lee, & Sangamon Counties]

Verbena stricta Vent. [Coles, DeWitt, Fulton, Kane, Lawrence, Massac, Montgomery, Moultrie, Pope, Saint Clair, Scott, Shelby, & Stevenson Counties]

Verbena stricta f. roseiflora Benke [LaSalle County]

Verbena urticifolia L. [Clark, Coles, Jackson, LaSalle, Livingston, Macon, Massac, McDonough, Mercer, Morgan, Ogle, Pope, Pulaski, Randolph, & Winnebago Counties]

Verbena urticifolia var. leiocarpa Perry & Fernald [Coles & Moultrie Counties]

Indiana:

Phyla cuneifolia (Torr.) Greene [Porter County]

Verbena canadensis (L.) Britton [Blackford & Delaware Counties]

Verbena urticifolia var. leiocarpa Perry & Fernald [Fountain County]

Arkansas:
Phyla lanceolata (Michx.) Greene [Sharp County]
Verbena bracteata Lag. & Rodr. [Desha & Lawrence Counties]
Verbena canadensis (L.) Britton [Fulton County]
x Verbena moechina Moldenke [Baxter & Fulton Counties]
Verbena simplex Lehm. [Marion & Sharp Counties]
Verbena stricta Vent. [Lawrence & Sharp Counties]
Verbena urticifolia L. [Craighead & Sharp Counties]
California:
Phyla nodiflora (L.) Greene [San Diego County]
Phyla nodiflora var. canescens (H.B.K.) Moldenke [Alameda County]
MEXICO:
Lantana camara f. parvifolia Moldenke -- delete the asterisk
Phyla incisa Small [Durango]
Phyla nodiflora (L.) Greene [Campeche, Nayarit, & Sonora]
Phyla nodiflora var. canescens (H.B.K.) Moldenke [Durango & Sonora]
Phyla nodiflora var. reptans (H.B.K.) Moldenke [Puebla & Querétaro]
Phyla strigulosa var. parvifolia (Moldenke) Moldenke [Puebla, Sonora, Veracruz, & Yucatán]
HONDURAS:
Phyla nodiflora var. longifolia Moldenke [Cortés]
Phyla strigulosa (Mart. & Gal.) Moldenke [Atlántida & Santa Bárbara]
EL SALVADOR:
Phyla strigulosa (Mart. & Gal.) Moldenke [San Miguel]
NICARAGUA:
Phyla betulaefolia (H.B.K.) Greene [Grenada]
Phyla nodiflora (L.) Greene [Masaya]
PANAMA:
Phyla betulaefolia (H.B.K.) Greene [Canal Zone & Colón]
Phyla nodiflora (L.) Greene [Canal Zone]
Phyla nodiflora var. longifolia Moldenke [Canal Zone & Panamá]
CUBA:
Clerodendrum aculeatum (L.) Schlecht. [Pinar del Río]
GONAVE ISLAND:
Ghinia subbiflora (Urb. & Ekm.) Moldenke
PUERTO RICO:
Lantana camara var. mutabilis (Hook.) L. H. Bailey
Lantana camara var. nivea (Vent.) L. H. Bailey is to be deleted
BARBADOS:
Phyla nodiflora (L.) Greene
SWAN ISLANDS:
Phyla nodiflora (L.) Greene [Larger Island]
COLOMBIA:
Lantana canescens H.B.K. [Tolima]

Paepalanthus barkleyi Moldenke [Cundinamarca]
Paepalanthus lamarckii Kunth [Arauca & Magdalena]
Paepalanthus macarenensis Moldenke [Méta]*
Paepalanthus tatei Moldenke [Méta]
Phyla nodiflora (L.) Greene [Atlántico]
Phyla nodiflora var. reptans (H.B.K.) Greene [Atlántico]
Phyla scaberrima (A. L. Juss.) Moldenke [Atlántico]

VENEZUELA:
Eriocaulon atabapense Moldenke -- add an asterisk
Eriocaulon tenuifolium Klotzsch [Amazonas]
Paepalanthus lamarckii Kunth [Amazonas]
Paepalanthus tatei Moldenke [Amazonas] -- delete the asterisk
Syngonanthus caulescens (Poir.) Ruhl. [Monagas]
Syngonanthus longipes Gleason [Amazonas]
Syngonanthus oblongus (Körn.) Ruhl. [Amazonas]

BRITISH GUIANA:
Eriocaulon atabapense Moldenke is to be deleted

ECUADOR:
Phyla betulaefolia (H.B.K.) Greene [Guayas]
Phyla strigulosa (Mart. & Gal.) Moldenke [Manabi]

GALAPAGOS ISLANDS:
Phyla strigulosa (Mart. & Gal.) Moldenke [Charles & Chatham]

PERU:
Aloysia scorodonioides (H.B.K.) Cham. [Ayacucho]
Citharexylum andinum Moldenke [Cajamarca]
Lantana glutinosa Poepp. [Huancavelica]
Lantana reptans Hayek [Ayacucho]

BRAZIL:
Aegiphila integrifolia (Jacq.) Jacks. [Rio Branco]
Duranta vestita var. glabrescens Moldenke [Rio Grande do Sul]
Eriocaulon neglectum Ruhl. [Rio Branco]
Ghinia spicata (Aubl.) Moldenke [Ceará]
Lantana brasiliensis Link [Santa Catharina]
Lantana camara var. angustifolia Moldenke
Lantana camara var. mutabilis (Hook.) L. H. Bailey [Espirito Santo & Rio de Janeiro]
Lantana glutinosa Poepp. [Santa Catharina]
Lantana minasensis Moldenke -- delete Espirito Santo and Rio de Janeiro]
Lantana montevidensis (Spreng.) Briq. [Santa Catharina]
Lantana reineckii Briq. [Santa Catharina]
Lippia schomburgkiana Schau. [Rio Branco]
Paepalanthus fasciculatus (Rottb.) Körn. [Rio Branco]
Paepalanthus fasciculatus f. tenellus Herzog [Pará]
Paepalanthus lamarckii Kunth [Ceará]
Paepalanthus pauperrimus Herzog [Rio Branco]
Paepalanthus planifolius var. conduplicarus Ruhl. is the correct orthography

Paepalanthus plumosus (Bong.) Körn. [São Paulo]
Philodice hoffmannseggii Mart. [Rio Branco]
Stachytarpheta maximiliani Schau. [Rio Grande do Sul]
Syngonanthus bisumbellatus (Steud.) Ruhl. [Goyaz]
Syngonanthus caulescens (Poir.) Ruhl. [Rio Branco & Santa Catharina]
Syngonanthus densiflorus (Körn.) Ruhl. [Maranhão]
Syngonanthus gracilis (Körn.) Ruhl. [Rio Branco & Santa Catharina]
Syngonanthus gracilis var. amazonicus Ruhl. [Rio Branco]
Syngonanthus gracilis var. hirtellus (Steud.) Ruhl. [Pará]
Syngonanthus gracilis var. olivaceus Ruhl. [Amazonas]
Syngonanthus macrocaulon Ruhl. [Amapá]
Syngonanthus simplex (Miq.) Ruhl. [Rio Branco]
Syngonanthus umbellatus (Lam.) Ruhl. [Rio Branco]
Timotocia rosularis (Sandw.) Moldenke [Goyaz]
Verbena hasslerana Briq. [Rio Grande do Sul]
Verbena hirta Spreng. [Rio Grande do Sul]
x Verbena intercedens Briq. [Rio Grande do Sul]
Verbena peruviana f. rosea Moldenke [Santa Catharina]
Verbena phlogiflora f. alba Moldenke [Santa Catharina]*
Verbena strigosa Cham. [Santa Catharina]
Verbena thymoides Cham. [Santa Catharina]
Vitex megapotamica f. albiflora Moldenke [Santa Catharina]*

BOLIVIA:
Citharexylum andinum Moldenke — delete the asterisk

PARAGUAY:
Aloysia lycioides var. schulzae (Standl.) Moldenke
Phyla strigulosa (Mart. & Gal.) Moldenke

CHILE:
Phyla nodiflora (L.) Greene [Valdivia]
Phyla nodiflora var. canescens (H.B.K.) Moldenke [Arica & Cautin]

ARGENTINA:
Verbena ballsii Moldenke [Salta]
Verbena tenera Spreng. [Catamarca]

FRENCH WEST AFRICA:
Clerodendrum splendens var. giletti (DeWild. & Durand) Thomas

SENEGAL:
Clerodendrum thyrsoideum Gürke
Premna quadrifolia Schum. & Thonn.

SIERRA LEONE:
Clerodendrum bakeri Gürke is to be deleted
Clerodendrum capitatum var. conglobatum (J. G. Baker) Thomas
Clerodendrum congense Engl. is to be deleted
Clerodendrum schliebenii Mildbr.
Clerodendrum umbellatum var. congense (Engl.) Moldenke

LIBERIA:

Eriocaulon nigericum Meikle
Eriocaulon pulchellum Körn.
Mesanthemum prescottianum (Bong.) Körn.
IVORY COAST:
Clerodendrum bakeri Gürke is to be deleted
Clerodendrum schweinfurthii var. bakeri (Gürke) Thomas
GOLD COAST:
Clerodendrum botryodes J. G. Baker
Clerodendrum laxicymosum De Wild.
NORTHERN NIGERIA:
Eriocaulon nigericum Meikle
CAMEROONS:
Clerodendrum splendens var. giletti (De Wild. & Durand)Thomas
FRENCH EQUATORIAL AFRICA:
Clerodendrum chevalieri Moldenke [Ubangi-chari]*
Clerodendrum chevalieri var. subintegrum (A. Chev.) Moldenke [Ubangi-chari]*
Clerodendrum cordifolium (Hochst.) A. Rich. [Chad Territory & Ubangi-chari]
Clerodendrum ubanghense A. Chev. [Ubangi-chari]*
Clerodendrum umbellatum var. centrale (A. Chev.) Moldenke [Ubangi-chari]*
Lippia callensi var. villosa Moldenke [Ubangi-chari]
Vitex chariensis var. latifolia A. Chev. [Ubangi-chari]
BELGIAN CONGO:
Clerodendrum aculeatum (L.) Schlecht.
Clerodendrum baumii Gürke
Clerodendrum bequaerti De Wild. is to be deleted
Clerodendrum bipindense Gürke
Clerodendrum congense Engl. is to be deleted
Clerodendrum dekindtii Gürke
Clerodendrum dubium De Wild. is to be deleted
Clerodendrum fuscum var. attenuatum Moldenke*
Clerodendrum fuscum var. lanceolatum Moldenke*
Clerodendrum inerme (L.) Gaertn.
Clerodendrum speciosissimum Van Geert
Clerodendrum splendens var. puberulentum Moldenke*
Clerodendrum splendens var. pubescens Moldenke*
Clerodendrum tanganyikense var. bequaerti (De Wild.) Moldenke
Clerodendrum tanganyikense var. dubium (De Wild.) Moldenke*
Clerodendrum tanganyikense var. microcalyx Moldenke*
Clerodendrum thomsonae Balf. f.
Clerodendrum triplinerve var. grandiflorum Moldenke*
Clerodendrum umbellatum var. congense (Engl.) Moldenke
Congea velutina Wight
Kalaharia spinescens var. hirsuta Moldenke
Lantana camara f. parvifolia Moldenke
Lippia callensi var. villosa Moldenke -- delete the asterisk

Premna bequaerti Moldenke -- delete the asterisk
Premna congolensis Moldenke*
Premna congolensis var. integrifolia Moldenke*
Premna matadiensis var. parvifolia Moldenke*
Premna quadrifolia var. subglabra Moldenke*
Premna zenkeri Gürke
Stachytarpheta urticaefolia (Salisb.) Sims
x Verbena hybrida Voss
Verbena tenuisecta Briq.

RUANDA & URUNDI:
Clerodendrum rotundifolium Oliv.
Premna bequaerti Moldenke

UGANDA PROTECTORATE:
Clerodendrum discolor (Klotzsch) Vatke
Clerodendrum fuscum Gürke
Clerodendrum grandicalyx E. A. Bruce is to be deleted
Clerodendrum laxicymosum De Wild.
Clerodendrum rotundifolium var. stuhlmanni (Gürke) Thomas
Clerodendrum tanganyikense J. G. Baker

ZANZIBAR PROTECTORATE:
Clerodendrum swynnertonii S. Moore

KENYA:
Premna resinosa (Hochst.) Schau.

ANGOLA:
Clerodendrum discolor var. pluriflorum Gürke [Mossamedes]

NORTHERN RHODESIA:
Clerodendrum tanganyikense var. bequaerti (De Wild.) Moldenke

BRITISH NYASALAND PROTECTORATE:
Clerodendrum discolor var. pluriflorum Gürke
Clerodendrum johnstoni Oliv.
Clerodendrum myricoides var. stolzei Thomas
Clerodendrum quadrangulatum var. reclinans Thomas
Clerodendrum schliebenii Mildbr.
Lippia praecox Mildbr.*
Lippia strobiliformis Moldenke
Vitex epidictyodes Mildbr.

SOUTHWEST AFRICA:
Clerodendrum buchneri Gürke

UNION OF SOUTH AFRICA:
Chascanum hederaceum var. natalense (H. H. W. Pearson) Moldenke [Cape of Good Hope]
Clerodendrum dekindtii var. dinteri Thomas [Transvaal]
Clerodendrum mekanjanum H. Winkler [Transvaal]
Clerodendrum scheffleri var. ellipticum Moldenke is to be deleted

MADAGASCAR:
Clerodendrum loniceroides Moldenke is to be deleted
Eriocaulon alleizettei Moldenke*

Vitex vondrozensis Moldenke*

PAKISTAN:

Caryopteris grata Benth. [Northwestern Provinces]

Clerodendrum bracteatum Wall. [East Bengal]

INDIA:

Caryopteris grata Benth. [Sikkim]

Clerodendrum indicum (L.) Kuntze [Khasi States]

Clerodendrum inerme (L.) Gaertn. [Travancore]

Clerodendrum villosum Blume [Mysore]

Gmelina asiatica L. [Travancore]

Lantana camara var. aculeata (L.) Moldenke [Punjab]

Stachytarpheta jamaicensis (L.) Vahl [Madras]

Tectona grandis var. glabrifolia Moldenke [Mysore]

BURMA:

Clerodendrum nutans var. penduliflorum (Wall.) Bakh. [Tenasserim]

ANDAMAN ISLANDS:

Vitex diversifolia Kurz [South Andaman]*

CEYLON:

Lantana indica Roxb.

Lantana trifolia L. is to be deleted

Lantana trifolia f. hirsuta Moldenke

CHINA:

Callicarpa aspera Hand.-Mazz. is to be deleted

Callicarpa rubella var. hemsleyana Diels [Hunan]

Clerodendrum fortunei Hemsl. -- delete the asterisk

Clerodendrum indicum (L.) Kuntze [Kwangtung]

Clerodendrum japonicum (Thunb.) Sweet [Kiangsi]

Clerodendrum kaempferi (Jacq.) Sieb. [Fukien]

Lantana camara var. aculeata (L.) Moldenke [Kiangsu]

Petrea volubilis L. [Kwangtung]

Phyla nodiflora (L.) Greene [Fukien]

Vitex trifolia var. simplicifolia Cham. [Fukien]

FORMOSA:

Clerodendrum thomsonae Balf. f.

HONGKONG:

Clerodendrum fortunei Hemsl.

Clerodendrum fragrans var. pleniflorum Schau.

Lantana trifolia L. is to be deleted

Lantana trifolia f. hirsuta Moldenke

LANTAU ISLAND:

Clerodendrum fortunatum L.

HAINAN ISLAND:

Vitex tripinnata (Lour.) Merr.

FRENCH INDO-CHINA:

Clerodendrum caryopteroides Moldenke [Laos]*

Clerodendrum kaempferi (Jacq.) Sieb. [Annam]

Eriocaulon achiton Körn. [Annam]

Eriocaulon alatum H. Lecomte [Annam]

Eriocaulon echinulatum Mart. [Annam]
Eriocaulon gracile Mart. [Annam]
Eriocaulon luzulaefolium Mart. [Annam]
Eriocaulon soucherei Moldenke [Annam]*
Gmelina tonkinensis Moldenke [Annam]
Teijsmanniodendron coriaceum (C. B. Clarke) Kosterm. [Annam]
Vitex leptobotrys H. Hallier is to be deleted
Vitex pinnata var. alata Moldenke -- delete the asterisk
Vitex tripinnata (Lour.) Merr. [Cambodia]

THAILAND:
Clerodendrum urticifolium (Roxb.) Wall.
Duranta repens var. alba (Masters) L. H. Bailey

FEDERATED MALAY STATES:
Avicennia marina (Forsk.) Vierh. [Selangor]
Clerodendrum nutans var. penduliflorum (Wall.) Bakh. -- delete the asterisk
Gmelina elliptica J. E. Sm. [Johore & Perak]
Peronema canescens Jack [Kedah]
Stachytarpheta mutabilis (Jacq.) Vahl [Pahang]
Vitex siamica F. N. Will. [Kedah & Kelantan]

STRAITS SETTLEMENTS:
Avicennia marina (Forsk.) Vierh. [Singapore]
Vitex pinnata L. [Langkawi]
Vitex siamica F. N. Will. [Langkawi & Rabana]

PHILIPPINE ISLANDS:
Avicennia marina var. rumphiana (H. Hallier) Bakh. [Negros & Palawan]
Clerodendrum minahassae var. brevitubulosum H. J. Lam [Tawi-tawi]
Gmelina elliptica f. lobata (Gaertn.) Moldenke [Cebu & Mindanao]
Phyla nodiflora (L.) Greene [Mindanao]
Phyla nodiflora var. reptans (H.B.K.) Moldenke [Luzon]
Phyla nodiflora f. spathulata Moldenke [Luzon]
Teijsmanniodendron bogoriense Koord. [Mindoro & Palawan]
Teijsmanniodendron longifolium (Merr.) Merr. is to be deleted
Vitex trifolia var. simplicifolia Cham. [Panay]
Vitex velutina (Koord. & Val.) Koord. [Luzon]

MARIANNA ISLANDS:
Citharexylum caudatum L. [Guam]

CAROLINE ISLANDS:
Gmelina elliptica J. E. Sm. [Corol & Koror]
Stachytarpheta urticaefolia (Salisb.) Sims [Yap]

RIOUW ARCHIPELAGO:
Avicennia alba Blume
Avicennia marina (Forsk.) Vierh.
Avicennia marina var. rumphiana (H. Hallier) Bakh. [Doerian]
Gmelina elliptica J. E. Sm. [Bintan]

Lantana camara var. aculeata (L.) Moldenke [Bintan & Papan]
Phyla nodiflora (L.) Greene [Penjingat]
Stachytarpheta jamaicensis (L.) Vahl [Bintan, Karimon, & Papan]
Stachytarpheta urticaefolia (Salisb.) Sims [Bintan, Boengoeran, & Toedjoej]
Vitex pinnata L. [Bakong, Bintan, Karimon, & Riouw]

LINGGA ARCHIPELAGO:
Avicennia marina (Forsk.) Vierh. [Singkep]
Gmelina elliptica J. E. Sm. [Lingga]
Lantana camara var. aculeata (L.) Moldenke [Singkep]
Stachytarpheta jamaicensis (L.) Vahl [Lingga]
Stachytarpheta mutabilis (Jacq.) Vahl [Lingga]
Vitex pinnata L. [Singkep]

SIMALUR ISLAND:
Gmelina elliptica J. E. Sm.
Gmelina elliptica f. lobata (Gaertn.) Moldenke
Phyla nodiflora f. spathulata Moldenke

SUMATRA:
Avicennia alba var. latifolia Moldenke
Avicennia marina var. resinifera (Forst.) Bakh.
Callicarpa vansteenisi Moldenke*
Gmelina elliptica f. lobata (Gaertn.) Moldenke
Lantana camara L.
Lantana camara var. mista (L.) L. H. Bailey
Lantana trifolia L. is to be deleted
Lantana trifolia f. hirsuta Moldenke
Phyla nodiflora var. reptans (H.B.K.) Moldenke
Phyla nodiflora f. spathulata Moldenke
x Stachytarpheta adulterina Urb. & Ekm.
Stachytarpheta australis Moldenke
Stachytarpheta mutabilis (Jacq.) Vahl
Vitex vansteenisi Moldenke*
Vitex velutina (Koord. & Val.) Koord.

MADURA ISLAND:
Avicennia marina (Forsk.) Vierh.
Avicennia officinalis L.
Garrettia cymarioides (Lam & Meeuse) Meeuse is to be deleted
Garrettia siamensis Fletcher
Gmelina elliptica J. E. Sm.
Gmelina elliptica f. lobata (Gaertn.) Moldenke
Lantana camara L.
Lantana camara var. aculeata (L.) Moldenke
Phyla nodiflora f. spathulata Moldenke
Stachytarpheta jamaicensis (L.) Vahl
Stachytarpheta urticaefolia (Salisb.) Sims
Vitex trifolia var. simplicifolia Cham.

MANTAWI ISLANDS:

Lantana trifolia L. is to be deleted
Lantana trifolia f. hirsuta Moldenke [Batu]
Peronema canescens Jack [Batu]
Vitex pinnata L. [Siberut]

KRAKATOA:
Avicennia marina (Forsk.) Vierh.
Lantana camara L.
Lantana camara var. aculeata (L.) Moldenke [Lang]

KARIMANDJAWA ISLANDS:
Vitex pinnata L.

VERLATEN ISLAND:
Lantana camara L.

JAVA:
Clerodendrum fortunatum L.
Clerodendrum trichotomum Thunb.
Garrettia cymarioides (Lam & Meeuse) Meeuse is to be deleted
Garrettia siamensis Fletcher
Gmelina elliptica f. lobata (Gaertn.) Moldenke
Gmelina glandulosa H. Hallier is to be deleted
Gmelina moluccana (Blume) Backer
Lantana achyranthifolia Desf.
Lantana camara var. angustifolia Moldenke
Lantana camara var. mista (L.) L. H. Bailey
Lantana camara var. nivea (Vent.) L. H. Bailey
Lantana tiliaefolia Cham.
Lantana trifolia L. is to be deleted
Lantana trifolia f. albicarpa Moldenke*
Lantana trifolia f. hirsuta Moldenke
Lantana trifolia f. oppositifolia Moldenke
Phyla nodiflora f. spathulata Moldenke
x Stachytarpheta abortiva Dans.
Stachytarpheta cayennensis (L. C. Rich.) Vahl is to be deleted
x Stachytarpheta trimeni Rech.
Stachytarpheta urticaefolia f. albiflora Moldenke
Tectona grandis f. abludens Koord. & Val.*
Vitex pinnata var. alata Moldenke
Vitex velutina (Koord. & Val.) Koord. -- delete the asterisk

KANBANGAN:
Lantana camara L.
Stachytarpheta urticaefolia (Salisb.) Sims
Vitex pinnata L.

ANAMBAS ISLANDS:
Stachytarpheta jamaicensis (L.) Vahl [Siantan]
Vitex pinnata L. [Siantan]
Vitex trifolia var. simplicifolia Cham. [Temaja]

BRITISH NORTH BORNEO:
Stachytarpheta jamaicensis (L.) Vahl

SARAWAK:
Gmelina philippensis Cham.
Gmelina uniflora Stapf
Stachytarpheta urticaefolia (Salisb.) Sims
BORNEO:
Avicennia marina (Forsk.) Vierh
Gmelina uniflora Stapf -- delete the asterisk
Gmelina uniflora var. villosa Bakh.*
Phyla nodiflora f. spathulata Moldenke
Vitex trifolia var. simplicifolia Cham.
KARIMATA ARCHIPELAGO:
Vitex pinnata L. [Penebangan]
TALAUT ISLANDS:
Avicennia marina var. rumphiana (H. Hallier) Bakh. [Karakalang]
Stachytarpheta jamaicensis (L.) Vahl [Karakalang]
CELEBES:
Avicennia alba var. latifolia Moldenke -- delete the asterisk
Gmelina elliptica f. lobata (Gaertn.) Moldenke
Lantana camara L.
Phyla nodiflora f. spathulata Moldenke
Stachytarpheta australis Moldenke
Stachytarpheta jamaicensis (L.) Vahl
Stachytarpheta mutabilis (Jacq.) Vahl
Stachytarpheta urticaefolia (Salisb.) Sims
Teijsmanniodendron longifolium (Merr.) Merr. is to be deleted
MOENA:
Avicennia marina var. rumphiana (H. Hallier) Bakh.
KANGEAN ARCHIPELAGO:
Avicennia marina (Forsk.) Vierh. [Kangean & Paliat]
Garrettia cymarioides (Lam & Meuse) Meuse is to be deleted
Garrettia siamensis Fletcher [Sepandjang]
Gmelina elliptica J. E. Sm. [Kangean]
Gmelina elliptica f. lobata (Gaertn.) Moldenke [Kangean & Saboenting]
Lantana camara L. [Kangean, Paliat, Saboenting, & Saeboes]
Lantana camara var. mista (L.) L. H. Bailey [Paliat]
Phyla nodiflora (L.) Greene [Kangean]
Phyla nodiflora f. spathulata Moldenke [Saeboes, Saoebi, Sasüel, & Sepandjang]
Stachytarpheta jamaicensis (L.) Vahl [Mamboerit, Saboenting, Saeboes, Saoebi, & Sasüel]
Tectona grandis L. f. [Kangean, Paliat, & Sepandjang]
Vitex pinnata L. [Bangko, Kangean, Paliat, Saboenting, & Sepapan]
LESSER SUNDA ISLANDS:
Avicennia alba Blume [Banka]
Avicennia marina (Forsk.) Vierh. [Bali & Banka]
Avicennia marina var. resinifera (Forst.) Bakh. [Wetar]

Avicennia officinalis L. [Bali, Banka, & Sumbawa]
Gmelina elliptica J. E. Sm. [Banka & Flores]
Gmelina moluccana (Blume) Backer [Timor]
Lantana camara L. [Bali & Banka]
Lantana camara var. aculeata (L.) Moldenke [Bali, Banka, & Lombok]
Lantana trifolia f. hirsuta Moldenke [Lombok]
Phyla nodiflora (L.) Greene [Soemba]
Phyla nodiflora var. longifolia Moldenke [Timor]
Phyla nodiflora f. spathulata Moldenke [Bali, Flores, & Timor]
Stachytarpheta jamaicensis (L.) Vahl [Banka & Sebesi]
x Stachytarpheta intercedens Dans. [Banka]
Stachytarpheta urticaefolia (Salisb.) Sims [Bali, Banka, & Salajar Islands]
Vitex pinnata L. [Bali, Banka, Billiton, Lombok, Salajar, Soemba, & Sumbawa]
Vitex pinnata f. anomala Moldenke [Banka]*
Vitex trifolia var. simplicifolia Cham. [Banka]

MOLUCCA ISLANDS:

Avicennia alba Blume [Ceram]
Avicennia eucalyptifolia Zipp. [Tanimber Islands]
Avicennia marina (Forsk.) Vierh. [Santari & Ternate]
Avicennia marina var. resinifera (Forst.) Bakh. [Taliaboe]
Avicennia marina var. rumphiana (H. Hallier) Bakh. [Ternate]
Avicennia officinalis L. [Halmahera & Tanimber Islands]
Gmelina elliptica J. E. Sm. [Ceram]
Gmelina elliptica f. lobata (Gaertn.) Moldenke [Amboina]
Gmelina glandulosa H. Hallier is to be deleted
Gmelina lepidota Scheff. [Ternate]
Gmelina macrophylla Wall. is to be deleted
Gmelina moluccana (Blume) Backer [Tanimber Islands]
Holmskioldia sanguinea Retz.
Lantana camara L. [Mangole & Sanana]
Lantana camara var. aculeata (L.) Moldenke [Ceram]
Lantana trifolia L. is to be deleted
Lantana trifolia f. hirsuta Moldenke [Amboina & Ceram]
Phyla nodiflora f. spathulata Moldenke [Amboina & Ternate]
Stachytarpheta jamaicensis (L.) Vahl [Little Key Islands & Ternate]
Stachytarpheta jamaicensis f. monstrosa (Moldenke) Moldenke [Amboina & Ternate]
Stachytarpheta mutabilis (Jacq.) Vahl [Ternate]
x Stachytarpheta trimeni Rech. [Amboina]
Stachytarpheta urticaefolia (Salisb.) Sims [Buru & Ceram]
Stachytarpheta urticaefolia f. albiflora Moldenke [Amboina]
Vitex trifolia var. simplicifolia Cham. [Mangole]

NEW GUINEA:

Archboldia ericoides Beer & Lam [Papua]

Avicennia marina (Forsk.) Vierh. [Northeastern New Guinea]
Avicennia marina var. resinifera (Forst.) Bakh. [Dutch New Guinea & Papua]
Avicennia officinalis L. [Papua]
Clerodendrum buchanani (Roxb.) Walp. [Northeastern New Guinea]
Gmelina dalrympleana (F. Muell.) H. J. Lam [Dutch New Guinea]
Gmelina dalrympleana var. schlechteri (H. J. Lam) Moldenke [Dutch New Guinea, Northeastern New Guinea, & Papua]
Gmelina lepidota Scheff. -- delete the asterisk
Gmelina macrophylla Wall. is to be deleted
Gmelina moluccana (Blume) Backer [Dutch New Guinea]
Gmelina papuana Bakh. is to be deleted
Gmelina schlechteri H. J. Lam is to be deleted
Gmelina sessilis var. papuana (Bakh.) Moldenke [Dutch New Guinea & Papua]*
Gmelina sessilis var. ramiflora Moldenke [Dutch New Guinea & Northeastern New Guinea]*
Phyla nodiflora var. longifolia Moldenke [Dutch New Guinea]
Phyla nodiflora var. reptans (H.B.K.) Moldenke [Dutch New Guinea]
Teijsmanniodendron hollrungii (Warb.) Kosterm. [Northeastern New Guinea & Papua]
Vitex trifolia var. simplicifolia Cham. [Papua]

SAIBAI ISLAND:
Gmelina dalrympleana (F. Muell.) H. J. Lam

AROE ISLANDS:
Gmelina dalrympleana var. schlechteri (H. J. Lam) Moldenke [Kobroör & Trangan]

LOUISIDADE ARCHIPELAGO:
Avicennia eucalyptifolia Zipp. [Heigh]

HAWAIIAN ISLANDS:
Lantana camara var. albiflora Moldenke is to be deleted
Lantana camara var. nivea (Vent.) L. H. Bailey [Oahu]
Vitex trifolia var. simplicifolia Cham. [Lanai]

BISMARK ARCHIPELAGO:
Phyla nodiflora var. reptans (H.B.K.) Moldenke [New Ireland]

SOLOMON ISLANDS:
Gmelina salomonensis f. glabrescens Moldenke [Bougainville]*

FIJI ISLANDS:
Clerodendrum inerme (L.) Gaertn. [Fulanga, Kandavu, & Koro]
Clerodendrum thomsonae Balf. f. [Viti Levu]

UNION ISLANDS:
Petraeovitex multiflora (J. E. Sm.) Merr. [Duke of York]

SAMOAN ISLANDS:
Stachytarpheta urticaefolia (Salisb.) Sims [Upolu]

AUSTRALIA:
Gmelina sessilis White & Francis is to be deleted
Phyla nodiflora var. longifolia Moldenke [Queensland]
Stachytarpheta jamaicensis (L.) Vahl

CULTIVATED:

Clerodendrum angolense Gürke [Belgian Congo]
Clerodendrum bakeri Gürke is to be deleted
Clerodendrum buchanani var. fallax (Lindl.) Bakh. [Colombia, El Salvador, Hawaiian Islands, Java, Marquesas Islands, Puerto Rico, & Samoan Islands]
Clerodendrum buruanum Miq. [Java]
Clerodendrum capitatum (Willd.) Schum. & Thonn. [Java]
Clerodendrum capitatum var. conglobatum (J. G. Baker) Thomas [Java]
Clerodendrum colebrokianum Walp. is the correct orthography; add Java
Clerodendrum cunninghamii Benth. [Java]
Clerodendrum fragrans (Vent.) R. Br. [Java]
Clerodendrum grandifolium Gürke [Belgian Congo]
Clerodendrum hastatum (Roxb.) Wall. is the correct orthography; add Java & Sweden
Clerodendrum indicum (L.) Kuntze [Java]
Clerodendrum kaempferi (Jacq.) Sieb. [Java]
Clerodendrum laevifolium Blume [Java & Straits Settlements]
Clerodendrum longiflorum var. pubescens Moldenke [Java]
Clerodendrum myrmecophila Ridl. is to be deleted
Clerodendrum nutans Wall. [Ternate]
Clerodendrum paniculatum L. [Java]
Clerodendrum phyllomega var. myrmecophilum (Ridl.) Moldenke [England]
Clerodendrum rotundifolium Oliv. [Singapore]
Clerodendrum sahelangii Koord. [Java]
Clerodendrum schweinfurthii var. bakeri (Gürke) Thomas [England & Sierra Leone]
Clerodendrum serratum var. dentatum H. J. Lam [India]
Clerodendrum serratum var. wallichii C. B. Clarke is to be deleted
Clerodendrum speciosissimum Van Geert -- delete Colombia, El Salvador, Guadeloupe, Hawaiian Islands, Marquesas Islands, Martinique, & Samoan Islands
Clerodendrum speciosissimum f. album Moldenke [Java]
Clerodendrum thomsonae var. variegatum Hort. [Java]
Clerodendrum trichotomum Thunb. [Belgian Congo]
Clerodendrum ugandense Prain [Java]
Clerodendrum umbellatum var. speciosum (Dombrain) Moldenke [Java]
Clerodendrum viscosum Vent. [Java]
Cornutia grandifolia var. intermedia Moldenke [California]
Eriocaulon kunthii Körn. [Brazil]
Eriocaulon sellowianum Kunth [Brazil]
Faradaya albertisii F. Muell. [Java]
Faradaya dimorpha Pulle [Australia & Puerto Rico]
Faradaya neo-ebudica Guillaum. [Java]

Faradaya papuana Scheff. [India & Java]
Gmelina arborea var. canescens Haines [Java]
Gmelina asiatica L. [India]
Gmelina elliptica J. E. Sm. [Belgian Congo]
Gmelina elliptica f. lobata (Gaertn.) Moldenke [Java]
Kalaharia spinescens (Oliv.) Gürke [Belgian Congo]
Lantana arubensis Moldenke [Java & Uruguay]
Lantana camara L. [Banka]
Lantana camara var. angustifolia Moldenke [Banka, Brazil, India, & Java]
Lantana camara var. flava (Medic.) Moldenke [Java]
Lantana camara var. mista (L.) L. H. Bailey [Java]
Lantana camara var. nivea (Vent.) L. H. Bailey [Java]
Lantana indica Roxb. [India]
Lantana leprieuri Moldenke [Senegal]*
Lantana montevidensis (Spreng.) Briq. [Java]
Lantana moritziana Otto & Dietr. [Java]
Lantana tiliaefolia Cham. [India & Java]
Lantana trifolia L. -- delete India
Lantana trifolia f. hirsuta Moldenke [India & Java]
Lippia alba (Mill.) N. E. Br. [India]
Paepalanthus planifolius (Bong.) Körn. [Brazil]
Phyla nodiflora (L.) Greene [India & Java]
Premna matadiensis var. parvifolia Moldenke [Java]
Stachytarpheta australis Moldenke [Java]
x Stachytarpheta debilis Dans. [Java]
x Stachytarpheta intercedens Dans. [Java]
Stachytarpheta urticaefolia (Salisb.) Sims [Belgian Congo, Ceram, & French Indo-china]
Stachytarpheta urticaefolia f. albiflora Moldenke [Java]
Tectona hamiltoniana Wall. [Java]
Verbena tenuisecta Briq. [Illinois]
Vitex agnus-castus f. latifolia (Mill.) Rehd. [Uruguay]
Vitex leucoxylon L. f. [Java]
Vitex lucens T. Kirk [New Zealand]
Vitex negundo L. [Java]
Vitex negundo var. intermedia (P'ei) Moldenke [Uruguay]
Vitex trifolia L. [Cuba & Sumatra]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Java & Sumatra]
Vitex trifolia var. simplicifolia Cham. [Java]

FOSSILIZED:
Holmskioldia speirii (Lesq.) MacGinitie [Miocene of Colorado]*
Petrea perplexans (Cockerell) MacGinitie [Miocene of Colorado]*

- - - - - -

(1) Moldenke, H. N., The known geographic distribution of the members of the Verbenaceae, Avicenniaceae, Stilbaceae, Symphoremaceae, and Eriocaulaceae. 215 pp. 1949.
(2) ------ do. ------. Supplement 1, in Phytologia 3: 283--296. 1950.
------ do. ------. Supplement 2, in Revista Sudamericana de Botanica 8: 165--174. 1950.
------ do. ------. Supplement 3, in Phytologia 3: 304--307. 1950.
------ do. ------. Supplement 4, in Phytologia 3: 374--382. 1950.
------ do. ------. Supplement 5, in Phytologia 3: 448--468. 1951.
------ do. ------. Supplement 7, in Phytologia 3: 484--490. 1951.
------ do. ------. Supplement 8, in Phytologia 4: 65--88. 1952.
------ do. ------. Supplement 9, in Phytologia 4: 119--124. 1952.

- -

ADDITIONAL NOTES ON THE ERIOCAULACEAE. IX

Harold N. Moldenke

PAEPALANTHUS BRITTONI Moldenke

Brother León has collected this species on iron ore along river shores in hilly country.

Additional citations: CUBA: Oriente: Mrs. G. C. Bucher 81 (N); León 20149 (N).

PAEPALANTHUS CALDENSIS Malme

An additional synonym is Paepalanthus ruhlandii Alv. Silv.

Additional citations: BRAZIL: Paraná: Hatschbach 1555 (N); Jönsson 123a [Macbride photos 25165] (Kr--photo, N, N--photo); Stellfeld 1064 [Herb. Mus. Parana. 2044] (N); Tessmann 3071 [Herb. Mus. Parana. 3071] (N), 3784 [Herb. Mus. Parana. 3784] (N). Rio Grande do Sul: Rambo 30965 (N, N). Santa Catharina: Reitz 2695 (N).

PAEPALANTHUS PETRAEUS Körn.

The Killip 34148 cited by me in Phytologia 4: 152 (1952) as this species proves to be P. planifolius var. alpestris instead.

PAEPALANTHUS PILOSUS (H.B.K.) Kunth

Additional citations: COLOMBIA: Antioquia: F. A. Barkley 18A146 (N), 18A148 (N); Valderrama V. & Barkley 18A164 (N). Cundinamarca: Cuatrecasas 401 (W--1772816), 9644 (W--1795905); Hol-

ton 122 (T); Killip 34090 (N); F. W. Pennell 1997 (N, N), 2085a (N); Pérez 66 [Herb. Nac. Colomb. 55] (W--1470663). Norte de Santander: Linden 751 (Br, N--fragment, N--photo, Z--photo). Putumayo: Cuatrecasas 11866 (W--1798481); Ewan 16360 (N). Santander: Araque Molina & Barkley 18S351 (N); Cuatrecasas 13500 (W--1850225); Linden 1326, in part (Br). VENEZUELA: Mérida: Sergent 52 (Ve); Steyermark 55727 (N). PERU: Cuzco: F. W. Pennell 13866 (N). Province undetermined: Collector undesignated 37 (Q). LOCALITY UNDESIGNATED: Linden 759 (Br).

PAEPALANTHUS PLANIFOLIUS (Bong.) Körn.

The species is cited from Paraguay in Plantae Hasslerianae 11: 256 (1903).

Additional citations: BRAZIL: Minas Geraes: Mendes Magalhães 1982 [Herb. Jard. Bot. Bello Horiz. 42099] (N). Paraná: Hatschbach 1500 (N). São Paulo: Brade 12224 [Herb. Rio de Jan. 30346] (Ja); W. Hoehne 2380 (Mg, N, N, No); Moldenke & Moldenke 19646 (Es, F, Lg, Mg, Mr, N, N, N, No, Ot, S, Sm). State undetermined: G. Gardner 5269 (N).

PAEPALANTHUS PLANIFOLIUS var. ALPESTRIS Körn.

This variety has been collected at an altitude of 10,000 feet in Norte de Santander. The Killip 34148 cited below was mistakenly cited as P. petraeus Körn. by me in Phytologia 4: 152 (1952). The Purdie specimen cited below was identified as P. petraeus by Hochreutiner, who, however, qualified his determination with the comment that the specimen is apparently a "form" of that species, "which may be a very variable species".

Additional citations: COLOMBIA: Antioquia: Araque Molina & Barkley 18A020 (N, N); Pérez F. & Barkley 18A141 (N); Valderrama V. & Barkley 18A119 (N). Cundinamarca: Killip 34148 (N). Norte de Santander: Schlim 554 (Br, N--fragmant, N--photo, Z--photo). Department undetermined: Purdie s.n. [New Grenada] (C).

PAEPALANTHUS PLANIFOLIUS var. CONDUPLICATUS Ruhl.

Additional citations: BRAZIL: São Paulo: Moldenke & Moldenke 19638 (N, N).

PAEPALANTHUS PLANIFOLIUS var. CONSANGUINEUS (Körn.) Ruhl.

Synonym: Platycaulon consanguineum Körn. ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 292. 1888.

PAEPALANTHUS PLANIFOLIUS var. PUBERULUS (Körn.) Ruhl.

Additional citations: BRAZIL: São Paulo: Brade 7194 [Herb. Inst. Biol. S. Paulo 6587] (N); A. Gehrt s.n. [Herb. Inst. Biol. S. Paulo 5766] (N); Moldenke & Moldenke 19637 (Es, F, Lg, Mg, Mr, N, No, Or, S, Sm).

PAEPALANTHUS PLANTAGINEUS (Bong.) Körn.

Synonym: Eupaepalanthus plantagineus Körn. ex V. A. Pouls.,

Vidensk. Meddel. Kjøbenhavn 1888: 306. 1888.

Additional citations: BRAZIL: Minas Geraes: P. Clausen 43 (N); Silveira 244 [Herb. Marie-Victorin 15841] (Vi); Ule 2716 [Herb. Rio de Jan. 47753] (Ja). State undetermined: Martius 892 (M).

PAEPALANTHUS PLUMOSUS (Bong.) Körn.

Additional citations: BRAZIL: Minas Geraes: Ule 2729 [Herb. Rio de Jan. 47746] (Ja).

PAEPALANTHUS POLYANTHUS (Bong.) Kunth

Synonym: Actinocephalus polyanthus Kunth ex V. A. Pouls., Vidensk Meddel. Kjøbenhavn 1888: 278. 1888.

The species has been collected at an altitude of 1800 meters in São Paulo, in anthesis in December and March.

Additional citations: BRAZIL: Paraná: Hatschbach 1460 (N). Rio de Janeiro: Sampaio 4828 [Herb. Rio de Jan. 47725] (Ja). São Paulo: Eugenio Leite 4074 (N); M. Kuhlmann s.n. [Dec. 1949] (N); B. Lutz s.n. [Herb. Rio de Jan. 47749] (Ja). State undetermined: P. Clausen 3 [Carapa] (N, N); Collector undesignated s.n. (N); G. Gardner 5243 (N), 5248 (N); Martius 829 (M).

PAEPALANTHUS POLYANTHUS var. VILLOSUS Beauverd

Additional citations: BRAZIL: Federal District: Moldenke & Moldenke 19600 (F, Mg, Mr, N, No, Ot, S, Sm), 20006 (N), 20007 (N). Rio de Janeiro: Brade 10122 [Herb. Rio de Jan. 22408] (Ja).

PAEPALANTHUS POLYGONUS Körn.

Additional citations: BRAZIL: State undetermined: G. Gardner 5245 (N--isotype).

PAEPALANTHUS POLYTRICHOIDES Kunth

The specimen cited by A. Silveira from "Maraca" is from Maracá Island, Pará, Brazil.

Additional citations: VENEZUELA: Mérida: Sergent 53 (Ve). SURINAM: Moldenke & Moldenke 19581 (Es, F, Lg, Mg, Mr, N, No, Ot, S, Sm). BRAZIL: Pará: Archer 8441 (N); Black 860 (N).

PAEPALANTHUS POLYTRICHOIDES f. VILLOSUS Moldenke

Additional citations: SURINAM: Moldenke & Moldenke 19582 (N--type). BRAZIL: Mattogrosso: J. G. Kuhlmann 1636 [Herb. Rio de Jan. 47664] (Ja, N).

PAEPALANTHUS RAMOSUS (Wikstr.) Kunth

Additional citations: BRAZIL: Bahia: Fróes 20114 (N). Minas Geraes: Mello Barreto 2496 [Herb. Jard. Bot. Bello Horiz. 4054] (N); Netto s.n. [Herb. Rio de Jan. 49128] (Ja). Rio de Janeiro: Sampaio s.n. [Herb. Rio de Jan. 47726] (Ja).

PAEPALANTHUS REGALIS Mart.

The species is recorded by Luetzelburg in Estudo Botanico do

Nordéste 3: 148 & 150 (1923) from Serra dos Trez Irmaos in central Bahia, where it is said to be typical of the carrasco.

PAEPALANTHUS RETUSUS C. Wright
Additional citations: CUBA: Pinar del Río: C. Wright 3744 (Pa--isotype).

PAEPALANTHUS RIGIDUS (Bong.) Kunth
Additional citations: BRAZIL: Minas Geraes: L. Riedel 1414 (C--isotype). State undetermined: Martius 880 (M).

PAEPALANTHUS ROBUSTUS Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: Mello Barreto 2484 [Herb. Jard. Bot. Bello Horiz. 8290] (N).

PAEPALANTHUS RORAIMENSIS Moldenke
Citations: VENEZUELA: Bolívar: Steyermark 58768 (N--type).

PAEPALANTHUS SALTICOLA Herzog
Additional citations: BRAZIL: Amazonas: Luetzelburg 23906 [Herb. Rio de Jan. 47729] (Ja--cotype, N--cotype), 23912 [Herb. Rio de Jan. 47674] (Ja--cotype). Rio Grande do Norte: A. Lutz s.n. [Herb. Rio de Jan. 31187] (Ja).

PAEPALANTHUS SAXATILIS (Bong.) Körn.
Additional citations: BRAZIL: Minas Geraes: B. Lutz s.n. [Herb. Rio de Jan. 47739] (Ja); Mello Barreto 4783 [Herb. Jard. Bot. Bello Horiz. 17503] (N); L. Riedel 293 (M--isotype).

PAEPALANTHUS SAXICOLA Körn.
Additional citations: BRAZIL: Goyaz: L. Riedel s.n. (M--isotype).

PAEPALANTHUS SCHENCKII V. A. Pouls.
Synonym: Eupaepalanthus schenckii V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 326--332. 1888.

PAEPALANTHUS SCHLIMII Körn.
The species is described by Killip and Smith as a cespitose herb, with grayish-white heads, growing in clumps. It has been found at altitudes of 2800 to 3000 meters, blooming in February and March. It has been mis-identified as "P. columbianus Ruhl." Jahn records the common name "piñuelita de páramo".
Additional citations: COLOMBIA: Boyacá: Pérez Arbeláez & Cuatrecasas 8091 (N, N). Norte de Santander: Killip & Smith 20621 (W--1355645). Santander: Cuatrecasas & García y Barriga 9930 (W--1798458), 9930a (W--1798457). VENEZUELA: Mérida: Jahn 975 (Ve).

PAEPALANTHUS SCHOLIOPHYLLUS Ruhl.
This species is recorded from Paraguay in Plantae Hasslerian-

ae 11: 256. 1903.

PAEPALANTHUS SCIRPEUS Mart.
Additional citations: BRAZIL: Minas Geraes: Silveira 346 [Herb. Marie-Victorin 15839] (Vi).

PAEPALANTHUS SCLERANTHUS Ruhl.
Additional citations: BRAZIL: Minas Geraes: Mello Barreto & Brade 1045 [Herb. Jard. Bot. Bello Horiz. 10731] (N); Ule 2717 [Herb. Mus. Nac. Rio 47745] (Ja--cotype, N--cotype).

PAEPALANTHUS SCOPULORUM Moldenke
Citations: VENEZUELA: Bolívar: Steyermark 59914 (N--type).

PAEPALANTHUS SERRALAPENSIS Moldenke
Synonym: Eriocaulon latifolium Bong., Mém. Acad. Pétersb., sér. 6, 1: 631, pl. 64. 1831, not E. latifolium J. Sm., 1809.

PAEPALANTHUS SESLEROIDES Griseb.
Literature: Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 47 & 114. 1946.
The species grows in dry or wet white siliceous sand of savannas and pine barrens. It has been collected in anthesis in November, December, and February. Carabia 3014 and 3871 were originally identified as P. pungens, but the flowers are definitely trimerous and they are best placed here. The species has also been confused with P. alsinoides, and the name Dupatya sesleroides occurs on the Shafer collection cited below.
Additional citations: CUBA: Pinar del Río: Acuña 10974 (Es), 14964 (Es); Carabia 740 (Cr, N), 3014 (N), 3871 (N); Hitch, León, & Roig s.n. [Herb. Roig 4085] (Es); León & Roca 6970 [Herb. Marie-Victorin 20279] (Ha, Vi); León, Victorin, & Alain 19628 (N); Moldenke & Moldenke 19880 (Es, Lg, Mg, N, No, Ot, Sm); Moldenke, Moldenke, León, Alain, & Acuña 15271 (Es); Shafer 10882 (Cm); Van Hermann & Muñoz s.n. [Herb. Roig 689] (Es); C. Wright 3234 (Pa--isotype). ISLA DE PINOS: Britton, Britton, & Wilson 14225 (Cm); Britton & Wilson 14319 (Cm), 15689 (Cm); Carabia 999 (Cr, N), 1083 (Cr, N), 3157 (Cr), 3930 (Cr, N), 3941 (Cr, N), 3949 (Cr, N), 3995 (Cr, N); Chrysler s.n. [31 Aug. 1924] (Ob--23924); O. E. Jennings 338 (Cm); León 17520 (Ha, N); León & Seifriz 17520 (Ha, N); León & Victorin 18855 (Ha); Victorin & Alain 166, in part (Ha), 167 (Ha).

PAEPALANTHUS SESSILIFLORUS Mart.
Additional citations: BRAZIL: Bahia: Martius 557 (M--isotype).

PAEPALANTHUS SPECIOSUS (Bong.) Körn.
The species is recorded from Campinas de Duro, in eastern Goyaz, by Luetzelburg, Estudo Botanico do Nordéste 3: 149 & 150 (1923), where it is said to be typical of the campinas. Malme

also records it in his Phanerogamen 3: 9 (1933).

Additional citations: BRAZIL: Goyaz: Glaziou s.n. (Cm). Mattogrosso: Rondon 1628 [Herb. Rio de Jan. 47655] (Ja). Minas Geraes: Brade 11321 [Herb. Rio de Jan. 26712] (Ja); P. Clausen s.n. (N); Sampaio 6844 [Herb. Rio de Jan. 47648] (Ja). BOLIVIA: Santa Cruz: Kuntze s.n. [Velasco, VII.92] (N, N).

PAEPALANTHUS SQUAMULIFERUS Moldenke

Citations: VENEZUELA: Bolívar: Steyermark 59777 (N--type).

PAEPALANTHUS STANDLEYI Moldenke

The Mexia collection cited below was originally identified as P. warmingii Körn. and the Mello Barreto collection as P. plumosus Körn.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 9688 [Herb. Jard. Bot. Bello Horiz. 24113] (N--type); Mexia 5881 (F00767670, N).

PAEPALANTHUS STELLARIS (Guill.) Kunth

The specimen cited below bears the cheironym Paepalanthus arnisii Ruhl.

Additional citations: BRAZIL: Minas Geraes: Foster & Mello Barreto 10841 [Herb. Jard. Bot. Bello Horiz. 32605] (N).

PAEPALANTHUS STRICTUS Körn.

Additional citations: BRAZIL: Minas Geraes: G. Gardner 5257 (N--cotype), 5258 (N--cotype, N--cotype).

PAEPALANTHUS SUBSESSILIS Moldenke

Citations: VENEZUELA: Lará: Steyermark 55495 (N--type).

PAEPALANTHUS SUBTILIS Miq.

The species has been collected at altitudes of from 100 to 1065 meters, blooming in March.

Additional citations: VENEZUELA: Amazonas: Araque Molina & Barkley 18V186 (N, N); Steyermark 58447 (N). Bolívar: Steyermark 59193 (N). BRITISH GUIANA: Maguire & Fanshawe 23000 (N). SURINAM: Moldenke & Moldenke 19584 (N). BRAZIL: Amazonas: Murca Pires 330 (N). Pará: Black 47-886 (N); Spruce s.n. [in vicinibus Santarem, Mart. 1850] (N).

PAEPALANTHUS SUBTILIS var. PUBERULUS Ruhl.

Additional citations: BRAZIL: Amazonas: Spruce s.n. [in vicinibus Barra, Dec.-Mart. 1850-51] (N--isotype).

PAEPALANTHUS SUCCISUS Mart.

Additional citations: BRAZIL: Minas Geraes: Silveira 492 [Herb. Marie-Victorin 15838] (Vi).

PAEPALANTHUS SUPINUS Körn.

The species is recorded by Malme in his Phanerogamen 3: 9

(1933).

PAEPALANTHUS SYNGONANTHOIDES Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: Macedo 1637 (N).

PAEPALANTHUS TATEI Moldenke
Additional citations: VENEZUELA: Lará: Steyermark 55428 (F--1221916, N).

PAEPALANTHUS TESSMANNII Moldenke
Additional citations: BRAZIL: Paraná: Tessmann 3649 [Herb. Mus. Parana. 3649] (N), 3696 [Herb. Mus. Parana. 3696] (N), 3781 [Herb. Mus. Parana. 3781] (N--type).

PAEPALANTHUS TORTILIS (Bong.) Mart.
Synonym: Eupaepalanthus tortilis Körn. ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 336. 1888.
The species is recorded from Serra Marsalina in central Bahia by Luetzelburg, Estudo Botanico do Nordéste 3: 149 & 150 (1923), where it is said to be typical of the carrasco. It is usually found in sandy and moist or wet soil or dry swamps, blooming in December and January. The binomial is often written "P. tortilis Mart."
Additional citations: VENEZUELA: Lará: Tamayo 302 (Ve), 2012 [Herb. Nac. Venez. 18484] (Ve). BRAZIL: Bahia: Glocker 236 (W--1342230); Martius 560 (T); Salzmann s.n. (T). Minas Geraes: Mexia 5756 (Gg--285349). Pernambuco: Pickel 3164 (Gg--276714, Ms), s.n. [Prazeres, Dec. 1924] (N), s.n. [Prazeres, Jan. 1931] (Mg, N). Rio de Janeiro: Blanchet 9 (T); Martius 557 (M). State undetermined: G. Gardner 848 (N); Martius 556 [Villa S. Georgii Insulanorum] (M).

PAEPALANTHUS TRICHOPETALUS Körn.
Additional citations: BRAZIL: Minas Geraes: G. Gardner 5268 (N--isotype).

PAEPALANTHUS TRICHOPHYLLUS (Bong.) Körn.
The species is recorded from Serra Marsalina, in central Bahia, by Luetzelburg, Estudo Botanico do Nordéste 3: 149 & 150 (1923), where it is said to be typical of the carrasco.

PAEPALANTHUS TRUXILLENSIS Körn.
The species inhabits limestone outcrops at altitudes of 3045 to 3475 meters, according to Steyermark.
Additional citations: VENEZUELA: Lará: Steyermark 55280 (F--1221906, N). Táchira: Steyermark 57371 (N). Trujillo: Linden 297 (Br--isotype, N--fragment of isotype, N--photo of isotype, Z--photo of isotype).

PAEPALANTHUS TUBERCULATUS Alv. Silv.
In his original description in Fl. Montium 222, pl. 147 (1928)

Silveira cites a collection of his from near Capao Redondo in the Serra do Cipó, and one of Brade from Itatiaia [Herb. Jard. Bot. Rio 1965; Herb. Silveira 365], Minas Geraes, blooming in April and June.

PAEPALANTHUS TUERCKHEIMII Ruhl.
Additional citations: HISPANIOLA: Dominican Republic: Chardon 28 (Ba); Thouin 34 (Q).

PAEPALANTHUS ULEANUS Ruhl.
The species is recorded by Luetzelburg, Estudo Botanico do Nordéste 3: 149 & 151 (1923) from Serra dos Orgãos, morros Acú e Isabelloca, Rio de Janeiro, at altitudes of from 2000 and 2300 meters, where it is said to be typical of no particular region.

PAEPALANTHUS VIGIENSIS Moldenke
Citations: BRAZIL: Pará: Murca Pires 1398 (N--type).

PAEPALANTHUS VILLIPES Moldenke
Citations: BRAZIL: Pará: Black 48-3278 (N--type).

PAEPALANTHUS VIRIDIS Körn.
Additional citations: BRAZIL: Piauhy: G. Gardner 2331 (N--cotype), 2332 (N--cotype).

PAEPALANTHUS VISCOSUS Moldenke
The leaves are described by Archer as sticky; the white flowers bloom in November. The species has been mis-identified as P. schraderi Körn., P. bifidus (Schrad.) Kunth, and Eriocaulon fasciculatum Bong.
Additional citations: SURINAM: Archer 2836 (N--isotype, N--photo of type, W--1663340--type, Z--photo of type); Weigelt s.n. (D--824288).

PAEPALANTHUS WARMINGIANUS (Körn.) Körn.
Synonymy: Paepalanthus warmingianus (Körn.) Körn. ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 223. 1888; Ruhl. in Engl., Pflanzenreich 13 (IV-30): 223. 1903. Eupaepalanthus warmingianus Körn. ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 313--321. 1888. Paepalanthus warmingii Körn., in herb.
Additional citations: BRAZIL: Minas Geraes: Glaziou 5455 [Macbride photos 22296] (F--717520--photo of type, Kr--photo of type); Mexia 5881 (Gg--286191).

PAEPALANTHUS WILLIAMSII Moldenke
Additional citations: VENEZUELA: Amazonas: Ll. Williams 15051 [Herb. Nac. Venez. 18500] (F--photo of isotype, N--type, N--isotype, N--photo of isotype, Sg--photo of isotype, Ve--isotype, Z--photo of isotype).

PHILODICE HOFFMANNSEGGII Mart.

The specimen cited by A. Silveira from "Marajo" is from Marajo Island, Pará, Brazil. Malme also cites the species in his Phanerogamen 3: 11 (1933). The species has been found in wet sandy soil along roadsides and at altitudes of about 100 meters, blooming in September and October.

Additional citations: COLOMBIA: Magdalena: Haught 2357 (N). Department undetermined: Cuatrecasas 4049 [Los Llanos, Río Orinoco, Puerto Carreño] (W--1773390). VENEZUELA: Amazonas: Steyermark 58430 (N). BRITISH GUIANA: Herb. Forest Dept. Br. Guian. WB.300 (N, Wb). BRAZIL: Amazonas: Luetzelburg 20532 [Herb. Mus. Nac. Rio 47700] (Ja), 20961 [Herb. Mus. Nac. Rio 47703] (Ja), 21043 [Herb. Mus. Nac. Rio 47702] (Ja). Pará: Black 47-874 (N), 47-1782 (N). State undetermined: G. Gardner 5242 (N).

RONDONANTHUS MICROPETALUS Moldenke

Citations: VENEZUELA: Bolívar: Steyermark 58777 (N--type).

RONDONANTHUS RORAIMAE (Oliv.) Herzog

Additional citations: VENEZUELA: Bolívar: Steyermark 58799 (N).

SYNGONANTHUS AKURIMENSIS Moldenke

Additional citations: VENEZUELA: Bolívar: Tamayo 3234 (F--photo of type, N--fragment of type, N--photo of type, W--type, Z--photo of type).

SYNGONANTHUS ANDROSACEUS (Griseb.) Ruhl.

Literature: Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 47 & 115. 1946.

The species has been found in white siliceous sand, on sandy savannas, and in lagoons, blooming in January, March, May, September, and December. Alain states that it grows in the white sand of the Los Indios region and is endemic to the savannas of Pinar del Río and Isal de Pinos. It has been mis-identified as Eriocaulon fuliginosum C. Wright.

Additional citations: CUBA: Pinar del Río: Acuña 10722 (Es); C. F. Baker 2101 (Es, Po--186164), 2962 (Es, Po--186163); Baker & Abarca 4194 (Es, Po--185974); Carabia 3019 (Cr, N); León 15946 (Ha), 17430 (N), 17432 (N); León & Alain 17796 (N), 19415 (N); Van Hermann 7916 (Es); Van Hermann & Muñoz s.n. [Herb. Roig 688] (Es).

SYNGONANTHUS ANTHEMIFLORUS (Bong.) Ruhl.

The spelling given above is correct for this binomial. Ruhland was not justified in changing it to "anthemidiflorus", because Bongard spelled the original basinym Eriocaulon anthemiflorum. This fact was verified for me by my friend, Miss Amy L. Hepburn, Natural Science Librarian at Columbia University on September 10, 1945.

Additional citations: BRAZIL: Minas Geraes: Glaziou 19981 (C); Martius 889 (T).

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A NEW SPECIES OF STRYCHNOS FROM RIO OIAPOQUE

Joseph V. Monachino

STRYCHNOS EUGENIAEFOLIA Monachino, sp. nov.

Arbuscula scandens, partis vegetatis omnino glabris, ramis cinereis, petiolis ca. 2-3 cm. longis, laminis foliorum ovatis usque ad elliptico-ovatis, ca. 4-6.5 cm. longis, 2-3.5 cm. latis, ad basin rotundato-cuneatis, ad apicem acuminatis, triplinervis, reticulo venularum undique modice prominente; fructis sphaericis magnis ca. 8 cm. diam., seminibus numerosis ca. 2.5 cm. longis, 1.8 cm. latis.

Vine, the vegetative parts completely glabrous, the branches cinereous; petioles ca. 2-3 mm. long; blades ovate to elliptic-ovate, ca. 4-6.5 cm. long, 2-3.5 cm. broad, broadly or roundly cuneate at base, acuminate at apex, little shining above, somewhat paler beneath, drying greyish with some tint of yellow, subcoriaceous, 3-plinerved and also with a pair of faint marginal nerves, the inner pair opposite and diverging near base of blade, the principal lateral nerves (secondaries) ascending (making ca. 60 degree angle with the midrib at middle of blade), the reticulation moderately prominent on both surfaces. Inflorescence and flowers lacking. Fruit globose, very large, (4.5-) 8 cm. diam., shell ca. 3 mm. thick, seeds numerous, flattened, irregular, ca. 2.5 cm. long, 1.8 cm. broad, the surface lightly roughened, glabrous, cinereous, the testa crustaceous.

Type. - R. L. Fróes 25844, Brazil, Territorio do Amapá, Rio Oiapoque, entre Igarapé Moncherri e Igarapé Nataia, floresta alta, terra firme, baixa, 4-II-1950, cipó de 9 cm. (Matured leafy stem and two separate fruits, deposited at The New York Botanical Garden.) The river has variant spelling: Oyapok, Oyapock, Oyapoc, Oiapock; it is on the boundary of French Guiana and northern Brazil.

Although the flowers of S. eugeniaefolia are not known and consequently its alliance is not revealed, it is easily distinguished from all the American species of Strychnos described, by its small ovate leaves and the total lack of puberulence or any kind of indumentum on its branchlets, petioles and leaf-blades. Verruculosity and microscopic (atomic) dots are absent from the leaves. Tendrils, but not spines, have been observed on this vine.

The association of large fruits with small leaves recalls S. pachycarpa. According to A. Ducke, the fruit resembles that of S. Blackii.

Dr. Ducke informed me (letter of March 30, 1952) that the species was collected twice by Fróes and later also by G. A. Black. The fruits were obtained on the first collection. R. Fróes has made attempts to locate flowers of the plant, but without success.

Sr. Fróes has provided me with an illustration showing a branching stem with foliage and also a detached fruit. It is from this sketch I infer that the plant has tendrils.

Since the original monograph in 1942, six new species of Strychnos have been proposed: pachycarpa Ducke (1945), Duckei Kruk. & Monach. (1946), Krukoffiana Ducke (1947), Torresiana Kruk. & Monach. (1948), Blackii Ducke (1950), Froesii Ducke (1951). In addition, three old species have been reinstated. Only one, S. hachensis Karsten (nomen confusum), was deleted in 1947 from our list of valid species. At least one other, S. Barnhartiana Krukoff, has been questioned; S. Smithiana Krukoff also needs clarification.

S. Torresiana, originally described from sterile material, falls in the intricate complex involving S. rubiginosa and relatives in the section Breviflorae; this has been ascertained by recent collection of its flowers. Ducke (1951) thought he had the fruit of the species from Rio de Janeiro, demonstrating an easy distinction between it and other members of the Breviflorae. But later (letter of Oct. 10, 1952) he visited the station where the fruit had been collected and found S. trinervis and S. Torresiana climbing on the same tree, and he verified that the fruit described and depicted in the Boletim was of S. trinervis.

S. Froesii very closely resembles S. javariensis vegetatively, judging from a sterile specimen collected by Ducke at Manaus ("No. 6," Aug. 8, 1941) and deposited at The New York Botanical Garden. The other Garden specimen, cited by Ducke as belonging to a young plant of S. Froesii (Luiz Emygdio de Mello Filho 567), is like S. hirsutus. S. javariensis has terminal flowers (Ducke 1770), whereas the inflorescence of S. Froesii was described as axillary. Ducke (1950) wrote that the fruits of S. javariensis are perfectly like those of S. diaboli, frequently a little larger. The fruit-shell of S. diaboli is fragile and thin, 1 mm. or less thick, whereas that of S. Froesii is described as hard-woody and very thick, 5-7 mm. thick. Experiments made at the Instituto Agronômico do Norte indicate that the extract of the bark of young plants of S. Froesii is more poisonous than that of any other species of Strychnos studied there.

Ducke has discovered that the fruits are very

important in the diagnoses of certain species of Strychnos. This is particularly so in the section Breviflorae, in which the flowers are nearly identical in many species. S. brachistantha and S. nigricans have nearly identical flowers and also nearly identical foliage, and it has been hinted that they may be conspecific. The former was believed confined to the northern region, Mexico and Central America to northern South America. Collections from Brazil were reported as S. nigricans, principally because of geographical considerations; but the safety of this criterion has been exploded. Ducke examined fruiting specimens resembling S. nigricans in every respect except for the very different fruits, collected in São Paulo and Minas by Dr. Kuhlmann and his nephew. The fruits were incomparably larger, hard-shelled, and contained many seeds, different from those of S. nigricans. Believing at first he had a new species, Ducke did not rest, but with his customary meticulousness borrowed for comparison flowering specimens, including an isotype, and a fruit of Central American S. brachistantha. It seemed hardly admissible that the same species could grow in two widely separated areas with very different climates (in the plateau of São Paulo and Minas the mean annual temperature is 17 to 18 degrees Centigrade, minima sometimes below zero). Yet Ducke found the two morphologically not separable (letter of Sept. 29, 1951). On basis of this discovery, S. brachistantha must be acknowledged the most wide-spread Strychnos in America.

The foregoing discussion, then, would suggest that expansion has been the general trend in Strychnos since 1942. Only one species has been submerged; of the six recently described, I would hold S. Torresiana under suspicion, but little reduction is otherwise anticipated. One can, thus, with some confidence a priori accept novelties in the genus if proposed after reasonable study. S. eugeniaefolia, however, needs no such circumstantial support, for it is so different from other species that not even affinity can be suggested.

Fróes and Ducke communicate that a second new species from Rio Oiapoque was recently discovered by Fróes, who is describing it in the Boletim of I. A. N. Its specific epithet will be based on the name of the river. I rely completely on information received from Fróes and Ducke that S. eugeniaefolia and Fróes' new species are surely not the same.

The chief studies on American Strychnos since the monograph in 1942 have been conducted by Dr. Ducke. True that a score of papers on the genus has

been written by the authors of the monograph, but these supplements and regional recapitulations hold a distant second place to the discoveries and explorations by Ducke and Fróes. Because of the superior work now being done by these botanists, I desired S. eugeniaefolia, which I first announced to be a new species in 1950 on basis of leafy material only, to be published by them. But they encouraged me to describe it myself, and to help the diagnosis, Rubens Rodriques Lima on the recommendation of Ducke and Fróes dispatched to me, late in 1952, two fruits of the species, without which I would not have submitted the present article.

REFERENCES TO PUBLICATIONS BY A. DUCKE

1945. O gênero Strychnos L. na Amazônia Brasileira. Boletim Técnico do Instituto Agronômico do Norte 3: 5-23; illust. I, II.

1947. New forest trees and climbers of the Amazon. VI. Tropical Woods 90: 27-28.

1950. Plantas novas on pouco conhecidas da Amazônia. Boletim Técnico do Instituto Agronômico do Norte 19: 20-29; illust. VII-IX.

1951. A new curare-plant from the Brazilian Amazon. Anais da Academia Brasileira de Ciencias 23: 209-212; illust. p. 211.

1951. O gênero Strychnos no Rio de Janeiro. Boletim do Museu Nacional, Nova Serie, Botânica 13: 1-7; illust. p. 7.

NOTES ON BROMELIACEAE. I

Lyman B. Smith

This series is begun with the aim of providing names for new taxa and combinations whose publication would be unduly delayed otherwise. Abbreviations for herbaria follow standard practice.

COLOMBIA and ECUADOR

AECHMEA HOPPII (Harms) L. B. Smith, comb. nov.
Streptocalyx hoppii Harms, Notizbl. 12: 526. 1935.

Pl. I, fig. 1: Sepal x 1; fig. 2: Petal x 1.

Type locality: On trees in dense forest, Archidona, Prov. Oriente, Ecuador, 900-1,000 meters. Type collected by W. Hopp (No. 1016).

COLOMBIA: PUTUMAYO: Uchupayaco, on the planada between Urcusique and Umbria on the banks of the Rio Uchupayaco, alt. 300 m., Feb. 22-23, 1942, R. E. Schultes 3368 (GH). Epiphyte, Rio San Miguel or Sucumbios, Conejo and vicinity, by the Quebrada Conejo, alt. 300 m., April 2-5, 1942, R. E. Schultes 3517 (GH). Epiphyte, Valley of Sibundoy, Sibundoy, alt. ca. 2,225-2,300 m., May 29, 1946, R. E. Schultes 6606a (US).

ECUADOR: NAPO-PASTAZA: Mera, April 17, 1940, Lugo 213 (S).

Harms described his Streptocalyx hoppii as having appendaged petals, thereby tacitly admitting that it was in the wrong genus. The type, which was presumably in Berlin, has not been seen but the collections by Schultes and that by Lugo from the type region agree closely with his detailed description.

ECUADOR

TILLANDSIA ZAMORENSIS L. B. Smith, sp. nov.

A T. duidae L. B. Smith, cui valde affinis, inflorescentia parva bipinnata, bracteis membranaceis differt.

Stemless; leaves to 45 cm. long, equaling the inflorescence, densely and minutely lepidote beneath, green; sheaths ovate, inconspicuous; blades ligulate, broadly acute and apiculate, flat, 3 cm. wide; scape erect, 3 mm. in diameter; scape-bracts imbricate and closely enfolding the scape, elliptic, acute, membranaceous, finely nerved, minutely lepidote toward the apex; inflorescence subdensely bipinnate, 20 cm. long; primary bracts ovate, 3 cm. long; spikes suberect, short-stipitate with 1 or 2 sterile bracts at base, lance-oblong, acute, strongly complanate, 7 cm. long, 15 mm. wide, densely 12-flowered; rhachis flexuous, excavated; floral bracts more or less imbricate but narrow and not at all concealing the rhachis, equaling the sepals, lance-oblong, acute, strongly carinate, thin, nerved, obscurely lepidote toward the apex; flowers short-pedicellate; sepals free, lance-oblong, acute, 15 mm. long, carinate, obscurely lepidote; petals imperfectly known, 4 mm. longer than

the sepals, yellowish rose (! Scolnik). Pl. I, fig. 3: Apex of leaf x ½; fig. 4: Primary bract and spike x ½; fig. 5: Sepal x 1.

Type in the herbarium of the New York Botanical Garden, collected on the Gualaquiza route to the Rio Zamora, Province of Santiago-Zamora, Ecuador, altitude 850 meters, December 25, 1948, by Rosa Scolnik (No. 1500).

This species is based on a single plant and further collections are necessary to ascertain the value of the characters used to distinguish it from Tillandsia duidae.

PERU

GUZMANIA CRYPTANTHA L. B. Smith var. PAUCIFLORA L. B. Smith, var. nov.

A var. cryptantha fasciculis paucifloris, sepalis minoribus differt.

Inflorescence 15 cm. long exclusive of the lower primary bracts which attain 24 cm.; fascicles 4-flowered; sepals 15 mm. long, connate for 10 mm.

Type in the Museo de Historia Natural "Javier Prado", Lima, Peru, collected in subtropical forest, Carpish, ridge between Huanuco and Tingo Maria, altitude 2,800-2,900 meters, August 9, 1947, by R. Ferreyra (No. 2404).

PITCAIRNIA ASPLUNDII L. B. Smith, sp. nov.

P. densifloram Brongn. in systema Mezii proxima sed foliis subtus membrana alba e lepidibus formata vestitis, bracteis florigeris atro-rubentibus, sepalis oblongis, ovario 1/2 infero differt.

Epiphytic (! Asplund); leaves (only one known), about 2 m. long, entire, petiolate, glabrous above, covered beneath with a fine white membrane of fused scales, the blade linear with a narrow median channel, caudate-acuminate, flat, 5 cm. wide; scape over 2 dm. long, 1 cm. in diameter, red (! Asplund), almost black when dry, finely brown-flocculose; upper scape-bracts broadly ovate, acuminate, exceeding the internodes, chartaceous, brown-flocculose; inflorescence simple, very densely cylindric, 23 cm. long, 3 cm. in diameter, brown-flocculose; floral bracts like the upper scape-bracts, erect, 5 cm. long, blackish red (! Asplund); flowers subsessile; sepals oblong, asymmetric, rounded and apiculate, 25 mm. long, ecarinate, subcoriaceous; petals curved-spreading, strongly zygomorphic, linear-spatulate, truncate, 7 cm. long, red, bearing a large entire scale at base; stamens included, anthers linear, 12 mm. long; ovary only about 1/2 superior; ovules apiculate. Pl. I, fig. 6: Leaf x 1/20; fig. 7: Flower x 1; fig. 8: Sepal x 1; fig. 9: Base of petal x 1.

Type in the Riksmuseet at Stockholm, collected on the shore of a rivulet in forest, Tingo Maria, Province of Huanuco, Department of Huanuco, Peru, July 16, 1940, by E. Asplund (No.

12263).

PITCAIRNIA FERREYRAE L. B. Smith, sp. nov.

P. archeri L. B. Smith in systema Mezii proxima sed foliorum laminis multo brevioribus latioribusque, inflorescentia pauciflora, bracteis florigeris acutis tenuibus differt.

Caulescent; stem 1 cm. in diameter, covered with the remains of old leaf-sheaths; new leaves fasciculate on the apex of the stem, apparently dimorphic but only one type well preserved; sheaths broadly ovate, 3 cm. long, serrate, dark castaneous, covered with a membrane of coalesced buff scales; petiole 15 cm. long, 5 mm. wide, subdensely serrate with dark spreading spines 2-3 mm. long; blade broadly oblanceolate, acuminate, long-cuneate at base, 44 cm. long, exceeding the inflorescence, 10 cm. wide, flat, entire, glabrous above, minutely flocculose beneath; scape erect, 4 mm. in diameter, densely brown-flocculose; scape-bracts erect, imbricate, the upper ones lanceolate, acute, membranaceous; inflorescence simple, dense, 7 cm. long; floral bracts broadly ovate, acute, distinctly shorter than the sepals, membranaceous; flowers subsessile; sepals lanceolate, acute, strongly asymmetric, 26 mm. long, ecarinate, subcoriaceous, dark brown, brown-flocculose; only very young petals known, apparently naked; anthers linear, apiculate; ovary largely superior; ovules apparently ecaudate. Pl. I, fig. 10: Leaf x 1/20; fig. 11: Floral bract and flower x 1; fig. 12: Sepal x 1.

Type in the Museo de Historia Natural "Javier Prado", collected in tropical forest at Plantacion Margarita, near Divisoria, Province of Coronel Portillo, Department of Loreto, Peru, altitude 1,500-1,600 meters, August 14, 1946, by R. Ferreyra (No. 1044).

In habit, Pitcairnia ferreyrae closely resembles P. pulchella Mez of Ecuador, but because of its naked petals and short floral bracts it falls nearer to P. archeri in Mez's key in the Pflanzenreich.

PITCAIRNIA SUBULIFERA L. B. Smith, sp. nov.

P. recurvatam (Scheidw.) C. Koch in systema Mezii proxima sed apicibus foliorum crasse subulatis atris, laminis utrinque glabris, sepalis acuminatis, petalis nudis differt.

Flowering plant 2 m. high (! Asplund); leaves all ending in a stout pungent black subulus, dimorphic, some reduced to lance-elliptic sheaths, 26 cm. long, dark castaneous and densely but fugaciously brown-flocculose toward the base, other leaves about 1 m. long, subpetiolate, the blades linear, acuminate, 4 cm. wide, flat and without a distinct channel, glabrous; scape 15 mm. in diameter, fugaciously white-flocculose; lower scape-bracts foliaceous, the upper ovate, acuminate, 6-7 cm. long; inflorescence simple, densely cylindric, 27 cm. long, glabrous; floral bracts erect, triangular-ovate, acuminate, 5 cm. long, much exceeding the sepals, chartaceous, nerved; pedicels

distinct, 3 mm. long; sepals narrowly triangular, 22 mm. long, nerved, the posterior ones carinate; petals 5 cm. long, coiling-recurved at anthesis, green (! Asplund), naked; anthers linear, 12 mm. long; ovary 2/3 superior; ovules caudate. Pl. I, fig. 13: Floral bract x 1; fig. 14: Sepal x 1.

Type in the Riksmuseet at Stockholm, collected on rock at Carpish, Province of Huanuco, Department of Huanuco, Peru, altitude 2,600 meters, August 16, 1940, by E. Asplund (No. 13163).

PITCAIRNIA UMBRATILIS L. B. Smith, sp. nov.

A P. brunnescente L. B. Smith, cui affinis, laminis foliorum angustioribus, scapi bracteis nervatis, bracteis florigeris angustis tenuibusque, sepalis minoribus differt.

Caulescent, flowering shoot 7 dm. long; leaves 8 dm. long; sheath broadly ovate, 3 cm. long, coarsely sulcate, dark castaneous, finely brown-flocculose; petioles 1 cm. wide, whitish-flocculose beneath, pectinate-serrate with dark slender spines 5 mm. long; blade linear, acuminate with an apical subulus, 35 mm. wide with a very narrow median channel, entire, sparsely pale-flocculose beneath; scape about 1 cm. in diameter; scape-bracts erect, very densely imbricate, the lowest foliaceous, the succeeding ones loosing the blade and then the peticle but enlarging the sheath, the highest elliptic, over 15 cm. long, pectinate-serrate with a stout dark subulate apex, strongly nerved; inflorescence simple, densely cylindric, 3 dm. long, brown-flocculose; floral bracts erect, all exceeding the sepals, serrulate, thin, nerved, the lowest broadly ovate, the others linear-lanceolate; pedicels slender, 6 mm. long; sepals narrowly triangular, 28 mm. long, ecarinate, nerved; petals curved at anthesis, 65 mm. long, naked, green (! Asplund); stamens included, anthers linear, 11 mm. long; ovary 3/4 superior; ovules caudate. Pl. I, fig. 15: Leaf x 1/20; fig. 16: Floral bract x 1; fig. 17: Sepal x 1.

Type in the Riksmuseet at Stockholm, collected in dense moist forest at Carpish, Province of Huanuco, Department of Huanuco, Peru, altitude 2,850 meters, August 15, 1940, by E. Asplund (No. 13162).

PUYA MEDICA L. B. Smith, sp. nov.

P. pauperam Mez in systema Mezii proxima sed bracteis amplioribus, grosse serratis, lepidotis, pedicellis brevibus, floribus majoribus, sepalis spinuloso-acuminatis differt.

Caulescent, the stem 3 cm. in diameter; flowering shoot 25-37 cm. high; leaves many, rosulate at the end of the stem, to 20 cm. long; sheaths suborbicular, 25 mm. long, their apical third serrulate and densely lepidote; blades narrowly triangular, acuminate, 12 mm. wide, glabrous above, covered beneath with white appressed scales, laxly serrate with slender spreading spines 3 mm. long; scape erect, slender, densely white-flocculose; scape-bracts subfoliaceous, the upper ones with thin

roseate sheaths; inflorescence slenderly cylindric with the apical third simple, 10-20 cm. long, 2-3 cm. in diameter; primary bracts triangular-ovate, acuminate, 3-4 cm. long, exceeding the few-flowered axillary branches, pectinate-serrate, subchartaceous, deep rose, covered with white appressed scales; floral bracts of the branches like the primary bracts, shorter than the sepals; pedicels distinct, to 3 mm. long; sepals lance-oblong with an acicular apex, 18-20 mm. long, carinate, densely white-flocculose; petals 34-40 mm. long, blue-green (! Cerrate).

Type in the U. S. National Herbarium, No. 2,100,007, collected in rocky montane rain forest, Aynin, near the bridge between Chiquian and Aquia, Province of Bolognesi, Department of Ancash, Peru, altitude 3,160 meters, April 23, 1952, by Emma Cerrate (No. 1333).

PERU: ANCASH: Province of Bolognesi, dry rocky ground, 4 km. below Chiquian, alt. 2,800-2,950 m., May 20, 1950, R. Ferreyra 7584 (US).

Cerrate notes that this plant is used as a remedy for pneumonia, hence the specific name. The species is strikingly like P. roezlii E. Morr. in its bracts and flowers, although easily distinguished by its small leaves and short flowering branches. It grows at about a thousand meters higher elevation than P. roezlii and may well represent an adaptation to more rigorous climate. Pl. II, fig. 1: Primary bract and axillary branch x 1; fig. 2: Sepal x 1.

PUYA PRATENSIS L. B. Smith, sp. nov.

P. humilem Mez simulans sed bracteis florigeris pectinato-serratis, sepalis majoribus, ellipticis, obtusis, ecarinatis differt.

Flowering plant 15-20 cm. high; leaves (only the upper ones known) about 2 dm. long; sheaths elliptic, 3 cm. long, serrulate, glabrous; blades narrowly triangular, rigid, pungent, 11 mm. wide, covered with cinereous appressed scales but becoming partly glabrous above, laxly armed with spreading red spines 3.5 mm. long; scape 1-2 cm. long, largely concealed by the leaves; scape-bracts foliaceous but only 5-6 cm. long; inflorescence simple, strobilate, ellipsoid, 9 cm. long, 3 cm. in diameter; floral bracts erect, imbricate, triangular-ovate, acuminate, 3 cm. long, much exceeding the sepals, pectinate-serrate, subcoriaceous, dark brown with a paler apex, bearing minute inconspicuous white stellate scales; pedicels stout, obconic, 5 mm. long; sepals elliptic, obtuse, 17 mm. long, ecarinate, dark brown when dry, lepidote; petals naked, elliptic-oblong, obtuse, 25 mm. long, blue-green (! Ferreyra). Pl. II, fig. 3: Floral bract and flower x 1; fig. 4: Sepal x 1.

Type in the Museo de Historia Natural "Javier Prado", collected in grassland, steppes of Cumbre Gavilan, above Cajamarca, Province of Cajamarca, Department of Cajamarca, Peru, altitude 3,100 meters, August 17, 1952, by R. Ferreyra (No. 8580).

TILLANDSIA CHARTACEA L. B. Smith var. PERUVIANA L. B. Smith, var. nov.

A var. chartacea omnibus partibus minoribus, spicis laxioribus et bracteis florigeris rhachin haud omnino obtegentibus differt.

Leaves 25-30 cm. long; spikes subdense; floral bracts imbricate but not wholly concealing the rhachis; sepals 16 mm. long, the posterior ones connate for 9 mm.

Type in the U. S. National Herbarium, No. 2,100,002, collected on subxerophytic slopes, Timpoc, 4 km. below Chiquian, Province of Bolognesi, Department of Ancash, Peru, altitude 2,500 meters, August 3, 1949, by Emma Cerrate (No. 454).

PERU: ANCASH: Province of Bolognesi, rocky clay soil of montane rain forest, alt. 3,200-3,300 m., Aug. 6, 1949, E. Cerrate 307 (US).

TILLANDSIA CONFINIS L. B. Smith, sp. nov.

T. minorem Mez & Sodiro in systema Mezii proxima sed foliorum laminis supra mox glabris, scapi vaginis strictis, sepalis duplo majoribus differt.

Epiphytic, stemless, 47 cm. high; leaves many in an infundibuliform rosette, 35 cm. long; sheaths ample, elliptic, to 13 cm. long, inconspicuously punctulate-lepidote, smooth and sublustrous, pale green splotched with dark purple especially on the inner face; blades straight, narrowly triangular, acuminate, 25 mm. wide, covered beneath with minute appressed cinereous scales, soon glabrous above; scape probably erect, slender, glabrous; scape-bracts strict, imbricate, su bfoliaceous, the upper ones with red sheaths; inflorescence laxly bipinnate, 21 cm. long; primary bracts broadly ovate, much shorter than the axillary spikes, the lower ones caudate, the upper apiculate; spikes spreading, linear-lanceolate, 10 cm. long, probably about 15 mm. wide at anthesis, strongly complanate, 10-flowered with 2-3 sterile bracts at the base; floral bracts strongly imbricate and undoubtedly concealing the rhachis at anthesis, lanceoblong, acute, sharply carinate, 24 mm. long, exceeding the sepals, even, lustrous, glabrous or nearly so; pedicels 1 mm. long; sepals linear, acute, 22 mm. long with the posterior ones connate for 13 mm., keeled, nerved, subchartaceous, sparsely lepidote with minute appressed brown scales; petals and stamens unknown; capsule slenderly cylindric, beaked, 27 mm. long. Pl. II, fig. 5: Leaf x 1/10; fig. 6: Primary bract and spike x 1/2; fig. 7: Posterior sepals x 1.

Type in the Museo de Historia Natural "Javier Prado", collected in tropical forest at Divisoria, between Tingo Maria and Pucallpa, Province of Coronel Portillo, Department of Loreto, Peru, altitude 1,500-1,600 meters, February 28, 1947, by R. Ferreyra (No. 1686).

VRIESIA LOPEZII L. B. Smith, sp. nov.

A V. barclayana (Baker) L. B. Smith, cui affinis, vaginis

foliorum indistinctis, inflorescentia gracillima tereti, bracteis florigeris tenuibus nervatis glabris differt.

Flowering plant 7 dm. high; leaves erect, 4 dm. long, covered with gray subappressed scales; sheaths very small and inconspicuous; blades linear-triangular, filiform-acuminate, 2 cm. wide; scape erect, 4 mm. in diameter, glabrous; scape-bracts erect, imbricate, elliptic, the lower ones lepidote and with a short foliaceous blade, the upper ones obtuse and glabrous; inflorescence simple, terete, 3 dm. long, 7 mm. in diameter, glabrous; rhachis broadly winged and enfolding the bases of the flowers; floral bracts like the upper scape-bracts, 3 cm. long, imbricate, exceeding the sepals, ecarinate, thin, nerved, green with purplish apices; pedicels obconic, 4 mm. long; sepals lanceolate, acute, 23 mm. long, ecarinate, thin, petals 35 mm. long, the blades elliptic, purple, the claw bearing 2 large oblong acute scales; stamens exserted. Pl. II, fig. 8; Plant x 1/10; fig. 9: Sepal x 1; fig. 10: Petal x 1.

Type in the U. S. National Herbarium, No. 2,100,204, collected at Samne-Casminche, Province of Trujillo, Department of La Libertad, Peru, altitude 1,800 meters, May 21, 1952, by A. Lopez M. (No. 846).

Plate I

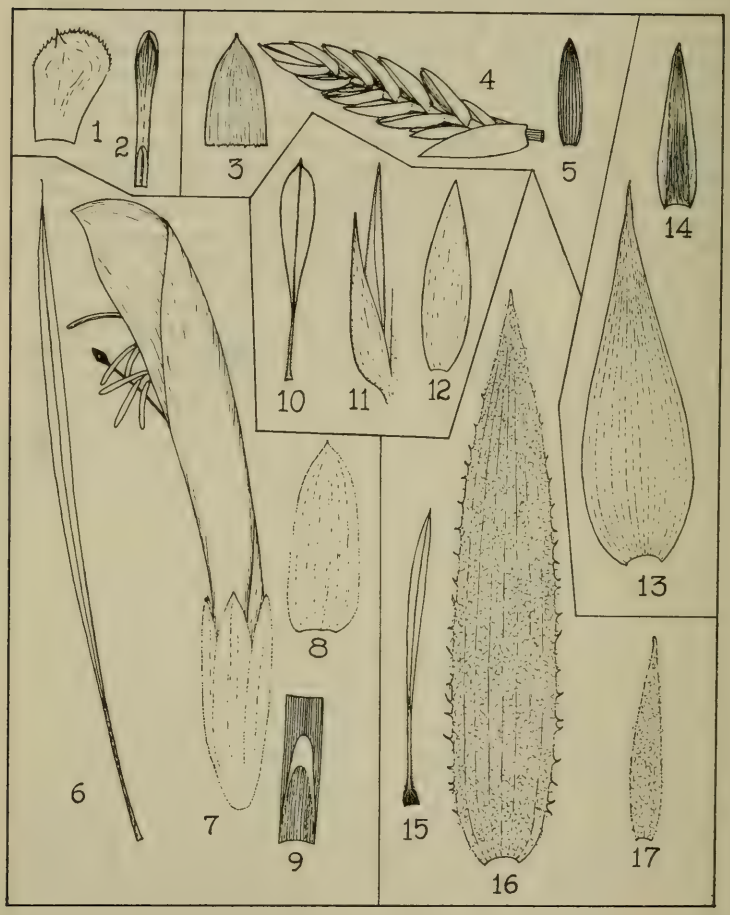
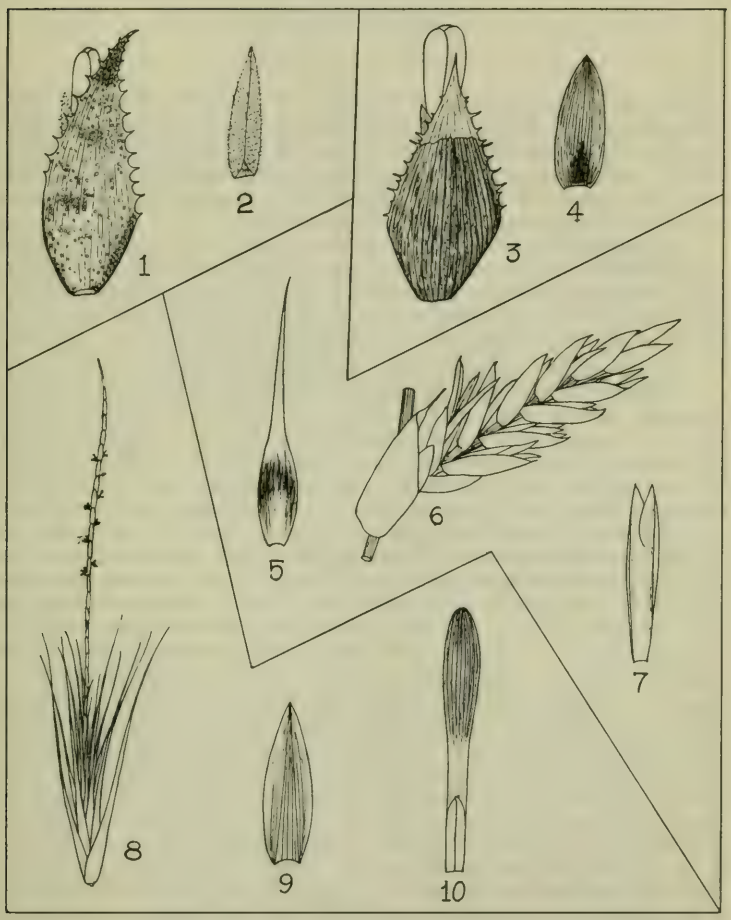


Plate II



A NEW TEXTBOOK ON THE FUNGI (1)

Harold N. Moldenke

Gäumann's splendid new book entitled "The Fungi" deals with four classes of fungi: the Archimycetes (4 families), the Phycomycetes (5 orders and 13 families), the Ascomycetes (14 orders and 40 families), and the Basidiomycetes (6 orders and 26 families). The bacteria and myxomycetes are excluded because the author does not regard them as true fungi.

It is the author's opinion that all fungi have developed from disturbances of the nutritional physiology of their algal ancestors, reducing them to a parasitic or saprophytic life. Their algal ancestors are thought to be the Siphonales, which gave rise to the oömycetes, and the Flagellata, which gave rise to the Phycomycetes, Ascomycetes, and Basidiomycetes.

Emphasis in the book is on morphological and developmental features and on the probable evolutionary relationships of the various groups. Since the emphasis is not purely taxonomic, it is, perhaps, not surprising that family names are given in some orders and not in others. One can only assume that the author means to imply that there is but a single family in such orders.

It is to be regretted that the author does not adopt the recognized standard ending of -ales for all the orders which he accepts. More and more taxonomic botanists in recent years are coming to discard the certain "exceptional" family names in the phanerogams which do not end in the standard termination of -aceae, and it is to be hoped that mycologists will soon follow suit in regard to these "exceptional" order designations. It is also to be regretted that family and other scientific group names are not always italicized. One finds the anomaly here of seeing family names, for instance, italicized when they occur in a sectional heading within a chapter, but given in ordinary roman type in the sentence immediately following and throughout the text. The present reviewer realizes that this limiting of italic type to names of generic or subgeneric rank in the body of a text is now quite common practice, yet he feels that it is inconsistent and unfortunate. If Agaricus is to be italicized as a scientific group name, as it is quite uniformly, then the words Agaricaceae and Uredinales ought also be italicized!

The 440 text figures are splendid, many representing habitat photographs, and make the book of more than passing interest even to the non-mycologist.

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(1) The fungi. A description of their morphological features and evolutionary development, by E. A. Gäumann. Translated from the German and arranged as an American text by F. L. Wynd; 420 pages, 440 figures. Hafner Publishing Company, New York, 1952, $10.

SEVEN SMALL PLANT COLLECTIONS IN COSTA RICA AND NEIGHBORING PANAMA

William A. Dayton

At varying intervals between February and July, 1943, under a grant from the Office of the Coordinator of Inter-American Affairs, six members of the U. S. Forest Service, Messrs. Arthur Bevan, Clarence A. Merker, William R. Barbour, John A. Scholten, Elbert L. Little, Jr., and I, were assigned to give technical advice to engineers of the Pan American Highway, chiefly in Costa Rica, and other United States officials and agencies working in that region. Two formal reports on this assignment were issued (12,13). Large numbers of wood samples, under the supervision of Mr. Scholten, timber engineer, were collected and a set submitted to the late Dean Samuel J. Record of the Yale University School of Forestry for identification. The main set of wood samples was deposited at the Forest Products Laboratory, Madison, Wisconsin.

Botanical material was collected from the timber trees from which the wood samples were made. The party, mostly as a sideline, collected (largely in multiple sets) 264 plant specimens, mostly of trees, in Costa Rica, including 31 specimens collected in the neighboring Chiriquí Province, Panama. In addition, Mr. William R. Barbour, the only member of the party to spend this entire period in Costa Rica, later (on two other missions) submitted to the Forest Service 34 additional specimens (chiefly timber trees) from that country.

The handling of all this botanical material and its distribution to various herbaria was entrusted to the writer, who served as dendrologist of this party during the last two and a half months of the period mentioned. The bulk of the identification work was done by Dr. Paul C. Standley of the Field (Chicago) Natural History Museum. Mrs. Agnes Chase, the late Dr. William R. Maxon, Dr. E. S. Luttrell, Prof. A. LeRoy Andrews, Mr. Edwin B. Bartram, and Dr. Hugh O'Neill have identified the (relatively few) grasses, ferns and fernworts, lichens, sphagnums, mosses, and sedges, respectively. Dr. Caroline K. Allen later checked the Lauraceae. The hearty thanks of our party are extended to these botanists for their generous and invaluable cooperation.

The main collection is deposited in the Field (Chicago) Natural History Museum, but a set of specimens correlated with wood samples has gone to Yale University. Other partial sets are deposited in the U. S. National Herbarium, the Forest Service Herbarium in Washington, the Museo Nacional in San José, the Tropical Forest Experiment Station at Rio Piedras, P. R., and several prominent herbaria in this country.

Evidently the flora of Costa Rica and of much of Panama is still imperfectly known. Costa Rica, with an area smaller than that of West Virginia, has well over 1,000 species of trees -- or about as many as the whole of the United States, and several hundred of these are economically important. Three-fourths of this Central American republic are in virgin, trackless and almost impenetrable forest and it is likely that members of our party were able to visit certain areas where no forester or botanist had hitherto traveled, so that our relatively small collections have, we believe, more than average scientific interest.

These seven collections, consisting of 298 specimens, are as follows:

1. The "1st (Forest Service) Costa Rica Collection," Forest Service serial nos. 95011 to 95024, incl.; Barbour's nos. 1001 to 1014, incl. Collected by William R. Barbour in February and March, 1943; 14 specimens, all trees.
2. The "2d (Forest Service) Costa Rica Collection," Forest Service serial nos. 95025 to 95069, incl.; Little's nos. 6001 to 6045, incl. Collected by Elbert L. Little, Jr., in February, 1943; 45 specimens, all trees or shrubs.
3. The "3d (Forest Service) Costa Rica Collection," Forest Service nos. 95070 to 95240, incl., including 2 intercalary numbers; Dayton's nos. 3001 to 3161, incl., including 12 intercalary numbers. Collected by William A. Dayton in whole or in part in May and June, 1943; 173 specimens, chiefly trees, shrubs or woody vines. Thirteen of these numbers were collected by Dayton jointly with William R. Barbour; 6 specimens were collected jointly by Dayton with C. A. Merker and J. A. Scholten; and 3 numbers were collected jointly by Dayton with C. A. Merker.
4. The "1st (Forest Service) Panama Collection," Forest Service nos. 95241 to 94271, incl.; Little's nos. 6046-8; 6051-63, and 6068-82. Collected in March, 1943, by Elbert L. Little, Jr., in Chiriquí Province, Panama; 31 specimens, all but 1 trees or shrubs.
5. The "4th (Forest Service) Costa Rica Collection," Forest Service nos. 95742 to 95758, incl.; Barbour's nos. 1015 to 1031, incl. Collected by William R. Barbour in the San Isidro Valley and in a paramo of the Sierra de la Muerte in September and October, 1943; 17 specimens, 5 of them timber trees.
6. The "5th (Forest Service) Costa Rica Collection," Forest Service no. 97100; no collector's no. Collected on behalf of the Forest Service by Sr. Amada Aguilar, Jan., 1945, in the vicinity of Turrialba.
7. The "6th (Forest Service) Costa Rica Collection," Forest Service nos. 98080 to 98093, incl. (with three intercalary nos.); Barbour's nos. 1032 to 1051, incl. (except 1035-1037). Collected by William R. Barbour (on furlough from the Forest Service) Jan.-Feb., 1946.

These seven small collections include 6 species new to science and 7 others possibly or probably new; 2 specimens of "campana," a tree which cannot yet be definitely placed botanically; and 1 family (Humiriaceae) and 2 genera new to North America. In addition to the new species, 15 species are not in Standley's Flora of Costa Rica (21) and several of the Panama plants may be first records for Panama. Quite a number appear to be range extensions, and many trees were observed much larger than Standley's Flora indicates. The list that follows is annotated briefly in cases where it is believed that our collections and notes have added something of interest to the record. The identifications, unless otherwise indicated, are by Dr. Standley. The left-hand numbers are those of the collectors (the 1000 sequence being Mr. Barbour's, the 3000 sequence those of the writer, and the 6000 sequence those of Dr. Little). The right-hand numbers are U. S. Forest Service Herbarium numbers. A prefixed "P" indicates a Panama plant; all others are Costa Rican. A prefixed asterisk (*) indicates that the species is not listed in Standley's Flora of Costa Rica. Abbreviations include: D.B.H., diameter breast high; fl., flowering; fr., fruiting; m., meters.

CRYPTOGAMS

As Standley's Flora of Costa Rica (21) does not include cryptogams none of the cryptogams named below are starred.

LICHENES
(Identified by Dr. E. S. Luttrell)

3143. Peltigera canina (L.) Willd. 95105
3070. Stereocaulon sp. 95096
3032. Sticta amplissima (Scop.) Rabenh. 95116
3031. " sylvatica (Huds.) Ach. 95117

BRYOPHYTA

MUSCI

SPHAGNACEAE
(Identified by Prof. A. LeRoy Andrews)

3060. Sphagnum meridense (Hampe) C. M. 95128 -- mixed with a (little S. magellanicum Brid.
3038. " " 95129 -- do.

DICRANACEAE
(Identified by Edwin B. Bartram)

3034. Dicranum frigidum C. M. 95107

ORTHOTRICHACEAE
(Identified by Edwin B. Bartram)

3066. Macromitrium serrulatum Mitt. 95113 --syn. M. verrucosum Bartr.

THUIDACEAE
(Identified by Edwin B. Bartram)

3057. Thuidium delicatulum (Hedw.) Mitt. 95112

SEMATOPHYLLACEAE
(Identified by Edwin B. Bartram)

3121a. Sematophyllum caespitosum (Swartz) Mitt. 95121

HEPATICAE

3033. An unnamed hepatic 95087

PTERIDOPHYTA
(Identified by the late Dr. William R. Maxon)

FILICALES

CYATHACEAE and Other Tree Ferns

The tree fern flora of Costa Rica is a rich one, but our party collected no material of these. A characteristic specimen is shown in Fig. 1. Fern tree trunk sections are used commonly in Costa Rica for growing orchids.

HYMENOPHYLLACEAE

3036. Hymenophyllum sp. 95099 --"sterile; not recognized" (W.R.M.).

POLYPODIACEAE

3120. Anogramma leptophylla (L.) Link 95132
3121. Cochlidium rostratum (Hook.) Maxon 95102 --intermixed (with a depauperate sterile specimen (of Elaphoglossum.
3037. Dryopteris denticulata (Sw.) Kuntze 95100 --"very depau- (perate" (W.R.M.).
3083. Polypodium moniliforme Lag. 95120 --"mixed with (a small species of Jamesonia" (W. (R.M.).
3047. " myriolepis Christ 95119
3022. " percussum Cav. 95118

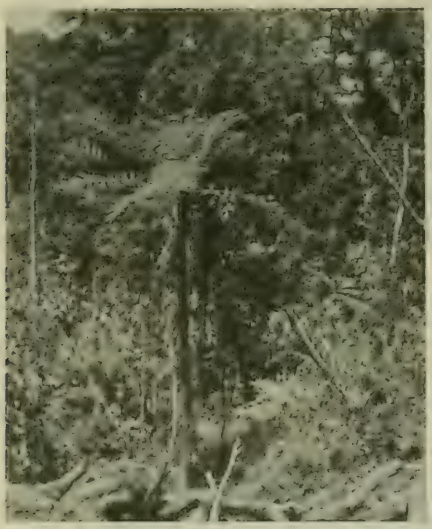

Fig. 1. A characteristic tree fern near route of Pan American Highway, Costa Rica. Photo by Wm. R. Barbour, 1943.

Fig. 2. Cleared pasture land near San Isidro del General. The bracken (Pteridium sp.) is mostly unmolested by the cattle, the palatability being low, as in the United States.

3035. Psilogramme villosula Maxon 95098
Pteridium sp.
Bracken was abundantly observed on cleared pasture land near San Isidro del General. Its palatability is low, as in the United States, and it is mostly unmolested by cattle. (Fig. 2).
3120a. Rhipidopteris peltata (Sw.) Schott 95101
3055. Vittaria filifolia Fée 95131

LYCOPODIALES

LYCOPODIACEAE

3074. Lycopodium contiguum Kl. 95111

SELAGINELLACEAE

3009. Selaginella poeppigiana (H. & G.) Spring 95124½ --"sens. (lat." (W.R.M.).

PHANEROGAMS

5. TAXACEAE

6030. Podocarpus montanus (Willd.) Lodd. 95045 --"Cipresillo"; "Cobola."

6. CONIFERAE

No conifers are native to Costa Rica and no material of this family was collected by our party. Two of the most commonly cultivated conifers are shown in Figs. 3 and 4.

19. GRAMINEAE
(Identified by Mrs. Agnes Chase)

Bambuseae

3075. Chusquea subtessellata Hitchc. 95070 --" particu- (larly fine specimen" (A. Ch.)

Festuceae

3140. Festuca tolucensis H. B. K. 95072
Abundant in patches near summit of Irazú, 3400 m.
3051. Poa annua L. 95078
Abundant in clearing, near Ojo de Agua, Copey oak formation, Cartago Province, 2900 m.

Fig. 3. San José housetops, with a pair of Norfolk-Island-pine trees (Araucaria excelsa R. Br.) to left of center. These stately evergreens, native to Norfolk Island (between New Zealand and the New Hebrides) are often planted in Costa Rican city parks and in front of churches.

Fig. 4. A windbreak of Bentham ("Mexican") cypress (Cupressus benthamii Endl.) at "Las Concavas," the estate of Mr. C. H. Lankester near Cartago.

Fig. 5. Pasture land in Guanacaste. The Coyol palms (Acrocomia vinifera Oerst.) are left standing, furnishing shade for cattle, which also greedily devour the fruits. Note the survival of the blood of the old Spanish "longhorns" in the animal at the right. Photo by John A. Scholten, 1943.

Aveneae

3139. Trisetum irazuense (Kuntze) Hitchc. 95081 --"exceptionally robust specimen" (A. Ch.).
Near summit of Irazú, 3400 m.

Agrostideae

3138. Agrostis tolucensis H.B.K. 95070
One of the most characteristic plants near summit of Irazú, 3400 m.

Paniceae

3130. Ichnanthus pallens (Swartz) Munro 95076 (=Panicum pallens Swartz)
3013a. Panicum maximum Jacq. 95074 --"Zacate de Guinea"
----. " polygonatum Schrad. 95073
----. " xalapense H.B.K. 95075
3110. Paspalum paniculatum L. 95077
3013b. Pennisetum purpureum Schumacher 95079 --"Yerba elefante."
3013c. Pseudechinolaena polystachya (H.B.K.) Stapf 95080

20. CYPERACEAE
(Identified by Dr. Hugh O'Neill)

3013d. Cyperus diffusus Vahl, var. tolucensis (H.B.K.) Kükenthal 95082 --"a common species on the edges of the mahogany forests in British Honduras and Guatemala" (H.O.). The species, not the var., is in Standley's "Flora of Costa Rica."

21. PALMAE

Nearly 100 species of palms are native to Costa Rica and many others are cultivated, but our party collected no botanical material of this group except an unidentifiable Geonoma. See Fig. 5.

32. BROMELIACEAE

3079. Puya dasylirioides Standl. 95122 --"still very rare in herbaria" (P.C.S.).
This bizarre plant, somewhat suggesting a cross between a century plant and a mullein, was collected by me on May 14 in a paramo near Dos Burros Peaks, Cerro de la Muerte, 3400 m. The dried fruiting stalks of the past season were still persistent,

and the great, succulent, clublike thyrses of the present year were sufficiently advanced to show that the flowers (which, so far as I know, have not been described), when they emerge, would have a rich larkspur-blue hue.

36. JUNCACEAE

3142. Luzula gigantea Desv. 95083

38. LILIACEAE

3030. Smilacina paniculata Mart. & Gal. 95126
Near Ojo de Agua Camp, Cartago Prov., 2900 m. May 13, fl. Not epiphytic here.
3135. Same as no. 3030. 95127
1023. do. 95745

40. AMARYLLIDACEAE

P 6081. Agave sp. 95241 --held personally by Dr. Little for further study. Possibly new.
3141. Bomarea acutifolia (Link & Otto) Herb. 95138
Near summit of Irazú, 3400 m.
3146. Same as no. 3141 95139 --"these two collections are somewhat different and may represent distinct species, but I cannot find any other name for either" (P.C.S.).
1021. Bomarea acutifolia (Link & Otto) Herb. 95742

50. ORCHIDACEAE
(Identified by Prof. Oakes Ames)

P 6082. Pachyphyllum muscoides (Kraenzl.) Schlechter 95263 -- (1st record for Panama. (=Orchidotypus muscoides Kraenzl.)
This specimen, with its notes, is, I presume, now in the possession of Prof. Ames. I have no record here of the data except that it was collected by Dr. Little Mar. 7, fl., in Chiriquí Province.

53. PIPERACEAE

6021. Piper irazuanum C. DC. 95044
Macho Cap Camp, 39 kilom. s. of Cartago, 2500 m., cloud (oak) forest. Dr. Little reports it as a small tree 4.6 m. high with a 5-cm. D.B.H., the flowers whitish green.

56. SALICACEAE

The Humboldt willow (Salix humboldtiana Willd.) is the only willow in Costa Rica. It is difficult to believe it is not native to the country; if not native, it is thoroughly naturalized. Dr. C. R. Ball tells me that Salix chilensis Molina (to which this species is sometimes referred) is a nomen ambiguum and that it is doubtful if it is a willow at all. We collected no botanical material of this willow. See Fig. 6.

57. MYRICACEAE

6018. Myrica pubescens Willd. 95037
Macho Gap Camp, 39 kilom. s. of Cartago and 5 kilom. n. of Copey, 2500 m., cloud (oak) forest, 6 m. high, 1 dm. D.B.H. Dr. Little reports the bark as whitish. Feb. 18, fl.

61. BETULACEAE

6037. Alnus acuminata H.B.K. 95026 --"Jaul." Dr. (Little reports this tree, collected (near summit of Cerros de Escazú, (San José Province, as 15 m. high, (with a D.B.H. of 4.5 dm.

62. FAGACEAE

* 6010. Quercus aáata C. H. Mull. 95046 --"Roble." Leaves (3 to 5 cm. long, oblong type, some- (what glaucous, rather coriaceous, (apices rounded.

6035. Quercus aáata C. H. Mull. 95054
Leaves of a lanceolate type, acuminate, about 7.5 cm. long.

6038. Quercus aáata C. H. Mull. 95060
Leaves oblong-lanceolate, mostly conspicuously toothed, acuminate, about 9 cm. long, relatively thin.

3153. Quercus aáata C. H. Mull. 95224
Just above Robert's finca, road up Irazú, 2900 m., assoc. with Q. irazuensis and Buddleia alpina. Tree 22 m. high, 4.5 dm. D.B.H., no acorns found (June 20).

6009. Quercus borucasana Trel. 95052

* 6001. Quercus copeyensis C. H. Mull. 95048 --"Roble."
6002. " " 95049
6003. " " 95057
6004. " " 95058
6005. " " 95050
6008. " " 95051
6039. " " 95053
3084. " " 95223 --Near Ojo de Agua.

Fig. 6. Humboldt willow (Salix humboldtiana Willd.) at Las Concavas, the estate of Mr. C. H. Lankester near Cartago.

Fig. 7. A stand of veteran Copey oaks (Quercus copeyensis C. H. Mull.). Mr. Arthur Bevan, former Director, Tropical Forest Expt. Sta., U. S. Forest Service, stands at base of tree in foreground. Photo by Wm. R. Barbour, 1943.

((Mills Co.) Camp, Pan American Highway,
(2900 m. Tree 28 m. high, 7.6 dm. D.B.H.
(May 15, fr.

Quercus copeyensis was published by Muller (July, 1942) to cover the type (but not "isotype") material of Q. costaricensis Liebm., forma kuntzei Trel., together with three sheets of Costa Rica and one sheet of Panama material. The description of Q. costaricensis (and possibly also of Q. endresi Trel.) in Standley's Flora of Costa Rica probably embraces Q. copeyensis as well. Muller describes this tree as "15 m. in height or taller." It seems likely that, until the U. S. Army engineers extended the route of the Pan American Highway into the high elevations in Costa Rica where this oak occurs in an almost pure stand and reaches its optimum development, this species was known only from a few scattered botanical specimens and from outlying locations. Certainly there is no hint in the references mentioned that this is, in some ways, one of the most remarkable oaks in the world (14,21). Messrs. Bevan, Barbour and Little were probably the first foresters and botanists to see this unique forest (2,5,7,8). I proposed in 1943 the English name "Copey oak" for this species; the Spanish equivalent would, I presume, be roble de Copey or, simply, roble Copey. So far as I have been able to ascertain the first published references to this Copey oak forest are by Thompson (24) Aug. 15, 1943, and by Carter (6)Aug. 26, 1943, followed shortly by more detailed accounts by Barbour (2) Sep. 1, 1943, and by Bevan (5) October, 1943. Barbour reports having measured a Copey oak 36.5 m. high with a 2.5 m. D.B.H. He indicates that extensive areas will run 20,000 board feet to the acre, and that individual acres will run at least 60,000 board feet each. Bevan refers to this Costa Rican Copey oak forest as "perhaps the largest single stand of oak timber in the world." The largest specimens he says are 38 m. or more tall, heavily buttressed at their bases to a height of 3 to 4 m. above ground, with a diameter of from 2 to 2.5 m. above the buttresses, and extending 25 m. to the first limb. The immense size of the individual trees in a veteran stand of this sort is hard to realize unless one sees a man or some other comparable object beside one of these giant oaks (see Fig. 7). Bevan aptly dubs this forest "the ancestral home of the gremlins," an illusion to the weird light effects and swirling mists which give this type of cloud forest an almost unearthly and "spooky" appearance. Thompson (op. cit.) refers to my opinion that this oak may prove to be the largest oak in the world, surpassing in size the valley oak of California and the white oak of eastern North America.

Miss Waterman (26) found the extractive of the heartwood toxic to two wood-decay fungi. The Forest Products Laboratory, Madison, Wisc., placed the wood intermediate between that of white and live oaks in hardness. The wood is durable (19).

Vogt (25) has guardedly alluded to the subject of selfish (mostly foreign) promotion interests looking toward wholesale commercial exploitation of this unique forest. At the time when former Vice President Wallace visited Costa Rica in March, 1943, Mr. Bevan tells me that he personally accompanied the Vice President in a visit to Sr. Montealegre, the Costa Rican Ministerio de Agricultura, at which time the subject of preserving a screen of this forest along the Highway, in the form of a national park, was discussed. I have a letter, dated Oct. 22, 1943, from Dr. Jorge León, Botanist of the Museo Nacional in San José, in which he states that Sr. Montealegre has appointed him a member of a commission of six conservation-minded persons "para estudiar las formas y medios necesarios para conservar nuestros bosques." It is to be hoped that some effective measures may be adopted to preserve a part of this unique forest from destruction, including at least a fringe of these oaks where the Pan American Highway transects the forest. Fig. 7.

6011. Quercus eugeniaefolia Liebm. 95055
6045. " " 95056
3154. " irazuensis Kuntze 95225

Above Roberts' finca, road up Irazú, 2900 m., assoc. with Q. aáata and Buddleia alpina. Tree 15 m. high, 3 dm. D.B.H.; no acorns found (June 20).

1013. Quercus oocarpa Liebm. 95021
6036. " " 95059
P 6055. " " 95267

The leaves of this sp. somewhat suggest that of the U. S. Q. mühlenbergii. Mr. Barbour reports that this species is locally considered the best of the oaks; wood durable and extremely hard, suitable for general construction.

P 6054. Quercus seemannii Liebm. 95268

Wood sample taken. Tree 30 m. high, 8 dm. in diameter above the buttresses.

63. ULMACEAE

P 6060. Chaetoptelea mexicana Liebm. 95243 (syn. Ulmus mexicana (Liebm.) Planch.). "Cenizo"; ("Tirra"; "Mexican elm."

P 6074. Chaetoptelea mexicana Liebm. 95244
P 6076. " " 95245

This species is so thoroughly elmlike in all respects except as to the wingless nutlets, that I personally would prefer to keep it in Ulmus. Miss Waterman (26) found the heartwood extractive very toxic to the growth of two wood-decay fungi.

64. MORACEAE

3019. Coussapoa donnell-smithii Mildbr. 95166

95. MAGNOLIACEAE

3050. Drimys winteri Forst. 95162 --"Quiebra-(muelas"; "Muelo"; "Wintersbark."

The silvery under-surfaces of the leaves make this tree a conspicuous object in the dark highland forests it inhabits; the pungent reddish inner bark is also highly diagnostic. Collected in cloud (oak) forest type, 2900 m., near Ojo de Agua (Mills Co.) Camp, Pan American Highway.

6029. Drimys winteri Forst. 95043 --"Quiebra-muelas."

Near Camp Empalme, along Pan American Highway, Cartago Province. The material, collected February 15, is in immature fruit. Dr. Little reports this tree as 15 m. high, 3 dm. D.B.H.

6028. Magnolia poasana (Pittier) Dandy 95041

Lt. Childs, Medical Corps, U.S.A., informs me that Dr. León, of the Museo Nacional, San José, states that use of the vernacular name "Candelillo" for this single native Costa Rican magnolia is erroneous.

98. ANNONACEAE

3044. Rollinia microsepala Standl. 95226 --"the second (collection" (P.C.S.). "Anona."

Hills 5 miles s. of Siquirres, Limón Province, 152 m. Tree 28 m. high, 7 dm. D.B.H., 14 m. usable length; wood sample taken.

99. MYRISTICACEAE

3160. Compsoneura sprucei (A. DC.) Warb. 95208

The nutmeg-like fruits are reported to be used locally as a substitute for nutmeg, but they seem to me to lack aromatic properties.

3003. Virola koschnyi Warb. 95238 --"Fruta dura-da."

Hills above Las Palomas, Limón Province, 730 m.; wood sample taken. May 6, fl. Third collection record?

1015. Virola sebifera Aubl. 95758
1042. " " 98091

102. LAURACEAE
(Identification by Dr. Caroline K. Allen)

6012. Aiouea costaricensis (Mez) Kostermans 95038 (syn. (Bellota costaricensis Mez); "Ira (rosa." Near Camp Empalme, along (Continental Divide 29 kilom. s. of (Cartago. Dr. Little reports this a (tree 18 m. high, with 2.5 dm. D.B.H.

6023. Aiouea costaricensis (Mez) Kostermans 95040

3126. Beilschmiedia austin-smithii (Standl.) Allen (?) 95218- ("Bolador." (Syn. Persea austin-smithii (Standl.). About 5 kilom. from San Isidro del (General, San José Province, 825 m. Large (tree; bark smooth, light gray; wood sample (taken. "Need flowers or fruit" (C.K.A.). (This species known hitherto only from the type (locality, Palmira, Alajuela Province (1,21). (Apparently a range extension and a second (record for the species.

* 1032. Licaria excelsa Kostermans 98084½ --apparently 2d (Costa Rica record. Specimen deposited in (U.S. National Herbarium.

1040. Nectandra brenesii (Standl.) Allen 98085 (syn. Ocotea (brenesii Standl.)

3123. Nectandra concinna Nees 95211 --"Colorado."

* 1012. Nectandra cufodontisii (O.C.Schmidt) Allen (?) 95017-- ("possibly" (C.K.A.) or "possibly" N. sinuata (Mez (as Standley identified it). "Quizarrá (zopilote." About 915 m., 6.5 kilom. east of (Turrialba. Mr. Barbour reports this a tree (15 m. high, 2.5 dm. D.B.H. May 21, fl.; flow- (ers yellowish white. Wood sample taken; wood (first quality for general use.

P 6047. Nectandra whitei (Woodson) Allen 95253 (syn. Ocotea (whitei Woodson). "Bambito"; "Bambito colora- (do." Eight kilom. n. of Camp El Volcán, (Chiriquí Province, 1830 m. Dr. Little reports (this a tree 28 m. high, 4.5 dm. D.B.H., 18 m. (clear. March 2, fl. Fruit greenish, 32 mm. (long, including the cup. Wood reddish; sample (taken.

P 6056. Nectandra whitei (Woodson) Allen 95254
Three kilom. n. of Camp El Volcán, Chiriquí Province, 1310 m. Dr. Little reports it a large tree 37 m. high, 9 dm. D.B.H. March 3, immature fruit.

P 6062. Nectandra whitei (Woodson) Allen 95252 --"Sigua amarilla."
Same location as above. Reported by Dr. Little to be a tree 37 m. high, 9 dm. in diameter above the buttresses 3 m. above the ground; 18 m. clear. March 3, immature fruit.

P 6069. Nectandra whitei (Woodson) Allen 95259 --same site as above.

1019. ? Nectandra sp. 95753 --"Arenillo." (Material sterile. "Probably Nectan- (dra sp., but I am unable to place it (definitely" (P.C.S.).

* 3124. Ocotea atirrensis Mez & J.D. Smith 95214 --"Tiquis- (saró." About 5 kilom. toward La (División from San Isidro del General, (825 m. Large tree with smooth gray (bark; wood sample taken. Associated (with bolador, chancho blanco, colo- (rado, comenegro, etc. Flowers and (fruit not seen.

* 6007. Ocotea austinii Allen (1) 95042

Near Camp Empalme, about 29 kilom. s. of Cartago, San José Province. Fruit about 2 cm. long; leaves distinctly petiolate. Reported by Dr. Little as a tree 18 m. high, 3 dm. D.B.H. Wood sample taken.

1011. Ocotea palmana Mez & J.D. Smith 95018 --"Ira zopi- lote."

About 6.5 kilom. east of Turrialba, over 915 m. Mr. Barbour reports this a tree 18 m. high, 2.5 dm. D.B.H., 9 m. clear. Wood sample taken; first-quality wood for general use.

3093. Ocotea veraguensis (Meissn.) Mez 95212 --"Quizzará." ("This is one of the few Central Amer- (ican Lauraceae that can be named with (complete confidence" (P.C.S.).

P 6078. Ocotea sp. 95261 --"Sigua canel- la."

Three kilom. north of Camp El Volcán, Chiriquí Province. Uncommon. Dr. Little reports this a tree 40 m. high, 11.7 dm. in diameter above buttresses (2.5 m. above the ground). Wood sample taken. "Need flowers or fruit" (C.K.A.).

P 6057. Persea rigens Allen 95255 --"Pizarrá."

Leaves much larger (about 3 dm.) and differing in form (oblong-lanceolate and acuminate) from those of no. 6058. Three kilom. north of Camp El Volcán, Chiriquí Province, 1310 m. Dr. Little reports this a tree 12 m. high, with a 1.5 dm. D.B.H. Previously determined by Standley as P. pallida Mez & Pittier.

P 6058. Persea rigens Allen 95256

Same site as above. Leaves coriaceous, crisp, oblong, acute, 3.5 cm. long. A larger tree than no. 6058, 9 dm. in diameter above buttresses (2.5 m. above ground); 12 m. clear. March 3, immature flowers. Previously determined by Standley as P. pallida Mez & Pittier.

P 6075. Persea rigens Allen, sp. nov. 95265 —THE TYPE (1). "Pizarra."

Same site as above. Dr. Little reports it a tree 27 m. high; wood sample taken. March 5; no flowers nor fruit seen.

P 6059. Persea rigens Allen 95257 —"Bambito colorado."

About 3 kilom. north of Camp El Volcán, Chiriquí Province, 1310 m. Dr. Little reports it a tree 34 m. high, 6 dm. in diameter above the buttresses at 2 m. March 3, immature flowers.

* 1033. Phoebe amplifolia Mez & J.D. Smith 98085½ —apparently a second Costa Rica record. Specimen deposited in U.S. National Herbarium.

105. CRUCIFERAE

3150. Lepidium costaricense Thell. 95109

117. SAXIFRAGACEAE

1025. Ribes ciliatum Humb. & Bonpl. 95754

The leaves of Mr. Barbour's material (all of which is at the Chicago Museum) are, as I recall, considerably larger than the maximum of "2 cm. long" indicated in Standley's Flora of Costa Rica.

119. BRUNELLIACEAE

6031. Brunellia costaricensis Standl. 95069
6032. " " 95035

Near Camp Empalme, along Pan American Highway, at 2225 m., cloud forest (oak) type. Dr. Little reports this tree to be about 18 m. high, with a 3 dm. D.B.H.

120. CUNONIACEAE

6006. Weinmannia pinnata L. 95067 —"Lorito"; ("Arrayán"; "Mora."

Near Camp Empalme, about 29 kilom. south of Cartago, San José Prov., 2225 m. Dr. Little reports this tree to be 26 m. high, 3.5 dm. D.B.H.; usable length 14 m.; Wood sample taken. The maximum height indicated for this sp. in the Flora of Costa Rica is 6 meters.

6014. Weinmannia pinnata L. 95068 —"Arrayán mora."

126. ROSACEAE

ROSOIDEAE

Sanguisorbeae

3061. Acaena cylindrostachya Ruiz & Pavon 95084
3088. Alchemilla pascuorum Standl. 95124
3151. " " 95085

Rubeae

3063. Rubus glaucus Benth. 95123 --"the fruit of (this is, I think, the best of its (genus" (P.C.S.).

PRUNOIDEAE (family AMYGDALACEAE of some authors)

P 6080. Prunus annularis Koehne 95262 --"Mamey." 1st (record for Panama? 3 kilom. north of Camp (El Volcán, Chiriquí Prov., 1310 m. Dr. (Little reports this as 33.5 m. high, with (4.5 dm. D.B.H., 18 m. clear. Wood sample (taken. March 5, no flowers nor fruit. The (maximum known height of this species in (Costa Rica noted in the Flora of Costa Rica (is indicated as 9 m.

128. LEGUMINOSAE

MIMOSOIDEAE (family MIMOSACEAE of some authors)

Ingeae

3097. Albizia adinocephala (Donn. Smith) Britt. & Rose 95134
About 5 kilom. south of Nicoya, Guanacaste Prov., 245 m. Tree 9 m. high, 2 dm. D.B.H. Wood sample taken. The generic name is ordinarily spelled Albizzia. Although Durazzini definitely states that the eponym of this genus is the Chevalier Filippo degl' Albizzi, his original spelling of the genus is consistently Albizia and he evidently preferred that orthography.

* 1008. Inga barbourii Standl., n. sp. (23) 95013 --"Guaba." (About 6.5 kilom. east of Turrialba, over (915 m. Mr. Barbour reports this a tree (32 m. high, with 4 dm. D.B.H., 14 m. (clear.

1010. Inga biolleyana Pittier 95014
Same locality as no. 1008 above. Mr. Barbour reports this a tree 37 m. high, 3.5 dm. D.B.H., 18 m. clear.

P 6053. Inga leptoloba Schlecht. 95240 --"Guaba." Wood sample taken.

1045. " " 98084

3128. Inga multijuga Benth. 95188 --"Guaba."
Near San Isidro del General, 760 m. Tree 15 m. high, with smooth gray bark; size up to 6 dm. D.B.H. Leaflets shiny above; pod about 18 cm. long, flattened, septate, with sharply raised margins.

3018. Inga pittieri Micheli (?) 95186 --sterile; "uncertain in this condition" (P.C.S.).

3114. Inga spectabilis (Vahl) Willd. 95187 --"no uncertainty about this one, for no other species has leaves like these" (P.C.S.).

3099. Lysiloma desmostachys Benth. 95203 --1st definite record for Costa Rica? This tree was in full bloom when collected (May 25; limestone formation about 5 kilom. south of Nicoya, 245 m.). The tree deserves cultivation as an ornamental. The flowers, in profuse spiciform clusters, have a rich aniselike scent, a matter I do not recall having seen mentioned in literature. Wood sample taken.

3017. Pithecellobium longifolium (Humb. & Bonpl.) Standl. 95185

3113. " " 95220
Along stream near Wunderlich Camp, San Isidro del General, San José Prov., 610 m. June 9, fr., the pods strongly falciform.

1014. Pithecellobium racemiflorum Donn. Smith 95019 --"Chaperno."
About 6.5 kilom. east of Turrialba, over 915 m. Mr. Barbour reports this a tree 28 m. high, with 4.5 dm. D.B.H., 9 m. clear. May 21, fl.; flowers white. Wood sample taken; wood second-quality for general uses.

3024. Pithecellobium saman (Jacq.) Benth. 95130 --"Cenízero." (syn. Samanea saman (Jacq.) (Merrill)
The name of this genus is usually misspelled Pithecolobium or Pithecollobium, both of which forms are contrary to the original spelling and obscure the etymology (10).

Acacieae

* 3002. Mimosa (?) 95207 --"Cascha." "I cannot run this down in Standley's key in his Flora of the Panama Canal Zone (20) nor match it with descriptions in his Flora of Costa Rica (21). Does Leucaena ever have bipinnate leaves" (W.A.D., 5/22/43). "I have checked this carefully against all the Central

(American Mimoseae, and it is not any species (known from the region. It is no known species (of Leucaena, and the flowers are racemose, not (capitate as in that genus. By exclusion it is (almost necessary for it to be placed in Mimosa, (but pods are necessary for complete determina- (tion" (P.C.S., 8/19/43). Of the wood the late (Prof. Record says (6/7/44) "I cannot match (it." Near Siquirres, Limón Prov., 65 m. Un- (armed tree; white flowers, the 10 stamens with (free filaments.

Adenanthereae

1048. Stryphnodendron excelsum Harms 98089
El General Valley. Third collection known? The late Prof. Record intimates that this is the first time a wood sample of this genus and species has been obtained.

CAESALPINOIDEAE (family CAESALPINIACEAE of some authors)

3098. Caesalpinia eriostachys Benth. 95142 —"Saena."
Near Nicoya, Guanacaste Prov., on limestone ridge. Furnishes a hard wood.
1006. Cassia grandis L. f. 95011 —"Carao."
1051. Prioria copaifera Griseb. 98086 —"Cativo."

PAPILIONATAE (family FABACEAE of some authors)

Sophoreae

* 3127. Ormosia toledoana Standl. (?) 95215 —"probably" (P.C.S.).
About 1.6 kilom. north of San Isidro del General, 760 m. Tree with smooth gray brown bark (larger trees with cinnamon-colored bark). Tree 22 m. high, with 2.5 dm. D.B.H., 6 m. clear; sizes up to 1.2 m. D.B.H. No flowers nor fruit seen. Wood sample taken. The late Prof. Record (6/7/44) reported: "No. 3127 is not Ormosia, but so far I have not been able to place it."
1003. Sweetia panamensis Benth. 95022 —"Guayacan"; "Carboncillo."
Puntarenas Province, highway west of Buenos Aires, 275 m. Mr. Barbour reports this a tree 15 m. high, 3 dm. D.B.H., 6 m. clear; sizes up to 6 dm. D.B.H.; wood very strong, hard, durable, suitable for general construction; wood sample taken.
3092. Sweetia panamensis Benth. 95237
Five kilom. northwest of Nicoya, 275 m. May 24 (no flowers nor fruit). Tree 12 m. high, 2.5 dm. D.B.H.

Genisteae

3137. Lupinus aschenbornii Schauer 95110
Near summit of Irazú, 3400 m. June 20, both in flower and in pod.

Dalbergieae

3096. Dalbergia retusa Hemsl. 95160 --"Cocobola."
"Specimens of these important trees are still very much to be desired from Central America. They accumulate so slowly and the taxonomy is still unsettled" (P.C.S.).

3106. Dalbergia retusa Hemsl. 95161

----. Dipteryx panamensis (Pittier) Record ----- (syn. Coumarouna panamensis Pittier). See Fig. 8. This tree (positively identified for us by Dr. Standley on the basis of notes, old fruit, and photographs) was observed by our party near Siquirres. None of us being steeplejacks we were unable to get foliage for botanical purposes. The local people say these trees have to be "burned down" to get rid of them. Standley (1928) has an excellent natural-size photograph (20, pl. 39) of the pods and part of a pinnate leaf of this species.

3095. Lonchocarpus minimiflorus Donn. Smith 95192 --"Chaperno."
Five kilom. south of Nicoya, 245 m. Tree 9 m. high, with 1 dm. D.B.H. May 25, fl.

3023. Platymiscium pinnatum (Jacq.) Dugand (?) 95222 --(syn. P. polystachyum Benth.). "Sangrillo." Material very fragmentary, - all that could be obtained with the wood sample.

3043. Platymiscium pinnatum (Jacq.) Dugand (?) 95221 --"Sangrillo." Material sterile ("probably" this sp., fide P.C.S.). Five kilom. south of Siquirres, Limón Prov., 125 m. Tree 23 m. high, 6 dm. D.B.H.; 9 m. clear; wood sample taken.
Under the name "cristobal" the wood of this tree is much used in San José and elsewhere for flooring and interior finishing.

1005. Pterocarpus hayesii Hemsl. 95020
1 kilom. north of Las Cañas, Guanacaste Province.

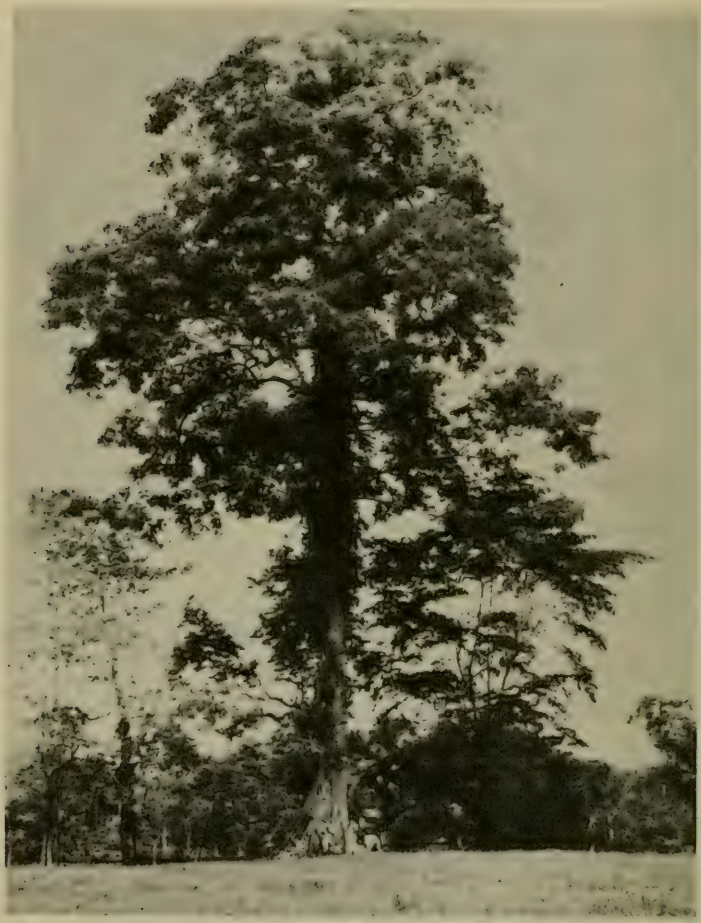

Fig. 8. Giant "Almendro" tree (Dipteryx panamensis (Pitt.) Rec.) near Siquirres, Costa Rica, elev. about 60 m., tropical rain forest. Members of the party standing at base of tree. To the right (stooping over) is a peon searching for the hard, nut-like pods of this tree, which contain coumarin (a vanilla substitute). This tree, and another one similar to it, have been left in this cleared pasture, as the wood is reported to be so hard it is impracticable to cut or saw the tree down. Photo by John A. Scholten. May 7, 1943 (U.S.F.S. For. Prod. Lab. no. M48387F).

Mr. Barbour reports this as a tree 12 m. high, with 2.5 dm. D.B.H., "loaded with waferlike fruits" (collected Apr. 14).

P 6048. Pterocarpus hayesii Hemsl. 95266 --"Pizarró."

Phaseoleae

----. Erythrina spp. -----

These shrubs and trees are very common in Costa Rica. See Figs. 9 and 10.

129. GERANIACEAE

* 3082. Geranium bolivarianum Dayton, nom. nov. 95086 --1st (record for North America.

Geranium cucullatum H.B.K., Nov. Gen. Sp. Pl. 5: 231. 1821.

Not G. cucullatum L. (Sp. Pl. 677. 1753) which is a synonym of Pelargonium cucullatum (L.) Ait. (Hort. Kew. 2: 426. 1789).

"When I first saw this (specimen) I was sure it was a new species, but now I am unable to separate it from Geranium cucullatum H.B.K. of the Colombia Andes. At any rate, it is a remarkable addition to the flora of North and Central America - another of the characteristic paramo plants" (P.C.S.).

Near summit of Dos Burros Peaks, Cerro de la Muerte, over 3400 m. (see Fig. 14). May 14, fl. A small spreading herb with rather showy purplish flowers. Collected in intermittent rains; I had no place to put the plants at the time except a pocket and, unfortunately, all but one of my specimens had to be discarded.

Geranium cucullatum H.B.K. is a homonym and needs a new name. The type locality of this species is from the Colombian Andes near the famous Bolivarian battlegrounds of Jenay (Feb. 2, 1821) and Bombona (Apr. 7, 1822), which battles occurred about the time this species was published. I have thought it not inappropriate to rename the plant after the illustrious "Libertador," Gen. Simon Bolivar, the founder of Nueva Granada (now Colombia) and who lies buried in that country.

130. OXALIDACEAE

3056. Oxalis vulcanicola Donn. Smith 95115

133. HUMIRIACEAE

Fig. 9

Fig. 10

Figs. 9 and 10. Poró (Erythrina rubrinervia H. B. K.). Used commonly as "living fenceposts." Fig. 9 (photo by John A. Scholten) taken in the city of San José near airport. Fig. 10 taken on road up Irazú.

* 3004. Humiria sp. 95189 --"Campana." Ori-
(ginally identified by Standley as "Lapla-
(cea? or Theaceae?"

Hills above La Florida, Limón Province, 230 m. Tree 18 m. high, with 3 dm. D.B.H.; wood sample taken. Assoc. with bernabé, pejiballito, pilón, and plomillo. See note on next specimen (3041).

3041. Humiria sp. 95190 --"Campana." Ori-
(ginally identified by Standley as "Lapla-
(cea? or Theaceae?"

Hills 6.5 kilom. south of Siquirres, Limón Province, 150 m. Tree 25 m. high, with 7 dm. D.B.H.; 12 m. clear; wood sample taken. This specimen, apparently identical with the preceding number (3004), both of which are unfortunately sterile, represents an important timber of Costa Rica. On preliminary examination of the wood, Prof. Record thought it is of Theaceae, but Dr. Standley says: "I still am unable to place this" and states that he knows of nothing in Theaceae to match it. Later (May 25, 1944) Dean Record wrote me: "Dayton & Barbour 3004 (F.S. No. 95189) and Merker, Scholten & Dayton 3041 (F.S. Ser. No. 95190) are both Humiria! Standley says: 'Both of the specimens are sterile and can't be described as new, which I presume they are.'" (18).

* 3129. Vantanea barbourii Standl. (22) 95235 --"Ira chiricana."

See Standley (22) and Barbour (3,4); also Figs. 11 and 12. I recognized this as a Vantanea and requested Mr. Standley, if it proved new (as I suspected), to name it in honor of Mr. Barbour, who had been interested in it for some months. This important bridge timber of the San Isidro valley, hitherto unknown to science, represents a genus and family new to the North American flora.

Type locality: 1.6 kilom. north of San Isidro del General, 0.8 kilom. west of Pan American Highway right-of-way, San José Province. Gentle southern slope, 760 m., rain forest type, clayey loam; growing in patches with alasán, guaba, etc. Tree 22 m. high, 3 dm. D.B.H.; 12 m. clear; sizes up to over 30 m. Bark brownish gray with longitudinal fissures. Strongest wood in this locality (apparently getting scarcer), used for heavy construction; pits in scalariform arrangement; wood sample taken. June 11, late fl. and early fr.

1018. Vantanea barbourii Standl. 95756 --in fruit. "The
(name 'níspero' was given locally, and
(seems to be used south of Rio Hermosa"
((W.R.B., Oct., 1943).

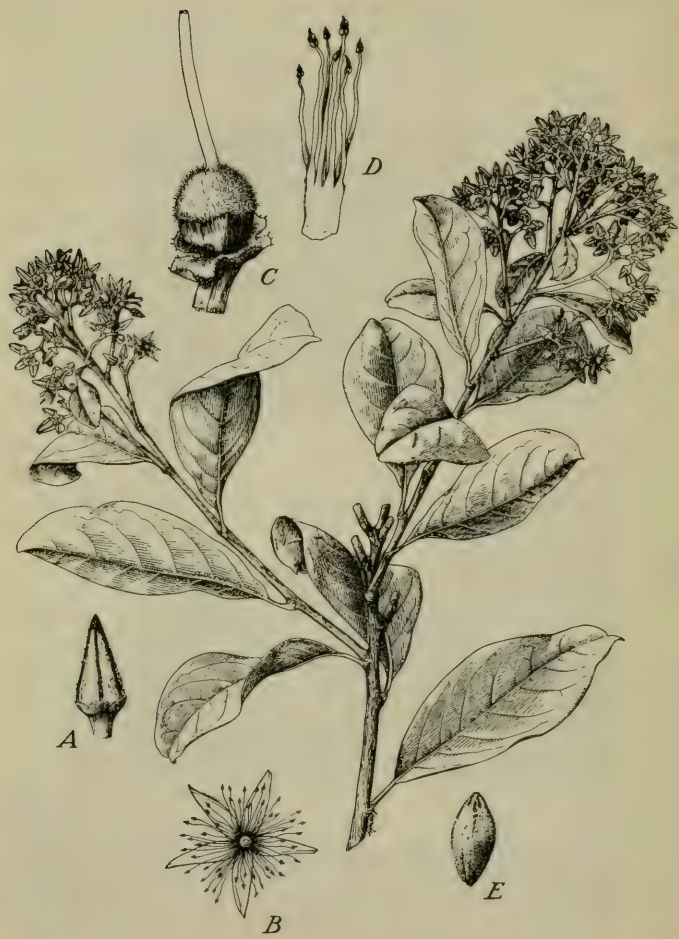

Fig. 11. Vantanea barbourii Standl. Habit drawing, ½ natural size. A, flower bud, x 3; B, flower, x 2½; C, calyx, receptacle, ripening ovary, and style, after caducous petals have fallen, x 2½; D, group of stamens with basal connective, x 2½. E, fruit, about x 2/3. Drawing by Miss Leta Hughey, U.S. Forest Service. All but "E" based on isotype in U. S. Forest Service Herbarium.

139. BURSERACEAE

3025. Protium sessiliflorum (Rose) Standl. 95171
Hills above La Florida, Limón Province, 230 m. Height of tree 12 m., 5 dm. D.B.H.
1047. Simaruba glauca DC. 98088

140. MELIACEAE

3042. Carapa guianensis Aubl. 95144 --"Cedro macho."
Above Siquirres, Limón Province.
1049. Carapa slateri Standl. 98081 --"Cedro macho."
P 6077. Cedrela tonduzii C. DC. 95242 --"Cedro"; "Spanish-cedar." "The best material I have seen of this very distinct species" (P.C.S.). 1st record for Panama?
Three kilom. north of Camp El Volcán, Pan American Highway, Chiriquí Prov., 1310 m. Dr. Little reports it a tree 43 m. high, 11 dm. D.B.H., crown 25 m. high and 15 m. wide. Wood sample taken. March 5; flowers white.
6024. Guarea excelsa H.B.K. 95032
Near Camp Empalme, Cartago Province, 2225 m. Dr. Little reports this a tree 21 m. high, with a 38 cm. D.B.H.; wood sample taken.
3100. Trichilia hirta L. 95172
1050. Trichilia propinqua (Miq.) C. DC. 98090 --fr.

143. VOCHYSIACEAE

1038. Vochysia ferruginea Mart. 98092 --fr.
1043. " " " 98093 --fr.
3001. Vochysia hondurensis Sprague 95240 --"Chancho"; "Magnolia."
1007. Vochysia (?) 95024 --"no species known to Central America" (P.C.S.). "Chancho colorado." Mr. Barbour reports this a tree 31 m. high, 7 dm. D.B.H., 15 m. clear; size up to 7 dm. D.B.H. Wood sample taken; "second-quality general timber."

147. EUPHORBIACEAE

3158. Croton gossypiifolius Vahl 95175 --"Tagua."
Reported as a balsa substitute. Wood sample taken. Up to 15 m. high.
3119. [??Croton --W.A.D.] 95205 --a very striking and rather common low forest shrub, with leaves brilliantly bluish on the under surfaces. "I am disgusted that I am un-

(able to place this, but I can't imagine
(where it is to be referred" (P.C.S.).

1004. Hieronyma alchorneoides Allemão 95012 —"Zapatero."
On highway west of Buenos Aires, Puntarenas Province, 275 m. Mr. Barbour reports this a tree 28 m. high, 6 dm. D.B.H., 15 m. clear, "good general-utility wood."

3006. Hieronyma alchorneoides Allemão 95178 —"Pilón."
(Wood sample taken.

3122. Hieronyma oblonga (Tulasne) Muell. Arg. 95179 —"Come-
(negro." About 5 kilom. from San Isidro
(del General, 825 m. Tree 18 m. high,
(with 25 cm. D.B.H. and usable length of
(6 m. Wood dark reddish brown, utilized
(locally. Sample taken.

6040. Hieronyma poasana Standl. 95027
Near summit of Cerros de Escazú, 2165 m. Dr. Little reports the tree as 12 m. high.

6042. Sapium pachystachys Schum. & Pitt. 95030
Near summit of Cerros de Escazú, 2165 m.; tree 11 m. high with 3 dm. D.B.H. Dr. Little reports the flowers as greenish. Pittier (15) has called attention, chiefly as a result of his Costa Rican experiences, to the desirability of studying the Central American species of Sapium as possible sources of rubber.

1034. Sapium thelocarpum Schum. & Pitt. 98087

165. SAPINDACEAE

3094. Cupania guatemalensis Radlk. 95158
Dr. Jorge León, formerly of the Museo Nacional in San José, tells me this tree is sometimes known by the vernacular name "Tarzana."

3104. Cupania guatemalensis Radlk. 95159

174. TILIACEAE

3046. Belotia panamensis Pittier 95170 —2d record
(for Costa Rica? Ojo de Agua (Mills Co.)
(camp, Pan American Highway, about 2900 m.
3125(95169) and 1016(95749). Originally determined by Standley as Goethalsia meiantha (Donn. Smith) Burret. See under Flacourtiaceae.

3156. Heliocarpus appendiculatus Turcz. 95176 —"Burío."
Reported as a balsa substitute. Wood sample taken.

——. Heliocarpus appendiculatus Turcz. 97100 —collected
near Turrialba.

3157. Heliocarpus donnell-smithii Rose 95177 —"Burío."
Prof. Record wrote me June 7, 1944 as regards no. 3157 (95177): "It is not Heliocarpus neither is it

anything else I recall having ever seen, and I have considered every possibility that I can think of. I shall write to Standley about it."

3105. Luehea candida (DC.) Mart. 95194 --"Guacimo"; "Molinillo."

P 6079. Sloanea macropoda Standl. (?) 95270 --"perhaps" ((P.C.S.). "Abroja."

Three kilom. north of Camp El Volcán, Chiriquí Province, 1310 m. Dr. Little reports this a tree 21 m. high, 4.5 dm. D.B.H. March 5, in bud; leaves not fully unfolded.

P 6051. Sloanea microcephala Standl. (?) 95269 --"Abroja."

Eight kilom. north of Camp El Volcán, Chiriquí Province, 1830 m. Dr. Little reports this a tree 25 m. high, 5 dm. D.B.H., 12 m. clear. He says the leaves are up to 65 cm. long and 28 cm. wide, the petioles up to 12.5 cm. long. March 2; no flowers nor fruit. Wood sample taken.

3102. Sloanea quadrivalvis Seem. 95228 --"Terciopelo." (N. B. Some prefer to place Sloanea (in Elaeocarpaceae.

177. BOMBACACEAE

1041. Ceiba pentandra (L.) Gaertn. 98082

186. THEACEAE

6044. Freziera candicans Tulasne 95065 (syn. Eurya (seemanniana Pittier)

Near summit of Cerros de Escazú, 2165 m. Dr. Little reports this tree as 12 m. high, with 3.8 dm. D.B.H. The rough twigs are beset with small papilliform whitish lenticels. The many, parallel-veined leaves have a satiny sheen beneath. Dr. Little states that the corollas are white and the calyces green.

1001. Laplacea semiserrata (Mart. & Zucc.) Cambess. 95015

About 1.6 kilom. northwest of San Isidro del General, San José Province, 610 m. Mr. Barbour reports this a tree 25 m. high, 8 dm. D.B.H., 15 m. clear; sizes up to 11 dm. D.B.H. Wood sample taken; "fair to good quality general construction lumber." These sprout leaves are much larger, more acuminate, and more conspicuously toothed than the presumably more normal leaves shown in the next specimen (1009).

1009. Laplacea semiserrata (Mart. & Zucc.) Cambess. 95016

About 6.5 kilom. east of Turrialba, Cartago Province, 925 m. Mr. Barbour reports this a tree 28 m. high, 4 dm. D.B.H., 15 m. clear; sizes up to 9 dm. D.B.H.; wood sample taken.

P 6061. Laplacea semiserrata (Mart. & Zucc.) Cambess. 95250--
("Mangle." Wood sample taken. March
(25, fr.
3004 (95189) and 3041 (95190). See under Humiria, Humiriaceae.

187. GUTTIFERAE

1039. Calophyllum brasiliense Camb. var. rekoi Standl. 98080
3069. Hypericum silenoides Juss. 95183
Near summit of Dos Burros peaks, Cerro de la Muerte, over 3400 m., above timberline.
3076. Hypericum silenoides Juss. 95184 --"these two collec-
(tions look different, and I may be wrong
(in referring them to the same species,
(but we have material matching both, and
(some intermediate between them" (P.C.S.).
1029. Hypericum silenoides Juss. 95751
3062. Hypericum strictum H.B.K. 95181
Dos Burros Peaks, Cerro de la Muerte, over 3400 m., above timberline.
N. B. Some prefer to place the St. Johnsworts (Hypericum spp.) in a distinct family, Hypericaceae.
P 6046. Tovomitopsis psychotriaefolia Oerst. 95246 --"Uvito."
(1st record for Panama?
Eight kilom. north of Camp El Volcán, Chiriquí Province, 1830 m. Dr. Little reports this a tree 18 m. high, with 2.5 dm. D.B.H., and 6 m. clear. Wood sample taken --"an attractive red." The maximum height hitherto known of this tree, as shown by Standley (21) is indicated as 7 m.
P 6068. Tovomitopsis psychotriaefolia Oerst. 95258 --"Uvito."
Same site as above (6046). Tree 15 m. high, 23-25 cm. D.B.H.
P 6070. Tovomitopsis psychotriaefolia Oerst. 95248 --"Uvito."
Same site as nos. 6046 and 6068 above. March 2, fr. Dr. Little reports the berries as "big, 1- to 5-seeded, orange coat around seed." Wood reddish; sample taken.
3015. Vismia guianensis (Aubl.) Pers. 95239
P 6052. " " " " 95271 --"Achote."
Eight kilom. north of Camp El Volcán, Chiriquí Province, 1830 m. Dr. Little reports this a tree 15 m. high, 25 cm. D.B.H., 9 m. clear, the bark with a yellow juice; wood sample taken.

199. FLACOURTIACEAE

* 1044. Casearia belizensis Standl. 98081½
Apparently a first Costa Rica record and the second for the species. Barbour's tree was 34 m. high, as contrasted with "12 m." for Standley's type tree (21).

Specimen deposited in U. S. National Herbarium.

3111. Hasseltia floribunda H.B.K. 95213

P 6063. Hasseltia panamensis Standl., n. sp. 95247 —"Cocobolo."

Three kilom. north of Camp El Volcán, Chiriquí Province, 1310 m. Reported by Dr. Little as a tree 30 m. high, with 5.5 dm. D.B.H., usable length 16 m.

* 3125. Gen. nov. (?) 95169 —originally reported by Standley as "probably" Goethalsia meiantha (Donn. Smith) Burret (syns. Luehea meiantha Donn. Smith; G. isthmica Pittier). (Material sterile. "Chancho blanco."

About 5 kilom. up the right-of-way, Pan American Highway, toward La Division from center of San Isidro del General, 825 m., rain forest type, assoc. with bolador, colorado, comenegro, tiquissaró, etc. Smooth light gray bark; wood hard, heavy, almost white. Record and Hess (17) describe the wood of this species as light and soft, which has led Mr. Barbour to question the identification. No flowers nor fruit seen. However, the leaf characters, including venation, correspond with the botanical descriptions of this species, and I am satisfied the material perfectly matches U.S. National Herbarium specimens thus labeled. See note under no. 1016 below.

1016. Same as no. 3125 (95169) above. 95749

Goethalsia is placed in Tiliaceae by Standley (20) and Record and Hess (17). Gleason (9) amended Pittier's description of the genus Goethalsia and placed it in Flacourtiaceae. M. Burret ("Goethalsia Pitt. doch eine Tiliaceae, keine Flacourtiaceae." Repert. Spec. Nov. 36: 195. 1934) disagrees with Gleason's family disposition of Goethalsia, as does Record ("Note on the classification of Goethalsia." Trop. Woods 40: 18. 1934) citing his own wood and twig examinations and the opinions of Pittier, Donnell Smith, Burret and Standley. In a later article ["Note on Goethalsia (Tiliaceae)." Trop. Woods 42: 21. 1935] Record mentions Rehder and Ducke as additional authorities in favor of placing this genus in Tiliaceae. In a letter to me dated May 25, 1944, Dean Record reports as follows:

"Barbour 1016 (F.S. Ser. No. 95749) and Dayton 3125 (F. S. Ser. No. 95169) are not Goethalsia but one of the Flacourtiaceae. Standley says: 'Now that you place them in Flacourtiaceae, I checked our material and find this same tree was collected twice by Skutch and that I determined each collection as a n. sp. of Hasseltia. The two are somewhat different, but I now believe they are one species because I do not believe the tree belongs to Hasseltia. ....

The general appearance is that of Hasseltia, but I don't believe it can be placed there. I should hate to describe a new genus in that family, but it may be necessary. .....At any rate, I shall be glad to give the plant further study, for evidently it is something quite new for Central America, at least.'" Later (June 7, 1944) Dean Record wrote me as follows: "Standley and I agree that Barbour 1016 and Dayton 3125 are flacourtiaceous, but not Hasseltia. I have suggested Hasseltiopsis as a possibility, but it may prove to be a new genus."

208. BEGONIACEAE

3048. Begonia luxii C. DC. 95088

210. CACTACEAE

3012. Rhipsalis cassutha Gaertn. 95219

221. COMBRETACEAE

* 1002. Terminalia amazonia (J.F. Gmel.) Exell 95023 —"Amarillón."

About 5 kilom. southeast of Buenos Aires, Puntarenas Province, 430 m.; abundant. Tree 30 m. high, 5 dm. D.B.H., 19 m. clear; sizes up to 12 dm. D.B.H. Mr. Barbour reports that the wood splits badly but is being sawed for camp construction, etc. March 30, fr.

222. MYRTACEAE

3107. Eugenia sericiflora Benth. 95163 —"Escobo."

A small tree, 6 m. high, in trap-rock formation about 5 kilom. north and east of Nicoya, 305 m. May 26, fr. The berrylike drupes, about the size of a common chokecherry, topped by the persistent 4-lobed calyx, contain a grooved, 2-lobed, stony seed.

3147. Myrtus oerstedii (Berg.) Hemsl. 95210 —"Arrayán."

223. MELASTOMACEAE

3059. Chaetolepis cufodontisii Standl. 95180

Dos Burros Peaks, above timberline, acid soil. May 14, fl. This low, slender-stemmed, small- and slim-leaved, woody trailer is very different from most other Costa Rican melastomes.

3115. Henrietella fascicularis (Swartz) Triana 95206

Near Wunderlich Camp, San Isidro del General, 610 m. June 9, fr. This species has been "reported" hitherto from Costa Rica, and this may be the first

definite collection. The shiny black berries are edible.

224. ONAGRACEAE

6016. Fuchsia arborescens Sims 95033
3029. Fuchsia splendens Zucc. 95169
A somewhat vinelike plant in this locality (Ojo de Agua Camp, near Cartago - San José Province border, 2900 m.) which did not appear to be epiphytic here; its upper leaves are ovate but not cordate. Mr. Barbour made a water-color painting of the plant. May 13, fl.
3148. Oenothera multicaulis var. tarquensis 95114 (syn. O. cuprea Schlecht.)

225. HALORHAGIDACEAE

----. Gunnera insignis (Oerst.) A. DC. -----
A conspicuous, rhubarblike plant. See Fig. 13.

227. ARALIACEAE

3085. Didymopanax pittieri March. 95137
6025. Gilibertia sessiliflora Standl. & A.C. Smith 95031 -- ("Manteco?"
Near Camp Empalme, Pan American Highway, Cartago Province, 2225 m. Dr. Little reports this a tree 28 m. high, with 6 dm. D.B.H.; wood sample taken. Collected Feb. 19, the greenish flowers in globular clusters.
6019. Oreopanax pycnocarpus Donn. Smith 95026
The large oval leaves (some of them over 30 cm. long) and the somewhat conelike fruits make this material rather distinctive. Oreopanax should be treated as a masculine noun; see my note under Panax on p. 452 of "Standardized Plant Names" (10).

228. UMBELLIFERAE

3027. Myrrhidendron donnell-smithii Coult. & Rose 95209
Ojo de Agua, near Cartago - San José Province line, 2900 m. May 13, fl. The habit of this plant, about 4.5 m. high and with a D.B.H. of 12.5 cm., was distinctly treelike; an arborescent umbellifer is something of a novelty! Coulter and Rose (Bot. Gaz. 19: 465. 1894) report that it is "the only arborescent (umbelliferous) species that we have seen from North America."

Fig. 12. Type locality of Vantanea barbourii Standl. Mr. Wm. R. Barbour and Sr. Valverde seated on an "ira chiricana" squared timber, about 0.6 x 0.6 x 12 m., probably destined for a bridge on the Pan American Highway. The darkness of the forest, rain and overcast skies were not conducive to photographic clarity!

Fig. 13. Gunnera insignis (Oerst.) A. DC., near road up Irazú. Photo by Wm. R. Barbour, June 20, 1943. Mr. John A. Scholten at right. Plant in immature flower.

Fig. 14. One of the twin peaks of Dos Burros, Cerro de la Muerte, over 3400 m. Photo by John A. Scholten May 14, 1943. Mr. Barbour and a peon standing and the writer sitting on top. Senecio andicola and Hypericum silenoides are prominent among the shrubs in the foreground.

230. CLETHRACEAE

3073. Clethra gelida Standl. 95156 —"very rare" (P. C.S.).
3086a. " " " 95157

233. ERICACEAE

3134. Arctostaphylos rubescens (Bertol.) Hemsl. 95136
3145. Cavendishia costaricensis Hoerold 95147
Near summit of Irazú, 3400 m. June 20, fl. A showy shrub or small tree.
3045. Cavendishia smithii Hoerold 95146
Ojo de Agua (Mills Co.) camp, Pan American Highway, 2900 m. May 13, in bud and flower. A small tree 4.5 m. high.
3087. Disterigma humboldtii (Klotzsch) Niedenzu 95201
Near Ojo de Agua (Mills Co.) camp, San José Province, 2900 m.
6033. Macleania glabra (Klotzsch) Hoerold 95066
Near Camp Empalme, along Pan American Highway, 2225 m. Epiphytic on Quercus.
3053. Pernettya coriacea Klotzsch 95193 —"Arrayán."
3054. " " " 95196
3064. " " " 95197
3073a. " " " 95216
3077. " " " 95198
3086. " " " 95199
3131. " " " 95202
3133. " " " 95217
P 6072. " " " 95264
Northwest side of Volcán Chiriquí, Chiriquí Province, 1375 m. March 4, fl. and fr.
1020. Pernettya coriacea Klotzsch 95752
Standley (21) says of the fruits of this species "Pittier believes that they may be poisonous." I do not know whether this was an oral or published remark, as I have been unable thus far to trace it in Dr. Pittier's works accessible to me. Of the related P. pentlandii DC. of Venezuela Pittier (16) remarks "frutas .... sospechosas." The writer knows of no fleshy-fruited ericaceous plants that are poisonous, and is inclined to be skeptical that the berries of Pernettya coriacea are toxic.
3064a. Pernettya prostrata (Cav.) Sleumer, var. purpurea (Don) Sleumer 95195
3077a. " " " " " 95200
This was not recognized by Standley in 1938 (21) as distinct from P. coriacea.
3040. Vaccinium consanguineum Klotzsch 95233 —"Arrayán."
3052. " " " 95232

3132. Vaccinium consanguineum Klotzsch 95234
1022. " " " 95755 --apparently (of the var. "irazuense Sleumer" type (W.A. (D.).

236. MYRSINACEAE

6020. Ardisia glanduloso-marginata Oerst. 95061
6027. Parathesis storkii Standl. 95063

239. SAPOTACEAE

3016. Chrysophyllum cainito L. 95153 --"Caimito"; star-apple.

241. STYRACACEAE

6043. Styrax argenteus Presl 95064
Near summit of Cerros de Escazú, about 10 kilom. southwest of San José, 2165 m., cloud forest type partly cleared for pasture. Dr. Little reports this a tree 15 m. high, with 3 dm. D.B.H.

245. LOGANIACEAE

3152. Buddleia alpina Oerst. 95140

246. GENTIANACEAE

3026. Halenia rhyacophila Allen 95106
Near Ojo de Agua (Mills Co.) camp, Pan American Highway, Cartago Province, 2900 m. May 13, fl.

247. APOCYNACEAE

3091. Stemmadenia obovata (Hook. & Arn.) Schum. 95230
Five kilom. southwest of Nicoya, 275 m., slatey loam. May 24, fl. The flowers, when fresh, were very showy, over 6 cm. broad, bright yellow, the lobes with a distinct twist.

252. BORAGINACEAE

* 3005. Cordia bicolor DC. 95154 --"Bernabé." "New (to Costa Rica" (P.C.S.). Hills above La (Florida, Limón Province. Size up to 18 m. (high and 7.5 dm. D.B.H.; bark fibrous. (May 7, in bud.
1041. Cordia bicolor DC. 98083
3103. Cordia toqueve Aubl. 95155 --3d record for (Costa Rica? Five kilom. south of Nicoya, (245 m.; limestone formation.

253. VERBENACEAE

P 6073. Citharexylum donnell-smithii Greenm. 95260 —1st record for Panama?

Northwest side of Volcán Chiriquí, Chiriquí Province, 1375 m., in island of xerophytic forest surrounded by lava alluvial fan; volcanic dust, pumice and lava boulders. Dr. Little reports this a tree 15 m. high, with 4.5 dm. D.B.H. March 4, the flowers just shed from the naked catkin axes.

3112. Cornutia grandifolia (Schlecht. & Cham.) Schauer 95141

P 6071. Lippia oxyphyllaria (Donn. Smith) Standl. 95251 —1st record for Panama?

Northwest side of Volcán Chiriquí, Chiriquí Province, 1375 m. Dr. Little reports this as common in groves at edge of savanna. March 4, fr.; fruit hop-like.

6015. Lippia torresii Standl. 95036 —"Caragua."

Macho Gap camp, 39 kilom. south of Cartago and 5 kilom. north of Copey, 2500 m.

256. SOLANACEAE

3014. Cestrum baenitzii Lingelsh. 95229

3155. Cestrum warscewiczii Klotzsch 95151

6022. Solanum dotanum Morton & Standl. 95062

Macho Gap camp, 5 kilom. north of Copey, Cartago Province, in cloud (oak) forest type, 2500 m. February 19, fl. Tree 6 m. high, 7.5 cm. D.B.H. Dr. Little reports that this occurs also as a climber.

3020. Solanum sanctaeclarae Greenm. 95150

1026. Solanum storkii Standl. 95748

257. SCROPHULARIACEAE

3072. Castilleja irasuensis Oerst. 95093

Near summit of Dos Burros Peaks, Cerro de la Muerte, 3400 m., above timberline. May 14, fl.

3136. Castilleja irasuensis Oerst. 95094

Near summit of Irazú, 3400 m. One of the most conspicuous herbaceous plants. June 20, fl.

1031. Castilleja irasuensis Oerst. 95743

3068. Castilleja quirosii Standl. 95092

Near summit of Dos Burros Peaks, 3400 m. Largely ericaceous type, above timberline. May 14, fl. Much larger plant than C. irasuensis, the habit suggesting somewhat a western U. S. Cordylanthus.

258. BIGNONIACEAE

W-1. Jacaranda copaia (Aubl.) D. Don 95227 —"Gallinazo."

A famous ornamental tree of Costa Rica and Panama, but collected in the wild by Mr. Julian A. Weston, of the International Balsa Corporation, San José, and turned over to our party, under the local name, "Aceituno," with a wood sample, as a possible substitute for balsa.

* 3008. Tabebuia guayacan (Seem.) Hemsl. (?) 95145 --"at (least I cannot find a better place for (it" (P.C.S.). "Plomillo."

Hills above La Florida, 230 m., associated with bernabé, campana, pejiballito, and pilón. Wood sample taken. Wood, which has a mild vinegar odor, is reported to be durable and to hold nails well. May 7; neither flowers nor fruit seen.

262. GESNERIACEAE

1024. Alloplectus ichthyoderma Hanst. 95747
6034. Columnea hirta Klotzsch & Hanst. 95034
3011. Columnea tomentulosa Morton 95204 (syn. C. to- (mentosa Oerst., not Roxb.)

266. ACANTHACEAE

3065. (Genus ?) 95097 --"sterile, and I (cannot place it" (P.C.S.).

Small herb; Dos Burros Peaks, Cerro de la Muerte, over 3400 m., above timberline.

270. RUBIACEAE

3067. Arcytophyllum lavarum Schum. 95182
3101. Calycophyllum candidissimum (Vahl) DC. 95143 --"Surá"; "Madroño."
3118. Cephaelis elata Swartz 95149

Near Wunderlich Camp, San Isidro del General, 610 m. Involucral bracts tawny orange. Not so handsome as the next species.

3117. Cephaelis tomentosa (Aubl.) Vahl 95148 --"the most (collected rubiaceous plant of tropical (America, and with a vast range" (P.C. (S.).
3007. Chimarrhis parviflora Standl. 95152 --"Pejiballi- (to." 1st definite record for Costa (Rica?

Hills above La Florida, Limón Province, 230 m. May 7, immature fl. The hard, golden-yellow to orange-color wood is among the handsomest of Costa Rican lumbers; it would undoubtedly be a choice interior finish if better known.

3021. Hamelia nodosa Mart. & Gal. 95173

1017. Ladenbergia sericophylla Standl. 95750
3116. Palicourea triphylla DC. 95174
Near Wunderlich Camp, San Isidro del General, 610 m. Small tree 4.5 m. high, with reddish flowers in a lilac-like thyrse. The ternately whorled leaves are a conspicuous feature.

271. CAPRIFOLIACEAE

6017. Viburnum costaricanum (Oerst.) Hemsl. 95028

273. VALERIANACEAE

* 3071. Valeriana woodsonii Standl. 95130 --"described from Chiriquí; new for Costa Rica" ((P.C.S.).
Dos Burros Peaks, Cerro de la Muerte, 3400 m. May 14, fl.
1028. Valeriana woodsonii Standl. 95746
In paramo, Cerro de la Muerte, October 10.

276b. LOBELIACEAE

3049. Centropogon gutierrezii (Planch. & Oerst.) Wimmer 95090
3028. Centropogon valerii Standl. 95095 --"known (previously from only 2 collections. (McVaugh calls this C. grandidentatus var. (Valerii McV., in which very likely he is (right. The leaves are quite different (from those of the typical variety" (P.C. (S.).
Ojo de Agua (Mills Co.) camp, 2900 m. May 13, fl.; very showy.
3011a. Lobelia irasuensis Planch. & Oerst. 95091 (syn. Laurentia irasuensis (Planch. & Oerst.) (Wimmer)
May 3, fl. Under the name Laurentia irazuensis, Standley (21, p. 1415. 1938) describes this species as an annual, and, under the name Lobelia irasuensis (op. cit., p. 1416), a perennial. My specimen seems to be annual.

280. COMPOSITAE

Vernonieae

6041. Vernonia stellaris Llave & Lexarza 95029
Near summit of Escazú, 2165 m. February 27, fl. Dr. Little reports this as 5.5 dm. high, growing along fence-rows, uncommon.

Eupatorieae

* 3080. Eupatorium sp. nov. 95164 -- "I cannot place (it with any species known from Central (America, although one would suppose there (were already names enough to include any- (thing. The plant appears to be a well (marked species" (P.C.S.). Standley's de- (termination, E. daytonii Standl., appears (never to have been published and to be a (nomen only.

* 3080a. Eupatorium sp. nov. 95165 --"this one is not (so outstanding, but I can't refer it sat- (isfactorily to any of the known Costa (Rican species" (P.C.S.). Standley's de- (termination, E. maestum Standl. does not (appear to have been published and hence is (a nomen only.

Both the above eupatoriums were collected near summit of Dos Burros Peaks, Cerro de la Muerte, about 3400 m., acid ericaceous site. May 14, fl.

Astereae

3149. Bellis perennis L. 95089

3039. Laestadia costaricensis Blake 95103 --"a rare plant" (P.C.S.).

Inuleae

3089. Gnaphalium spicatum Lam. 95104

Helianthea e

3162. Wedelia acapulcensis H.B.K. 95133

3010. Zexmenia frutescens (Mill.) Blake 95236

3161. " " " " 95237

Showy tree, 16 m. high, with 15 cm. D.B.H., growing wild on bank of Rio Reventazón, grounds of Inter-American Institution of Agricultural Sciences, Turrialba. June 29, fl.

Senecioneae

3081. Senecio andicola Turcz. 95191 --material sterile; (somewhat suggests a Ledum in appearance.

Near summit of Dos Burros Peaks, Cerro de la Muerte, over 3400 m., above timberline. See Fig. 14.

1027. Senecio andicola Turcz. 95757

* 1030. Senecio mortuosus Standl., sp. nov. 95744 --"the plant (is undoubtedly different from any other

(species known from Central America, but
(it is very desirable to describe the
(characteristic leaves, whose nature can
(not be guessed from the upper ones" (P.C.
(S.). It is doubtful that this name has
(been published.

3078. Senecio oerstedianus Benth. 95125

Cichorieae

3144. Hypochaeris radicata L. 95108

SUMMARY

Of the 298 specimens collected by members of the party 5 species from Costa Rica and 1 species from Panama have been named by Dr. Standley as new to science; 7 others (from Costa Rica) appear to be new and of these 4 cannot now be positively placed even to genus; Miss Allen has described one Panaman species as new; 15 species (besides the novelties) are not listed in Standley's "Flora of Costa Rica" and an additional one appears to be new to that country; 1 family (Humiriaceae), 1 genus (Vantanea), and 1 species of Geranium are new to the Central and North American flora; 5 species appear to be first records for Panama; also there are several second and third records and numerous additions to information as regards size, distribution, phenology, characteristics, values, etc. All in all, therefore, the collections appear to have a scientific interest disproportionate to their relatively small size.

This report, besides the above features, takes occasion to correct a few common misspellings of names; to publish a large number of vernacular names not appearing hitherto in literature; one new scientific name is also published.

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THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND ERIOCAULACEAE. SUPPLEMENT 10

Harold N. Moldenke

Since the preparation of the previous installment of these supplementary lists the following new geographic records have come to light and are enumerated here for the first time, along with certain emendations of previous records. The specimens on which these additions are based are deposited in the herbaria of the British Museum (Natural History) at London, the Jardin Botanique de l'Etat at Brussels, the United States National Museum at Washington, and the New York Botanical Garden at New York.

UNITED STATES OF AMERICA:
Mississippi:
Eriocaulon decangulare L. [Stone County]
Phyla nodiflora (L.) Greene [Hancock County]
Verbena brasiliensis Vell. [Hancock County]
Verbena halei Small [Stone County]
Verbena scabra Vahl [Harrison County]
Verbena tenuisecta Briq. [George County]
Colorado:
Verbena bracteata Lag. & Rodr. [Adams County]
Verbena stricta Vent. [Elbert County]
CURACAO:
Lantana moritziana Otto & Dietr.
COLOMBIA:
Aegiphila aculeifera Moldenke [Huila]
Aegiphila cuatrecasasi Moldenke [Huila]
Aegiphila guianensis Moldenke [Caquetá]
Aegiphila lehmannii Moldenke [Santander]
Aegiphila sessiliflora Moldenke [Cauca]
Avicennia tonduzii Moldenke [Valle del Cauca]
Citharexylum kunthianum Moldenke [Huila]
Citharexylum subflavescens Blake [Huila]
Duranta mandoni Moldenke [Boyacá]
Duranta sprucei var. colombiensis Moldenke -- delete the asterisk
Lantana cujabensis Schau. [Cundinamarca]
Lantana cujabensis var. punctata Moldenke [Huila]
Lantana glutinosa Poepp. [Cundinamarca]
Lantana moritziana Otto & Dietr. [Huila]
Lippia americana f. pilosa Moldenke [Bolívar, Cundinamarca, & Méta]
Paepalanthus andicola Körn. [Cauca & Norte de Santander]

Paepalanthus killipii Moldenke [Huila & Méta]
Paepalanthus lodiculoides Moldenke [Méta]
Paepalanthus schultesii Moldenke [Norte de Santander]
Philodice hoffmannseggii Mart. [Magdalena]
Stachytarpheta mutabilis (Jacq.) Vahl [Santander]
Stachytarpheta straminea Moldenke [Antioquia]
Syngonanthus oblongus (Körn) Ruhl. [Amazonas]
Syngonanthus umbellatus (Lam.) Ruhl. [Amazonas]
Syngonanthus vaupesanus Moldenke [Amazonas]
Verbena glabrata H.B.K. [Cauca]
Vitex cymosa Bert. [Tolima]
Vitex klugii Moldenke [Amazonas]
Vitex orinocensis var. glabra Moldenke [Méta]*

ECUADOR:
Lantana rugulosa H.B.K. [Cañar]
Lippia americana f. hyptoides (Benth.) Moldenke [Guayas]
Lippia americana f. pilosa Moldenke [Guayas]
Paepalanthus crassicaulis Körn. [Loja]
Verbena hispida Ruíz & Pav. [Azuay]

PERU:
Amasonia lasiocaulos Mart. & Schau. [San Martín]
Citharexylum flexuosum var. subglabrum Moldenke is to be deleted
Citharexylum kobuskianum Moldenke [La Libertad]
Citharexylum peruvianum Moldenke [Ayacucho]*
Duranta sprucei var. colombiensis Moldenke [Amazonas]
Lippia americana f. hyptoides (Benth.) Moldenke [Piura]
Verbena cuneifolia Ruíz & Pav. [La Libertad]
Verbena litoralis H.B.K. [Ancachs & Cajamarca]

BRAZIL:
Eriocaulon magnificum Ruhl. [Paraná]
Paepalanthus exiguus (Bong.) Körn. [Rio Branco]
Syngonanthus longipes Gleason [Guaporé]
Verbena lobata var. sessilis Moldenke [Paraná]*

BOLIVIA:
Lantana trifolia f. hirsuta Moldenke [Tarija]

PARAGUAY:
Lippia arechavaletae Moldenke

SIERRA LEONE:
Clerodendrum splendens var. giletti (De Wild. & Durand) Thomas

BELGIAN CONGO:
Clerodendrum dewittei Moldenke*
Clerodendrum sessilifolium Moldenke*
Clerodendrum splendens var. longicuspe Moldenke*
Gmelina elliptica J. E. Sm.

KENYA:
Clerodendrum dalei Moldenke*

ANGOLA:
Eriocaulon welwitschii Rendle -- delete the asterisk
NORTHERN RHODESIA:
Clerodendrum luembense De Wild.
SOUTHERN RHODESIA:
Clerodendrum discolor var. crenatum Thomas
Clerodendrum glabrum var. vagum (Hiern) Moldenke
Clerodendrum tanganyikense var. bequaerti (De Wild.) Moldenke
Eriocaulon strictum Milne-Redhead
Eriocaulon welwitschii Rendle
Premna hildebrandtii Gürke
Vitex payos var. glabrescens (Pieper) Moldenke
Vitex welwitschii Gürke
BRITISH NYASALAND PROTECTORATE:
Phyla nodiflora (L.) Greene
Priva cordifolia var. flabelliformis Moldenke
Vitex madiensis var. gossweileri Pieper
PORTUGUESE EAST AFRICA:
Clerodendrum pleiosciadium Gürke
FRENCH INDO-CHINA:
Callicarpa nudiflora Hook. & Arn. [Tonkin]
THAILAND:
Callicarpa macrophylla Vahl
Clerodendrum laevifolium Blume
Clerodendrum laevifolium var. fletcheri Moldenke*
Premna tomentosa Willd.
PHILIPPINE ISLANDS:
Callicarpa longivillosa Merr. is to be deleted
BRITISH NORTH BORNEO:
Eriocaulon beccarii Suesseng. & Heine is to be deleted
SARAWAK:
Eriocaulon truncatum Hamilt.
NEW GUINEA:
Callicarpa macrophylla Vahl [Papua]
CULTIVATED:
Callicarpa arborea Roxb. [Sumatra]
Clerodendrum laevifolium var. fletcheri Moldenke [Thailand]
Holmskioldia tettensis (Klotzsch) Vatke [Southern Rhodesia]

HORTUS DUROBRIVENSIS I.

Bernard Harkness

It is intended to present under the above title and in forty-five or more parts a complete catalog of the living collection of woody plants of the parks of Rochester, New York. Such descriptive, cultural and historical notes as seem most valuable are given in brief.

Scientific names follow the Bibliography of Cultivated Trees and Shrubs by Alfred Rehder, with some few exceptions. A conservative orthography is maintained with respect to capitalization of specific names honoring persons and of nouns in apposition.

The authors cited in addition to the accepted author of each taxon are included to indicate some of the references regularly used in preparation of this work, with emphasis on recent publications.

While more complete data of the weather and soils of the park areas will be presented in appendices, it may well be noted at the beginning that Highland Park is on the broken terrain of a moraine deposit of limy gravels and sands. Durand-Eastman Park has nearly neutral sands and silt loams derived from river delta deposits in a glacial lake. A low temperature of -22 degrees Fahrenheit has been recorded in Rochester, but, usually, temperature extremes are tempered by proximity to Lake Ontario.

Many have been instrumental in the building and preservation of the Rochester parks; only a few representative names are mentioned. In 1888 the Ellwanger and Barry nursery firm gave the land area on which Highland Park was started as well as a complete collection of their nursery list. John Dunbar was active until 1926 in building the collections with skill and knowledge from English training. As Director, Patrick Slavin kept the collections from neglect through the difficult periods of depression and war. Still living are two whose life work was in the parks. Bernard Slavin, a keen plantsman, has had several hybrids and seedling forms of his raising named in his honor. Richard E. Horsey shared most generously with me his knowledge of the collections and his records kept of the plantings for over forty years are basic to this study.

ABELIA - R. Brown in Abel - Narr. Jour. China. 1818
CAPRIFOLIACEAE -- Honeysuckle Family.

Abelia Graebneriana, Rehd.
GRAEBNER ABELIA c & w China

Rehder in Sargent - Plantae Wilsonianae. 1911

Bean I,115 (1950); Besant in Chittenden 192(1940)

Recorded as representing Wilson's #4422 from Fahn-Hsien, w Hupeh, in woodlands from 1500 to 2300 meters of altitude, collected in 1910, plants came to us from the Arnold Arboretum in 1912. The plant persisted in Highland Park somewhat sheltered by taller shrubs until 1951, when it was uprooted by accident. The same plant is now established in the Herbarium courtyard planting. It is recorded as reaching 10 feet in 1930 but severe winters since have reduced it to annual growth up to 3 feet. It is interesting in that it has the larger leaf of the type description rather than the smaller leafed variations of other of Wilson's numbers. It is reported (Bull. of Pop. Inf. 16:2) unreliable after several tests at the Morton Arboretum.

Abelia grandiflora, (André) Rehd.
GLOSSY ABELIA (chinensis x uniflora)

Rehder in Bailey - Cyc. Am. Hort. 1900

Mottet 262 (1924); van Melle 61 (1943)

Plants of this best known of the Abelias were received at Highland Park from the nursery of Leon Chenault & Sons, Orleans, France in 1919 but were lost from overcrowding by more vigorous plants after about 25 years. A photo in Cornell Bulletin 772, The Winter Hardiness of Some Ornamental Woody Plants in New York State by John F. Cornman is a record of our plants. A new start of Glossy Abelia now grows in the Herbarium courtyard. Here it is best cut to the ground to encourage strong new shoots which flower in late summer and autumn.

ABIES - Will constitute Part II.

ACANTHOPANAX, Miquel - Ann. Mus. Bot. Lugd.-Bat. 1863
ARALIACEAE - Ginseng Family.

Acanthopanax divaricatus, (S.&Z.) Seeman
KEYA ARALIA Japan

Seeman in Journal of Botany. 1867

Blackburn 73 (1952); Pourtet 550 (1949)

An inconspicuous member of a genus that lacks outstanding ornamental characteristics, its five-leaflet pattern of foliage and, in most years, its abundance of black fruits in round heads are its special graces. Pourtet mentions its habit of dropping its leaves early in the fall which limits its landscape value. Plants were received from the Arnold Arboretum in 1906 and 1907. A maximum height of 10 feet was recorded in 1940.

Acanthopanax Giraldii, Harms
GIRALDI ARALIA c & nw China

Harms in Bot. Jahrb. 1905

Krüssmann 20 (1952); Li 80 (1942)

Densely growing to four feet with numerous very bristly shoots, our plant has its older stems die back and apparently will never reach the nine foot height of its natural habitat. It is recorded as being Purdom's #849, but the province of that number and the date of accession here are not known at present. Probably hardier strains are in cultivation. Flowering and fruiting are infrequent on our plant.

Acanthopanax lasiogyne, Harms
SIKANG ARALIA w China

Harms in Sargent - Plantae Wilsonianae. 1915

Bean I,140 (1950); Li 78 (1942)

The Rochester experience with this plant agrees with that reported from Kew Gardens by Bean who calls it one of the hardiest and most satisfactory of the hardy araliads. Certainly the zone given in Rehder as VII? may be changed to V. It is the tallest plant of the genus in the Highland Park collection reaching 14 feet with a natural arching spread of almost as many feet. It flowers and fruits well. Our plant was obtained from R.&J. Farquhar in 1917. Introduction of this valuable plant should be credited to E. H. Wilson who collected it near Tachienlu

in 1908 and 1910 and from whose specimens Harms described the species. As its range has not been extended by later collections and as the Tachienlu area now is included in that province, an English name of Sikang Aralia is proposed.

Acanthopanax senticosus, (Rupr. & Maxim.) Harms
MANCHURIAN ARALIA n Asia

Harms in Nat. Pflanzenfam. 1897

Li 71 (1942); Woeikoff 75 (1941)

The large five-segmented leaf gives a rather coarse effect for this plant which stays at about six feet in cultivation. In the shady forests across northern Asia, including Japan, it is reported to reach 15 feet. Woeikoff notes the use of young foliage as a salad. The St. Petersburg nursery of Regel & Kesselring was the source in 1910 of one Highland Park plant; the other came from the Arnold Arboretum with a U.S.D.A. introduction number. This plant may well be called Manchurian Aralia.

Acanthopanax Sieboldianus, Mak.
FIVELEAF ARALIA Japan

Makino in Bot. Mag. Tokyo. 1898

van Melle 62 (1943); Wyman 95 (1949)

The only plant of its genus which has made its way generally into nursery lists. Gardeners have valued it as useful for its tolerance of less favorable conditions of soil and shade. It is good hedging material and its slight thorniness adds to its effectiveness. Plants of Fiveleaf Aralia are dioecious and material in cultivation seems to be all pistillate, which, without fertilization, produces no fruit.

Acanthopanax Simonii, Schneid.
SIMON ARALIA c China

C.K. Schneider - Ill. Handb. Laubh. 1909

Bean I,144 (1950); Li 75 (1942)

This shrub might well be chosen to represent the genus in gardens where neat and small (6 ft.) plants only are desired. Its leaves are not large, its sum-

mer flowering and black fruits in autumn are abundant. Its thorniness is confined to a few prickles curved like some rose species. Our plant was received from the Arnold Arboretum in 1919.

Acanthopanax Wardii, W. W. Sm.
THREELEAF ARALIA w China

W. W. Smith in Notes Bot. Gard. Edinb. 1917

Blackburn 73 (1952); Li 88 (1942)

From R.& J. Farquhar & Co., the Boston nursery firm, in 1917 there came two plants called Acanthopanax lasiogyne. It was not until the studies for this work were undertaken that it was discovered that one plant lacked the tomentose flower parts of that species, and that it must be referred to this species, formerly known as A. ternatum. As Li states it closely simulates A. lasiogyne, but in addition to the technical characters separating them, a close checking of our plants showed that the Threeleaf Aralia holds its leaves in good condition until early November at least two weeks longer than the Sikang species, the leaves are less leathery in texture and its individual fruits are noticeably larger.

ACER -- Will constitute Part III.

ACTINIDIA, Lindley - Nat. Syst. Bot., ed.2. 1836
ACTINIDIACEAE -- Actinidia Family

Actinidia arguta, (S.& Z.) Miq.
BOWER ACTINIDIA ne Asia, Japan

Miquel in Ann. Mus. Bot. Lugd.-Bat. 1867

Krüssmann 37 (1951); Woeikoff 32 (1941)

When grown, as it is in Highland Park, in a shrub form by annual pruning back, its flowering and fruiting qualities are lost, though the large leaves on new shoots give a bold, exotic effect. Bower Actinidia is the hardiest of the genus and its fruiting potentialities have been demonstrated at Geneva, New York. Woeikoff notes, however, that its pollination is not always achieved by insects which makes its fruit crop uncertain. In its native forests it is a strong climber going to the tops of large trees. Plants were received here in 1892 from the Spath nurseries of Berlin, Germany.

Actinidia chinensis, Planch.
CHINESE ACTINIDIA c China

Planchon in Lond. Jour. Bot. 1847

Blackburn 83 (1952); Wilson II,32 (1913)

The young shoots of Chinese Actinidia are densely set with pinkish hairs which extend over the stem and veins of the leaf. Our plant does not respond as well as other Actinidias to the annual cutting back, but sends out awkward long shoots each season. It is probably best grown as a vine. Seven years after Wilson sent seeds from Hupeh to England in 1900, its European introduction, plants were received at Highland Park from the Veitch nurseries.

Actinidia polygama, (S.& Z.) Max.
SILVER VINE e Asia, Japan

Maximowicz in Mem. Div. Sav. Acad. Sci.
St. Petersb. 1859

Bean I,182 (1950), Woeikoff 32 (1941)

Silver Vine responds well to the annual cutting back given in Highland Park and usually exhibits the characteristic silvering of some of its leaves. It has also flowered well but produces no fruits. Bean recommends growing it as a thicket because of its weak growth. Bean labels the fruits as disagreeable in flavor, but Woeikoff, though admitting a burning reaction when unripe, compares the ripe fruits to fresh figs. Our start came from the Arnold Arboretum in 1923.

AESCULUS, Linnaeus - Sp. Pl. 1753
HIPPOCASTANACEAE -- Horse-Chestnut Family.

Aesculus arguta, Buckl.
TEXAS BUCKEYE Mo. to Texas

Buckley in Proc. Acad. Nat. Sci. Phil. 1860

Krüssmann 39 (1951); Pourtet 517 (1949)

At first considered a shrub (Sargent - to 1.5 m. high, with numerous small stems often prostrate on the ground in the autumn from the weight of the abundant fruit) as observed at Larissa, Texas, at Rochester Texas Buckeye has grown into small tree

form, single trunked with rough bark and up to 18 feet in height. It is tolerant of dry weather and will grow in the shade of overhanging trees. Its small leaf size is distinctive and its apiculate bud scales indicate its relationship to A. glabra. Two plants of Texas origin have leaves which remain puberulous through the season, which suggests the same variations exist as are recognized in other species of the Buckeyes. It sheds its leaves early in the fall. Texas Buckeye has been growing in Rochester since 1911.

Aesculus carnea, Hayne
RED HORSE-CHESTNUT (Hippocastanum x Pavia)

Hayne in Guimpel, Otto & Hayne - Abbild. Fremd. Holzart. 1821

Bean I,188 (1950); Sheat 36 (1948)

Though not a long-lived tree, its striking beauty in flower recommends this hybrid of the Common Horse-Chestnut from the Balkan Peninsula and the Red Buckeye of our southern states. As Sheat records, it is a stable hybrid reproducing itself well by seed. Most of the park plantings are derived from an East Avenue tree from seed sown in 1916. In a normal fall season the foliage turns a pleasing golden-yellow through the middle of October.

Aesculus carnea f. Brioti, (Carr.) Rehd.
RUBY HORSE-CHESTNUT (Hippocastanum x Pavia)

Rehder - Bibliog. of Cult. Trees & Shrubs. 1949

Bean I,188 (1950); Wyman 124 (1951)

According to its history as given by Bean, this clone of greatest brilliance in flower came from seed at Trianon in 1858. It is a vigorous plant with larger leaves and flower panicles well worth the necessary trouble of grafting it on Common Horse-Chestnut stock to perpetuate it. Our trees are presumably from the Ellwanger and Barry nursery which had at one time a varied collection of Aesculus varieties.

Aesculus discolor, Pursh var. mollis, (Raf.) Sarg.
SCARLET BUCKEYE s U. S.

Sargent - Trees and Shrubs II. 1913

Bean I,186 (1950); Blackburn 85 (1952)

Brought north from Georgia, Alabama or the lower Mississippi valley, Scarlet Buckeye makes a small tree, probably never much over 20 feet, of elegant habit, often distinctly vase-shaped with a flat top. It has other distinctions: dark red flowers, leaves conspicuously white downy beneath and seeds much lighter in color than other buckeyes. It holds its leaves well into autumn with very little change of color. Our Scarlet Buckeyes were received as plants from the Arnold Arboretum in 1915.

Aesculus glabra, Willd.
OHIO BUCKEYE ec U. S.

Willdenow - Enum. Pl. Hort. Berol. 1809

Werthner 324 (1935); Wyman 125 (1951)

A native Ohioan, William B. Werthner, has characterized the Ohio Buckeye as singularly graceless in habit, with bark of a disagreeable odor and with fruit poisonous to cattle, and of little economic use. But he does point out its especial ornamental value in the spring when the unfolding leaves burst out of rose-tinted sheaths. Full foliage is reached early before many trees have come into leaf. Individual trees vary but some have been noted here as holding partly green leaves until the middle of October when others were completely bare. A part of our many Ohio Buckeyes represent a collection of seed by R. E. Horsey at Columbus, Ohio in 1914.

Aesculus glabra var. leucodermis, Sarg.
WHITEBARK BUCKEYE Mo., Ark.

Sargent - Trees and Shrubs II. 1913

Krüssmann 41 (1951); Pourtet 517 (1949)

As grown here, the young wood is not as light-barked as the name implies. The trunk bark quickly grows to considerable thickness and is dark with deep fissures to whitish inner bark producing a distinctive striped effect. A white tomentum on the

undersides of the leaves is pronounced. By the middle of October the leaves are mostly yellowed and fallen. Our plants are from the Arnold Arboretum and one represents a collection by E. J. Palmer at Eureka Springs, Arkansas in 1913.

Aesculus glabra var. Sargentii, Rehd.
SARGENT BUCKEYE Iowa, Kan., Mo.

Rehder in Jour. Arn. Arb. 1926

Bean in Chittenden I,59 (1951)

Rehder seems to have given Sargent Buckeye the incorrect habit designation of a shrub in his Manual. Bean follows by calling it shrubby. So far as can be observed here and in the Arnold Arboretum it is tree-like in habit to 25 or more feet high. The Gray's Manual, 8th ed., classification of small tree or large shrub seems more accurate. Sargent never writes of this variety as differing in growth habit from the type, and he made a var. monticola for the shrubby form. Sargent Buckeye varies in having, frequently, two more leaflets and a heavier pubescence on branchlets and leaves. Our plants have a conspicuous rufous pubescence on the leaf petioles. The foliage drops early in the fall.

Aesculus Hippocastanum, L.
COMMON HORSE-CHESTNUT Balkan Pen.

Linnaeus - Sp. Pl. 1753
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Bean I,190 (1950); Turrill 138 (1929)

Knowledge of the origin of this tree did not accompany its introduction into horticultural use in 1576. Over 250 years later it was discovered that the widely distributed Horse-Chestnut was one of the interesting relict species native to restricted areas in the Balkans. Except for an unfortunate leaf blotch disease, the Horse-Chestnut is still an important ornamental flowering tree. Some trees in Highland Park gave a good yellow foliage effect last October.

Aesculus Hippocastanum f. Baumanni, Schneid.
BAUMANN HORSE-CHESTNUT

Schneider - Ill. Handb. Laubh. 1909

Pourtet 516 (1949); Wyman 125 (1951)

In many situations, as public parks where fruiting is undesirable, the double-flowering Baumann Horse-Chestnut is preferable to plant. Its flowers are of good substance and last longer than those of the typical tree. Our trees are equally floriferous and the flower effect is most stately. There is no record of the source of our two old specimen trees.

Aesculus Hippocastanum f. umbraculifera, (Jag.) Schelle
UMBRELLA HORSE-CHESTNUT

Schelle in Beissner et al. - Handb. Laubh.-Ben. 1903

Bean I,191 (1950); Krüssmann 41 (1951)

Undoubtedly as a younger tree it had more definite form, or if it were grown in a less crowded situation our one old Umbrella Horse-Chestnut would be more convincing. Krussmann gives a thick and spherical crown as characteristic, while Bean describes it as with a low, dense rounded head of branches. It will be necessary to start some new plants to be certain that we have good material of this form; its source is not known.

Aesculus hybrida, DC
LYON BUCKEYE (octandra x Pavia)

De Candolle - Cat. Hort. Monsp. 1813

Krüssmann 41 (1951); Pourtet 519 (1949)

Many forms of this hybrid have been recorded. The one known as Lyoni was in the Ellwanger and Barry collection; one of our plants came here from the Arnold Arboretum in 1915. The flowers of Lyon Buckeye are an intermediate orange red, but various color combinations from the Yellow (or Sweet) Buckeye and Red Buckeye have been noted. A striking rufous pubescence along the midrib of the leaves is an inheritance from A. octandra. In habit our 25 foot trees are upright and densely branching. Leaves yellow and fall by the middle of October.

Aesculus mississippiensis, Sarg.
MISSISSIPPI BUCKEYE (glabra x Pavia)

Sargent in Jour. Arn. Arb. 1920

Krüssmann 41 (1951)

Representing this hybrid, we have a plant received from the Arnold Arboretum in 1922. Another tree is recorded as from Harbison's #1061A, which with #1061 are the type collections made in Brookville, Mississippi in 1913. These two trees of small statue (18') have some redness along the veins and midribs in the autumnal coloring of their leaves. Their fruits are small as compared with Ohio Buckeye. Another more vigorous (28') seedling of Harbison's #1061A without redness on the leaves evidently is closer to the glabra ancestry.

Aesculus neglecta, Lindl. var. pubescens, (Sarg.) Sargent
ETOWAH BUCKEYE se U.S.

Sargent in Jour. Arn. Arb. 1924

Blackburn 85 (1952)

Older plants of Etowah Buckeye in Highland Park have become excellent trees; one is 36 feet high. The Arnold Arboretum and the Ellwanger and Barry nursery are the known sources of our trees, those from the latter source being yellow-flowered. Sargent wrote here that the Arnold Arboretum plants from the Stone Mountain, Georgia collection made by Harbison were all red-flowered. Leaves fall early from this variety, the trees being bare early in October.

Aesculus neglecta var. tomentosa, Sarg.
OCONEE BUCKEYE S. Carolina

Sargent in Jour. Arn. Arb. 1924

Blackburn 85 (1952)

In the nursery catalogs of Ellwanger and Barry this plant was listed as A. rubra carnea superba. Another plant known in horticulture as Michauxi is now considered synonymous. Mr. Horsey noted of the latter at Highland Park that, though the leaves were the same, it appeared slower growing and dwarfer in

habit. Our best tree of Oconee Buckeye is only 18 feet high. In addition to its slow-growing habit, the felty, grayish undersurface of the leaves and its red flowers distinguish it. A few handsome golden brown, pink-veined leaves were hanging on one tree last October fifteenth, but most plants were bare of leaves.

Aesculus octandra, Marsh.
SWEET BUCKEYE e U.S.

Marshall - Arbust. Am. 1785

Peattie 479 (1950); Wyman 125 (1951)

Highland Park has a tree of Sweet Buckeye which is over 50 feet in height. Its recorded heights of ninety feet make this the largest tree of the native Buckeyes, and its value as a large specimen tree is thereby indicated. Good golden brown autumn foliage with some reddish tinting was noted last year in the middle of October.

Aesculus octandra f. vestita, (Sarg.) Fern.
KENTUCKY SWEET BUCKEYE Ohio valley, w Kentucky

Fernald in Rhodora. 1937

Blackburn 85 (1952)

A good number of trees of this variety are growing in Highland Park, some from the wild and others from European and American cultivation. Though Fernald in Gray's Manual of Botany, 8th ed., speaks of this forma as rare, Horsey found it to be common in the Ohio valley and in the western Kentucky uplands. When Sargent first separated this plant he selected the Pikeville, Kentucky specimen of R. E. Horsey for the type specimen. Hence, if a geographical name is to be associated with this plant, it should be Kentucky rather than Carolina. R. E. Horsey collected seed at Portsmouth, Ohio in September, 1915 from which a tree grown in Highland Park now stands just under 30 feet in height. Autumn leaf fall varies with some trees holding their leaves until the middle of October.

Aesculus parviflora, Walt.
BOTTLEBRUSH BUCKEYE se U.S.

Walter - Fl. Carol. 1786

Bean I,193 (1950); van Melle 185 (1943)

Long valued for its July flowering, Bottlebrush Buckeye by suckering grows into large clumps. It is most impressive when there is opportunity for mass effects to be viewed over a sweep of lawn, which is descriptive of an era of landscapes now past for private homes. In parks and other large-scale plantings it should be introduced more frequently.

Aesculus parviflora f. serotina, Rehd.
LATE BOTTLEBRUSH BUCKEYE Alabama

Rehder in Jour. Arn. Arb. 1928

Blackburn 84 (1952)

About August tenth, at least two weeks later than the Bottlebrush Buckeye in Highland Park, comes the flower display in Durand-Eastman Park of this form. Their longer flower stalks had been noted before, but it was not until recently that their later flowering was found to check with Rehder's published forma. It is not known when or how these plants were acquired, but it must have been soon after their first introduction to cultivation in 1919.

Aesculus Pavia, L.
RED BUCKEYE se U.S.

Linnaeus - Sp. Pl. 1753

Bean I,194 (1950); Pourtet 518 (1949)

Sargent wrote here that he was unable to establish Red Buckeye at the Arnold Arboretum; Bean mentions it as a rarity in English gardens; Pourtet, however, calls it perfectly hardy at Barres. Because of its propensity to hybridize with other species, it seems possible that it may not always be represented by the true species, which may well be rather tender. The most acceptable planting here is a clump of several stems thinly branched reaching 18 feet in height but scarcely ornamental. Other more tree-like plants labelled for Red Buckeye are of doubtful identity.

Aesculus plantierensis, André
DAMASK HORSE-CHESTNUT (x carnea x Hippocastanum)

André in Rev. Hort. 1894

Bean I,194 (1950); Mottet 110 (1924)

It seems necessary to differ from Rehder in the separation of Damask Horse-Chestnut from the x carnea group. It is now well established by chromosome count that it is the result of a back cross of the x carnea with Hippocastanum, the latter being the seed parent. Though this back cross supposedly brought sterility, one of our trees was fruiting sparsely in 1952. Because of its softer pink flower color and longer life as a healthy tree it may well be recommended as better than the Red Horse-Chestnut.

Aesculus splendens, Sarg.
FLAME BUCKEYE s U.S.

Sargent in Trees and Shrubs II. 1913

Bean I,195 (1950); Blackburn 85 (1952)

From the 1915-16 distribution of plants by the Arnold Arboretum, one plant of the Flame Buckeye of wet calcareous soils in Alabama and neighboring states has survived in Highland Park. It is now a large shrub, 16 feet high. This is an indication that it is as hardy as the rest of the southern buckeyes, a point on which Rehder was uncertain. It does have a brightness to its red flowers which merits the praise given it by Sargent. There is only a slight yellowing of the leaves before they begin to fall in mid-October.

Aesculus turbinata, Blume
JAPANESE HORSE-CHESTNUT Japan

Blume - Rumphia. 1837

Blackburn 84 (1952); Pourtet 516 (1949)

As an ornamental tree, the Japanese Horse-Chestnut extends the flowering time by one week beyond that of Common Horse-Chestnut and bears a somewhat larger leaf. Some yellowing of the leaves takes place before they fall off in late October. Plants were received at Highland Park in 1907 from the Ellwanger and Barry nursery.

Aesculus woerlitzensis, Koehne
WOERLITZ BUCKEYE Origin unknown.

Koehne in Repert. Sp. Nov. Reg. Veg. 1912

Blackburn 87 (1952); Krüssmann 42 (1951)

Woerlitz Buckeye is a tree out of European nurseries for which no counterpart has been reported as a native plant nor has an accepted hybridity been proposed. Rehder places it close to A. neglecta in relationship. Early importations made by the Ellwanger and Barry nursery had the horticultural names of A. purpurea and A. rubra. Trees in Highland Park are now over 25 feet tall.

Aesculus woerlitzensis var. Ellwangeri, Rehd.
ELLWANGER BUCKEYE Origin unknown.

Rehder in Mitt. Deutsch. Dendr. Ges. 1913

Blackburn 87 (1952)

The variety honoring the Rochester nurseryman came to the Ellwanger and Barry nursery as A. atrosanguinea and A. Whitleyi from European sources. It has darker red flowers and larger leaflets than the Woerlitz tree. Highland Park trees range around 25 feet in height. Their mid-October golden brown foliage has, in full sun, additional handsome red tints.

AILANTHUS, Desfontaines in Hist. Mem. Acad. Sci. Paris. 1786
SIMAROUBACEAE -- Quassia Family.

Ailanthus altissima, (Mill.) Swingle
TREE OF HEAVEN n China

Swingle in Jour. Wash. Acad. Sci. 1916

Bean I,197 (1950); Krüssmann 42 (1951)

An ubiquitous urban tree, but in park plantings no weedier than many other trees. The large fruit clusters which may remain most of the winter have considerable ornamental value. Maturing fast, older trees in Highland Park of 50 and 40 foot heights have recently all died out and the tree, apparently, is not destined to attain old age in this area.

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NOTES ON NEW AND NOTEWORTHY PLANTS. XVI

Harold N. Moldenke

BRASSICA OLERACEA var. CAPITATA f. RUBRA Moldenke, f. nov.

Haec forma a forma typica varietatis foliis rubro-purpureis recedit.

This form differs from the typical form of the variety in its red-purple foliage.

The type of the form was collected by H. N. Moldenke (no. 3358) from cultivated material at Watchung, Somerset County, New Jersey, on August 1, 1927, and is deposited in the Britton Herbarium at the New York Botanical Garden.

BUDDLEJA LONICEROIDES (Moldenke) Moldenke, comb. nov.

Clerodendrum loniceroides Moldenke, Lloydia 13: 208. 1950.

CALLICARPA BORNEENSIS Moldenke, sp. nov.

Frutex; ramis crassis perconspicue tetragonis profunde sulcatis plusminusve tomentosis; foliis amplissimis sessilibus subamplexicaulibus obovatis tenuiter chartaceis utrinque griseoviridibus acuminatis utrinque plusminusve dense stellato-pubescentibus vel tomentellis glanduloso-denticulatis; inflorescentiis axillaribus caulifloris fascciulato-cymosis ubique dense sordido-pubescentibus vel tomentellis.

Woody plant; stems coarse, very conspicuously tetragonal with rounded angles, very deeply sulcate between the angles, more or less tomentose with brownish branched hairs, more densely so at the nodes; nodes not annulate; principal internodes 6—9 cm. long; leaves decussate-opposite, very large, sessile, somewhat amplexicaul at the base, obovate, thin-chartaceous, gray-green on both surfaces, 47—50 cm. long, 9—15.5 cm. wide, acuminate at the apex, more or less densely stellate-pubescent or tomentellous on both surfaces, less so in age above, much more densely so along the midrib on both surfaces, often densely villous along the midrib above, abundantly glandular-denticulate along the margins; midrib very stout, flat above, very prominent beneath; secondaries slender, about 15 per side, divergent-ascending, arcuately anastomosing at the margins, flat above, prominent beneath; tertiaries numerous, regular, subparallel, at right angles to the secondaries, obscure above, prominent beneath; veinlet reticulation abundant, obscure above, prominulous beneath; inflorescence axillary, cauliflorous, fasciculate-cymose, densely sordid-pubescent or tomentellous throughout; peduncles, inflorescence-branches, and pedicels very slender, the pedicels much elongated, 7—15 mm. long; calyx campanulate, canescent-puberulent throughout, with a few larger branched hairs near the apex, about 2 mm. long and wide, its rim minutely 5-toothed; corolla and stamens not well enough developed for des-

cription; pistil apparently one; style terminal; stigma capitate.

The type of this very distinct species was collected by F. H. Endert (no. 3723) at W. Koetai, in central east Borneo, at an altitude of 1100 meters, on September 29, 1925, and is deposited in the Herbarium Bogoriense at Buitenzorg. Unfortunately the inflorescences are so badly infested with fungus and the flowers so very young that one cannot be sure of the floral characters. Mr. Joseph V. Monachino, however, agrees with me that the plant is probably verbenaceous, and, if so, probably a Callicarpa. It was sent to me by the curators of the Buitenzorg herbarium as verbenaceous.

CLERODENDRUM CARYOPTEROIDES Moldenke, sp. nov.

Frutex; ramis ramulisque gracillimis, sarmentis dense puberulis; foliis oppositis; petiolis gracillimis dense puberulis; laminis submembranaceis ovatis longiuscule acuminatis serratis, ad basin acutis vel subtruncatis, supra leviter puberulis, subtus dense puberulis; inflorescentiis terminalibus cymosis abbreviatis, cymis dense multifloris.

Shrub; branches and branchlets very slender, the younger parts densely puberulent; twigs very slender, densely puberulent; nodes not annulate; principal internodes 0.8--3.5 cm. long; leaves decussate-opposite; petioles very slender, 4--15 mm. long, densely puberulent; leaf-blades submembranous, dark-green above, lighter beneath, ovate, 3--5 cm. long, 1.5--2.5 cm. wide, rather long-acuminate at the apex, acute or subtruncate at the base, serrate from about the widest point to below the apex, finely puberulent above, densely puberulent beneath; midrib filiform, flat above, prominulous beneath; secondaries filiform, 4 or 6 per side, ascending, hardly arcuate, ending in teeth, flat above, slightly prominulous beneath; veinlet reticulation indiscernible; inflorescence terminal, cymose, much abbreviated, the cymes densely many-flowered, about 1 cm. long and 1.5 cm. wide; calyx campanulate, its tube about 2 mm. long, its 5 lobes very long, 3--4 mm. long, long-attenuate-ovate, finely puberulent outside; corolla mauve, tubular, its tube broad, 3.5--4 mm. long, densely white-villous at the mouth, the limb somewhat 2-lipped, the lobes short, 1--1.5 mm. long, broadly ovate, acute at the apex; stamens inserted near the apex of the corolla-tube, included by the limb; style terminal, 5 mm. long, glabrous; ovary subrotund, 1 mm. long and wide, glabrous.

The type of this species was collected by A. Pételot (no. 4345) on the plain of Jarres, at about 1100 meters altitude, in the province of Xieng Khouang, Laos, Indochina, in May, 1931, and is deposited in the Britton Herbarium at the New York Botanical Garden. The plant bears great similarities to the genus Caryopteris and may eventually prove to be a species of that genus.

CALLICARPA VANSTEENISI Moldenke, sp. nov.

Frutex; ramis virgatis perobtuse tetragonis leviter obscure-

que puberulis; foliis decussatis; petiolis gracilibus minute puberulis; laminis chartaceis vel submembranis fragilibus ellipticis acuminatis, ad basin acutis vel acuminatis, adpresso-serratis, utrinque levissime obscureque puberulo-strigillosis; inflorescentiis cymosis axillaribus densiuscule multifloris.

Shrub; branches apparently virgate, very obtusely tetragonal, very finely and obscurely puberulous; nodes annulate; principal internodes 2.2--12.5 cm. long; leaves decussate-opposite; petioles slender, 1--2 cm. long, minutely puberulent; blades thin-chartaceous or submembranous, fragile, dark-green above, lighter beneath, elliptic, 7--13 cm. long, 2.5--5 cm. wide, acuminate at the apex, acute or acuminate at the base, appressed-serrate along the margins from near the base to the apex, very lightly and obscurely puberulous-strigillose on both surfaces, especially beneath; midrib slender, flat above, prominulous beneath; secondaries very slender or filiform, about 8 per side, ascending, only slightly arcuate, mostly obscure above, very slightly prominulous beneath; veinlet reticulation indiscernible above, rather conspicuous beneath; inflorescence cymose, axillary, mostly shorter than the subtending petioles, rather densely many-flowered; peduncles very short, filiform, puberulent; inflorescence-branches and pedicels filiform, puberulent, several mm. long; bractlets linear, about 1 mm. long or less, puberulent; calyx campanulate, puberulent, its tube about 1.5 mm. long, the spreading, triangular-ovate lobes about 1 mm. long, attenuate at the apex; corolla small, its tube equaling the calyx, its limb bilabiate, about 4 mm. wide, densely puberulent outside; stamens exserted 4--5 mm. from the corolla-mouth; fruiting-calyx hardly enlarged; fruit drupaceous, globose, about 3 mm. long and wide, glabrous, red.

The type of this species was collected by Cornelis Gijsbert Gerrit Jan van Steenis (no. 6373) -- in whose honor it is named -- at Boer in Poepandji, Atjeh, Sumatra, on May 3, 1934, and is deposited in the Herbarium Bogoriense at Buitenzorg.

CLERODENDRUM DALEI Moldenke, sp. nov.

Frutex; ramis ramulisque gracilibus sparsissime puberulis glabrescentibus; foliis decussatis numerosis; petiolis gracilibus minute pilosulis vel glabris nigrescentibus; laminis submembranaceis ellipticis, ad basin et apicem longiter acuminatis, utrinque glabris; inflorescentiis axillaribus vel terminalibus subpaucifloris nigrescentibus.

Shrub; branches and branchlets slender, light-gray, very sparsely puberulent, eventually glabrescent; nodes not annulate; principal internodes 0.9--5.3 cm. long; leaves decussate-opposite, numerous; petioles slender, 7--10 mm. long, minutely scattered-pilosulous or glabrous, nigrescent in drying; blades submembranous, elliptic, dark and nigrescent above in drying, much lighter beneath, 7--11 cm. long, 2--4 cm. wide, long-acuminate at both ends, entire, glabrous on both surfaces; midrib very slender, flat above, prominulous beneath; secondaries filiform, 4--6 per side, arcuate-ascending, flat and often ob-

scure above, only very slightly subprominulous beneath; veinlet reticulation rather sparse, indiscernible above, flat beneath; inflorescence axillary and fasciculate or terminating much abbreviated axillary twigs, rather few-flowered, nigrescent in drying; peduncle and its branches more or less pubescent, densely so toward the base; pedicels filiform, 1--2 mm. long, glabrous, nigrescent; bractlets linear, about 1 mm. long, nigrescent; calyx campanulate, about 3 mm. long and 2 mm. wide, its rim distinctly 5-toothed, the teeth triangular-acute and about 1 mm. long; mature corolla not seen.

The type of this species was collected by I. R. Dale (no. 3811) -- in whose honor it is named -- near Marjoreni, S. Digo, Kenya, in September, 1937, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM DEWITTEI Moldenke, sp. nov.

Frutex volubilis; ramis gracilibus griseis glabris; ramulis gracillimis brunneis glabris; foliis decussatis oppositis vel subopposito-approximatis; laminis membranaceis brunnescentibus elliptico-lanceolatis acuminatis integris, ad basin rotundatis, utrinque glabris nitidisque; inflorescentiis axillaribus vel supra-axillaribus dense multifloris umbellatis vel capitatis.

Woody vine; branches slender, light grayish, glabrous; branchlets very slender, brownish, glabrous; nodes not annulate; principal internodes 2.5--6.5 cm. long; leaves decussate-opposite or subopposite-approximate, apparently confined to the young branchlets, borne on conspicuously elevated corky sterigmata; petioles slender, 5--8 mm. long, short-pubescent in lines on the flattened upper surface, otherwise glabrous; leaf-blades membranous, dark-green on both surfaces, brunnescent in drying, hardly lighter beneath, elliptic-lanceolate, 5--9 cm. long, 2.1-3.5 cm. wide, acuminate at the apex, entire, rounded at the base, glabrous and shiny on both surfaces; midrib very slender, flat above, prominulous beneath; secondaries filiform, 5 or 6 per side, arcuate-ascending, irregular, flattened or microscopically prominulius above, prominulous beneath, not conspicuously anastomosing; veinlet reticulation very abundant and fine, conspicuous but hardly prominulous on both surfaces; inflorescence on the leafless branches, on short supra-axillary or axillary twig-like peduncles 3--4 cm. long, bearing several linear bractlets, especially toward the base, glabrate or minutely and sparsely puberulous, densely many-flowered, umbelliform or capitate; pedicels filiform, 1--3 mm. long, glabrate or minutely puberulous; bractlets numerous, linear, 2--3 mm. long, often light-colored; calyx campanulate, about 7 mm. long and 5 mm. wide, glabrous, deeply 5-lobed, the lobes ovate, about 2 mm. long, apiculate; corolla hypocrateriform, its tube very slender, about 18 mm. long, glabrous, its limb about 1 cm. wide; stamens exserted about 15 mm. from the corolla-mouth.

The type of this species was collected by G. F. de Witte (no. 291) at Lukulu, Katanga, Belgian Congo, between April 30 and May

3, 1931, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

CLERODENDRUM LAEVIFOLIUM var. FLETCHERI Moldenke, var. nov.

Haec varietas a forma typica speciei recedit laminis foliorum sinuato-dentatis et calicibus sub anthesi profunde 5-fissis 4--11 mm. longis.

This variety differs from the typical form of the species in having sinuate-dentate leaf-blades and deeply 5-fid calyxes which are 4--11 mm. long during anthesis.

The type of the variety was collected by H. B. G. Garrett (no. 899) in waste ground at the Forestry Department, Chiengmai, Thailand, on November 26, 1934, and is deposited in the herbarium of the Royal Forestry Department at Bangkok.

CLERODENDRUM SESSILIFOLIUM Moldenke, sp. nov.

Subfrutex; ramis paucis gracilibus subtetragonis sulcatis levissime puberulis; foliis sessilibus firme chartaceis vel subcoriaceis ellipticis acutis, as basin acutis vel acuminatis, argute serratis, supra subglabratis nitidisque, subtus glabrescentibus dense impresso-punctatis; inflorescentiis terminalibus subspicatis vel racemiformibus paucifloris.

Woody subshrub; stems apparently few, 45 cm. tall, branched, issuing from a hard, knobby base, slender, finely puberulent throughout with microscopic hairs, subtetragonal, sulcate; principal internodes 4--9 cm. long; nodes not annulate; leaves sessile or practically so, firmly chartaceous or subcoriaceous, elliptic, 4--6.5 cm. long, 2--3.5 cm. wide, acute at the apex, acute or acuminate at the base, sharply serrate from below the middle to the apex with rather appressed teeth, subglabrate and shiny above, glabrescent beneath and densely impressed-punctate; midrib slender, very slightly prominulous above and beneath; secondaries very slender, ascending, regular, about 10 per side, rather sharply prominulous on both surfaces; veinlet reticulation abundant, prominulous and conspicuous on both surfaces; inflorescence apparently terminal, subspicate or racemiform, apparently few-flowered; calyx campanulate, 6--7 mm. long and wide, densely puberulent; corolla hypocrateriform, the tube slender, about 14 mm. long, glabrous or microscopically pilosulous on the outside, its limb about 10 mm. wide, the lobes reflexed; stamens exserted 10--11 mm. from the corolla-mouth; pistil exserted about 15 mm. from the corolla-mouth; stigma bifid, one branch about 1 mm. long, the other weak and only 0.5 mm. long.

The type of this species was collected by Ad. Hock at Nikondama, Belgian Congo, in October, 1911, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. The plant has much of the aspect of a member of the Lamiaceae.

CLERODENDRUM SPLENDENS var. LONGICUSPE Moldenke, var. nov.

Haec varietats a forma typica speciei recedit lobis calicis 7 mm. longis, ad basin angustatis, usque ad apicem longissime caudato-attenuatis.

This variety differs from the typical form of the species in having the calyx-lobes about 7 mm. long when mature, narrow at the base and very long caudate-attenuate to the apex.

The type of this variety was collected by Hyacinth Vanderyst (no. 13894) at Kisandu, Belgian Congo, in November, 1924, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

COSMOS BIPINNATUS f. PLENIFLORUS Moldenke, f. nov.

Haec forma a forma typica speciei floribus centralibus petaloideis recedit.

This form differs from the typical form of the species in having its disk-florets modified into a crowded mass of petal-like structures the same color as the ray-florets.

The type of the form was collected by H. N. Moldenke (no. 15921) from cultivated material at Watchung, Somerset County, New Jersey, on September 3, 1943, and is deposited in the herbarium of the Bailey Hortorium at Ithaca.

ERIOCAULON SOUCHEREI Moldenke, sp. nov.

Herba acaulescens; foliis rosulatis membranaceis rectis vel patentibus graminoideis acutis saepe subulatis obscure fenestratis utrinque glabris vel subglabris; vaginis anguste cylindricis valde adpressis subcontortis glabris oblique fissis; scapis numerosis gracillimis vel filiformibus stramineis rectis 2-costatis glabris; capitulis conicis griseis 4 mm. longis 2 mm. lat.

Acaulescent herb; leaves rosulate, membranous, erect or the outermost spreading, bright-green, broadly linear or grass-like, 1--3 cm. long, 0.5--2 mm. wide, acute at the apex and often subulate-tipped, very obscurely fenestrate, glabrous or subglabrous on both surfaces, numerous; sheaths narrowly cylindric, closely appressed to the scapes, 2--4 cm. long, equaling or surpassing the leaves, slightly twisted, glabrous, obliquely split at the apex, its limb ovate, erect, appressed, not swollen, rather attenuate-acute; scapes mostly numerous, very slender or filiform, stramineous, erect, 6--24 cm. long, 2-costate, glabrous; heads conic, grayish, about 2 mm. wide and to 4 mm. long, sharply acute when young; involucral bractlets obovate, gray, about 2.7 mm. long and 0.9 mm. wide, abruptly long-caudate-acuminate at the apex, conspicuously concave on the inner surface, glabrous; receptacle very densely long-pilose with white hairs; staminate florets: sepals 3, hyaline, about 1.8 mm. long, obovate, connate at the base, obtuse at the apex, glabrous; petals united into a slender white tube for about 1.6 mm.; stamens 6; filaments about 0.3 mm. long; anthers about 0.2 mm. long; pistillate florets: sepals 3, separate, hyaline, narrowly oblong-elliptic, about 1.2 mm. long and 0.15 mm. wide; petals apparently absent; style white, filiform, about 0.6 mm. long, glabrous; stigma-branches 3, filiform, about 0.75 mm. long; ovary 3-celled, 3-lobed, 3-sulcate, 3-ovulate, white, glabrous, about 0.45 mm. long and wide.

The type of this very distinctive species was collected by Pierre Bertin Riviere de la Souchère (no. 3) -- in whose honor it is named -- in the marsh of Boun ko M'leo, on basalt rock at about 50 meters altitude, in the neighborhood of Ban mi Thuot, province of Darlac, Annam, French Indochina, in November, 1951, and is deposited in the Britton Herbarium at the New York Botanical Garden.

ERYTHRONIUM AMERICANUM f. OSWALDI Moldenke, f. nov.

Haec forma a forma typica speciei laminis foliorum immaculatis recedit.

This form differs from the typical form of the species in having its leaf-blades completely unspotted at all stages of growth and at all seasons.

The type of the form was collected by Fred W. Oswald -- in whose honor it is named -- in woodland under sweet gum and sugar maple trees 0.2 mile north of Route 4 and 0.2 mile east of Forest Avenue, Paramus, Bergen County, New Jersey, on April 20,

1953, and is deposited in the Britton Herbarium at the New York Botanical Garden, under the distribution number of H. N. Moldenke 21370.

LIPPIA AMERICANA f. HYPTOIDES (Benth.) Moldenke, stat. nov.
Lippia hyptoides Benth., Pl. Hartw. 122. 1843.

LIPPIA AMERICANA f. PILOSA Moldenke, f. nov.
Haec forma a forma typica speciei ramulis juvenilibus valde longiter pilosis, pilis adpressis, recedit.
This form differs from the typical form of the species in having its young branches conspicuously long-pilose, the hairs mostly appressed.
The type of the form was collected by E. P. Killip, A. Dugand and R. Jaramillo (no. 38334) in a deep wooded canyon, at an altitude of 380 to 600 meters, at Quebrada Cabaña, Hacienda El Cucharo, between Tocaima and Pubenza, Cundinamarca, Colombia, on May 8, 1944, and is deposited in the Britton Herbarium at the New York Botanical Garden.

LIPPIA PRAECOX Mildbr., n. sp.
Herba perennis; ramulis numerosis gracilibus brevibus 1—4 cm. longis simplicibus dense albo-hirsutis; foliis decussatis subsessilibus vel breviter alato-petiolatis oblongo-ovatis utrinque dense albo-hirsutulis obtusis vel rotundatis saepe obscure 3-denticulatis, usque ad basin angustatis; inflorescentiis axillaribus capitatis dense albo-hirsutulis.
Perennial herb growing from a large woody underground stem often 1.5—2.5 cm. thick and 4 cm. long, apparently burned off periodically; above-ground stems several or numerous, apparently slender and short, 1—4 cm. long, simple, densely white-hirsute; principal internodes 5—10 mm. long; leaves decussate-opposite, subsessile or with carinate-winged very short petioles, oblong-ovate, 5—7 mm. long, 4—5 mm. wide, densely white-hirsutulous on both surfaces, obtuse or rounded at the apex, narrowed into the petiole at the base, often obscurely 3-denticulate near the apex; inflorescence axillary, capitate, decussate-opposite; peduncles filiform, 1—1.5 cm. long, densely white-hirsutulous; heads many-flowered, hemispheric; bractlets broadly ovate, about 3 mm. long and wide, acuminate at the apex, rounded or subtruncate at the base, densely whitish-hirsutulous or short-pubescent on the back, ciliate-margined; corolla hypocrateriform, 3.5—4 mm. long, the tube very narrow, the limb about 1.5 mm. wide.
The type of this species was collected by A. Stolz (no. 2210) at Kyimbila, altitude 1350 meters, Nyasaland, in 1912, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

LYCIUM SUBGLABRUM (Moldenke) Moldenke, comb. nov.
Citharexylum flexuosum var. subglabrum Moldenke in Fedde, Repert. 37: 222—223. 1934.

x POPULUS SCHREINERI Moldenke, nom. nov.
Populus trichocarpa Hook. x P. maximowiczii Henry ex Rehd., Man. Cult. Trees & Shrubs, ed. 2, 78. 1940.

x QUERCUS CAESARIENSIS Moldenke, hybr. nov.
Arbor hybrida foliis Q. rubra L. [Q. falcata Michx.] et Q. ilicifolia Wang. intermediis.
Natural hybrid with foliar and other characters intermediate between those of Q. rubra L. and Q. ilicifolia Wang.
The type of the hybrid was collected by H. N. Moldenke (no. 10581) in sandy woods at Forked River, Ocean County, New Jersey, on June 13, 1938, and is deposited in the Britton Herbarium at the New York Botanical Garden.

x QUERCUS PINETORUM Moldenke, hybr. nov.
Arbor hybrida foliis Q. rubra L. [Q. falcata Michx.] et Q. velutina Lam. intermediis.
Natural hybrid with foliar and other characters intermediate between those of Q. rubra L. and Q. velutina Lam.
The type of the hybrid was collected by H. N. Moldenke (no. 4044) in sandy soil along a roadside at Wildwood, Cape May County, New Jersey, on August 1, 1928, and is deposited in the Britton Herbarium at the New York Botanical Garden.

x RUBUS RYDBERGI Moldenke, hybr. nov.
Planta hybrida caulibus foliisque inflorescentiisque R. ostryifolius Rydb. et R. nigrobaccus L. H. Bailey intermediis.
Natural hybrid plants, with stem, leaf, and inflorescence characters intermediate between those of R. ostryifolius Rydb. and R. nigrobaccus L. H. Bailey.
The type of the hybrid was collected by H. N. Moldenke (no. 1269) in a thicket at Watchung, Somerset County, New Jersey, on June 24, 1930, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA LOBATA var. SESSILIS Moldenke, var. nov.
Haec varietas a forma typica speciei foliis sessilibus laminis 1—2 cm. longis 5—13 mm. latis recedit.
This variety differs from the typical form of the species in having its leaves sessile, with the blades 1—2 cm. long and 5—13 mm. wide.
The type of the variety was collected by Gert Hatschbach (no. 2876) at Varzea, São José dos Pinhaes, Paraná, Brazil, on December 2, 1952, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VITEX ORINOCENSIS var. GLABRA Moldenke, var. nov.
Haec varietas a forma typica speciei foliis utrinque glaberrimis recedit.
This variety differs from the typical form of the species in

having its leaves completely glabrous on both surfaces.

The type of the variety was collected by Elbert L. Little, Jr., and Ruby Rice Little (no. 8286) in a cleared river-bottom forest of the Río Méta, Puerto López, Méta, Colombia, at an altitude of 240 meters, on July 28, 1944, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VITEX VANSTEENISI Moldenke, sp. nov.

Arbor parva; ramulis gracilibus obtusissime tetragonis albo-lenticellatis dense brunneo-puberulis; foliis 1-foliolatis; petiolis densissime brunneo-puberulis articulatis; laminis chartaceis ellipticis vel elliptico-ovatis acutis vel acuminatis integris, ad basin acutis vel brevissime acuminatis, supra dense puberulis, subtus dense breviterque pubescentibus, pilis brunneis velutinis; inflorescentiis abbreviatis axillaribus cymosis.

Treelet; branchlets slender, very obtusely tetragonal, white-lenticellate, densely brown-puberulent; twigs similar but even more densely brown-puberulent; nodes annulate; principal internodes 2.5--4 cm. long; leaves decussate-opposite, 1-foliolate; petioles slender, 1--4 cm. long, very densely brown-puberulent, articulate at the apex; petiolule 4--6 mm. long, densely brown-puberulent; leaf-blade chartaceous, grayish-green above, elliptic or elliptic-ovate, 5.5--15 cm. long, 2.8--6.3 cm. wide, acute or acuminate at the apex, entire, acute or very shortly acuminate at the base, densely puberulent above, less conspicuously so in age, densely short-pubescent beneath with brown velutinous hairs; midrib slender, reddish, flat or very slightly subimpressed above, prominent beneath; secondaries slender, 7--10 per side, arcuate-ascending, reddish, anastomosing near the margins, flat above, prominulous beneath; inflorescence abbreviated, apparently axillary in the uppermost axils of the twigs, cymose, much shorter than the subtending leaves; peduncles slender, 1--1.5 cm. long, very densely short-pubescent with dark-brown velutinous hairs; cymes 1--1.5 cm. long and wide, rather dense; bractlets linear, 1--2 mm. long, densely short-pubescent; calyx campanulate, its tube about 3 mm. long, very densely fulvous-pubescent, the lobes elongate, oblong, foliaceous, conspicuous, 2--3 mm. long, acute; immature corolla short-exserted, yellow, its tube cylindric, about 8 mm. long, densely puberulent.

The type of this species was collected by Cornelis Gijsbert Gerrit Jan van Steenis (no. 9400) along a forest edge at 1300 to 1500 meters altitude, between Gadjah and Blana Kedjerren (Gajo 'Lands), northern Sumatra, on February 27, 1937, and is deposited in the herbarium of the Botanisch Museum at Utrecht. The species in its general habit reminds one greatly of V. erioclona H. J. Lam and V. longisepala King & Gamble.

VITEX VONDROZENSIS Moldenke, sp. nov.

Arbor; ramulis gracillimis griseis densissime puberulis vel breviter pubescentibus; foliis 1-foliolatis; petiolis subfili-

formibus articulatis dense brunneo-puberulis; laminis subcoriaceis ellipticis longe acuminatis integris, ad basin attenuato-acutis, supra glabris, subtus leviter puberulis; inflorescentiis cymosis axillaribus plerumque trifloris.

Tree, 5--6 m. tall; trunk about 8 cm. in diameter; branchlets and twigs very slender, grayish, very densely puberulent or short-pubescent when young, less so in age, very obtusely tetragonal; nodes annulate on older wood; principal internodes 1--5 cm. long; leaves decussate-opposite, 1-foliolate; petioles very slender or subfiliform, 5--8 mm. long, densely brown-puberulent or short-pubescent, articulate at the apex; petiolule obsolete; blades subcoriaceous, uniformly gray-green on both surfaces, elliptic, 2.5--5.5 cm. long, 0.8--2 cm. wide, long-acuminate at the apex, entire, sometimes subrevolute in drying, attenuate-acute at the base, glabrous above, very finely puberulous beneath; midrib very slender, impressed above, sharply prominent beneath; secondaries filiform, few, 4 or 5 per side, obscure or indiscernible above, very finely subprominulous beneath, plainly arcuately joined several mm. from the margins in several loops; veinlet reticulation indiscernible on both surfaces; inflorescence cymose, axillary, equaling or exceeding the subtending leaves; peduncles filiform, divergent, 1.5--2 cm. long, densely brown-puberulent or short-pubescent; cymes usually 3-flowered; pedicels filiform, 6--9 mm. long, densely brown-puberulent; bracts lanceolate, foliaceous, conspicuous, few, about 1 cm. long and 2 mm. wide, puberulent; calyx campanulate, its tube 4--5 mm. long, densely puberulent outside, the five foliaceous ovate-lanceolate lobes 8--9 mm. long, long-attenuate to the apex, finely puberulous on the outside; corolla very zygomorphic, red, the tube funnelform, sharply curvate, densely puberulent on the outside, about 3 mm. wide at the base and 7 mm. wide at the apex, 2--2.5 cm. long, the lobes very small, about 3 mm. long, obtuse; stamens short-exserted; fruiting-calyx and fruit not seen.

The type of this species was collected by Raymond Decary (no. 4888) at Vondrozo, near Farafangana, Madagascar, on September 4, 1926, and is deposited in the herbarium of the Muséum National d'histoire Naturelle at Paris. The collector records the common name "hazomamo".

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ADDITIONAL NOTES ON THE ERIOCAULACEAE. X

Harold N. Moldenke

In addition to the abbreviations for the names of herbaria explained in previous installments of these notes, the following are herein employed: B = Botanisches Museum und Garten, Berlin; Hw = Howard University, Washington; Lm = Los Angeles County Museum, Los Angeles; and Rs = Rancho Santa Ana, Anaheim, California.

SYNGONANTHUS Ruhl.

The Pennell & Killip 5835 so identified and distributed, at least insofar as the New York Botanical Garden specimen is concerned, is not eriocaulaceous. It is also worthy of note that the illustration identified as Paepalanthus sp. in Massart et al., Mission Belge au Brésil 2: fig. 634 (1930) is actually a Syngonanthus.

SYNGONANTHUS ACIPHYLLUS (Bong.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: L. Riedel s.n. [Macbride photos 29988] (N--photo of isotype).

SYNGONANTHUS ACOPANENSIS Moldenke

Additional citations: VENEZUELA: Bolívar: Cardona 2280 (F--photo of type, N--fragment of type, N--photo of type, Si--photo of type, W--1903497--type, Z--photo of type).

SYNGONANTHUS AKURIMENSIS Moldenke

Additional citations: VENEZUELA: Bolívar: Lasser 1705 (N, N, W--1901897).

SYNGONANTHUS AKURIMENSIS var. AMAZONICUS Moldenke

Citation: BRAZIL: Amazonas: Fróes 22433 (N--type).

SYNGONANTHUS ALBOPULVINATUS Moldenke

Citation: VENEZUELA: Amazonas: Maguire, Phelps, Hitchcock, & Budowski 31774 (N--type).

SYNGONANTHUS ALLENI Moldenke

Additional citations: COLOMBIA: Vaupés: P. H. Allen 3149 (F--photo of type, N--fragment of type, N--photo of type, W--1951957--type, Z--photo of type).

SYNGONANTHUS ALLENI var. PARVUS Moldenke

Besides the annotated specimens cited below, I am informed that specimens of the type collection have been deposited in the herbaria of the United States National Museum at Washington and of the Royal Botanic Gardens at Kew.

Additional citations: VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 29238 (N--type, Ve--isotype).

SYNGONANTHUS AMAZONICUS Moldenke

Citation: BRAZIL: Amazonas: Murça Pires 727 (N--type).

SYNGONANTHUS ANDROSACEUS (Griseb.) Ruhl.

A synonym is Paepalanthus androsaceus var. flavescens Griseb., of which the type collection is C. Wright 3236. The Roig 14965, cited below, is not typical of the species.

Additional citations: CUBA: Pinar del Río: C. F. Baker 2101 (S); Ekman 10792 (S), 11607 (S), 18135, in part (Es); León, Moldenke, Acuña, & Alain 23405, in part (N); León, Victorin, &

Alain 17796 (Ha); Moldenke & Moldenke 19882 (B, Es, F, Fy, Hw, Lg, Lm, Mg, Mr, N, N, No, Ot, Rs, S, Sm, Ss); Moldenke, Moldenke, León, Alain, & Acuña 15272 (Es); Roig 14965 (Es); C. Wright 3235 (S--isotype), 3236 (Pa, S, S).

SYNGONANTHUS ANOMALUS (Körn.) Ruhl.

The species is said to be frequent on marshy banks along rivers, blooming in December. The stamens are said to be white. A synonym is Syngonanthus esmeraldae Ruhl., of which the type is Spruce 3259.

Additional citations: VENEZUELA: Amazonas: Fróes 25389 (N); Luetzelburg 20763 [Herb. Mus. Nac. Rio 47727] (Ja), 22147 [Herb. Mus. Nac. Rio 47734] (Ja); Maguire, Cowan, & Wurdack 30409 (N, N); Schultes & López 9268 (N); Spruce 2039 [Macbride photos 22277, in part] (N--photo of isotype), 3259 [Macbride photos 22277, in part] (Br, N, N--photo). BRITISH GUIANA: Jenman 4755 (W--200876, W--936271).

SYNGONANTHUS ANOMALUS var. STOLONACEUS Herzog

Additional citations: BRAZIL: Amazonas: Luetzelburg 23739 [Macbride photos 18740] (N--photo of type).

SYNGONANTHUS ANTHEMIFLORUS (Bong.) Ruhl.

Literature: Castellanos, Gen. Sp. Argent. Erioc. 93 (1945).

Illustrations: Castellanos, op. cit. pl. 19, as S. anthemidiflorus (1945).

Specimens have been mis-identified as Eriocaulon viviparum Bong. and Paepalanthus anthemidiflorus Kunth.

Additional citations: BRAZIL: Minas Geraes: P. Clausen s.n. [Aug.-April, 1840] (Br, Br), s.n. [1840] (S); Glaziou 15554 (Br), 19981 (Br); Martius 889 [Luschnath 43] (Br); L. Riedel s.n. [Serra da Lapa] (Br--isotype, N--photo of isotype, Z--photo of isotype); Weddell 1895 [40] (Br, N--photo, Z--photo).

SYNGONANTHUS APPRESSUS (Körn.) Ruhl.

Additional citations: BRAZIL: São Paulo: L. Riedel 2302 (M--cotype, S--cotype); G. Gardner 5255 (N--cotype, N--photo of cotype, S--cotype, Z--photo of cotype).

SYNGONANTHUS ARENARIUS (Gard.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Silveira 517 [Herb. Marie-Victorin 12430] (Vi).

SYNGONANTHUS ARENARIUS var. HETEROPHYLLUS (Körn.) Ruhl.

Synonyms are Syngonanthus heterophyllus (Körn.) Ruhl. and S. heterophylla (Körn.) Ruhl., ined., not S. heterophyllus Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Martius s.n. [Minas Novas ad Chapada, Juni 1818; Macbride photos 18741] (N--photo).

SYNGONANTHUS ATROVIRENS (Körn.) Ruhl.
Synonyms: Syngonanthus atro-virens Ruhl. ex Alv. Silv., Fl. Montium 340, sphalm. 1928.
Additional citations: BRAZIL: Minas Geraes: Burchell 3748-2 (Br); Martius s.n. [Macbride photos 18742] (N--photo of type).

SYNGONANTHUS AURIFIBRATUS Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: Silveira 582 [Herb. Marie-Victorin 12427] (N--photo of isotype, Vi--isotype).

SYNGONANTHUS BALDWINI Moldenke
Additional citations: BRAZIL: Amazonas: J. T. Baldwin 3479 (N--type, S--isotype), 3546 (N).

SYNGONANTHUS BARTLETTII Moldenke
Original publication: Moldenke, Phytologia 1: 335--336. 1938.
Additional citations: BRITISH HONDURAS: H. H. Bartlett 11263a (N); Usher 26 (I, N).

SYNGONANTHUS BELLUS Moldenke
Additional citations: BRAZIL: Pará: Black 48-3280 (Be--37772), 50-8647 (N), 50-8724 (N); Murça Pires 1397 (Be--37528--isotype, N--type); N. T. de Silva 138 (Be--42543).

SYNGONANTHUS BIFORMIS (N. E. Br.) Gleason
The species has been found on sandy flats bordering woods, along streams in rain forests, and common on moist mossy sandy banks along rocks, at altitudes of 150 to 1220 meters. The flowers are described as white, blooming in March, September, October, and November. It has been widely confused with S. gracilis (Körn.) Ruhl. Additional specimens of Maguire & Politi 27342 are said to be deposited in the herbaria at the United States National Museum, Chicago Natural History Museum, and Royal Botanic Gardens at Kew.
Additional citations: COLOMBIA: Vaupés: Cuatrecasas 6975 (N, N), 7158a (N, W--1774225). VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 29518 (N, Ve); Maguire & Politi 27342 (N, Ve); Steyermark 57804a (N), 58468 (N, S). Bolívar: Cardona 266 [Herb. Nac. Venez. 18486] (Ve); G. G. Simpson 27 [Herb. Nac. Venez. 18487] (Ve), 31 [Herb. Nac. Venez. 18488] (Ve); Steyermark 59196 (N, S), 59305 (N), 60484 (N, S). Sucre: Steyermark 62719 (N, S). BRITISH GUIANA: Forest Dept. Br. Guian. WB.161 (N). SURINAM: Maguire 24728 (N). BRAZIL: Amazonas: Luetzelburg 20800 [Herb. Mus. Nac. Rio 47715] (Ja), 20875 (Ja), 21991 [Herb. Mus. Nac. Rio 47672] (Ja). Mattogrosso: Rondon 1629 [Herb. Mus. Nac. Rio 47662] (Ja).

SYNGONANTHUS BISULCATUS (Körn.) Ruhl.
Material of this species has been mis-identified in herbaria as Paepalanthus elegans Mart. and Syngonanthus elegans (Bong.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Glaziou 20010 [Macbride photos 22279] (C, N--photo), 20014 (C); Mendes Magalhaes 4335 [Herb. Jard. Bot. Belo Horiz. 45166] (N).

SYNGONANTHUS BISUMBELLATUS (Steud.) Ruhl.
The specimen cited below was originally distributed as f. elatus Herzog.
Additional citations: BRAZIL: Goyaz: Luetzelburg 1441 (N).

SYNGONANTHUS BISUMBELLATUS f. ELATUS Herzog
This trinomial occurs mis-spelled "S. biumbellatus f. elata". Luetzelburg, in his Estudo Botanico do Nordéste 3: pp. 149 & 151 (1923), writes the name "S. bisumbellatus f. elata" and records the form from Alto Rio Preto in northeastern Bahia, where he says it is typical of the carrasco and frequent in the brejo formations.

SYNGONANTHUS BLACKII Moldenke
Citations: BRAZIL: Pará: Black 47-1839 (N--type).

SYNGONANTHUS BULBIFER (Huber) Ruhl.
The specimen cited by Silveira from "Maracá" is from Maracá Island in the state of Pará, Brazil.
Additional citations: BRAZIL: Pará: Guedes 601 [Macbride photos 10676] (N--photo of type).

SYNGONANTHUS CAESPITOSUS (Wikstr.) Ruhl.
Additional citations: BRAZIL: State undetermined: Freyreiss 8 (N, N--photo, S, Z--photo).

SYNGONANTHUS CANALICULATUS Alv. Silv.
Some material of this species has been confused in herbaria with S. laricifolius (Gardn.) Ruhl.
Additional citations: BRAZIL: Minas Geraes: Mello Barreto 9494 [Herb. Jard. Bot. Belo Horiz. 24811] (N); Silveira 575 [Herb. Marie-Victorin 12431] (Vi--isotype).

SYNGONANTHUS CANDIDUS Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: Mendes Magalhães 2123 [Herb. Jard. Bot. Belo Horiz. 42637] (N).

SYNGONANTHUS CAPILLACEUS Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: J. E. Oliveira 143 [Herb. Jard. Bot. Belo Horiz. 33787 & 33788] (N, N).

SYNGONANTHUS CAULESCENS (Poir.) Ruhl.
Additional synonyms: Carphocephalus caulescens Kunth ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 359. 1888; Syngonanthus caulescens var. humilis Kunth, in herb.
Literature: Morong, Paraguay 250, as Dupatya caulescens (Poir.) Kuntze. 1892; Plantae Hasslerianae 11: 256. 1903; Malme,

Phanerogamen 3: 10. 1933; Castellanos, Gen. Sp. Pl. Argent. Eriocaul. 95, pl. 20. 1945; Abiatti, Eriocaulaceas 332. 1946.

This species is very widely distributed from Mexico [Veracruz] through Costa Rica, Colombia [Cundinamarca, Méta, Norte de Santander, & Vaupés], Venezuela [Amazonas, Anzoategui, Bolívar, & Carabobo], British Guiana, Surinam, and French Guiana to Peru [San Martín], Brazil [Amapá, Amazonas, Bahia, Goyaz, Mattogrosso, Minas Geraes, Paraná, Pernambuco, Piauhy, Rio de Janeiro, Rio Grande do Sul, & São Paulo], Bolivia [Santa Cruz], Paraguay, and Argentina [Corrientes & Misiones].

It has been collected in forests, mountain forests, bogs, shaded and open swamps, swampy places, damp campos, woody campos, very wet places in campos, moist depressions in llanos, stagnant river valleys, and very wet soil below springs, at the margins of pools, and on igneous outcrops in open savannas. It is often found on firm soil, although it is really an aquatic plant. It is said to be common in "marichales", frequent on moist sandy banks among rocks and infrequent along sandy stream banks under Mauritia. It is recorded by Luetzelburg, Estudo Botanico do Nordéste 3: pp. 149 & 151 (1923) from eastern Goyaz, northeastern Bahia, and central Bahia, where it is said to be typical of the carrasco. The plants are almost acaulescent when young and are then very misleading. The flowers are described as white or cream-colored, blooming in May and from August to March. It has been collected at altitudes of 200 to 3200 meters.

Material of this species occurs in herbaria identified as Eriocaulon splendens Bong., Paepalanthus caulescens Kunth, P. caulescens (Poir.) Kunth, P. procerus Klotzsch, P. splendens Mart., P. splendens var. β Körn., P. surinamensis Miq., Syngonanthus caulescens Ruhl., S. caulescens (Bong.) Ruhl., S. caulescens (Poir.) Vog., and Limnoxeranthemum Salzm.

The species is cited from Corrientes, Argentina, "det. Johnston", by Parodi in Darwiniana 6: 163 (1943). Another specimen of Maguire, Kunhardt, & Politi 27299 is said to be deposited in the United States National Herbarium at Washington. A Britton Herbarium sheet of Cuatrecasas 7886 is S. huberi Ruhl., with flaccid leaves, but the United States National Herbarium sheet is plainly S. caulescens. I compared the two in 1945. The Stockholm sheet of Brade 5528 is a mixture with Leiothrix flavescens, the Britton Herbarium sheet of Jörgensen 3723a is a mixture with a Calpidisca sp., and the Washington sheet of Galen Smith & Idrobo 1561 is mixed with something cyperaceous.

Additional citations: MEXICO: Veracruz: J. G. Smith 116 (E). COSTA RICA: Province undetermined: H. Pittier s.n. [Cienaga de Agua Buena, Cañar Gordar; Herb. Instit. Physico-geogr. Nat. Costaric. 11043] (Br). COLOMBIA: Cundinamarca: F. W. Pennell 2888 (E--844392, F--485587). Magdalena: Haught 2355 (N). Méta: Cuatrecasas 7823 (N, N), 7886, in part (N, W--1796749); F. W. Pennell 1411 (E--843999, F--485387); Galen Smith & Idrobo 1561 (W--2047796). Norte de Santander: Schlim 193 (Br). Vaupés: P. H.

Allen 3212 (W--1951975); Cuatrecasas 6981 (N, N). Department undetermined: Mutis 3933 (W--1562695). VENEZUELA: Amazonas: Maguire & Politi 27342a (N, W), 27343a (N); Steyermark 58519 (N). Anzoategui: H. Pittier 14295 (Ve, W--1778560), 14324 (Ve, W--1778577), 14450 [Herb. Nac. Venez. 18492] (N, Ve), 15154 [Herb. Nac. Venez. 18411] (Ve). Bolívar: Killip 37683 [Herb. Nac. Venez. 18489] (Ve, W--1855639); Steyermark 59262 (F--1209396), 59303 (N), 59308 (N), 60494 (N). Monagas: Maguire, Kunhardt, & Politi 27299 (N, Ve). State undetermined: Cruger s.n. [1859] (S); Otto 941 (Br, S). BRITISH GUIANA: Forest Dept. Br. Guian. WB.255 (N, Wb). SURINAM: Kappler 1002 (S). FRENCH GUIANA: Leprieur s.n. [févr. 1835] (Du). PERU: Loreto: Klug 2866 (N, S). San Martín: Klug 3270 (N, N, S). BRAZIL: Amapá: J. T. Baldwin 4056 (W--1878246); Black 49-8204 (N). Amazonas: Luetzelburg 21037 [Herb. Mus. Nac. Rio 47707] (Ja); Spruce s.n. [in vicinibus Barra, Dec.-Mart. 1850-51] (N); Ule 7610 (N, W--1615004). Bahia: Salzmann s.n. [Bahia, inter sphagna] (Br). Goyaz: Burchell 7941 (Br); M. A. Chase 11740 (W--1470134), 12054 (W--1470-137); Murça Pires & Black 2416 (N), 2431 (N); J. E. Pohl s.n. [Lagem, praedium in prov. Goyazense 1839] (Br), s.n. [prope fl. Riachão, 1839] (Br); Weddell 1921 [19] (Br). Mattogrosso: M. A. Chase 11803 (W--1495702); J. G. Kuhlmann 1633 [Herb. Mus. Nac. Rio 47663] (Ja); Lindman A.2625 (S, S), A.3389 (S, S); Malme 1658b (S), 1658ba (S), 1678 (S), 1678a (S), 2150 (S); J. E. Rombouts s.n. [Herb. Inst. Agron. S. Paulo 2787] (W--1459552). Minas Geraes: Bunbury 76 (Br); Burchell 5818 (Br); M. A. Chase 11256 (W--1470135); P. Clausen 3 (Br), 6 (Br), 173 (Br), 286 (S), 1173 (E), s.n. [Aug.-April, 1840] (Br, Br); Langsdorff s.n. [1859] (M), s.n. (S); Lindberg 569 (Br), 569a (Br); Macedo 2853 (N); Mello Barreto 2585 [Herb. Jard. Bot. Belo Horiz. 4795] (N), 4674 [Herb. Jard. Bot. Belo Horiz. 17528] (N); Mendes Magalhães 2091 [Herb. Jard. Bot. Belo Horiz. 42452] (N), 2121 [Herb. Jard. Bot. Belo Horiz. 42629] (N), 3192 (Be--14810); Mosén 1056 (S, S, S, S); J. E. Oliveira 67 [Herb. Jard. Bot. Belo Horiz. 32592] (N), 933 [Herb. Jard. Bot. Belo Horiz. 42436] (N); J. E. Pohl s. n. [ad Piraposa, cataractam fl. S. Franc.] (Br); Regnell I.450 [1857] (S), I.450 [3/4/1868] (S), I.450 [5/2/1870] (S, S); Silveira 221 [Herb. Marie-Victorin 12425] (Vi); Ule 2719 [Herb. Mus. Nac. Rio 47756] (Ja); Weddell 1039 [45] (Br); Widgren 8 (S), 230 (S, S), 331 (Br), 824 (S, S), s.n. (S, S); Zehntner s. n. [Herb. Mus. Nac. Rio 47731] (Ja). Pará: Black 50-9906 (N). Paraná: Ayrton de Mattos 4288 (N), 4365 (N), 4411 (N), 4657 (N); Ceccatto 117 [Herb. Mus. Parana 3231] (N); Dusén 2298 [Herb. Mus. Nac. Rio Jan. 4806] (S, S), 7206 (S), 10433 (S, S), 10822 (S), 11078 (S), 15619 (S, S), 17538 (S), s.n. [Herb. Mus. Nac. Rio Jan. 4808] (S), s.n. [2.3.1904] (S); Gurgel 15083 [Herb. Mus. Nac. Rio 47656] (Ja); Hatschbach 1761 (N); Hertel 4133 (N);

Jönsson 122a (Br, S); Tessmann 2746 [Herb. Mus. Parana. 2746] (N), 3611 [Herb. Mus. Parana. 3611] (N), 3784a (N). Pernambuco: Pickel s.n. [Pombos, Jan. 1930] (N). Rio Branco: Black 51-12673 (N), 51-13749 (N), 51-13998 (N). Rio de Janeiro: Arens s.n. [Herb. Mus. Nac. Rio 40968] (Ja); Brade 9782 [Herb. Mus. Nac. Rio 22407] (Ja); Dusén 1906 (S); Eugenio Leite 4115 (N); Glaziou 6447 (S), 13283 (Br, Br); Raven s.n. (Br). Rio Grande do Sul: Canisio 134 (S); Eugenio Leite 101 (N), 433 (N); Lindman A.533 (S, S), A.1205 (S, S); Malme 582 (S, S), 724 (S), 897 (S); Rambo 30865 (N), 34685 (N, S), 35244 (N). Santa Catharina: Rambo 49585 (S). São Paulo: Brade 5528, in part (S), 5534 (S), 6344 (S), 12227 [Herb. Mus. Nac. Rio Jan. 30343] (Ja, S); Burchell 3780 (Br), 4341 (Br); Collector undesignated 963 (Br); Guillemin s.n. [9bre 1841] (Du); Heiner s.n. (S); Herter 4325 (S); W. Hoehne 767 (N, Wh, Wh, Wh, Wh), 2378 (N), 2379 (N); Löfgren 366 (S), 1214 (S); B. Lutz s.n. [Herb. Mus. Nac. Rio Jan. 15082] (S); Moldenke & Moldenke 19636 (Es, N), 19671 (N), 19903 (N), 19907 (N); Pickel 639 (N, Sf), 5526 (N). State undetermined: J. Anderson s.n. (S); G. Gardner 5253 (N); Glaziou 15519 (Br), 15679 (Br), 17306 (Br), 22297 (Br); Luschnath 47 [Martius 888] (Br); J. E. Pohl s.n. [Brasiliae 1839] (Br); Raben 967 (Br); L. Riedel 1480 (S, T), s.n. [Brasilia] (Br); Sellow 1296 (Br), 1394 (Br), s.n. [Brasilia] (Br), s.n. (S, S, S). MARAJO ISLAND: Huber 2666 (S), s.n. [1.VII.1902] (S). BOLIVIA: Santa Cruz: Kuntze s.n. [Yapacani, VI.92] (N), s.n. [Velasco, VII.92] (N); Steinbach 5446 (N), 6908 (S). PARAGUAY: Balansa 566a (Br); Hassler 1061 (N), 4709 (S), 6697 (S), 8483 (S), 12532 (S); Jorgensen 3723a (N), 4174 (D--803931, N, S); Lindman s.n. (S); Osten 8813 (S); Rojas 1522 [Herb. Osten 8331] (Go). URUGUAY: Sellow D.1394 (S). ARGENTINA: Corrientes: G. J. Schwarz 340 (W--1931488).

SYNGONANTHUS CAULESCENS var. ANGUSTIFOLIUS Moldenke

This variety is said to be common in bogs at an altitude of about 150 meters, blooming in April, with conspicuous white flower-heads.

Citation: COLOMBIA: Méta: Haught 2747 (N--type).

SYNGONANTHUS CAULESCENS var. BELLOHORIZONTINUS Alv. Silv.

The original publication of this trinomial was inaccurately written "S. caulescens var. bello horizontina".

SYNGONANTHUS CAULESCENS var. PROCERUS (Klotzsch) Moldenke

Synonym: Paepalanthus procerus Klotzsch in Schomb., Reise in Brit. Guian. 3: 1115. 1848; Schomb., Faun. & Fl. Brit. Guian. 1115, hyponym. 1848.

Additional citations: BRAZIL: Minas Geraes: Glaziou 19995 (C). Rio de Janeiro: Glaziou 12249 (Br).

SYNGONANTHUS CENTAUROIDES (Bong.) Ruhl.
This binomial is often written "S. centauroides Ruhl."
Additional citations: BRAZIL: Minas Geraes: Magalhães Gomes & Schwacke 2492 [Herb. Magalhães Gomes 2492; Herb. Jard. Bot. Belo Horiz. 26696] (N); L. Riedel 1063 [Macbride photos 10677] (M--isotype, N--photo of isotype, S--isotype), s.n. (Br--isotype).

SYNGONANTHUS CENTAUROIDES var. SUBAPPRESSUS Ruhl.
Additional citations: BRAZIL: Rio Grande do Sul: Eugenio Leite 432 (N).

SYNGONANTHUS CHRYSANTHUS (Bong.) Ruhl.
Literature: Rambo, Anais Botanicas Nr. 2. 1950.
A synonym is Paepalanthus morulus Kunth, of which the type collection is Sellow s.n.
Additional citations: BRAZIL: Rio de Janeiro: Sellow s.n. [Cabo Frio] (S), s.n. [Brasilia] (Br, E--photo, F--photo, N--photo, Z--photo).

SYNGONANTHUS CIRCINNATUS (Bong.) Ruhl.
A synonym is Eriocaulon circinnatum Bong. The binomial is sometimes written "Syngonanthus circinnatus Ruhl."
Additional citations: BRAZIL: Minas Geraes: L. Riedel 1044 [Macbride photos 10678] (N--photo of isotype), 1077 (M), s.n. [S. de Lapa] (S--isotype), s.n. (Br--isotype).

SYNGONANTHUS COMPACTUS Ruhl.
The specimen cited by Silveira from "Manaos" is from Amazonas, Brazil.

SYNGONANTHUS COSTATUS Ruhl.
Specimens of this species have been misidentified in herbaria as "S. niveus var. rosulatum Kunth". A synonym is Leiothrix lindavii Ruhl., of which the type collection is Magalhães Gomes 3108.
Additional citations: BRAZIL: Minas Geraes: Magalhães Gomes 3108 [Herb. Jard. Bot. Belo Horiz. 26685] (N), 3109 [Herb. Com. Geogr. e Geol. Minas Gerais 1364; Herb. Jard. Bot. Belo Horiz. 26686] (N); Silveira 520 [Herb. Marie-Victorin 12434] (Vi).

SYNGONANTHUS COWANI Moldenke
Additional citations: VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 30466 (N--type, Ve--isotype), 30780 (N, W).

SYNGONANTHUS DEALBATUS Alv. Silv.
Additional citations: BRAZIL: Minas Geraes: Silveira 581 [Herb. Marie-Victorin 15845] (N--photo, Vi).

SYNGONANTHUS DENSIFLORUS (Körn.) Ruhl.
Literature: Malme, Phanerogamen 3: 10. 1933.
A synonym is Paepalanthus densiflorus Körn. The species in-

habits wet ground along streamlets.

Additional citations: BRAZIL: Goyaz: M. A. Chase 11753 (W--1495700); Glaziou 22316 (S); Macedo 1835 (N); Weddell 2132 [12] (Br--cotype), 2141 [7] (Br--cotype), 2383 [22] (Br--cotype). Maranhão: Murça Pires & Black 2549 (Z). Mattogrosso: Malme 1456c (S), 1963 (S), 3369 (S), 3369a (S). Minas Geraes: Mendes Magalhães 306 [Herb. Jard. Bot. Belo Horiz. 32616] (N); J. E. Oliveira 72 [Herb. Jard. Bot. Belo Horiz. 32613] (N); L. Riedel 2348 [Macbride photos 10680] (N--photo of cotype), s.n. [Franca] (S--cotype). Piauhy: G. Gardner 2966 (M--cotype, N--cotype). State undetermined: Glaziou 22316 (Br). BOLIVIA: Santa Cruz: Kuntze s. n. [VII.92] (N).

SYNGONANTHUS DENSUS (Körn.) Ruhl.

This binomial is often written "S. densus Ruhl."

Additional citations: BRAZIL: Goyaz: G. Gardner 4385 [Macbride photos 10681] (N--photo of cotype, S--cotype); Weddell 2127 [11] (Br--cotype).

SYNGONANTHUS DENSUS var. PUMILUS Moldenke

Additional citations: BRAZIL: Amazonas: Luetzelburg 20568, in part [Herb. Mus. Nac. Rio de Janeiro 47668] (Ja--type, N--isotype).

SYNGONANTHUS DROUETII L. B. Sm.

Original publication: L. B. Sm., Contrib. Gray Herb. 117: 34-35 & 43, pl. 2, figs. 41-43. 1937.

The type is Drouet 2112 in the Gray Herbarium, collected on sandy banks and flats 4 km. south of Vigia, Pará, Brazil. It is said to be closely related to S. simplex and S. gracilis, from which species its strikingly large inner involucral bractlets diatinguish it at once. In habit it is said to resemble S. niveus.

SYNGONANTHUS DUIDAE Moldenke

Additional citations: VENEZUELA: Amazonas: Steyermark 58199 (N--type).

SYNGONANTHUS ELEGANS (Körn.) Ruhl.

Literature: Hoehne, Relat. Anual Instit. Bot. 37. 1946; Abiatti, Eriocaulaceas 336. 1946.

Specimens are often found in herbaria under the names Paepalanthus elegans Kunth, Syngonanthus elegans (Bong.) Ruhl., and S. elegans var. rufescens Ruhl. The type collection of the last-mentioned trinomial is Glaziou 20012. Many specimens of the Moldenke & Moldenke collections cited below were originally distributed as S. niveus (Bong.) Ruhl.

The species is widely used in florist decorations in Brazil and the United States under the names of "sempreviva de Diamantina", "sempervarium", "starflower", "skyrocket", "Brazilian everlasting", "diamond flower", and "sempreviva".

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FIVE VARIETAL TRANSFERS OF UNITED STATES TREES

Elbert L. Little, Jr.

These nomenclatural transfers for five varieties of United States trees are in the genera Quercus, Ulmus, Cercocarpus, and Prunus (2). They are needed for the Forest Service Check List of the Native and Naturalized Trees of the United States (Including Alaska), now in press.

QUERCUS STELLATA Wang. var. MISSISSIPPIENSIS (Ashe) Little, comb. nov. Delta post oak

Quercus mississippiensis Ashe, Torreya 31: 39. 1931.

This variation of the Mississippi Valley in bottom lands of western Mississippi, southeastern Arkansas, and eastern Louisiana has been distinguished by foresters of the Southern Forest Experiment Station ever since its publication as a species by W. W. Ashe in 1931. Ashe noted that Q. mississippiensis was one of the common oaks on intermediate or better drained classes of alluvial lands of the lower Mississippi Valley. It was a timber tree of importance, its lumber not separated in marketing from upland white oak.

J. A. Putnam and Henry Bull (The trees of the bottomlands of the Mississippi River delta region. U. S. Dept. Agr., Forest Service, Southern Forest Expt. Sta. Occas. Paper 27, 207 pp. 1932. Mimeographed.) described this oak at length (pp. 156-159). Under the heading post oak together with two specific names Quercus stellata Wangenh. and Q. mississippiensis Ashe, they explained that this post oak probably was not the true Q. stellata, which it closely resembles in most respects, and, if not a variety, was the very closely allied newly published species Q. mississippiensis. They observed that this variation differs from Q. stellata in size, quality, and habitat. developing a tall, straight, massive trunk with broad, open crown of stout branches and branchlets. Ordinarily medium-sized, in West Carroll Parish, Louisiana, it often reaches 100 to 110 feet in height and 3 feet or more in diameter. This common bottomland oak occurs throughout the Delta region but principally in second bottoms. Noting that small trees occasionally were confused with small specimens of overcup oak, Q. lyrata Walt., they pointed out the differences between these two in leaves, branchlets, fruit, and bark of large trees (pp. 163-164).

Some years later, Putnam (Management of bottomland hardwoods. U. S. Dept. Agr., Forest Service, Southern Forest Expt. Sta. Occas. Paper 116, 60 pp. 1951) accepted Delta post oak (Q. mississippiensis) as a species in a table of Important Bottomland Species.

The Forest Products Laboratory, in examining wood from a single tree of this variation, reported that the samples showed wider rings, more pronounced springwood pore zone, and more golden color of the heartwood than specimens of Q. stellata but that these differences might be related to site conditions.

Clair A. Brown (Louisiana trees and shrubs. La. Forestry Comm. Bul. 1, 262 pp., illus. 1945) accepted the species Q. mississippiensis Ashe, Mississippi Valley oak (p. 70, fig. 37C) and regarded it as more closely related to Q. lyrata than to Q. stellata. He thought it possibly might prove to be a variety of the former.

Quercus mississippiensis is transferred to varietal status under Q. stellata Wangenh. (Beytr. Teutsch. Holzger. Fortwiss. Nordamer. Holz. 78, pl. 6, fig. 15. 1787). Apparently none of the varietal names published under Q. stellata, including Q. stellata var. attenuata Sarg., is the same.

ULMUS AMERICANA L. var. FLORIDANA (Chapm.) Little, comb. nov.
Florida elm

Ulmus floridana Chapm., Fl. Southeast. U. S. 416. 1860.

Some authors have accepted Ulmus floridana Chapm., of the Coastal Plain from eastern North Carolina to central Florida, as a distinct species but others have not. For example, Charles Sprague Sargent (Silva No. Amer. 7: 43. 1895; Man. Trees No. Amer. Ed. 2, corr., p. 309. 1926) listed this name as a synonym of U. americana L., American elm.

Florida botanists report the two to be distinct and to flower at different times. Erdman West and Lillian E. Arnold (The native trees of Florida. 212 pp., illus. 1946) accepted Ulmus floridana Chapm., Florida elm (p. 60, fig.). They suggested that this tree may represent a geographical variety of U. americana L., which, they noted, grows on drier ground, normally has downy twigs, and has converging tips on the fruits. I observed Florida elm in Highlands Hammock State Park near Sebring, Fla.

As no varietal name under U. americana seems applicable, the specific epithet floridana is reduced to a variety of U. americana L. (Sp. Pl. 226. 1753).

CERCOCARPUS

The North American genus Cercocarpus H. B. K., cercocarpus or "mountain-mahogany" (family Rosaceae), is a difficult one, because of numerous puzzling intergrades and hybrids between the extreme forms. The complexity of the variations in western United States is illustrated by two monographs from extreme points of view. Rydberg (No. Amer. Fl. 22: 418-424. 1913) accepted 21 species, including in western United States 8 species of trees and 3 of shrubs. Floyd L. Martin (A revision of Cercocarpus. Brittonia 7: 91-111, illus. (maps). 1950) in a conservative monograph, though with field work confined to southern California, reduced the number of species in this genus to 6. All the variations in western United States were combined into 2 species, C. montanus Raf., composed of 8 varieties, and C. ledifolius Nutt., with 3 varieties.

Many botanists probably will prefer a middle course somewhere between the two extremes, with an intermediate number of species. For example, Kearney and Peebles (Ariz. Flora 388-390. 1951) retained in the revision of their work on Arizona plants (Fl. Pl. Ferns Ariz. U. S. Dept. Agr. Misc. Pub. 423: 406-407. 1942) the same number of species of Cercocarpus, five, though mentioning Martin's reduction to two.

Of the taxa or entities in the United States reaching tree size, Martin accepted six varieties in the two species. Sargent (Man. Trees No. Amer. Ed. 2, corr. 550-555. 1926) had five tree species. Following the reduction of the two local California island species by Dunkle (So. Calif. Acad. Sci. Bul. 39: 1-2. 1940), I accepted three tree species with two additional varieties in the preliminary mimeographed Check List of 1944. These three species were further accepted in my popular illustrated handbook, Southwestern Trees (pp. 58-60, figs. 1950).

Cercocarpus ledifolius var. intercedens Schneid. can be united with C. ledifolius Nutt. as a species without varieties. Both variations occupy almost the same broad range and differ scarcely except in width of the narrow leaves and degree of rolling of the margins.

C. betuloides Nutt. and C. breviflorus A. Gray in Arizona are quite different in habit. The former is generally a tree with a single trunk up to 6 inches in diameter and compact crown, while the latter is usually shrubby or branching from near the base and has open widely spreading branches and long slender twigs. Though their ranges meet in Arizona, the two probably have a different history. C. breviflorus is a species

of the interior mountains of Arizona, New Mexico, trans-Pecos Texas, and northern Mexico, while C. betuloides is a Pacific coast species of the California chaparral. In central Arizona, chiefly in Yavapai and Gila counties, is an island of genuine California chaparral vegetation with a smaller number of species, partly Californian, and including C. betuloides. (Perhaps the rarest of these disjunct species now separated by great expanses of deserts is Fremontia californica Torr. For more than two years I lived in this interesting Arizona chaparral while in forest influences research at the Sierra Ancha Experimental Forest in Gila County.)

C. douglasii Rydb. once was reported as a State record for Arizona by Kearney (Wash. Acad. Sci. Jour. 21: 69. 1931) on authority of a determination by Rydberg but afterwards was reduced by Kearney and Peebles (Fl. Pl. Ferns Ariz. 407. 1942) to synonymy under C. betuloides. In the original description of C. douglasii, C. betulaefolius blancheae Schneid. "in part" was cited in synonymy. C. alnifolius was another segregate.

CERCOCARPUS BETULOIDES Nutt. var. BLANCHEAE (Schneid.) Little, comb. nov. alderleaf cercocarpus

Cercocarpus betulaefolius Nutt. var. blancheae Schneid., Deut. Dendrol. Gesell. Mitt. 14: 127. 1905.
Cercocarpus alnifolius Rydb., No. Amer. Fl. 22: 421. 1913.
Cercocarpus betuloides [var.] alnifolius (Rydb.) Dunkle, South. Calif. Acad. Sci. Bul. 39: 2. 1940.
Cercocarpus montanus Raf. var. blancheae (Schneid.) F. L. Martin, Brittonia 7: 103. 1950.

Cercocarpus betuloides Nutt. (in Torr. & Gray, Fl. No. Amer. 1: 427. 1840; June) in its widespread typical variety, C. betuloides var. betuloides, is found in central Arizona and from western Oregon south through California to northern Lower California, Mexico. Three other varieties of restricted distribution can be maintained, var. macrourus (Rydb.) Jeps. in southwestern Oregon and northern California, var. traskiae (Eastw.) Dunkle of Santa Catalina Island, and var. blancheae, for which the new combination is made, on Santa Rosa, Santa Cruz, and Santa Catalina Islands of California.

When checking these names more than ten years ago, I noted that this new combination might be needed, but the type collections of the United States National Museum (US) were then in protective storage. Martin took up the older varietal epithet and designated Blanche Trask in 1896 (Mo) as the lectotype of C. betulaefolius Nutt. var. blancheae Schneid. C. alnifolius Rydb. (type US 340025, seen) was based upon the same collection.

VARIETIES OF PRUNUS SEROTINA EHRH.

Rogers McVaugh (A revision of the North American black cherries (Prunus serotina Ehrh., and relatives). Brittonia 7: 279-315. 1951) in a conservative monograph has united several species with Prunus serotina Ehrh., black cherry, recognizing five subspecies, one further sudbivided into two varieties.

In Forest Service Check Lists, subdivisions of species are cited as varieties, not subspecies. Accordingly, the five subspecies of Prunus serotina Ehrh. are here treated as varieties, two of which are new combinations. A summary of the nomenclature follows. Additional synonyms were listed by McVaugh and by Alfred Rehder (Bibliog. Cult. Trees Shrubs 345. 1949).

Prunus serotina Ehrh. black cherry
Prunus serotina Ehrh., Beitr. Naturk. 3: 20. 1788.

Prunus serotina var. serotina black cherry (typical)
Prunus serotina Ehrh., Beitr. Naturk. 3: 20. 1788.
Prunus serotina subsp. serotina var. serotina (McVaugh, Brittonia 7: 295. 1951).

PRUNUS SEROTINA Ehrh. var. ALABAMENSIS (Mohr) Little, comb. nov. Alabama black cherry
Prunus hirsutus Ell., Sketch Bot. S.-C. 1: 541. 1821.
Prunus alabamensis Mohr, Torrey Bot. Club Bul. 26: 118. 1899.
Prunus cuthbertii Small, Torrey Bot. Club Bul. 28: 290. 1901.
Prunus australis Beadle, Biltmore Bot. Studies 1: 162. 1902.
Padus alabamensis (Mohr) Small, Fl. Southeast. U. S. 574, 1331. 1903.
Padus cuthbertii (Small) Small, Fl. Southeast. U. S. 574, 1331. 1903.
Prunus serotina [f.?] 6. alabamensis (Mohr) Schneid. ex Schwerin, Deut. Dendrol. Gesell. Mitt. 1906 (15): 3 [1907].
Prunus serotina subsp. hirsuta (Ell.) McVaugh, Brittonia 7: 299. 1951.

The epithet alabamensis was used as a trinomial before hirsutus. P. serotina alabamensis was published by Schwerin apparently as a form, credited to Schneider (Illus. Handb. Laubholzk. 1: 643. 1906). However, Schneider expressed belief that Padus alabamensis was a local form without making a trinomial. The type of Prunus alabamensis Mohr (C. Mohr, May 11, 1898, near Birmingham, Ala., US 338624, US 772666) has been examined.

PRUNUS SEROTINA Ehrh. var. EXIMIA (Small) Little, comb. nov. Escarpment cherry
Prunus eximia Small, Torreya 1: 146. 1901.
Padus eximia (Small) Small, Fl. Southeast. U. S. 573, 1331. 1903.

Prunus serotina subsp. eximia (Small) McVaugh, Brittonia 7: 302. 1951.

An isotype of Prunus eximia Small (A. A. Heller 1592, US 213849) has been examined.

Prunus serotina var. rufula (Woot. & Standl.) McVaugh
southwestern black cherry

Prunus salicifolia H. B. K. var. acutifolia S. Wats., Amer. Acad. Arts Sci. Proc. 22: 411. 1887; nom. provisor.
Padus rufula Woot. & Standl., U. S. Natl. Mus. Contrib. U. S. Natl. Herbarium 16: 132. 1913.
Padus virens Woot. & Standl., U. S. Natl. Mus. Contrib. U. S. Natl. Herbarium 16: 133. 1913.
Prunus virens (Woot. & Standl.) Shreve, Carnegie Inst. Wash. Pub. 217: 43. 1915.
Prunus virens var. rufula (Woot. & Standl.) Sarg., Arnold Arboretum Jour. 2: 117. 1920.
Prunus rufula (Woot. & Standl.) Tidestr., Biol. Soc. Wash. Proc. 48: 39. 1935.
Prunus parksii Cory, Rhodora 45: 326. 1943.
Prunus serotina subsp. virens (Woot. Standl.) McVaugh, Brittonia 7: 303. 1951.
Prunus serotina subsp. virens var. virens (Woot. Standl.) McVaugh, Brittonia 7: 305. 1951.
Prunus serotina subsp. virens var. rufula (Woot. Standl.) McVaugh, Brittonia 7: 307. 1951.

McVaugh (pp. 304-305) rejected the oldest varietal epithet by Watson as a provisional name. The southwestern variations Padus rufula and Padus virens, differing in pubescence and intergrading, do not merit separate names. They were united by Sargent, who reduced the former to Prunus virens var. rufula. When both are combined as one variety of Prunus serotina, the oldest varietal epithet thus remains var. rufula. McVaugh published the variety as a quadrinomial, here cited as a ternary combination.

Prunus serotina var. salicifolia (H. H. K.) Koehne
capulin black cherry

Prunus capuli Cav., Anal. Hist. Nat. [Madrid] 2: 110. 1800.
Prunus salicifolia H. B. K., Nov. Gen. Sp. 6: 241, pl. 563. 1824.
Prunus serotina β salicifolia (H. B. K.) Koehne, Deutsche Dendr. 305. 1893.
Prunus serotina subsp. capuli (Cav.) McVaugh, Brittonia 7: 308. 1951.

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ADDITIONAL NOTES ON THE ERIOCAULACEAE. XI

Harold N. Moldenke

SYNGONANTHUS ACIPHYLLUS (Bong.) Ruhl.

Kunth in Enum. Pl. 3: 578 (1841) cites Eriocaulon aciphyllum Bong. to Act. Petrop. 6 (1): 636, pl. 38. The illustration is apparently unpublished.

SYNGONANTHUS CAESPITOSUS (Wikstr.) Ruhl.

Kunth in Enum. Pl. 3: 574 (1841) gives three literature citations for Eriocaulon caespitosum Wikstr. These are Wikstr., K. Vet. Acad. Handl. 78, pl. 4 (1820), Roem. & Schult., Mant. 2: 469, and Bong., Act. Petrop. 6 (1): 628.

SYNGONANTHUS CAULESCENS (Poir.) Ruhl.

Kunth in Enum. Pl. 3: 577 (1841) cites Eriocaulon splendens Bong., a synonym of this species, to Act. Petrop. 6 (1): 633, with an apparently unpublished plate 66. He describes two varieties, but does not give them separate names. One is supposed to have lower stature and the other has very short or almost obsolete stems and a solitary peduncle. They are said to be from near Barbacena, Brazil.

SYNGONANTHUS CENTAUROIDES (Bong.) Ruhl.

Kunth in his Enum. Pl. 3: 578 (1841) cites Eriocaulon centauroides Bong. to Act. Petrop. 6 (1): 635, with an apparently unpublished plate 45. The type was collected at Serra da Lapa, Minas Geraes, Brazil.

SYNGONANTHUS CHRYSANTHUS (Bong.) Ruhl.

Kunth in his Enum. Pl. 3: 575 (1841) cites Eriocaulon chrysanthum Bong to Act. Petrop. 6 (1): 628, with an unpublished plate 43 representing it. The type is from near Rio de Janeiro, Brazil.

SYNGONANTHUS CIRCINNATUS (Bong.) Ruhl.

Kunth in his Enum. Pl. 3: 577 (1841) cites Eriocaulon circinnatum Bong. to Act. Petrop. 6 (1): 633, with an apparently unpublished plate 39 to depict it. The type is from Serra da Lapa.

SYNGONANTHUS ELEGANS (Körn.) Ruhl.

Kuhlmann states that this plant is called "flor de Diamantina" in Brazil because of its abundance in the Diamantina district of Minas Geraes, and in the trade as "sempre-viva". He says (1951) that it has lost its popularity in the trade in Brazil recently. It is supplied commercially to the trade in the United States by "Praxedes Ribeiro, Av. Rio Branco 9 - S/119, Rio de Janeiro" and by "Alvaro Guieiro, Rua Francisco Sa 58, Diamantina, Minas Gerais", according to a letter received from

the American Embassy in Rio de Janeiro, written July 2, 1951. Although sold extensively in New York, it is very doubtful whether the plants are actually cultivated there, or, in fact, anywhere. It is most probable that all the commercial material is gathered from wild plants in Minas Geraes. The species is said to flower in April. Much of the commercially marketed material has the inflorescences dyed red, blue, purple, yellow, or green.

Additional citations: BRAZIL: Minas Geraes: Glaziou 20012 (Br, C, N); Mello Barreto 9674 [Herb. Jard. Bot. Belo Horiz. 24640] (N); Mendes Magalhães 1904 (Be--13885), 2074 [Herb. Jard. Bot. Belo Horiz. 42246] (N); Mexia 5735 (N, Qu, S); L. Riedel s. n. [Serra da Lapa] (N--photo of isotype, S--isotype, Z--photo of isotype); Williams & Assis 6911 (S). CULTIVATED: New York: Hub Floral Manufacturing Co. s.n. (N). Brazil (São Paulo): Moldenke & Moldenke 19937 (Es, N, Sm), 19938 (B, Es, F, Hw, Lm, Mg, Mr, N, No, Rs, S, Sm, Ss).

SYNGONANTHUS ELEGANS var. ELANATUS Ruhl.

The Glaziou collection cited below is usually found in herbaria under the names Paepalanthus elegans Kunth or Syngonanthus elegans (Bong.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: G. Gardner 5282 (S); Glaziou 20013 (Br, C).

SYNGONANTHUS ELEGANTULUS Ruhl.

Material of this species has been widely misidentified as Paepalanthus elegans Kunth, P. niveus Kunth, and Syngonanthus niveus (Bong.) Ruhl. The Brussels sheet of Glaziou 16398, in fact, was identified as Paepalanthus elegans by Taubert and corrected to P. niveus by Ruhland! The labels made for the Macbride cotype photograph at the Chicago Natural History Museum read "Glaziou 16296" in error. The species is said to bloom in January.

Additional citations: BRAZIL: Minas Geraes: G. Gardner 5282, in part (N); Glaziou 15549 (Br), 16396 [Macbride photos 10682] (Br--cotype, N--fragment of cotype, N--photo of cotype), 16398, in part (Br, N), 17316 (Br); Magalhães Gomes 66 [Herb. Jard. Bot. Belo Horiz. 26610] (N).

SYNGONANTHUS EUSCHEMUS Ruhl.

Additional citations: BRAZIL: Goyaz: Glaziou 22300 [Macbride photos 10683] (Br--cotype, N--photo of cotype), 22301 (N--cotype, S--cotype). Pará: Sioli s.n. [Herb. Inst. Agron. Norte 29163a] (N).

SYNGONANTHUS FERTILIS (Körn.) Ruhl.

Literature: Malme, Phanerogamen 3: 10. 1933.

Additional citations: BRAZIL: Mattogrosso: J. G. Kuhlmann 1630 [Com. Lin. Teleg. 1630; Herb. Mus. Nac. Rio 47652 & 47653] (Ja, Ja, N); Malme 3342 (N, S, S); Weddell 3397 [no. 27] (Br--

cotype, N--photo of cotype, Z--photo of cotype).

SYNGONANTHUS FISCHERIANUS (Bong.) Ruhl.

Kunth in his Enum. Pl. 3: 574 (1841) cites the synonymous Eriocaulon fischerianum Bong. to Act. Petrop. 6 (1): 627, with an unpublished plate 29. Other synonyms are Paepalanthus nardifolius Kunth, of which the type is Sellow 4957, and P. vaginatus Mart., of which the type is Clausen 46.

The species produces resplendent, straw-like, white flowers and grows in marshy campos and montane ditches. It has been collected at an altitude of 500 meters, blooming in April and July.

Additional citations: BRAZIL: Amazonas: Ule 7665 (N, W--1615007). Goyaz: Glaziou 22298 (Br, S). Mattogrosso: Kuntze s.n. [VII.92] (N). Minas Geraes: P. Clausen 46 (Br); Löfgren 362 (S); Mendes Magalhães 162 [Herb. Jard. Bot. Belo Horiz. 32594] (N); J. E. Oliveira 1317 [Herb. Jard. Bot. Belo Horiz. 45187] (N); Regnell III.1263 (S, S); Widgren 6 (S), 99 (S), 823 (S, S), s.n. [1845] (S), s.n. (S, S). Pará: Spruce s.n. [in vicinibus Santarem, Aug. 1850] (N, S). Paraná: Dusén 7207 (S); Mattos 4436 (N). São Paulo: Brade 5532 (S), 5533 (S); Burchell 3782 (Br, N); W. Hoehne 766 (Wh, Wh); L. Riedel 1478 [Macbride photos 10684] (M, N--photo, S). State undetermined: Raben 966 (Br, E--photo, F--photo, N--photo, Z--photo); Sellow 4957 (Br, E--photo, F--photo, N--photo, Z--photo). BOLIVIA: Santa Cruz: Kuntze s.n. [VII.92] (N, N); Steinbach 5507 (D--763556, N).

SYNGONANTHUS FLAVIDULUS (Michx.) Ruhl.

Literature: Michaux, Fl. Bor.-Am. 2: 166. 1803; Pursh, Fl. Am. Sept. 1: 92. 1814; Elliott, Sketch Bot. S. C. & Ga. 2: 567. 1824; Ruhland in Engl., Pflanzenreich 4 (30): 256. 1903; Alain, Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 115. 1946; A. C. Martin, Am. Midl. Nat. 36: 533, pl. 4. 1946; Fernald, Rhodora 49: 128--129. 1947.

The species has been collected in anthesis also in July, October, and December, and in fruit in February, March, April, May, and September. It has been found on ancient sand-dunes, in roadside ditches, in low pinelands near swimming-pools, in pine woods, flatwoods, moist grassy openings in live oak hammocks, wet sandy meadows, moist pinebarrens, moist sedgy places, low black sandy muck near bays, and wet places in general.

Recorded common names include "buttons" and "pipewort". Martin in the reference cited above discusses the endosperm morphology, while Fernald gives a very detailed discussion of the supposed occurrence of the species in Virginia, a record apparently not substantiated by fact. Dowell 7140, cited below, is a depauperate specimen. Sheets number 186011 and 186012 in the Pomona College herbarium contain mixtures. The specimen on the former sheet is actually Eriocaulon septangulare With. and belongs on sheet 186012, collected by Brewer & Chickering at Island Pond, Vermont. The Ellis specimen from Georgia is erron-

eously mounted along with E. septangulare material on sheet 186012. It is hoped that this error will be corrected by the curators of that herbarium.

Specimens of this species are often found in herbaria under the synonymous designations of Eriocaulon flavidulum Michx., Dupatya flavidula (Michx.) Kuntze, Dupotya flavidula (Michx.) Kuntze, Paepalanthus flavidulus Kunth, and P. flavidus Kunth. Specimens are often mis-identified as Eriocaulon septangulare With., E. gnaphalodes Michx., Lachnocaulon anceps (Walt.) Morong, L. glabrum Körn., L. minus (Chapm.) Small, L. nudus Rhoads, and L. nunus Rhoads. The "Eriocaulon flavidulum" of Pursh, Fl. Am. Sept. 1: 92 (1814) is E. parkeri B. L. Robinson.

Additional citations: NORTH CAROLINA: Bladen Co.: Blomquist 5740 (H--19366). Brunswick Co.: R. K. Godfrey 48362 (No--17427), s.n. [Aug. 16, 1948] (No--17464). County undetermined: M. A. Curtis s.n. (D--752343). SOUTH CAROLINA: Florence Co.: Ravenel s.n. [Florence, July 1879] (Br). Lexington Co.: E. A. McGregor 257 (Du--75961). GEORGIA: Burke Co.: M. B. Ellis s.n. [Alexander] (Po--186011). Charlton Co.: E. E. Barker E.8606 (Gu); W. H. Duncan 2050 (N); J. S. Harper 161 (Gu--16933), 402 (D--718638); Leeds 1285 (D--700887); Pyron & McVaugh 1495 (Gu--13936). Clinch Co.: D. E. Eyles 178 (Gu--28392). Lowndes Co.: Quarterman 1267 (Va). Ware Co.: J. S. Harper 41 (D--768586). Wayne Co.: Ruth s. n. [June 1893] (Ob--23922). FLORIDA: Alachua Co.: G. F. Weber s. n. [Gainesville, 3-28-28] (Fl--5440, Fl--5441); West & Arnold s. n. [Gainesville, 12 May 1939] (Fl--30617). Baker Co.: West & Arnold s.n. [Taylor, 25 Apr. 1940] (Fl--1104). Bay Co.: R. F. Martin 1707 (N). Bradford Co.: West & Arnold s.n. [Hampton, 15 May 1940] (Fl--32188). Brevard Co.: C. D. Mell s.n. [Indianola, Oct. 1, 1907] (Vt); Edw. Palmer 580 (Pr); Rhoads s.n. [Merritt, 4-2-1928] (Fl--5436, Fl--5437), s.n. [Merritt's Island, Apr. 2, 1928] (Fl--5439). Clay Co.: W. M. Canby s.n. [Magnolia, March 1858] (Pa), s.n. [Hibernia, March 1869] (Cm, Pa, Pr); Leeds 1286 (D--700886); Murrill s.n. [Keystone Heights, 28 Mar. 1939] (Fl--5407), s.n. [May 8, 1940] (H--61586). Collier Co.: C. C. Deam 58689 (Dm), 60549 (Dm, N), 66040 (Dm, Es, N). Dade Co.: A. P. Garber s.n. [Miami, June 1877] (Pa); Small & DeWinkeler 9505 (Fl--29138). De Soto Co.: H. H. Rusby s.n. [Arcadia, Apr. 1, 1935] (N). Duval Co.: Clausen & Trapido 3290 (Ba); Curtiss 4140 (Du--76747, Es), 4786 (Al, Es), s.n. [near Jacksonville, June] (Cm); W. H. Duncan 1271 (Bt--57960, Gu--18509); Lighthipe s.n. [South Jacksonville, April 13, 1897] (Ur, Ur). Flagler Co.: West & Arnold s.n. [Andalusia, 18 Apr. 1940] (Fl--18646). Franklin Co.: A. W. Chapman s.n. [1860] (Ms); Saurman s.n. [Apalachicola, 1867] (Pa, Pr); A. Wood s.n. [Apalachicola, May 1857] (Pa). Gilchrist Co.: Martin, De Vall, & Arnold s.n. [Trenton, 19 May 1940] (Fl--32179). Hernando Co.: Murrill s.n. [Brooksville,

5/9/39] (Fl--24255). Highlands Co.: C. C. Deam 64249 (No--21314); Phillips & Buswell s.n. [April 9, 1939] (Bu); Small & DeWinkeler s.n. [Kuhlman, April 25, 1921] (H--42908, We). Hillsborough Co.: Britton, Britton, & Shafer 107 (Cm, Ur). Indian River Co.: Mac Daniels s.n. [Vero Beach, April 16, 1936] (Ba). Jefferson Co.: Lighthipe s.n. [Lloyd's, April 10, 1891] (Ur). Lake Co.: A. S. Hitchcock 10873 (Po--186007), s.n. [vicinity of Eustis, June & July 1894] (Fl--5452, Ka); Nash 143 (Es), 1944 (Es); M. E. B. Norton 1889 (Gg--105755). Lee Co.: H. C. Beardslee s.n. [Feb. 25, 1918] (Ob--94497); Buswell s.n. [April 24, 1932] (Bu); C. C. Deam 60668 (Dm, N); H. N. Moldenke 688 (Go, H--9662, Ur), 940 (Go, H--241, Ob--23925, Ur); J. P. Standley 10 (Ur). Leon Co.: A. Wood s.n. [Tallahassee] (Pa). Manatee Co.: L. H. Bailey 6660 (Ba); Cuthbert 1489 (Fl--5448), 1516 (Fl--5445), s.n. [Bradentown, June 22, 1916] (Fl--5450), s.n. [Bradenton, March 13, 1917] (Fl--5447), s.n. [Bradentown, April 6, 1917] (Fl--5446, Fl--5449); Dowell 7139 (Mb), 7140 (Mb); Tracy 6643 (Cm). Marion Co.: J. A. Drushel 10135 (Gg--276709); Groves s.n. [Citra, Feby. 1894] (Al). Martin Co.: W. F. Buchanan s.n. [March 23, 1938] (Gu--16011, Gu--16012); P. O. Schallert s.n. [5/2/41] (N). Nassau Co.: L. H. Bailey 6865 (Ba). Okeechobee Co.: Buswell s.n. [May 25, 1935] (Bu). Orange Co.: H. C. Beardslee 127 (Ob--94493); F. S. Blanton 6491 (Ba, Duu--226796, Gg--223695); Bright 3653 (Cm); W. M. Canby s.n. [Orlando, Mch. 18, 1890] (Ur); P. O. Schallert 6116 (Ur). Osceola Co.: Bitting 241 (Ga), 242 (Fl--5451); Moyer 277 (No--2648); P. O. Schallert s.n. [5/2/41] (Gg--305862); Singletary 153 (H--46214). Palm Beach Co.: W. B. Fox s.n. [Apr. 2, 1945] (No--15811); F. C. Randolph 17 (Ba). Pinellas Co.: Allabach s.n. [Clearwater, Feb. 10, 1939] (Cm); M. S. Bebb s.n. [Clear Water, 1894] (Ur); S. M. Deam 4069 (Dm, Po--267594); Tracy 7588 (Cm, Es); M. H. Williams s.n. [Feb. 4, 1926] (H--25700). Polk Co.: C. C. Deam 66089 (Dm); Jennings & Jennings s.n. [s.e. of Ft. Meade, late Dec. 1919] (Cm). Putnam Co.: J. H. Barnhart 2116 [Herb. Barnhart 2562] (N); Laessle s.n. [Welaka, 5/3/40] (Fl--32178); West & Arnold s.n. [East Palatka, 7 June 1940] (N). Saint Johns Co.: W. F. Buchanan s.n. [March 24, 1938] (Gu--16013, H--52325); Doggett s.n. [April 1869] (Al); M. C. Reynolds s.n. [St. Augustine, Mar.-July 1875] (Pr), s.n. [St. Augustine, April] (Ur); West & Arnold s.n. [St. Augustine, 7 June 1940] (N). Sarasota Co.: B. H. Smith s.n. [March 12, 1904] (H--23030). Seminole Co.: H. C. Beardslee s.n. [Longwood, April 1928] (Ob--94495); H. C. Beardslee, Jr., 37 (Ob--98698); Fallass s.n. [Feb. 28, 1911] (Se--3904); Foster, Smith, & Smith s.n. [Plant. Exsicc. Gray. 1334] (Bl--49511, Gu--23855, Ms, Ur). Sumter Co.: Scott s.n. [April 1, 1935] (H--28608). Union Co.: Murrill s.n. [April 12, 1940] (H--61270). Volusia Co.: H. C. Beardslee s.n. [New Smyrna, Mch. 1925] (Ob--94496); E. Brainerd

s.n. [March 28, 1909] (Vt); Dowell 7352 (Mb), 7381 (Mb); Eastwood s.n. [Holly Hill, Mar. '90] (Bl--16616); Noble s.n. [Lake Helens, 1905] (Po--267593). County undetermined: Bird s.n. [Summer, 1933] (Dp--2925); A. W. Chapman s.n. [Florida] (Pa, Pr, Pr, Pr); Fell s.n. [1873] (Pr); Herb. Univ. Vermont s.n. (Vt); A. P. Garber s.n. [1877; Herb. Marie-Victorin 43452] (Vi); La Force s.n. [Lake Findlay, April 24, 1921] (Al); Lighthipe s.n. [St. Nicholas, May 4, 1896] (S); I. S. Smith s.n. [May 1894] (Ob--58173); Van Hyning s.n. [Paradise, April 3, 1924] (Ob--23919). ALABAMA: Baldwin Co.: C. T. Mohr s.n. [June 14, 1880] (Du--76748). LOCALITY OF COLLECTION UNDETERMINED: H. C. Beardslee s.n. ["Painesville, Ohio"] (Ob--23923); A. W. Chapman s.n. [Southern Flora] (Ms, Pr); D. N. Dean s.n. (Ms); Herb. L. H. Bailey s.n. (Ba).

SYNGONANTHUS FLAVIPES Moldenke

Additional citations: VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 30465 (N--type, Ve--isotype).

SYNGONANTHUS FUSCESCENS Ruhl.

Additional citations: BRAZIL: Minas Geraes: Sena 14569 [Macbride photos 10685] (N--photo of type).

SYNGONANTHUS GLANDULIFER Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Mendes Magalhães 4336 [Herb. Jard. Bot. Belo Horiz. 45168] (N); Silveira 549 [Herb. Marie-Victorin 12429] (N--photo of isotype, Vi--isotype, Z--photo of isotype).

SYNGONANTHUS GLANDULOSUS Gleason

The species has been collected at 1520 meters altitude in Venezuela, blooming in September. Steyermark reports the common name of "guanak" for it and states that the natives boil the entire plant for the treatment of toothache. The Rombouts collection cited below was identified as S. caulescens by Uittien.

Additional citations: VENEZUELA: Bolívar: Steyermark 58621 (N, S). SURINAM: Rombouts 556 (N). BRAZIL: Amapá: Black 49-8256 (N). Amazonas: Luetzelburg 20940 [Herb. Mus. Nac. Rio Janeiro 47709] (Ja).

SYNGONANTHUS GOYAZENSIS (Körn.) Ruhl.

Additional citations: BRAZIL: Goyaz: G. Gardner 4384 [Macbride photos 10696] (N--photo of type, S--isotype); Glaziou 22310 (Br, N, S). Minas Geraes: J. E. Oliveira 116 [Herb. Jard. Bot. Belo Horiz. 32601] (N).

SYNGONANTHUS GRACILIS (Körn.) Ruhl.

Literature: Kunth, Enum. Pl. 3: 578 (1841); Plantae Hasslerianae 11: 256 (1903); Malme, Phanerogamen 9 (1933); Luetzelburg,

Estudo Botánico do Nordéste 3: 149 & 151 (1923).

Kunth cites the synonymous Eriocaulon gracile Bong. to Act. Petrop. 6 (1): 634, with an unpublished plate 46, the type having been collected in dry shady places on Mount Itacolumi. Other synonyms are Paepalanthus eriophyllus Mart. and Syngonanthus eriophyllus (Mart.) Ruhl., of which Wullschlägel 762 is the type.

Luetzelburg records S. gracilis from Brejo do Correiro in southern Piauhy, where he says it is typical of the carrasco and frequent in the brejo. It has been collected at altitudes from 450 meters in Colombia to 1980 meters in Venezuela, blooming in February, August, September, October, and November. It is found in wet depressions among sand-dunes, in moist depressions in llanos, on large mesas, and locally frequent in moist sand among rocks. Steyermark 59196 and 62719 were originally identified as this species, too, but prove to be S. biformis (N. E. Br.) Gleason instead. Cuatrecasas 6973, originally distributed as S. gracilis, is actually the type collection of S. vaupesanus Moldenke. The Spruce 1502 specimen cited below is very immature and does not match well other material of this species. Specimens of Maguire 29267 are said to be also in the Belém, Kew, Chicago Natural History Museum, and United States National Museum herbaria.

Some specimens of this species have been mis-identified as Eriocaulon filiforme Bong.

The several varieties proposed by Herzog, Ruhland, and Silveira are poorly defined and need critical study.

Additional citations: COLOMBIA: Méta: Cuatrecasas 7884 (N); F. W. Pennell 1427 (E--844006, F--485393). Vaupés: P. H. Allen 3184 (E); R. E. Schultes 5443 (W--2048149), 5837 (N). VENEZUELA: Amazonas: B. Maguire 29267 (N, Ve); Steyermark 58162 (N), 58197 (N). Bolívar: Lasser 1738 (N), 1803 (N, W--1901899). BRITISH GUIANA: Maguire & Fanshawe 23180 (N), 23181 (N), 23245 (N), 23246 (N); A. C. Smith 2173, in part (S). SURINAM: Lanjouw & Lindeman 128 (N), 3013 (N); Moldenke & Moldenke 19580 (Es, Lg, Mg, N, No, Ot, Sm); Wullschlägel 762 (Br, N). BRAZIL: Amazonas: Luetzelburg 20687 [Herb. Mus. Nac. Rio Janeiro 47711] (Ja), 20938 [Herb. Mus. Nac. Rio Janeiro 47710] (Ja), 21004 [Herb. Mus. Nac. Rio Janeiro 47719] (Ja), 21289 [Herb. Mus. Nac. Rio Janeiro 47714] (Ja); Spruce 1502 (S). Minas Geraes: P. Clausen 7 (Br), 44 (Br, N), 164 (Br), 206 (Br), s.n. [Aug.-April 1840] (Br); Mendes Magalhães 384 [Herb. Jard. Bot. Belo Horiz. 34280] (N). Pará: Black 48-3526 (Be--38012), 50-8688, in part (N); Murça Pires 1271 (Be--37045); Sioli s.n. [Herb. Inst. Agron. Norte 29158] (N). Rio Branco: Black 51-12593 (N), 51-13202 (N), 51-13766 (N). Santa Catharina: Reitz 4735 (Z). State undetermined: G. Gardner 5281 (N). URUGUAY: Rosengurtt B.1103 (W--1694991).

SYNGONANTHUS GRACILIS var. AMAZONICUS Ruhl.

The specimen cited by Ruhland from "Marajo" is from Marajo Is-

land, Pará, Brazil.

Additional citations: BRAZIL: Goyaz: Murça Pires & Black 2396 (N). Maranhão: Murça Pires & Black 2537 (N). Mattogrosso: Lindman A.3277 (S, S). Pará: Burchell 8911 (Br--cotype, E--photo of cotype, F--photo of cotype, N--cotype, N--photo of cotype, Z--photo of cotype). Rio Branco: Black 51-12561 (N).

SYNGONANTHUS GRACILIS var. AUREUS Ruhl.

This trinomial was originally published as S. gracilis var. aurea Ruhl. It is written in the same way in Plantae Hasslerianae 11: 256 (1903). The New York Botanical Garden's sheet of Malme 1653 is mixed with Xyris sp. It was originally identified as var. olivaceus Ruhl., while Glaziou 15680 was distributed as var. glabriusculus Ruhl.

Additional citations: VENEZUELA: Falcón: A. Hernández 19 [Herb. Nac. Venez. 18471] (N, Ve). BRAZIL: Amazonas: Black 48-3039 (Be--36941, N); T. Guedes 76 (Be--43299); Ule 7665 (S). Goyaz: Burchell 7177 (Br--cotype, T--cotype); Macedo 3333 (N), 3355 (N). Mattogrosso: Malme 1576 (S, S), 1653 (N, S), 1653b (S), 3507 (S). Minas Geraes: G. Gardner 5270 [Herb. Mus. Nac. Rio Janeiro 49126] (Ja--cotype, N--cotype, S--cotype); Glaziou 15680 (Br--cotype, N--cotype). Piauhy: G. Gardner 2748 bis (N). São Paulo: L. Riedel 3304 (N).

SYNGONANTHUS GRACILIS var. GLABRIUSCULUS Ruhl.

This trinomial was originally published by Ruhland as S. gracilis var. glabriuscula.

The variety is described as having white flowers, found in the Vellozia association, and frequent on open banks, at altitudes of 200 to 1980 meters, blooming in January, August, September, and December. Specimens of Maguire & Politi 27917 are said also to be in the Belém, Kew, Chicago, and Washington herbaria.

Additional citations: VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 30714 (N); Maguire & Politi 27917 (N, Ve); Steyermark 57804 (N), 58184 (N, S). BRAZIL: Bahia: Martius 1083 (M--cotype). Minas Geraes: P. Clausen s.n. [1840] (S); Glaziou 17308 (Br), s.n. (N); Ule 2721 [Herb. Mus. Nac. Rio Janeiro 47754] (Ja, N). São Paulo: Löfgren 1108 (S).

SYNGONANTHUS GRACILIS var. HIRTELLUS (Steud.) Ruhl.

Steyermark 57814, originally identified as this variety, is actually S. simplex (Miq.) Ruhl.

Additional citations: BRAZIL: Goyaz: Weddell 2136 (Br--cotype, E--photo of cotype, F--photo of cotype, N--photo of cotype, Z--photo of cotype); J. E. Pohl s.n. [Lagem] (Br--cotype, E--photo of cotype, F--photo of cotype, N--cotype, N--photo of cotype, Z--photo of cotype). Maranhão: Murça Pires 2266 (N); Murça Pires & Black 2249 (N), 2251 (N), 2266 (N). Pará: Murça Pires & Silva 4204 (N).

SYNGONANTHUS GRACILIS var. KOERNICKEANUS Ruhl.

Synonyms include Limnoxeranthemum pubescens Salz., of which the Salzmann specimen cited below is probably the type, Paepalanthus filiformis var. minor Mart., of which the Clausen & Riedel specimen cited below is probably the type, and Syngonanthus eriophyllus var. glandulifera Ruhl., of which Wullschlägel 763 is the type. The Brussels sheet of Weddell 552, cited below, was originally identified as Paepalanthus brizoides Kunth.

The variety has been collected in anthesis in August & April.

Additional citations: SURINAM: Wullschlägel 763 (Br, E--photo, F--photo, N, N--photo, Z--photo). BRAZIL: Amazonas: Luetzelburg 21003 [Herb. Mus. Nac. Rio Janeiro 47718] (Ja, N), 21132 [Herb. Mus. Nac. Rio Janeiro 47712] (Ja, N, S), 21150 [Herb. Mus. Nac. Rio Janeiro 47708] (Ja, N), 21156 [Herb. Mus. Nac. Rio Janeiro 47689] (Ja, N). Bahia: Salzmann s.n. (E). Goyaz: Burchell 6917 (Br). Maranhão: Murça Pires & Black 2198 (N). Minas Geraes: Clausen & Riedel s.n. [Caxoeira do Campo, April 1839] (Br); L. Riedel 2304 (N--photo of cotype, S--cotype, Z--photo of cotype). Pará: Murça Pires & Silva 4263 (N); Spruce s.n. [prope Santarem, Aug. 1850] (S). Rio de Janeiro: Weddell 552 [34] (Br, N--photo, Z--photo). São Paulo: L. Riedel 557 (M--cotype, N--photo of cotype, S--cotype, S--cotype, Z--photo of cotype).

SYNGONANTHUS GRACILIS var. LUETZELBURGII Herzog

This variety is recorded by Luetzelburg in his Estudo Botanico do Nordéste 3: 149 & 151 (1923) from Vao do Faria, in southern Piauhy, where it is said to be typical of the carrasco.

SYNGONANTHUS GRACILIS var. OLIVACEUS Ruhl.

Additional citations: BRAZIL: Amazonas: Spruce 1502 (S). Goyaz: J. E. Pohl s.n. [ad Rio Riachao, 1839] (Br--cotype, N--cotype, N--photo of cotype, Z--photo of cotype). Minas Geraes: Widgren 9 (S--cotype), 826 (S--cotype), s.n. [1845] (N--cotype, S--cotype), s.n. (S--cotype).

SYNGONANTHUS GRACILIS var. PALLIDUS Ruhl.

This trinomial was originally published by Ruhland as S. gracilis var. pallida.

The plant has been collected at 320 meters altitude, blooming in November.

Additional citations: COLOMBIA: Méta: Cuatrecasas 7884 (W--1796748).

SYNGONANTHUS GRACILIS var. SETACEUS Ruhl.

A synonym is Paepalanthus oxycnemis Mart., of which the Luschnath specimen cited below is probably type.

Additional citations: BRAZIL: Minas Geraes: Luschnath s.n. [Campos bravos, 1834] (Br, N).

SYNGONANTHUS GRACILIS var. TENUISSIMUS Ruhl.

Additional citations: BRAZIL: Minas Geraes: Regnell III.1266 (N--cotype, N--photo of cotype, S--cotype, S--cotype, Z--photo of cotype), III.1801 (S--cotype, S--cotype).

SYNGONANTHUS HABROPHYUS Ruhl.

Additional citations: BRAZIL: Federal District: Brade 11004 [Herb. Mus. Nac. Rio Janeiro 26708] (Ja, N). Minas Geraes: Mello Barreto 8905 [Herb. Jard. Bot. Belo Horiz. 25851] (N, N); Sampaio 6704 [Herb. Jard. Bot. Belo Horiz. 12232] (N, S). Rio de Janeiro: Glaziou 6449 [Macbride photos 10687] (N--photo of type).

SYNGONANTHUS HELMINTHORRHIZUS (Mart.) Ruhl.

Synonyms include Paepalanthus helminthorrhizus Mart., P. helminthorrhizus var. α Körn., P. helminthorrhizus var. β Körn., Syngonanthus glandulosa Herzog, and S. glandulosus Herzog (not Gleason).

The Brade 6585, of which a photograph is cited below, is said to be deposited in the Munich herbarium.

Additional citations: BRAZIL: Goyaz: Glaziou 22313 (Br, S); Macedo 1903 (N), 3341 (N); J. E. Pohl 3302 (Br). Mattogrosso: Solos 241 [Herb. Inst. Biol. S. Paulo 2752] (N). Minas Geraes: G. Gardner 5264 [Macbride photos 10688] (N--photo); Mello Barreto 9495 [Herb. Jard. Bot. Belo Horiz. 24791] (N). São Paulo: Brade 6585 [Macbride photos 18743] (N--photo), s.n. [Herb. Inst. Biol. S. Paulo 6585] (N); Burchell 5206 (Br); W. Hoehne 1868 (N); Moldenke & Moldenke 19642 (Es, Lg, Mg, Mr, N, No, Ot, S, Sm), 19902 (Es, F, Lg, Mg, Mr, N, No, Ot, S, Sm); L. Riedel 2202 (M--cotype, N--photo of cotype, S--cotype, Z--photo of cotype). PARAGUAY: Hassler 11427 (S).

SYNGONANTHUS HETEROPEPLOIDES Herzog

The species has been collected at an altitude of 200 meters in Venezuela, blooming in August.

Additional citations: VENEZUELA: Amazonas: Steyermark 57848 (N, S). BRAZIL: Amazonas: Luetzelburg 21991 [Macbride photos 18745] (N--photo of type).

SYNGONANTHUS HETEROTRICHUS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Silveira 379 [Herb. Marie-Victorin 12437] (N--photo of isotype, Vi--isotype).

SYNGONANTHUS HUBERI Ruhl.

The species is mentioned in Gleason's Tyler Duida Report, page 327 (1931). The specimen cited by Silveira from "Marajo" is from Marajo Island, Pará, Brazil. The species is described as a submerged plant, found at altitudes of 220 to 320 meters, blooming in September and November.

Additional citations: COLOMBIA: Méta: Cuatrecasas 7879 (N, W--1774231), 7886, in part (N); Triana 1023.3 (Hn). Vaupés: Cuatrecasas 6982 (N, N); P. H. Allen 3211a (W--1951974). BRITISH

GUIANA: A. C. Smith 2112 (S). BRAZIL: Amazonas: Luetzelburg 22160 [Herb. Mus. Nac. Rio Janeiro 47736] (Ja), 22184 [Herb. Mus. Nac. Rio Janeiro 47737] (Ja), 23739 [Herb. Mus. Nac. Rio Janeiro 47682] (Ja), 23760 & 23761 [Herb. Mus. Nac. Rio Janeiro 47657] (Ja, N). Pará: Huber 173 [Macbride photos 10689] (N--photo of type); Sampaio 5460 [Herb. Mus. Nac. Rio Janeiro 18739] (Ja, N), 5460a [Herb. Mus. Nac. Rio Janeiro 18740] (Ja, N).

SYNGONANTHUS HUMBERTI Moldenke

The species is found in forests and on the edges of lakes, at altitudes of 860 to 1600 meters, blooming in January, August, and October.

Additional synonyms: MADAGASCAR: Alleizette s.n. [Ambatolaona, X.1905] (P), s.n. [Mandraka, Août 1906] (P), s.n. [Andringitra, Jan. 1916] (P); Humbert 3487 (N--fragment of type, N--isotype, P--type), 11138 (N, P); Perrier de la Bâthie 7253 (P).

SYNGONANTHUS HUMBOLDTII (Kunth) Ruhl.

A synonym is Paepalanthus humboldtii Kunth. Specimens are sometimes mis-identified as P. fasciculatus (Rottb.) Körn. The species has been collected at 270 meters altitude, blooming in November.

Additional citations: COLOMBIA: Vaupés: Cuatrecasas 7693 (N, N); Idrobo & Schultes 657 (W--2029520). VENEZUELA: Amazonas: Humboldt & Bonpland s.n. [Herb. Willdenow 2375; Macbride photos 10664] (N--photo of type). Bolívar: Lasser 1762 (N).

SYNGONANTHUS HUMBOLDTII var. ELONGATUS Moldenke

Isotypes are said to be deposited also in the Kew, Chicago, and Washington herbaria.

Additional citations: VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 30558 (N--type, Ve--isotype).

SYNGONANTHUS HUMBOLDTII var. GLANDULOSUS Gleason

This plant is said to be the dominant savanna herb in wet savannas northwest of the base of Cerro Moriche, Amazonas, Venezuela. It has been collected at altitudes of 100 to 1100 meters and in anthesis in January and August. It has been mis-identified as Paepalanthus humboldtianus Kunth, Syngonanthus humboldtii (Kunth) Ruhl., and S. verticillatus (Bong.) Ruhl. Additional specimens of Maguire, Cowan, & Wurdack 30985 are said to be in the Chicago and Washington herbaria. The original collection is Tate 1308, from Amazonas, Venezuela.

Additional citations: VENEZUELA: Amazonas: Holt & Gehriger 234 (Cm, N, Ve); Maguire, Cowan, & Wurdack 30985 (N, Ve); Steyermark 57857 (N, S). Bolívar: Cardona 267 (Ve). State undetermined: Herb. Nac. Venez. s.n. (Ve).

SYNGONANTHUS HUMBOLDTII var. MACROCEPHALUS Moldenke

Additional citations: VENEZUELA: Amazonas: Maguire & Politi

27649 (N--type), 27796 (N, Ve).

SYNGONANTHUS HUMBOLDTII var. ORINOCENSIS Moldenke
Additional isotypes are said to be in the Belém, Chicago, Kew, and Washington herbaria.
Additional citations: VENEZUELA: Amazonas: B. Maguire 29340 (N--type, Ve--isotype).

SYNGONANTHUS HYGROTRICHUS Ruhl.
Additional citations: BRAZIL: Minas Geraes: Glaziou 19998 [Macbride photos 10690] (Br--cotype, N--cotype, N--photo of cotype); Schwacke 8479 [Herb. Magalhães Gomes 2964; Herb. Jard. Bot. Belo Horiz. 26669] (N--cotype).

SYNGONANTHUS IMBRICATUS (Körn.) Ruhl.
Specimens of this species have been mis-identified as S. eburneus (Körn.) Ruhl.
Additional citations: BRAZIL: Bahia: Blanchet 958 (M, S), s. n. [Macbride photos 18746] (N--photo of isotype).

SYNGONANTHUS INSULARIS Moldenke
Alain in Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 47, 105, & 115 (1946) states that this species is endemic to the region of white siliceous sands and moist places in the savannas at Los Indios on the Isle of Pines. It has been collected in anthesis in February and has been mis-identified as S. lagopodioides (Griseb.) Ruhl.; in fact, Ekman 12095 is a mixture with material of that species.
Additional citations: ISLA DE PINOS: Britton, Britton, & Wilson 14162 (Cm--isotype, S--isotype); Carabia 3156 (Cr, N); Ekman 12095, in part (S), 12522 (I, S); León 17521 (N); León & Seifriz 17521 (Ha).

SYNGONANTHUS INUNDATUS (Körn.) Ruhl.
Additional citations: BRAZIL: Goyaz: L. Riedel 2745 [Macbride photos 10691] (N--photo of type, S--isotype). State undetermined: Herb. Rio de Janeiro s.n. (Ja).

SYNGONANTHUS KEGELIANUS (Körn.) Ruhl.
Additional citations: SURINAM: Kegel s.n. [Macbride photos 25170] (N--photo of isotype).

SYNGONANTHUS KUHLMANNII Moldenke
Additional citations: BRAZIL: Mattogrosso: J. G. Kuhlmann 1635 [Herb. Com. Linhas Teleg. Estrat. 1635; Herb. Rio de Janeiro 47666] (Ja--type, N--isotype).

SYNGONANTHUS LAGOPODIOIDES (Griseb.) Ruhl.
The species inhabits sandy savannas and has been collected in anthesis also in January, February, April, and December. Specimens have been mis-identified as S. wilsoni Moldenke. Acuña

14904 and 14907 are anomalous in having leaves 4 to 6 cm. long. The type collection is a mixture with Eriocaulon fuliginosum C. Wright, while Ekman 12095 is a mixture with Syngonanthus insularis Moldenke.

Additional citations: CUBA: Las Villas: Ekman 17105 (S). Pinar del Río: Acuña 14904 (Es), 14905 (Es), 14906 (Es), 14907 (Es), 14908 (Es); C. F. Baker 2096 (Es, Po--185870); Carabia 739 (Cr, N), 742 (Cr, N), 743 (Cr, N), 744 (Cr, N), 3021 (Cr, N); Ekman 17254 (S), 17906 (S), 10823 (I, S), 11035a (S), 11035b (S), 11061 (S), 11145 (S); León 15359 (N, N), 15421 (N, N), 17434 (N), 17438b (N); León & Alain 19406 (N), 19481 (N); León & Alain Joseph 17795 (N); León, Moldenke, Acuña, & Alain 23402 (N), 23403 (N), 23405, in part (N), 23406 (N), 23407 (N); León & Roca 6930 (Ha); León & Victorin 20480 (Ha); Moldenke & Moldenke 19872 (Es, Lg, N, Ot, Sm), 19875 (N), 19878 (Es, F, Lg, Mg, Mr, N, N, No, Ot, S, Sm), 19916 (N), 19917 (N), 19918 (Es, Lg, N, Ot, Sm), 19920 (N), 19922 (Es, Lg, N, Sm), 19923 (N), 19924 (Es, Lg, N, Sm), 19926 (Es, Lg, Mg, Mr, N, No, Ot, S, Sm), 19927 (Es, Lg, N), 19929 (Es, Lg, Mg, N, Ot, Sm), 19930 (Es, Lg, N, Sm), 19931 (Es, Lg, Mg, Mr, N, No, Ot, Sm), 19932 (N), 19933 (N); Moldenke, Moldenke, León, Alain, & Acuña 15273 (Es), 15274 (Es); Roig & Acuña 12936 (Es); C. Wright 3237, in part (Pa--isotype, S--isotype, S--isotype). ISLA DE PINOS: Alain & Killip 2116 (Z), 2187 (W--1959542), 2199a (W--1959543), 2202 (W--1959544); Britton, Britton, & Wilson 14223 (Cm), 15787 (Cm), 15789 (Cm); Britton, Wilson, & León 6049 (Ha); Carabia 997 (Cr, N), 1082 (Cr, N), 1189 (Cr, N), 3933 (Cr, N); Ekman 11765 (S), 11942 (S), 11974 (S), 12016 (S), 12071 (S), 12095, in part (S), 12192 (S), 12973 (S); León 6049 [Herb. Marie-Victorin 20278] (Vi), 17506 (N), 17543 (N); León, Albán, & Killip 17024 (Ha); León & Seifriz 17506 (Ha); Victorin & Alain 69 (Ha).

SYNGONANTHUS LARICIFOLIUS (Gardn.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Archer & Mello Barreto 4930 [Herb. Jard. Bot. Belo Horiz. 17512] (N); Glaziou 19981 (N); J. E. de Oliveira s.n. [13-VII-940] (Be--14907); Schwacke 8496 [Herb. Magalhães Gomes 2983; Herb. Jard. Bot. Belo Horiz. 26636] (N).

SYNGONANTHUS LEONII Moldenke

Additional citations: CUBA: Pinar del Río: León & Alain 19491 (Ha--isotype, N--type), 19496 (Ha, N).

SYNGONANTHUS LINEARIS Ruhl.

Additional citations: BRAZIL: Minas Geraes: Magalhães 1367 [Macbride photos 10692] (N--photo of type).

SYNGONANTHUS LLANORUM Ruhl.

Additional citations: COLOMBIA: Méta: F. W. Pennell 1430 (E--844007, N). Santander del Norte: Karsten s.n. [Macbride photos 29992] (N--photo of type). VENEZUELA: Guárico: Lasser 146 (W--1878267).

SYNGONANTHUS LONGIPES Gleason

The species is described as an annual to 1 meter tall, occasional in little wet savannas, growing at altitudes of 150 to 1220 meters, blooming in January and September. An additional specimen of Maguire, Cowan, & Wurdack 30983 is said to be in the Washington herbarium. The species is known also by Tate 1329 from Bolívar, Venezuela, and by Appun 1199, ImThurn 33, and Schomburgk 1060 from Mount Roraima, British Guiana.

Additional citations: VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 30983 (N, Ve). Bolívar: Cardona 52 [Herb. Nac. Venez. 18497] (Ve), 220 (Ve), 844 [Herb. Nac. Venez. 18496] (Ve); Steyermark 60304 (F--1209387, F--1209388, N). BRAZIL: Guaporé: Cordeiro & Silva 278 (N).

SYNGONANTHUS LUNDELLIANUS Moldenke

A synonym is Eriocaulon lundellianus Moldenke, in herb. The type collection is a mixture with a species of Xyris.

Additional citations: BRITISH HONDURAS: O'Neill 8546 (It--isotype).

SYNGONANTHUS MACROCAULON Ruhl.

The specimen cited by Silveira from "Cunani" is from Pará, Brazil. The species is found in water of small streams in dense forests at altitudes of 420 to 500 meters, blooming in January and March.

Additional citations: COLOMBIA: Méta: André 1143 (N); Killip 34259 (N, S). BRAZIL: Amapa: Black 49-8493 (N); Murça Pires & Silva 4206 (N).

SYNGONANTHUS MARGINATUS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 8930 [Herb. Jard. Bot. Belo Horiz. 25939] (N).

SYNGONANTHUS MENDESII Moldenke

Citations: BRAZIL: Minas Geraes: Mendes Magalhães 4339 [Herb. Jard. Bot. Belo Horiz. 45173] (N--type).

SYNGONANTHUS MINUTULUS (Steud.) Moldenke

A synonym is Eriocaulon minutulum Steud., Syn. Pl. Cyp. 2: 270 (1855). The species has been mis-identified as S. pusillus (Bong.) Ruhl., a synonym. Kunth in his Enum. Pl. 3: 577 (1841) cites Eriocaulon pusillum Bong., the name-bringing synonym, to Act. Petrop. 6 (1): 634, with an apparently unpublished plate 29.

Additional citations: BRAZIL: Minas Geraes: Silveira 519

[Herb. Marie-Victorin 12432] (N--photo, Vi).

SYNGONANTHUS NANUS Moldenke

Citations: BRAZIL: Paraná: Ceccatto s.n. [Herb. Mus. Parana. 3230] (N--type).

SYNGONANTHUS NITENS (Bong.) Ruhl.

Malme mentions this species in his Phanerogamen 3: 9 (1933). Luetzelburg in his Estudo Botanico do Nordéste 3: 149 & 151 (1923) records it from Rio Preto and Rio das Femeas in eastern Bahia, where he says it is typical of the carrasco and frequent in the brejo. A synonym is Psilocephalus nitens Kunth ex V. A. Pouls., Vidensk. Meddel. Kjøbenhavn 1888: 343 (1888).

The disposition of the material cited below is very unsatisfactory. Probably several varieties are represented, but the proposed varieties proposed by Körnicke and Ruhland do not seem to be very clear-cut. The extra long-peduncled specimens may represent a separate species, named Paepalanthus longiscapus V. A. Poulson tentatively by Poulson and typified by Mosén 762 (as compared to Mosén 763 which Poulson regards as typical S. nitens. Riedel 2305 and Weddell 2442 also have short peduncles and so does Martius 895. Most of the rest of the material here cited has long peduncles. The Gardner 2965, Macedo 3353, Stephan s.n., and Swallen 9611 have been regarded by some as representing var. filiformis, while Hassler 9430 has been called S. gracilis Ruhl.

Additional citations: BRAZIL: Goyaz: Luetzelburg 1433 (N); Weddell 2442 (N, N). Mattogrosso: Swallen 9611 (N). Minas Geraes: Burchell 5764 (Br); Macedo 3353 (N); Mendes Magalhães 416 [Herb. Jard. Bot. Belo Horiz. 34293] (N); Mosén 762 (S), 763 (S, S); Regnell III.1802 (S); L. Riedel 295 (S--isotype); Stephan s.n. (N); Ule s.n. [Uberaba, VI/1892; Herb. Rio Janeiro 47724] (Ja). Paraná: Dusén 10487 (S). São Paulo: Brade 5531 (S); Burchell 5208 (Br); F. C. Hoehne 6591 (N); Löfgren 367 (S); L. Riedel 2305 (M, S). State undetermined: G. Gardner 2964 (N), 2965 (N); Martius 895 (M). PARAGUAY: Hassler 9430 (S).

SYNGONANTHUS NITENS var. ERECTUS Ruhl.

This trinomial is given as S. nitens var. erecta Ruhl. by Malme in his Phanerogamen 3: 10 (1933) and by Ruhland himself in the original publication.

Additional citations: BRAZIL: Goyaz: Burchell 7483 (Br--cotype); Glaziou 22307 (Br--cotype, E--photo of cotype, F--photo of cotype, N--cotype, N--photo of cotype, S--cotype, S--cotype, Z--photo of cotype); Weddell 2139 (Br), 2442 (Br). Mattogrosso: Weddell 3340 (Br), 3385 (Br).

SYNGONANTHUS NITENS var. FILIFORMIS (Bong.) Ruhl.

The basinym, Eriocaulon filiforme Bong., is cited by Kunth in his Enum. Pl. 3: 577 (1841) to Act. Petrop. 6 (1): 634, with an

apparently unpublished plate 53, the type from Serra da Lapa. Other synonyms are Paepalanthus lamprocephalus Mart. and P. lamprocephalum Mart., of which the type is Clausen 13 [Herb. Martius 895] and P. filiformis Körn. Several of the specimens cited below were originally identified as S. gracilis (Körn.) Ruhl. Other specimens identified as var. filiformis are, I believe, better regarded as typical S. nitens and var. koernickei and are herein cited under those entities. The type collection of var, filiformis is short-peduncled. The variety is listed by Malme in his Phanerogamen 3: 10 (1933). It has been collected in anthesis in August and September.

Additional citations: BRAZIL: Goyaz: Weddell 2384 (Br). Mattogrosso: Malme 1927 (S), 1969a, in part (S), 1969b, in part (S), 1969c (S). Minas Geraes: Clausen 13 [Herb. Martius 895] (Br, E--photo, F--photo, N--photo, Z--photo); L. Riedel 1032 (Br--isotype, N--photo of isotype, S--isotype, Z--photo of isotype), s.n. [ad Barbacena] (Br). State undetermined: Collector undesignated 210 (Br); Sellow s.n. [Brasilia] (Br); Stephan s.n. [Congonhas do Campo, 1843] (Br). PARAGUAY: Rojas 6270 (S).

SYNGONANTHUS NITENS var. HIRTULUS Ruhl.

Additional citations: BRAZIL: Goyaz: Glaziou 22304 [Macbride photos 22290] (Br--cotype, Kr--photo of cotype, N--cotype, N--photo of cotype), 22306 (Br--cotype).

SYNGONANTHUS NITENS var. KOERNICKEI Ruhl.

Several of the specimens cited below were originally identified as var. filiformis (Bong.) Ruhl. or as S. gracilis Ruhl. or as S. gracilis var. aurea Ruhl. The two Dusén collections are short-peduncled.

Additional citations: BRAZIL: Minas Geraes: G. Gardner 5279 (N--cotype); Mello Barreto 2550 [Herb. Jard. Bot. Belo Horiz. 8241] (N); 2583 [Herb. Jard. Bot. Belo Horiz. 8285] (N); Mendes Magalhães 4349 [Herb. Jard. Bot. Belo Horiz. 45199] (N); Weddell 1914 (Br--cotype, E--photo of cotype, F--photo of cotype, N--photo of cotype, Z--photo of cotype). Paraná: Dusén 2517 (S), 7208 (S). PARAGUAY: Hassler 4671 (S), 9436 (S), 9436b (S).

SYNGONANTHUS NITENS f. MALMII Moldenke

Additional citations: BRAZIL: Mattogrosso: Malme 1966a (N--fragment of type, N--photo of type, S--type, Z--photo of type).

SYNGONANTHUS NITENS f. PILOSUS Moldenke

Additional citations: BRAZIL: Mattogrosso: Malme 1966 (N--fragment of type, N--photo of type, S--type, Z--photo of type), 1969 (S), 1969a, in part (S), 1969b, in part (S).

SYNGONANTHUS NIVEUS (Bong.) Ruhl.

Several collections originally distributed as this species have proved to be var. rosulatus (Körn.) Moldenke, S. elegans

(Körn.) Ruhl., or S. elegantulus Ruhl. It has been collected in anthesis in May.

Additional citations: BRAZIL: Federal District: Brade 10987 [Herb. Mus. Nac. Rio Janeiro 26707] (Ja). Minas Geraes: Glaziou 16395 (E--photo, F--photo, N, N--photo, Z--photo), 16398, in part (Br); Ule 2723 [Herb. Mus. Nac. Rio Janeiro 47757] (Ja). State undetermined: Collector undesignated 207 [Caxoeira do Campo, Maio '39] (Br).

SYNGONANTHUS NIVEUS var. ROSULATUS (Körn.) Moldenke

Many of the specimens cited below had been originally determined as S. niveus (Bong.) Ruhl.; the Clausen sheet was labeled as Eriocaulon niveum Bong.

Additional citations: BRAZIL: Minas Geraes: P. Clausen s.n. (Br); Mendes Magalhães 2097 [Herb. Jard. Bot. Belo Horiz. 42496] (N), 2134 [Herb. Jard. Bot. Belo Horiz. 42660] (N); Mexia 5734 (Gg--286183, M1, N, S, Ug); Weddell 1894 (Br); Wied-Neuwied s.n. [Rio Belmonte] (Br--cotype). Rio de Janeiro: Glaziou 6449 (S); Luschnath s.n. [Herb. Martius 1087] (T--cotype); L. Riedel 539 (S), 559 (M--cotype), s.n. [Brasilia] (Br). São Paulo: Regnell III.1265 (S, S). State undetermined: Herb. A. Gray s.n. (T).

SYNGONANTHUS OBLONGUS (Körn.) Ruhl.

Cuatrecasas 6951, originally identified as this species, proves to be S. caulescens (Poir.) Ruhl. instead. The Murça Pires 739 cited below was originally identified as vae. aequinoctialis Ruhl. Additional specimens of Maguire & Maguire 29158 and of Maguire, Cowan, & Wurdack 29630 are said to be in the Kew and Washington (former) and Chicago and Washington (latter) herbaria. The species is described as having pale-green leaves and white flower-heads and to be found at the base of waterfalls and occasional in moist places among rocks, at altitudes of from 200 to 1300 meters, blooming in April, October, and November. It is recorded by Luetzelburg in his Estudo Botanico do Nordéste 3: 149 & 151 (1923) from São Bento das Lagos, in eastern Bahia, and is said to be typical of the carrasco there.

Whether the so-called var. aequinoctialis is really distinct or not is questionable. The characters given by Ruhland do not seem to be constant, but the typical form of the species does seem to have plainly villous flower-heads, while the variety has them subglabrous.

Additional citations: COLOMBIA: Amazonas: Garcia-Barriga 13716 (W--2058380). Vaupés: Cuatrecasas 7158 (N, N); R. E. Schultes 5823 (N, Ug), 5837b (N). VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 29630 (N, Ve); Maguire & Maguire 29158 (N, Ve). BRAZIL: Amazonas: Black 48-2621 (Be--33356); Fróes 25385 (N); Murça Pires 739 (N), s.n. [Rio Icana, Tunuí, 1947] (Be--30620); Spruce 2578 (N). Mattogrosso: J. G. Kuhlmann 1631 [Herb. Mus. Nac. Rio Janeiro 47665] (Ja). Piauhy: G. Gardner 2962 [Macbride photos 10693] (N--isotype, N--photo of type).

SYNGONANTHUS OBLONGUS f. ABBREVIATUS Herzog

The form is recorded (as "f. abbreviata") by Luetzelburg in his Estudo Botanico do Nordéste 3: 149 & 151 (1923) from Rangel, southern Piauhy, where it is said to be typical of the brejo.

SYNGONANTHUS OBLONGUS var. AEQUINOCTIALIS Ruhl.

The Murça Pires 739 originally identified as this variety seems, rather, to represent the typical form of the species. See under S. oblongus for a note about the validity of this variety.

Additional citations: BRAZIL: Amazonas: Luetzelburg 23907 [Herb. Mus. Nac. Rio Janeiro 47730] (Ja, N), 23938 & 23945 [Herb. Mus. Nac. Rio Janeiro 47733] (Ja, N); Spruce 2578 [Macbride photos 22291] (Br--isotype, N--photo of isotype, S--isotype, S--isotype).

SYNGONANTHUS ONEILLII Moldenke

The species apparently grows in association with S. hondurensis Moldenke since the two were originally mixed by Lundell under his no. 8543 -- the S. oneillii material here being regarded as no. 8543a. The name is sometimes written "Syngonanthus O'Neillii", but was not originally published thus.

Additional citations: BRITISH HONDURAS: O'Neill 8548 (Au--isotype, Au--isotype, Ba--isotype, Cm--isotype, Gg--276716--isotype, Mb--isotype, N--isotype), 8549 (Ba, Gg--276715, I, Mi, N, N).

SYNGONANTHUS PAEPALOPHYLLUS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Silveira 522 [Herb. Marie-Victorin 12436] (N--photo of isotype, Vi--isotype).

SYNGONANTHUS PARAËNSIS Ruhl.

Additional citations: BRAZIL: Amazonas: J. T. Baldwin 3231 (N), 3479 (N), 3546 (Be--32040); Black 48-2578 (Be--33313); Murça Pires 422 (Be--28380, N). Pará: Spruce s.n. [fl. Aripecurú, Dec. 1849; Macbride photos 18747] (N--isotype, N--photo of type).

SYNGONANTHUS PAUPER Ruhl.

The Mello Barreto collection cited below was originally distributed as S. habrophyus Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 4794 [Herb. Jard. Bot. Belo Horiz. 17534] (N); Sena 14557 [Macbride photos 10694] (N--photo of type); Silveira 540 [Herb. Marie-Victorin 15835] (N--photo, Vi).

SYNGONANTHUS PERUVIANUS Ruhl.

The Macbride photograph is erroneously numbered "19b" on its accompanying label.

Additional citations: PERU: San Martín: Stubel 196 [Macbride

photos 10695] (N--photo of type).

SYNGONANTHUS PHELPSAE Moldenke

Additional specimens of the type collection are said to be in the Caracas, Chicago, and Kew herbaria. The species is frequent in sphagnum hummocks in wet shrubby savannas, blooming in December, at altitudes of 4500 feet.

Additional citations: VENEZUELA: Amazonas: Maguire, Phelps, Hitchcock, & Budowski 31707 (N--type, W--isotype); Maguire & Politi 27584 (N, Ve), 27697 (N, Ve).

SYNGONANTHUS PHELPSAE var. ELONGATUS Moldenke

Additional citations: VENEZUELA: Amazonas: Cowan & Wurdack 31098 (N--type, Ve--isotype).

SYNGONANTHUS PHILODICOIDES (Körn.) Ruhl.

This binomial is sometimes mis-spelled "Paepalanthus philodecoides Koern."

Additional citations: BRAZIL: Goyaz: Weddell 2080 (Br--cotype, N--photo of cotype, Z--photo of cotype), 2126 (Br--cotype, E--photo of cotype, F--photo of cotype, N--cotype, N--photo of cotype, Z--photo of cotype).

SYNGONANTHUS PITTIERI Moldenke

The original publication is in Ann. Mo. Bot. Gard. 27: 269 (1940). The species is found in savannas at altitudes of 700 to 1100 meters, blooming in March.

Additional citations: PANAMA: Chiriquí: H. Pittier 3316 (N--photo of type, W--677698--type, Z--photo of type).

SYNGONANTHUS PLANUS Ruhl.

The label on the photograph cited below states "Rio de Janeiro" in error.

Additional citations: BRAZIL: Minas Geraes: Glaziou 11634 [Macbride photos 11634] (N--photo of type).

SYNGONANTHUS PLUMOSUS Alv. Silv.

The specimen cited below was originally distributed as S. laricifolius (Gardn.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 8927 [Herb. Jard. Bot. Belo Horiz. 25930] (N).

SYNGONANTHUS PULCHER (Körn.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: G. Gardner 5265 [Macbride photos 10697 & 25175] (N--photo of isotype, N--photo of isotype); Mello Barreto 2544 [Herb. Jard. Bot. Belo Horiz. 10690] (N).

SYNGONANTHUS RECLINATUS (Körn.) Ruhl.

The species is recorded by Luetzelburg in his Estudo Botanico do Nordéste 3: 149 & 151 (1923) from Morro do Chapéo in central

Bahia, Santa Maria in eastern Bahia, and several localities in eastern Goyaz, where it is said to be typical of the carrasco and frequent in the campinas.

Additional citations: BRAZIL: Goyaz: G. Gardner 3488 [Macbride photos 10698 & 25176] (N--photo of type, N--photo of isotype, S--isotype), 3785 (N); Luetzelburg 1340 (N); Murça Pires & Black 2418 (N). Maranhão: Murça Pires & Black 1610a (N), 2259 (N).

SYNGONANTHUS REFLEXUS Gleason

The species has been collected at 200 meters altitude, blooming in August.

Additional citations: VENEZUELA: Amazonas: Steyermark 57816 (N, S); Ll. Williams 15068 [Herb. Nac. Venez. 18503] (Ve). BRAZIL: Pará: Sioli s.n. [Herb. Inst. Agron. Norte 29163] (N).

SYNGONANTHUS RHIZONEMA Ruhl.

Additional citations: BRAZIL: São Paulo: Glaziou 13284 [Macbride photos 10699] (Br--isotype, N--fragment of isotype, N--photo of type).

SYNGONANTHUS RUFO-ALBUS Alv. Silv.

The specimen cited below was originally identified at S. laricifolius (Gard.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mello Barreto 2517 [Herb. Jard. Bot. Belo Horiz. 8230] (N).

SYNGONANTHUS SAVANNARUM Moldenke

The species forms congested rosettes in small tussocks, its heads whitish, and is abundant on otherwise bare ground in sandy areas at about 1200 feet altitude, blooming in September, according to Sandwith.

Additional citations: BRITISH GUIANA: Appun 1009 (K); Sandwith 1371 (K, N).

SYNGONANTHUS SCHLECHTERI Ruhl.

A synonym is Paepalanthus schlechteri (Ruhl.) Macbr., Candollea 5: 348. 1934.

SYNGONANTHUS SCHWACKEI Ruhl.

Literature: Moacyr do Amaral Lisboa, Revista do Escola de Minas 8 (April 1951).

SYNGONANTHUS SCLEROPHYLLUS Ruhl.

Additional citations: BRAZIL: Goyaz: Glaziou 22305 [Macbride photos 10700] (Br--isotype, N--fragment of isotype, N--photo of type).

SYNGONANTHUS SIMILIS Ruhl.

Additional citations: BRAZIL: Minas Geraes: Sena 14570 [Macbride photos 10701] (N--photo of type).

SYNGONANTHUS SIMPLEX (Miq.) Ruhl.

The species is said to be frequent on white sand on the border of small savannas, at an altitude of 150 meters, blooming in September. The Steyermark collection cited below was originally identified as S. gracilis var. hirtellus (Steud.) Ruhl. Additional specimens of Maguire & Politi's collection are said to be in the Chicago, Kew, and Washington herbaria.

Additional citations: VENEZUELA: Amazonas: Maguire & Politi 28035 (N, Ve); Steyermark 57814 (N); G. H. H. Tate 248 (N), 300 (N). BRITISH GUIANA: Maguire 23219 (N). SURINAM: Hostmann 15 [633] (N--photo of isotype, S--isotype, S--isotype, Z--photo of isotype). BRAZIL: Amazonas: Murça Pires 737 (N). Goyaz: Murça Pires 2365 (N); Murça Pires & Black 2365 (N). Maranhão: Murça Pires & Black 2179 (N). Rio Branco: Black 51-13725 (N).

SYNGONANTHUS SPADICEUS (Körn.) Ruhl.

The Stephan collection cited below was originally identified as Paepalanthus vautherianus Kunth.

Additional citations: BRAZIL: Minas Geraes: Stephan s.n. [Congonhas do Campo, 1843] (Br--isotype, N--isotype); Warming 535 [Macbride photos 22295] (N--photo).

SYNGONANTHUS SQUARROSUS Ruhl.

The label on the Macbride photograph says "Glaziou 15540" in error.

Additional citations: BRAZIL: Minas Geraes: Glaziou 15541 [Macbride photos 10702] (Br--isotype, N--fragment of isotype, N--photo of type, Qu--fragment of isotype); Mello Barreto 2576 [Herb. Jard. Bot. Belo Horiz. 10705] (N).

SYNGONANTHUS STEYERMARKII Moldenke

Citations: VENEZUELA: Táchira: Steyermark 57372 (N--type).

SYNGONANTHUS TENUIS (H.B.K.) Ruhl.

The species is said to be infrequent in wet places at an altitude of 125 meters, blooming in December, with ampliate marginal flowers. The Spruce collection cited below was originally distributed as "Paepalanthus tenuis H.B.K."

Additional citations: VENEZUELA: Amazonas: Herb. Humboldt s.n. [Macbride photos 10703] (N--photo of type); Maguire, Cowan, & Wurdack 30473 (N); Spruce 3706 (Br). Bolívar: Cardona 836 [Herb. Nac. Venez. 18499] (N, Ve). BRAZIL: Amazonas: Schultes & López 10308 (N, W--1997107). Pará: Black 50-8688, in part (N).

SYNGONANTHUS TRICOSTATUS Gleason

The species is said to be frequent in muddy areas at altitudes of 1220 to 2000 meters, blooming in November and February. An additional specimen of the Maguire, Phelps, Hitchcock, & Budowski collection cited below is said to be in the United States National Herbarium at Washington. The species has been collected on Mount Roraima, British Guiana, by R. H. Schomburgk.

Additional citations: VENEZUELA: Amazonas: Maguire, Phelps, Hitchcock, & Budowski 31706 (N, Ve). Bolívar: Lasser 1473 (N, W-1901894); Steyermark 59367 (N, S), 59643 (N); G. H. H. Tate 809 (N). BRITISH GUIANA: Maguire & Fanshawe 23113 (N); Sandwith 1372 (N). BRAZIL: Goyaz: Macedo 2138 (N). Maranhão: Murça Pires & Black 2244 (N).

SYNGONANTHUS ULEI Ruhl.

The specimen cited by Silveira from "Manaos" is from Amazonas, Brazil.

Additional citations: BRAZIL: Amazonas: Fróes 24908 (N); Ule 6176 [Macbride photos 10704] (N--photo of type). Pará: Ducke 8403 (S).

SYNGONANTHUS UMBELLATUS (Lam.) Ruhl.

The specimen cited by Silveira from "Marajo" is from Marajo Island in Pará, Brazil. Cuatrecasas 6951 was originally identified as S. oblongus (Körn.) Ruhl. The Schomburgk specimen was identified as "Paepalanthus umbillatus Kunth". Another synonym is Syngonanthus umbellatus f. latifolius Herzog (originally published as "f. latifolia"), of which the type is Luetzelburg 21957. The species is found in grass savannas and in rocky soil with white sand, at altitudes of from 200 to 400 meters, blooming from June to September and in December.

The West Indian records are so noteworthy that they had better be given in full here: Ekman collected the plants in (1) peat savannas at Sabana de los Geugibres, Matanzas, prov. Duarte, Cordillera Septentrional, August 8, 1930, and (2) in moist savanna at El Valle, Sabana de la Mar, prov. Samaná, Cordillera Central, July 14, 1930. The second is sterile (H.15698), but is probably this species.

Additional citations: HISPANIOLA: Dominican Republic: Ekman H.15698 (S), H.15867 (S). COLOMBIA: Amazonas: Garcia-Barriga & Schultes 14166 (W--2058753). Vaupés: P. H. Allen 3213 (W--1951976); Cuatrecasas 6951 (N, W--1796729); Gutiérrez Villegas & Schultes 918 (It, N). VENEZUELA: Amazonas: Steyermark 57846 (F--1205138, N, S). Bolívar: Killip 37355 (W--1855099). BRITISH GUIANA: Abraham 137 (N); C. B. Clarke s.n. [1897] (N); De la Cruz 4013 (D--603281, N); A. S. Hitchcock 16946 (N, S); Jenman 1073 (N); Maguire & Fanshawe 23252 (N); M. R. Schomburgk 216 (Du); A. C. Smith 2166 (S). SURINAM: Essed xxx (N); Hostmann 592a (S); Kappler 592b (S), 592c (S); Maguire 24380 (N); Maguire & Stahel 23662 (N); Moldenke & Moldenke 19577 (B, Es, F, Fy, Lg, Lm, Mg, Mr, N, No, Ot, Rs, S, Sm, Ss), 19578 (Es, Lg, Mg, N, Ot, Sm), 19579 (Es, Es, N); Samuels 234 (N); Wullschlägel 761 (Br), s.n. [Berlyn, Para] (Br). FRENCH GUIANA: Martin s.n. [Cayenne] (Br). BRAZIL: Amapá: Black 49-8258 (N); Black & Lobato 50-9492 (Z); Fróes 26045 (N). Amazonas: Black 48-3049 (Be--36951); T. Guedes 73 (Be--43296), 74 (Be--43297); Killip & Smith 30084 (N,

S); Luetzelburg 21957 [Herb. Mus. Nac. Rio Janeiro 47681] (Ja, N--photo, S, Z--photo), 21990 [Herb. Mus. Nac. Rio Janeiro 47688] (Ja), 22895 [Herb. Mus. Nac. Rio Janeiro 47677] (Ja), 23644 [Herb. Mus. Nac. Rio Janeiro 47658] (Ja), 23708 [Herb. Mus. Nac. Rio Janeiro 47696] (Ja); Spruce 2531 (Br). Pará: Black 48-3274 (Be--37767), 50-8816 (N); Murça Pires 1400 (Be--37531, N); Murça Pires & Silva 4265 (N). Rio Branco: Black 51-13704 (N), 51-13840 (N).

SYNGONANTHUS UMBELLATUS var. LIEBMANNIANUS (Körn.) Ruhl.

Luetzelburg in his Estudo Botanico do Nordéste 3: 149 & 151 (1923) spells the varietal name "liebmanniana". He records the variety from Campinas de Duro in eastern Goyaz.

Additional citations: BRAZIL: Mattogrosso: Swallen 9612 (W--1903233), 9613 (W--1903234). São Paulo: L. Riedel 2349 (M--isotype, S--isotype). State undetermined: Lund 560 [Macbride photo 22286] (N--photo).

SYNGONANTHUS VAUPESANUS Moldenke

The type collection was originally identified as S. gracilis (Körn.) Ruhl. The species is said to grow in rocky soil with white sand, at altitudes of 220 to 400 meters, blooming in September and December, the flowers white.

Additional citations: COLOMBIA: Amazonas: Garcia-Barriga & Schultes 14148 (W--2058741). Vaupés: P. H. Allen 3169 (W--1951961), 3211 (W--1951973); Cuatrecasas 6973 (It--fragment of type, N--isotype, N--photo of type, W--1796730--type, Z--photo of type). BRAZIL: Goyaz: Murça Pires & Black 2417 (N). Pará: Black 50-8645 (N); N. T. Silva 144 (Be--42549, N).

SYNGONANTHUS VENEZUELENSIS Moldenke

Additional citations: VENEZUELA: Bolívar: Steyermark 59347 (N--type, S--isotype).

SYNGONANTHUS VENUSTUS Alv. Silv.

Additional citations: BRAZIL: Minas Geraes: Souza Brito s.n. [Herb. Mus. Nac. Rio Janeiro 4805] (N, S).

SYNGONANTHUS VERNONIOIDES (Kunth) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Mendes Magalhães 1087 [Herb. Jard. Bot. Belo Horiz. 39229] (N); Sellow B.1295 [c. 270] (N--photo of isotype, S--isotype, Z--photo of isotype).

SYNGONANTHUS VERNONIOIDES var. CONFUSUS (Körn.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: Herb. A. Gray s. n. (T); L. Riedel 541 [561?] (S--isotype).

SYNGONANTHUS VERNONIOIDES var. MINOR (Kunth) Ruhl.

Based on Kunth's description in his Enum. Pl. 3: 529 (1841), the type from the summit of Serra do Santo Antonio

Additional citations: BRAZIL: Minas Geraes: Sellow 1295 [Macbride photos 10705] (Br--isotype, N--fragment of isotype, N--photo of type).

SYNGONANTHUS VERTICILLATUS (Bong.) Ruhl.

A synonym is Paepalanthus verticillatus Kunth.

Additional citations: BRAZIL: Goyaz: Weddell 2140 [no. 13] (Br, N--photo, Z--photo). Minas Geraes: G. Gardner 5263 (N); Mendes Magalhães 4337 [Herb. Jard. Bot. Belo Horiz. 45169] (N); L. Riedel 1033 (S--isotype), s.n. [Serra da Lapa] (Br--isotype, N--photo of isotype, Z--photo of isotype); Sampaio 6694 (S). State undetermined: Glaziou 19979 (Br, C).

SYNGONANTHUS WAHLBERGII (Wikstr.) Ruhl.

Th. Arwidsson in Bot. Notiser 1934: 84 (1934) records this species also from Nigeria, Tanganyika, and the Union of South Africa. It grows at altitudes of 4800 to 5000 feet.

Additional citations: SOUTHERN RHODESIA: Brain 3773 [Govt. Herb. Salisbury 10739] (Rh); Corby 74 [Govt. Herb. Salisbury 20927] (Rh), 133 [Govt. Herb. Salisbury 21586] (Rh), 145 [Govt. Herb. Salisbury 22490] (Rh); F. Eyles 1437 (Rh), 1803 (Rh), 3390 (Rh); Herb. Queen Victoria Memorial 7038 (Rh), 7442 (Rh); Rattray 416 (Rh), 684 [Govt. Herb. Salisbury 13679] (Rh); Stent & Brain s.n. [Govt. Herb. Salisbury 6002] (Rh); Wild 154 [Govt. Herb. Salisbury 13727] (Rh), 1551 [Govt. Herb. Salisbury 16096] (F--photo, N, N--photo, Rh, Sg--photo, Z--photo), 2524 [Govt. Herb. Salisbury 20052] (Rh).

SYNGONANTHUS WEDDELLII Moldenke

Additional citations: BRAZIL: Goyaz: Weddell 2725 (Br--type, N--fragment of type, N--photo of type, Z--photo of type).

SYNGONANTHUS WIDGRENIANUS (Körn.) Ruhl.

A synonym of this species is Paepalanthus widgrenianus Körn. The species has been collected at altitudes of 1600 meters, blooming in May and December. Brade 5532 was originally identified as S. fischerianus (Bong.) Ruhl.

Additional citations: BRAZIL: Minas Geraes: B. Lutz s.n. [Herb. Mus. Nac. Rio Janeiro 47748] (Ja); Macedo 2751 (N); Silveira 226 [Herb. Marie-Victorin 12435] (Vi); Widgren 5 (S), 100 (S), 822 (N--photo of cotype, S--cotype, S--cotype, Z--photo of cotype), s.n. [Macbride photos 10706] (N--photo, S); Williams & Assis 7248 (S). Paraná: Hatschbach 1138 (N); Mattos 4328 (N). São Paulo: Brade 5532 [Herb. Inst. Biol. S. Paulo 6582] (N), 12228 [Herb. Mus. Nac. Rio Janeiro 30342] (Ja, S); W. Hoehne 766 (N); Eugenio Leite 3901, s.n. [V. 1950] (N); Moldenke & Moldenke 19644 (B, Es, F, Fy, Lg, Lm, Mg, Mr, N, No, Ot, Rs, S, Sm, Ss), 19909 (Es, N); L. Riedel s.n. [Taubaté] (S). State undetermined: G. Gardner 2957 (N), 5274 (N).

SYNGONANTHUS WILSONII Moldenke

Alain, in Contrib. Ocas. Mus. Hist. Nat. Coleg. La Salle 7: 105 & 115 (1946), spells the name "S. wilsoni Moldenke". Carabia 741 and 746, originally identified as this species, are actually pubescent forms of S. lagopodioides (Griseb.) Ruhl. The León & Roca collection cited below was originally distributed as S. androsaceus (Griseb.) Ruhl. The species has been collected in anthesis in December.

Additional citations: CUBA: Pinar del Río: León & Roca 7498 (Ha). ISLA DE PINOS: Alain & Killip 2162 (N); Britton, Britton, & Wilson 15789 (S--isotype); Carabia 998 (Cr, N); Ekman 12101 (S).

SYNGONANTHUS XERANTHEMOIDES (Bong.) Ruhl.

Kunth, in his Enum. Pl. 3: 578 (1841), cites Eriocaulon xeranthemoides Bong. to Act. Petrop. 6 (1): 635, with an apparently unpublished plate 40 as illustration, with the type from swampy places in the Serra da Chapada. Another synonym is Paepalanthus xeranthemoides Mart. The species is said to be rather conspicuous because of its white flower-heads, growing in swampy areas in llanos, at altitudes of 140 to 150 meters, blooming in April.

Additional citations: COLOMBIA: Méta: Haught 2740 (N). VENEZUELA: Amazonas: Ll. Williams 13857 (W--1832611). State undetermined: Herb. Nac. Venez. s.n. (Ve). BRAZIL: Goyaz: G. Gardner 3490(N,S,W--938120); Weddell 2385 [no. 15] (Br), 2964 [no. 21] (Br). Mattogrosso: Lindman A.2649 (S, S, S); Malme 1456 (S, S), 1960a (S), 1960b (S), 1960c (S). Minas Geraes: J. E. Pohl s.n. [1839] (Br); L. Riedel s.n. (Br--isotype). Paraná: G. Jönsson 438a [Herb. Mus. Parana. 4] (N, S). Rio de Janeiro: Luschnath s. n. [Campos Boa Perna, April 1834] (Br, N); Martius 561 (M). São Paulo:Löfgren 390 (S); L. Riedel 1475 (S). State undetermined: G. Gardner 5278 (N); Herb. A. Gray s.n. [Brasil] (T); Weddell 1890 [no. 39; São Francisco de Chagas] (Br).

SYNGONANTHUS YACUAMBENSIS Moldenke

Citation: ECUADOR: Azuay: Prieto P.197 (N--type).

SYNGONANTHUS YAPACANENSIS Moldenke

Isotypes are said to be deposited also in the Chicago, Kew, and Washington herbaria.

Additional citations: VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 30782 (N--type, Ve--isotype).

TONINA Aubl.

Literature: Aublet, Hist. Pl. Guian. Fr. 2: 856. 1775; Kunth, Enum. Pl. 3: 494. 1841; Moldenke, Carnegie Inst. Wash. Publ. 522: 147. 1940; B. P. Reko, Bol. Soc. Bot. Mex. 4: 36. 1946.

TONINA FLUVIATILIS Aubl.

Literature: Kunth, Enum. Pl. 3: 494. 1841; Moldenke, Carnegie

Inst. Wash. Publ. 522: 147--148. 1940; Moldenke, Ann. Mo. Bot. Gard. 28: 411. 1941; Hodge, Revist. Fac. Nat. Agron. 7: 286. 1947; Determinac. Ejemp. Herb. Fac. Nac. Agron. Medellin 50. 1949.

The synonym Hyphydra amplexicaulis Vahl is listed in Spreng., Syst. 3: 891. Other synonyms are Tonina triandra Mart., of which the Martius collection cited below is the type, and Eriocaulon amplexicaule Rottb. The Bommer specimen cited below is labeled as from "Guinea", but this must surely be an error for Guiana. The specimen cited by Silveira from "Cunani" is from Pará, Brazil.

The species is a medium-sized, slender, aquatic herb, with green flowers, found in mossy forests, swamps, roadside ditches, and among grass about springs. It is said to be occasional in shallow swampy places, abundant in wet soil that is flooded during the rainy season, and forming mats in open marshy ground along streams. Woodson, in a letter to me dated August 1, 1941, states that he collected it in the rainy season, but that the stems were tufted, not floating, and not even in a temporary pool. It has been found at altitudes from sea level to 3400 meters, blooming in January, February, April, May, July, August, September, October, November, and December.

Additional citations: BRITISH HONDURAS: Schipp 693 (S). NICARAGUA: Cabo Gracias a Díos: Lanneberger s.n. [P. O. Schallert 12168] (H--9663). COSTA RICA: Limón: Dodge, Catt, & Thomas 8070 (S). Puntarenas: H. Pittier 4042 (Br), 6575 (Br). San José: Skutch 2465 (S), 3891 (N, S). PANAMA: Chiriquí: Woodson & Schery 752 (N). CUBA: Pinar del Río: Ekman 11120 (S), 11226 (S). Province undetermined: C. Wright 3242 (Pa, S, S). TRINIDAD: D. W. Alexander 5171 (S, S), s.n. [Trin. Bot. Gard. Herb. 5171] (R); Britton, Britton, & Mendelson 1069 [Trin. Bot. Gard. Herb. 9539] (R); W. E. Broadway 2212 (Br), s.n. [Trin. Bot. Gard. Herb. 5277] (R); W. G. Freeman s.n. [Trin. Bot. Gard. Herb. 8020] (R), s.n. [Trin. Bot. Gard. Herb. 9380] (R), s.n. [Trin. Bot. Gard. Herb. 9578] (R), s.n. [January 28, 1920] (R), s.n. [Dec. 3, 1922] (R); Freeman, Williams, & Cheesman s.n. [Trin. Bot. Gard. Herb. 10991] (R); Trin. Bot. Gard. Herb. 824 (N, R), 1959 (R), 4660 (R); Warming 259 (S). COLOMBIA: Antioquia: Archer 334 (Fn--319); Scolnik, Araque Molina, & Barkley 19An415 (N). Caldas: F. W. Pennell 10492 (N). Chocó: Araque Molina & Barkley 19Ch093 (N, S); Cuatrecasas 21430 (F--1359965); Killip 35273 (N, S); Sneidern 4984 (F--1302011). Magdalena: Haught 2287 (N). Méta: Cuatrecasas 3509 (F--1330843), 4498 (F--1329928); Galen Smith & Idrobo 1560 (W--2047795); Haught 2579 (Gg--316198, N). Narino: R. Espinosa 2936 (N). Valle del Cauca: Cuatrecasas 16197 (N), 16961 (N), 21039 (F--1359977); Killip & Garcia 33298 (N, S). Department undetermined: Lehmann B.T.1189 (N); Moritz s.n. [Columbien] (Br, S). VENEZUELA: Anzoategui: H. Pittier 15163 [Herb. Nac.

Venez. 18504] (Ve). Bolivar: Steyermark 60953 (N, S). State undetermined: Karsten 9 [Baul, Llano del Orinoco] (Ve). BRITISH GUIANA: A. S. Hitchcock 16861 (S); Jenman 4667 (Ka); Linder 54 (S); A. C. Smith 2181 (S). SURINAM: Collector undesignated s.n. (Du); Hostmann & Kappler 608 (S); Kuyper 100 (N); Weigelt s.n. [1827] (Br, Gg--105757, S); Wullschlägel 775 (Br). FRENCH GUIANA: Collector undesignated 222 (Br); Leprieur s.n. [févr. 1835] (Du), s.n. [Cayenne] (Br); Martin s.n. [Cayenne] (Br, Br); L. C. Richard s.n. (Q). ECUADOR: Imbabura: André 3387 (N). PERU: Loreto: Asplund 13933 (S); Ll. Williams 3779 (S). BRAZIL: Amazonas: J. T. Baldwin 3227 (N); Fróes 25384 (N); Luetzelburg 21959 [Herb. Mus. Nac. Rio Janeiro 47678] (Ja), 21992 [Herb. Mus. Nac. Rio Janeiro 47687] (Ja), 22896 [Herb. Mus. Nac. Rio Janeiro 47676] (Ja); Spruce s.n. [in vicinibus Barra, Dec.-Mart. 1850-51] (S), s.n. [prope Barra, Prov. Rio Negro] (S). Bahia: Don s.n. (S); Glocker 52 (S); L. Riedel 366 (S); Salzmann s.n. [Bahia] (Br). Ceará: Drouet 2558 (S). Mattogrosso: Weddell 3426 (Br). Pará: Burchell 9468 (Br), 9555 (Br); Drouet 2044 (S); Murça Pires & Black 8 (Be--17025); Sampaio 5644 [Herb. Mus. Nac. Rio Janeiro 19105] (Ja). Rio de Janeiro: Brade & Santos Lima 11700 [Herb. Nac. Rio Janeiro 26711] (Ja); Rudolphi 42 (S); Sampaio 8145 [Herb. Mus. Nac. Rio Janeiro 47654] (Ja). State undetermined: Martius s.n. [Brazil] (S, S); Sellow 909 (S). LOCALITY OF COLLECTION UNDETERMINED: Dupuis s.n. (S); Herb. Alstroemer s.n. (S); Herb. Bommer s.n. [Guinea] (Br); Herb. Mus. Nac. Rio Janeiro no. prov. II (Ja); Herb. Reichenbach s.n. [Guiana] (Br); Swartz s.n. (S); Herb. Vahl s.n. (S).

ERIOCAULACEAE Lindl.

Literature: Kunth, Enum. Pl. 3: 492--493. 1841; H. H. Rusby, Comparison of English and German Works on the Genera of Plants 7. 1898; Luetzelburg, Estudo Botanico do Nordéste 147--151. 1923; A. Silveira, Flor. Montium [396]--420. 1928; Moldenke, North Am. Fl. 19: 17--50. 1937; Moldenke, Phytologia 1: 309--336 & 343. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 139. 1940; Chron. Bot. 7: 362--363. 1943; Eyles & Robertson, U. S. Pub. Health Bull. 286: 106. 1944; M. B. & R. S. Foster, Brazil Orch. Trop. 212. 1945; Abbiatti, Rev. Mus. La Plata n.s. 6: 311-322. 1946; Moldenke, Phytologia 2: 152--153. 1946; Moldenke, Phytologia 2: 372--381. 1947; Moldenke, Phytologia 2: 490--499. 1948; W. H. & M. B. Duncan, Key Fam. Monocot. Southeast U. S. [2 & 3]. 1949; E. J. Alexander, Journ. N. Y. Bot. Gard. 50: 56. 1949; Barkley, Rev. Fac. Nac. Agron. Medellin 9 (33): 60. 1949; Moldenke, Phytologia 3: 141--144 & 178--180. 1949; Moldenke, Phytologia 3: 321 & 382. 1950; Meikle & Baldwin, Am. Journ. Bot. 39: 44--45. 1952; Santapau, Journ. Bombay Nat. Hist. Soc. 51: 214. 1952.

The Fosters in the book cited above make this interesting comment "If you have ever seen the little 'hatpins' in the Flor-

ida flatwoods and marshlands, you would be quite intrigued to find here in Brazil a "hat pin' in size or shape to fit any style of hat, large or small. The greatest number of species in this family of Eriocaulaceae are native to South America, and Brazil certainly has its share. We had found them in many sections of the high rocky hills, but here seemed to be the greatest variety in one area. These little flowers are collected by the millions and shipped to the States as 'sempervivums', everlasting flowers. They look like miniature strawflowers and are dipped and dyed in many colors to be sold as an artificial decoration." The species to which he refers in the latter part of this quotation is Syngonanthus elegans (Körn.) Ruhl.

BLASTOCAULON Ruhl.
A synonym is Blastocaulum Ruhl. ex Alv. Silv., Gl. Mont. 274, sphalm. 1928.

BLASTOCAULON ALBIDUM (Gardn.) Ruhl.
Additional citations: BRAZIL: Minas Geraes: G. Gardner 5273 (S—isotype).

BLASTOCAULON RUPESTRE (Gardn.) Ruhl.
The Mexia 5780 collection cited below was originally distributed as Paepalanthus minutulus Mart., later re-determined as "Blastocaulon rupestris (Gardn.) Ruhl." A synonym is Syngonanthus rupestris (Gardn.) Ruhl.
Additional citations: BRAZIL: Minas Geraes: G. Gardner 5272 (S—isotype); Mello Barreto 10129 (N); Mexia 5779 (Gg—285360, N, S), 5780 (D—767072, N, S); Schwacke 8486 [Herb. Jard. Bot. Belo Horiz. 26666; Herb. Magalhães Gomes 2962] (N).

CARPTOTEPALA INSOLITA Moldenke
Additional citations: VENEZUELA: Bolívar: Steyermark 60703 (N—type, S—isotype).

COMANTHERA L. B. Sm.
Originally published in Contrib. Gray Herb. 117: 38. 1937.

COMANTHERA LINDERI L. B. Sm.
Originally published in Contrib. Gray Herb. 117: 38—39 & 44, pl. 2, figs. 55—60 (1937), based on Linder 40, from British Guiana, in the Gray Herbarium. The flowers of this genus are said to resemble closely those of Rondonanthus Herzog in being pedicellate and having free petals. These staminate flowers with a single stamen and greatly reduced perianth are unlike anything else in the family. The pistillate flowers are sessile, unlike those of Rondonanthus, but closely resembling those of Paepalanthus Mart.

ERIOCAULON Gron.
Literature: Kunth, Enum. Pl. 3: 539—540. 1841; Fyson, Journ.

Ind. Bot. 2: 133—149. 1919; Fyson, Journ. Ind. Bot. 2: 192—195, 261, 307—314. 1921; Moldenke, Carnegie Inst. Wash. Publ. 522: 140. 1940; Abbiatti, Rev. Mus. La Plata n.s. 6: 322. 1946; Moldenke, Phytologia 3: 180. 1949; Razi, Ecology 31: 285. 1950; Razi, Poona Univ. Journ., sci. sect. 1 (2): 6. 1952; Meikle & Baldwin, Am. Journ. Bot. 39: 45, 50, & 51. 1952.

Synonyms: Bussevillia Lesson in Bougainville, Journ. Navig. Autour Globe Frêg. Thétis et Corv. l'Esperance, vol. 2 (1837); Busseuillia Lesson apud Van Steenis, Bull. Jard. Bot. Buitenz., ser. 3, 18: 460. 1950.

Razi in the first of the references cited above states that seed dissemination in this genus is epizoic, with alternative methods by formation of wings on the fruit or seed and in rainwash, river or sea drift.

ERIOCAULON ACHITON Körn.

Fyson in Journ. Ind. Bot. 2: 202 & 204 (1921) cites this species from eastern Bengal and Bombay. He feels that it is derived from E. thwaitesii Körn., although Körnicke felt it was closest to what he called "E. truncatum Mart."

The Schmid specimen cited below may have had its label crossed with no. 81 cited under E. sexangulare L.

Additional citations: FRENCH INDOCHINA: Annam: Schmid 80 (N).

ERIOCAULON AFRICANUM Hochst.

Additional citations: SOUTHERN RHODESIA: Whellans 529 [Govt. Herb. Salisbury 34005] (N).

ERIOCAULON ALATUM H. Lecomte

The species is said by Brass to be abundant in wet grassy plains. The heads are brown and it has been collected in anthesis in September.

Additional citations: FRENCH INDOCHINA: Annam: Schmid 79a (N). Cochinchina: Pierre s.n. (N). NEW GUINEA: Papua: Brass 7821 (N), 7884 (N).

ERIOCAULON ALLEIZETTEI Moldenke

The species is said to inhabit wet places among siliceous rocks, at altitudes of 1400 to 1850 meters, blooming from May to July.

Additional citations: MADAGASCAR: Alleizette 124m (N—photo of type, P—type, Z—photo of type); Humbert & Swingle 4721 bis (P); Perrier de la Bâthie 7259 (N, P).

ERIOCAULON ALPESTRE Hook. f. & Thoms.

Literature: Körn. in Miq., Ann. Mus. Lugd.-Bat. 3: 163. 1867.

The type of this species was collected by Kieske, probably in Japan. The species is found at altitudes of 5000 to 12,000 feet.

Additional citations: INDIA: Assam: Hooker & Thomson s.n. [Mont. Khasia, 5-6000 ped.] (Br, M). Sikkim: J. D. Hooker s.n. [Sikkim, 8-12,000 ped.] (Br, C).

ERIOCAULON ANGUSTIFOLIUM Körn.
Additional citations: BRAZIL: Goyaz: G. Gardner 4382 [Macbride photos 10555] (N--photo of type, S--isotype).

ERIOCAULON APICULATUM H. Lecomte & Moldenke
The species is found in forests at altitudes of 40 to 100 meters, blooming in December and September.
Additional citations: MADAGASCAR: Bernier 79 (N--isotype, N--photo of type, P--type, Z--photo of type); Lam & Meeuse 5788 (Le--93970-63); Perrier de la Bâthie 7252 (N, P).

ERIOCAULON ARECHAVALETAE Herter
Literature: Castellanos, Lilloa 20: 238 & 244. 1949.
Additional citations: URUGUAY: Moldenke & Moldenke 19694 (Ss).

ERIOCAULON ARENICOLA Britton & Small
Additional citations: ISLA DE PINOS: Britton, Britton, & Wilson 14179 (S--isotype); Ekman 12029 (S).

ERIOCAULON ATABAPENSE Moldenke
One of the isotypes cited from the Britton Herbarium in Phytologia 3: 182 (1949) is now in the Cornell University herbarium (It). The A. C. Smith 2280 in the Britton Herbarium, cited on the same page as this species, proves to be E. tenuifolium Klotzsch instead. E. atabapense inhabits moist sand among rocks, blooming in October. Specimens of Maguire 29256 are said to be also in the Chicago, Kew, Belém, St. Louis, and Washington herbaria.
Additional citations: VENEZUELA: Amazonas: B. Maguire 29256 (N, Ve).

ERIOCAULON ATRATUM Körn.
Fyson, Journ. Ind. Bot. 2: 310 (1921) cites this species only from Adam's Peak, Ceylon. He illustrates it on his plate 26. The Kuntze 20046 and Thwaites 131 originally distributed as this are actually var. major Thwaites.

ERIOCAULON ATRATUM var. MAJOR Thwaites
A synonym is E. atratum var. minor Mart., based on the same collection. Var. major was published by Thwaites in his Enum. Pl. Zeyl. 1: 341 (1864). It has been collected at altitudes of 2200 to 2300 meters, blooming in February. The specimens cited below have been mis-identified as typical E. atratum Körn. and E. ceylanicum Körn.
Additional citations: CEYLON: Kuntze 20046 (N); Thwaites 131 (Br--isotype, N--photo of isotype, T--isotype, Z--photo of isotype).

ERIOCAULON AUSTRALE R. Br.
Kunth in his Enum. Pl. 3: 569 (1841) cites this to Brown's Prodromus page 254, the type collected at Port Jackson. Flecker

3603 was originally determined as E. spectabile F. Muell.

Additional citations: AUSTRALIA: Queensland: Flecker 3603 (Qu), 7063 (Qu); E. Henry 4654 (Qu); Shirley s.n. [Stradbroke Is.] (N).

ERIOCAULON BARBA-CAPRAE Fyson

This was originally published in Journ. Ind. Bot. 2: 197 (1921), based on a Collett collection from Shillong, Assam. The densely tufted linear leaves are black when dry. It is said to be very closely similar to E. mitophyllum Hook. f. and E. miserum Körn. from the same area, differing from the former in its "tall" instead of globose receptacle and from both in its black instead of white anthers. Fyson illustrates it on his plate 4.

ERIOCAULON BEAUVERDI Moldenke

The Scheidweiler collection cited below was originally identified as E. humboldtii Kunth. One of the Moldenke & Moldenke 19643 specimens cited in Phytologia 3: 183 (1949) from the Britton Herbarium (N) is now in the North Queensland Herbarium (Qu).

Additional citations: BRAZIL: São Paulo: Moldenke & Moldenke 19643 (B, Fy, Hw, Lm, Rs, Ss); Scheidweiler s.n. (Br).

ERIOCAULON BENTHAMI Kunth

Additional citations: MEXICO: Jalisco: Hartweg 258 (Br--isotype, N--photo of isotype, Z--photo of isotype). Michoacán: Barkley, Paxson, & Webster 2736 (N).

ERIOCAULON BIFISTULOSUM Van Heurck & Muell.-Arg.

A synonym is E. fluitans Griff. ex Moldenke, Known Geogr. Distrib. Memb. Erioc. 34, nom. nud. (1946); Known Geogr. Distrib. Memb. Verben. 126 & 204, nom. nud. 1949.

Wild in Rhodesia Agric. Journ. 49: 12--13 (1952) describes the species well and records the common name "water pipewort" or "water-pipewort". He illustrates it in his fig. 10, based on Dehn 769. He states that this is the only truly aquatic species of the genus in Rhodesia, being a floating plant with a long vertical submerged stem bearing many, slender, submerged, almost capillary, root-like leaves, and, at water-level, 6 to 20 narrowly spreading peduncles with black heads. Although widely distributed, he says it is not a common plant. Its numerous delicate leaves may have some value as food. The Baron specimen cited below was originally identified as E. melanocephalum Kunth, a species of the New World which this one very closely resembles.

Additional citations: MADAGASCAR: d'Alleizette 245m (P); Baron 926 (P); Decary 406 (N, P, P), 6256 (P); Le Myre de Vilers s.n. [Emyrne, février 1889] (P); Perrier de la Bâthie 7246 (P), 7247 (P); Waterlot 87 (P), 747 (P).

ERIOCAULON BREVIFOLIUM Klotzsch

Additional citations: BRITISH GUIANA: Schomburgk 107 [Macbride photos 25158] (N--photo of isotype, Z--photo of isotype).

MIRE, A NEW SPECIES OF BRUNFELSIA FROM BOLIVIA

Joseph V. Monachino

The identity of a species of Brunfelsia collected by Leandro Aristeguieta in March, 1953, in the State of Barinas in Venezuela (no. 1669, abundant near Barinitas) posed a problem. The plant appeared closely allied with specimens distributed as B. bonodora (Vell.) Macbride, B. latifolia (Pohl) Bentham, and B. maritima Bentham, differing, however, in the fine prominulous reticulation of veinlets on the glaucescent underside of the leaves. A similar Brunfelsia with the same leaf type, was collected by F. J. Hermann (11237) on March 7, 1944, near Rio Orteguaza, Comisaría del Caquetá, Colombia. An attempt at routine identification of these specimens revealed considerable difficulty in the taxonomy of the genus, principally from the standpoint of evaluation of specific criteria. It also discovered a new species from Bolivia, which cannot be placed with any of those previously described, even when a great measure of variation is admitted possible for each of them.

BRUNFELSIA MIRE Monachino, sp. nov.

Frutex; foliis magnis, petiolis 3-8 mm. longis, laminis oblanceolatis 18-26 cm. longis, 5-8.5 cm. latis, ad basin angustatis, ad apicem acuminatis, glabris subtus pallidis, reticulo venarum subtus prominente, areolis latis; inflorescentiis capituliformibis, floribus numerosis confertis; pedicellis usque ad 8 mm. longis glabris; calyce campanulato usque ad 14 mm. longo glabro; corolla violacea hypocrateriformi, tubo e calyce longe exserto calycem duplex longiore 2.7-3.5 cm. longo superne paullo curvato glabro vel subglabro, limbo 3.2-5 cm. lato.

Shrub; leaves subcoriaceous, large, petiole 3-8 mm. long, blades oblanceolate 18-26 cm. long, 5-8.5 cm. broad, tapering at base, acuminate at apex, glabrous, pale beneath, lateral nerves straight, principal ones 12-13 pairs, reticulation of veins prominent beneath, areolae broad; inflorescence capituliform, flowers many, crowded, bracts sparsely minutely pubescent, pedicel up to 8 mm. long, glabrous; calyx campanulate, reticulate-venulose, up to 14 mm. long, glabrous, lobes about 3 mm. long, becoming more deeply cut; corolla violet, hypocrateriform, the tube far-exserted from calyx, about twice the length of the calyx, 2.7-3.5 cm. long, slightly curved above, gla-

brous or nearly so, limb 3.2-5 cm. broad.

Type. - Otto Buchtien 1298, Bolivia, Mapiri region, San Carlos, alt. 850 m., January 25, 1927, Baumchen, 1 m., bluten violett (flowering specimen at The New York Botanical Garden). Other specimens examined from Bolivia (deposited at N.Y.B.G.): Miguel Bang 2352, Uchimachi Coroico, in forest shade, scarce, July 20, 1894, bush, in fruit. H. H. Rusby 862, Beni River, July, 1886; 1030, near Yungas, 4000 ft., 1885; 2611, Mapiri, 2500 ft., May, 1886. O. E. White 1072, Huachi, head of Beni River, alt. 3000 ft., August, 1921, "Miré."

These six collections show uniformity in botanical characters, a constancy which has strengthend confidence in the distinctiveness of the species.

Brunfelsia Mire has been confused with B. hydrangeaeformis (Pohl) Bentham, which it resembles superficially in its large oblanceolate leaves. The affinity is rather with the B. bonodora-B. maritima group, notably with the Aristeguieta and the Hermann specimens mentioned above. The calyx of B. Mire is larger, but not as large as that of B. hydrangeaeformis, from which it differs in the nervature of its leaves, smaller glabrescent calyx, and in the great length the corolla is exserted from the calyx. Bang 2352 was cited as B. hydrangeaeformis by H. H. Rusby in the Bulletin of The New York Botanical Garden (4: 426. 1907). All the Rusby collections cited above were similarly disposed by Britton in the same Bulletin (27:23. 1900). Material represented by O. E. White 1072 was the subject of an histological examination by Heber W. Youngken in the Journal of the American Pharmaceutical Association (14:195-200. 1925). Professor Youngken, on basis of leaf anatomy, identified the plant as B. hydrangeaeformis. H. H. Rusby had previously discussed the physiological properties of the Miré in the same Journal (13:101-102. 1924). The plant was reported used by the Indians of Central Bolivia as a paralysant of the voluntary muscles and as a remedy for cutaneous parasites. It was said to induce profuse perspiration capable of destroying all skin parasites. Thomas S. Githens (loc. cit.) corroborated the claim of muscular paralysis and stimulation of the sweat glands.

The large oblanceolate leaves, with wide areolae formed by the prominent veins, and the larger calyx separate B. Mire from the species of B. latifolia group. B. bonodora was proposed by Macbride in 1930 as based on an earlier name for B. latifolia. The basonym was Besleria bonodora Vellozo (Fl. Flum. 261. 1825; Ic. 6:80. 1827), a name placed in the synonymy

of B. latifolia by Bentham and by Schmidt. From the original description and illustration, however, Vellozo's species cannot be definitely identified, although one may guess it has been correctly interpreted. That Macbride and others since Bentham have without question identified B. bonodora with B. latifolia, is more a case of following the leader than one of independent judgment. Material from Peru identified as B. bonodora is barely distinguishable from B. maritima Bentham, at least as suggested by Spruce 1495. However, in the Spruce specimen the pedicels are long, up to 2 cm. long, and the corolla-lobes are narrow. A specimen collected by Riedel (no. 18) in Brazil resembles B. maritima-B. bonodora in Peru, proving that in Brunfelsia the same species can be widely distributed. A photo of the type of B. maritima (Lund 75, maritimas Taipu pr. Rio Janeiro) is at the Field Museum. No authenticated material of B. latifolia (Pohl) Bentham (in DC. Prodr. 10:199. 1846; non B. latifolia Hort. ex Steud., in syn., 1840) was examined. The description by Bentham and that by Schmidt (in Mart. Fl. Bras. 8:257. 1862) disagree on the size of the leaves and calyx. The name was based on Franciscea latifolia Pohl (Pl. Bras. Ic. 1:3,t.2. 1827. Type. - "hab. ad Tijuca, non procul Rio de Janeiro."). The description and illustration by Pohl, "folia...ad tres unicias longa, unam et quartam, ad sesquinunciam lata," do not suggest the large leaves described by Schmidt. B. grandiflora D. Don (N. Edin. Phil. Journ. Apr.-Oct., 86. 1829. Type. - "Peruvia ad Uchiza, v.s. Herb. Ruiz nunc in Mus. Lamb.") is described by Bentham as similar to and perhaps varietal of B. latifolia. The United States National Herbarium and the Field Museum were requested to send on loan southern Brazil specimens of B. latifolia, B. bonodora, and B. maritima, but no authenticated material of the first two was received. The Field Museum lacked southern Brazilian specimens of B. latifolia and B. bonodora; the U. S. Nat. Herbarium supplied two, one from Rio de Janeiro that flowered at the Botanical Garden, Washington, D. C., and only one actually collected in the wild, Kuhlmann 1327, Matto Grosso, Caminho do Porto Velho, determined by C. V. Morton. The latter specimen, with puberulent leaf-underside, calyx and corolla, the calyx up to 12 mm. long, corolla-tube up to 3.5 cm long, so differs from others named B. latifolia that, on the one hand it suggests something new, and on the other hand casts suspicion on the specific distinctions that already have been drawn in the genus. It is thus seen that the specimens available fell far short of the number examined

by Bentham and by Schmidt. Therefore a clarification of the true identity of B. bonodora and B. latifolia was not possible by circumstantial evidence, that is, by suits of specimens from the type localities, any more than by examination of the types.

Of the Multiflorae with the corolla-tube far exserted from the calyx, there is B. ramosissima (Pohl) Bentham (based on Franciscea ramosissima Pohl, 1827). The earlier Gerardia brasiliensis Sprengel (1825) is probably the same (the name "Gardoquia obovata Spr." has also been referred to the same species), and a strict application of priority would demand a new combination. Two formae of B. ramosissima were described by Schmidt in 1862, β. confortiflora (Franciscea confortiflora Pohl) and γ. parciflora, in addition to the typical forma. The species has short narrow leaves and an entirely different appearance from B. Mire. Schmidt placed Franciscea divaricata Pohl in the synonymy of B. ramosissima β. confortiflora, and B. acuminata (Pohl) Bentham in that of B. ramosissima.

Of the Multiflorae with the corolla-tube usually not as prominently exserted from the calyx (see also B. macrophylla and B. silvicola), B. Lindeniana (Planch.) Nicholson (Franciscea Lindeniana Planchon, 1865, "introduction de Libon, qui l'a envoyé de les catingas de l'interieur de la province de Ste. Cathérine à M. Linden.") appears to have smaller leaves than our species, and a long cylindrical calyx-tube, according to specimens from cultivation deposited at The New York Botanical Garden. An isotype of B. obovata Bentham is at N.Y.B.G. B. cuneifolia J. A. Schmidt and B. silvicola Taubert ("calyce...corollae tubum medium vix aequante...folia 2.5-5 x 1.5-2 cm.") are described as allied with B. obovata. Fróes 20210 from the region of Serras de Sincorá, Bahia, suggests B. bahiensis, but the leaves are smaller, 4-8.5 cm. long (in B. bahiensis "3-4 poll. longa, 1-1.5 poll. lata."). Of the larger leaved species authenticated material of B. hydrangeaeformis (Pohl) Bentham and an isotype of the very closely related B. capitata Bentham (Gardner 563) were available. The varieties B. capitata β. angustifolia Bentham and B. hydrangeaeformis β. glabriuscula Schmidt (syntype. - Gardner 563, the type number of B. capitata) have been proposed. B. macrophylla (Cham. & Schlecht.) Bentham was described as similar to B. hydrangeaeformis (type. - Brasil aequinoctiale, Sellow. "corollae tubo subrecto calyce subduplo longiore...calyx 10-12 lin longus...folia...subtus praecipue ad nervos venasque rufo-pubescentia...in petiolum...rufo-tomentosum attenu-

ata."). B. exima (Scheidweiler) Hooker is referred to B. hydrangeaeformis. B. calycina Bentham (type. - Lund 755, S. Paulo, "calyx pollicaris...foliis...in nervo medio subtus hirtellus.") is referred to B. pauciflora β. calycina by Schmidt. Besleria inodora Vellozo (non Brunfelsia inodora Martius) is also placed in the synonymy. Franciscea (Brunfelsia) macrantha Lemaire was described as having a large tomentose calyx. The combination "Brunfelsia macrantha" has been attributed to Lemaire by Bailey and Raffill, but Lemaire noted that his species was not a true Brunfelsia. Bailey and Raffill listed the new combinations B. calycina var. macrantha and B. calycina var. eximia, and also B. calycina var. floribunda (based on B. floribunda Hort.).

The Longiflorae are chiefly of the West Indies. B. inodora Martius was described from cultivation. B. Tastevini Benoist (1928), from Rio Jardão in the Amazon Valley, was described as having a corolla-tube 4 cm. long, and was said to resemble B. americana.

The Uniflorae in South America comprise perhaps three species. The basonym of B. uniflora (Pohl) Don antedates that of B. Hopeana (Hook.) Bentham by one year. The description of B. mutabilis (Pohl) Poiteau presents no point of difference from B. uniflora. B. australis Bentham was reduced to a variety of B. Hopeana by Schmidt. A Kuntze specimen (x. 92) identified as B. australis (inflorescence up to 4-flowered), obtained from cultivation in Paraguay, resembles some cultivated forms named B. latifolia. B. paraguayensis Chodat was referred to B. uniflora forma obovatifolia Hassler by Hassler, who also proposed B. uniflora forma intermedia. A Trinidad specimen collected by L. J. Graff recalls B. Hopeana β.? pubescens Bentham (possibly B. Lockharti Hort. ex Heynh., nomen nudum), originally based on a Lockhart specimen from Trinidad. Miller & Johnston 265 from Margarita Island also has pubescent leaves, but likewise pubescent are the young leaves of Gardner 1798, a collection cited by Bentham as typical B. Hopeana. C. V. Morton (Proc. Biol. Soc. Wash. 62:151-152. 1949) presents differences between his B. amazonica (isotype at N.Y.B.G., corolla-tube about 2 cm. long) and B. guianensis Bentham.

The Regel names in Brunfelsia (falcata, gracilis, longiflora, multiflora, Sieberi) and B. Schomburgkiana Klotzch are nomina nuda. The following names were published in synonymy: B. augusta Hort. ex Gentil, under B. calycina; B. Spruceana hb. M. by Schmidt under B. maritima, Martia opifera Lacerda in hb. M. under B. Hopeana, and F. Pohliana Hort. ex Schmidt under B. ramosissima.

The above Brunfelsia species and names involved were reviewed in order to clear B. Mire. It is noted that much reliance had to be placed on descriptions and that the material available was inadequate for delimiting the taxa accurately. For a true understanding of the species of Brunfelsia a critical revision of the whole genus is required.

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ADDITIONAL NOTES ON THE GENUS AEGIPHILA. XI

Harold N. Moldenke

AEGIPHILA Jacq.

Unidentified species of this genus are mentioned in Guilherme de Almeida, Revista Florestal 5: 15 & 17, figs. 7 & 8 (1946); Falcão, Guia dos Visitantes Jard. Bot. Rio de Jan. 42 (1947); and Kuhlmann & Kühn, Flor. Dist. Ibití 116 (1949), as well as in Plantae Hasslerianae 9: 200 (1902) and in Stellfeld, Vellozoa 4 (5): 99 (1946). Almeida reports his plant is used for cork in Brazil, while Kuhlmann & Kühn describe theirs as ptenophyte, "arbusto da capoeira, Estação Experimental, sem órgãos prolíficos em Março de 1943, M. K[uhlmann] no. 1,277".

The Murça Pires & Black 891 (Be--17905), distributed as a member of this genus, is actually a species of Besleria; Rambo 42144 and 43385 are a species of Pisonia; Schwacke s.n. [11/IX/887; Herb. Rio de Jan. 44804] is a species of Hyptis; and the J. M. Schunke s.n. [Herb. Mus. Javier Prado 14234; W--1901564] may be a species of Schlegelia.

AEGIPHILA ACULEIFERA Moldenke

The species is described by Little as a small tree 5 to 10 m. tall, the trunk 5—10 cm. in diameter at breast height, with gray rough bark, growing at an altitude of 8900 feet, with white-pink flowers blooming in April.

Additional citations: COLOMBIA: Huila: Little 7711 (N).

AEGIPHILA ALBA Moldenke

Little in Carib. Forester 9: 269 (1949) describes the species as a small to large tree 8 to 20 m. tall, with a trunk 15 to 30 cm. in diameter, common especially in cutover areas, in wet tropical and mountain forests, widely distributed in western Ecuador. He records the additional common names of "savaluca" and "savaluca de montaña".

Additional citations: ECUADOR: Esmeraldas: Little 6331 [U. S. Forest Serv. 98292] (N). Guayas: Camp E.3606 (N).

AEGIPHILA AMAZONICA Moldenke

The species is described as a shrub or small tree, with green branches and white flowers blooming in January, April, September,

and December, growing in capoeira and on terra firma.

Additional citations: BRAZIL: Amazonas: Black 47-1472 (Be--29750); Ducke 864 (Be--10438); J. G. Kuhlmann s.n. [Herb. Rio de Janeiro 22546] (F--photo of type, N--photo of type, Si--photo of type, Z--photo of type); Murça Pires 347 (Be--28301, N); Murça Pires & Black 1013 (Be--17981, N).

AEGIPHILA AUSTRALIS Moldenke

The species has been collected in small sandy woods, blooming in January.

Additional citations: BRAZIL: Santa Catharina: Sehnem 3334 (Rb).

AEGIPHILA BOGOTENSIS (Spreng.) Moldenke

The Schimpff 252 and 267 cited as this species in Phytologia 1: 188 (1937) are really A. monticola Moldenke, while the Daniel 3283 and Tomás 1512 cited in Phytologia 2: 390 (1947) are A. grandis Moldenke.

Dryander records the common name "tabaquillo". It is described by collectors as a shrub 2.5 m. tall or a tree 8 m. tall, growing at altitudes of 2200 to 2900 m. The flowers are white, blooming in February. Fruit has been collected in August. Cuatrecasas says "hoja membranacea, flexible, crasiuscula, gruesa, verde clara, o verde grisacea haz, semibrillante, grisacea enves, verde oscura; caliz verde; corola amarilla luego rosada".

Additional citations: COLOMBIA: Caldas: Cuatrecasas 23354 (F-1347021); Dryander 2809 (F--1293884). Cauca: Cuatrecasas 23639 (F--1341823). Cundinamarca: Goudot s.n. [Bogotá] (F--photo, N--photo); Triana 2123 (F--photo, N--photo). Valle del Cauca: Cuatrecasas 22536 (F--1347123). VENEZUELA: Mérida: Garcia Barriga 13294 (W--1987231). ECUADOR: Carchi: Lehmann 6338 (F--photo, N--photo).

AEGIPHILA BOGOTENSIS var. AEQUINOCTIALIS Moldenke

Camp describes this as a tree 7 m. tall, with leaves deep-green and nitid above, pale-green or dullish beneath, the corolla pale but clear yellow, and the fruit pyriform and 4-loculed, with four bony seeds, growing at altitudes of 8000 to 9000 feet, blooming and fruiting in July and August. He says that "although the majority of the people in the region know the true 'lugma' (lucma) and many of them grow it around their homes, they still insist on calling this abundant and completely wild forest tree 'lugma' (or lucma), too, probably because of some similarity in the leaves. They readily admit the possibility of confusion, but shrug their shoulders. A few of the more intelligent said that if they are asked which 'lugma' they mean, they call this one 'lugma del monte'".

Additional citations: ECUADOR: Azuay: Camp E.4249 (N), 4595 (N), 5193 (N--type).

AEGIPHILA BOLIVIANA Moldenke

Additional citations: BOLIVIA: Santa Cruz: Steinbach 2799 [Herb. Osten 14831b] (Ug), 3116 (F--photo, N--photo), 6554 (F--photo), 7250 (F--photo, N--photo), 7289 (F--photo, N--photo).

AEGIPHILA BRACHIATA Vell.

The species is listed by Herter, Flórula 104 (1930) as A. triantha Schau., but in Revist. Sudam. Bot. 6: 97 (1939) he corrects this to A. brachiata, giving A. triantha as a synonym. Rambo in Anais Bot. Herb. Barbosa Rod. 3: 72 (1951) spells the name "A. branchiata Vell." in error. The Emrich painting cited below is labeled "Citharexylum solanaceum var. typica", obviously in error.

The species is said to be a shrub to 4 m. tall, found in primeval forests and secondary woods, blooming in October and November.

Additional citations: BRAZIL: Paraná: Hatschbach 1052 (N). Rio de Janeiro: Glaziou 14165 (Bz--16829), 17714 (F--photo, N--photo). Rio Grande do Sul: K. Emrich s.n. [10.II.1926] (N--painting); Friedrichs 32928 (Rb). State undetermined: Sellow 1322 (F--photo, N--photo), 3012 (F--photo, N--photo).

AEGIPHILA BRACTEOLOSA Moldenke

The species has been mis-identified in herbaria as "A. arborescens Vahl" and has been collected in anthesis in February and September.

Additional citations: BRAZIL: Amazonas: Luetzelburg 22296 [Herb. Rio de Janeiro 44816] (Ja), 22657 [Herb. Rio de Janeiro 44815] (Ja); Poeppig 2488 (F--2 photos, N--2 photos); Spruce s. n. [in vicinibus Barra] (F--photo, N--photo). Pará: Ducke 16992 [Herb. Rio de Janeiro 5433] (Ja).

AEGIPHILA BREVIFLORA (Rusby) Moldenke

Additional citations: BOLIVIA: El Beni: Cardenas 16, special (F--photo of type, N--photo of type).

AEGIPHILA BUCHTIENII Moldenke

Additional citations: BOLIVIA: La Paz: Buchtien 1716 (F--photo, N--photo), 1717 (F--photo of isotype, N--photo of isotype)

AEGIPHILA CANDELABRUM Briq.

The species is mentioned in Plantae Hasslerianae 11: 504 (1904). It is described as a shrub 1 to 3 m. tall, with yellowish petals, growing in thickets in fields, blooming in November.

Additional citations: PARAGUAY: Fiebrig 4638 (F--photo, N--photo), 4875 (F--3 photos, N--3 photos); Hassler 7974 (N, N--fragment, S, V--1128), 7974a (F--photo).

AEGIPHILA CAPITATA Moldenke

Additional citations: BRAZIL: São Paulo: Burchell 3547 (F--photo of isotype, N--photo of isotype).

AEGIPHILA CASSELIAEFORMIS Schau.

Additional citations: BRAZIL: São Paulo: F. C. Hoehne s.n. [Herb. Inst. Biol. S. Paulo 1225] (N, W--1616672).

AEGIPHILA CHRYSANTHA Hayek

Camp describes the species as a much-branched vine climbing over trees and shrubs, with the leaves very deep-green above, pale-green beneath, and the internal flesh and surface of the fruit orange-crimson, growing at altitudes of 2000 to 3000 feet in Ecuador. Fróes says that in Amazonas, Brazil, it is a vine climbing large trees, the stems 5 inches in diameter, with white flowers, growing on low terra firma in high forests. It has been mis-identified in herbaria as "A. cuspidata Mart." and has been collected in anthesis in June, July, and October, and in fruit in June.

Additional citations: ECUADOR: Chimborazo: Camp E.3863 (N). Guayas: Eggers 14348 (F--2 photos, N--2 photos). BRAZIL: Amazonas: Fróes 20533 (N), 22543 (Be--32332, N), 26304 (N). Bahia: Curran 225 (F--photo, N--photo). Maranhão: Ducke 2302 [Herb. Rio de Janeiro 5432] (Ja). BOLIVIA: Santa Cruz: Kuntze s.n. (F--photo, N--photo).

AEGIPHILA CORDIFOLIA (Ruíz & Pav.) Moldenke

The Mathews collection cited below was originally identified by herbarium workers as a species of Cordia and then of Buddleja.

Additional citations: PERU: Huánuco: Ruíz & Pavon s.n. [Miña, Panatahua] (F--photo of isotype, Sg--photo of isotype). Department undetermined: Mathews s.n. [1862] (M).

AEGIPHILA COSTARICENSIS Moldenke

Matuda in Am. Midl. Nat. 44: 575 (1950) cites his numbers 572, 2101, 6152, and 17395 and records the synonym "Clerodendron matudai Standl."

The species is described as a shrub 3 m. tall, growing in forests and wet forests at an altitude of 30 m., blooming in June.

Additional citations: MEXICO: Chiapas: Matuda 17968 (N). COSTA RICA: Puntarenas: Skutch 5346 (W--1971979).

AEGIPHILA CRENATA Moldenke

The species has been collected in anthesis in January.

Additional citations: BRAZIL: Minas Geraes: Sampaio 6385 [Herb. Rio de Janeiro 44827] (N); Schenck 3310 (F--photo, N--photo). Paraná: Dusén 9701 (F--photo, N--photo). State undetermined: Sellow 5091 (F--2 photos, N--2 photos).

AEGIPHILA CUATRECASASI Moldenke

The species is said to be a tree 5 to 15 m. tall, the trunck 25 cm. in diameter at breast height, the bark gray, fissured in many small plates, the fruit green, growing in cafetals and along fences at an altitude of 4600 m., in immature fruit in May.

Additional citations: COLOMBIA: Huila: Little 7940 (N); Little & Ramirez 7800 (N).

AEGIPHILA CUNEATA var. HIRSUTISSIMA Moldenke
Citation: PERU: Loreto: Killip & Smith 29040 (N--type).

AEGIPHILA DEPPEANA Steud.
Matuda describes this species as a woody vine with yellow flowers, growing at altitudes of 200 m., blooming in December.
Additional citations: MEXICO: Chiapas: Matuda 18742 (N). Nayarit: Nelson 4254 (F--photo, N--photo). Tamaulipas: Schiede & Deppe 259 (F--photo, N--photo). Veracruz: E. Palmer 464 (F--photo, N--photo). State undetermined: Pavon s.n. [Nueva España] (F--photo, N--photo, Sg--photo); Sartorius s.n. (F--photo, N--photo). TRES MARIAS ISLANDS: Maltby s.n. [Tres Marias Is.] (F--photo, N--photo). COLOMBIA: Magdalena: Cy. Allen 150 (Ew).

AEGIPHILA DUCKEI Moldenke
Additional citations: BRAZIL: Amazonas: Ducke s.n. [Herb. Rio de Janeiro 35662] (F--photo of type, N--photo of type, Si--photo of type, Z--photo of type).

AEGIPHILA ELATA Sw.
Matuda in Am. Midl. Nat. 44: 575 (1950) records the common names "taco" and "taquito" and cites his no. 16624. The species is also listed in Fawcett, Prov. List Indig. Nat. Fl. Pl. Jamaica 30 (1893). Specimens have been mis-identified as A. quinduensis (H.B.K.) Moldenke, "A. levis Wright", and Citharexylon sp. It has been collected in fruit in May. It is described by Wright as a bush 10 feet tall, growing in woods.
Additional citations: CUBA: Oriente: Acuña 15174 (Es); Hioram & Maurel 4799 (F--photo, N--photo); N. Taylor 414 (F--photo, N--photo); C. Wright 277 (Hv, Hv), 429 (F--photo, N--photo), 1354 [1865; Herb. Sauvalle 1777] (Hv). JAMAICA: Alexander Prior s.n. (F--photo, N--photo); E. G. Britton 2952 (F--photo, N--photo); . Harris & Britton 10726 (F--photo, N--photo); Maxon 8820 (F--photo, N--photo); Nichols 75 (F--photo, N--photo); Rehder s.n. (F--photo, N--photo); Swartz s.n. (F--photo of type, F--photos of 3 isotypes, N--photo of type, N--photos of 3 isotypes). HISPANIOLA: Dominican Republic: Abbott 1368 (F--photo, N--photo), 2386 (F--photo, N--photo); Eggers 1602 (Sg--16047). TRINIDAD: Trin. Bot. Gard. Herb. 2384 (F--photo, N--photo), 2387 (F--photo, N--photo). MEXICO: Tabasco: J. N. Rovirosa 421 (F--2 photos, N--2 photos, Pa). GUATEMALA: Alta Verapaz: Türckheim 7961 (F--photo, N--photo). Izabal: P. C. Standley 24684 (F--photo, N--photo). HONDURAS: Atlántida: P. C. Standley 53746 (F--photo, N--photo), 53758 (F--photo, N--photo), 55166 (F--2 photos, N--2 photos). Yoro: P. Wilson 656 (F--photo, N--photo). COSTA RICA: Puntarenas: H. Pittier 12017 (F--photo, N--photo). PANAMA: Panamá: R. S. Williams 829 (F--photo, N--photo). VENEZUELA: Aragua: Fendler 2373

(F--photo, N--photo). Bolívar: Ll. Williams 12828 (Ew). Carabobo: H. Pittier 8806, in part [Herb. Nac. Venez. 12613] (Ve). SURINAM: Samuels s.n. (F--photo, N--photo). BRITISH GUIANA: De la Cruz 3320 (F--3 photos, N--2 photos, Sg--photo); Fanshawe 2884 [Herb. Forest Dept. Br. Guian. 6031] (N). FRENCH GUIANA: Broadway 421 (F--photo, N--photo). CULTIVATED: Austria: Herb. Hort. Schönbr. s.n. (F--photo, N--photo).

AEGIPHILA ELEGANS Moldenke

Additional citations: PERU: Junín: Killip & Smith 26338 (F--2 photos, N--2 photos). Loreto: Killip & Smith 27562 (Ec--photo, F--photo, N--photo, Sg--photo), 27991 (F--photo, N--photo). BRAZIL: Amazonas: Krukoff 8701 (Br).

AEGIPHILA ELONGATA Moldenke

Additional citations: BOLIVIA: La Paz: Buchtien 1546 (F--photo of isotype, N--photo of isotype).

AEGIPHILA EXIGUIFLORA Moldenke

Additional citations: BRAZIL: Pará: Ducke s.n. [Herb. Rio de Janeiro 18951] (F--photo of type, N--photo of type, Si--photo of type, Z--photo of type).

AEGIPHILA FALCATA Donn. Sm.

Matuda in Am. Midl. Nat. 44: 575 (1950) records the common names "taco" and "taquito".

Additional citations: GUATEMALA: Quezaltenango: Tonduz & Rojas 148 (F--photo, N--photo). Retalhuleu: J. D. Smith 1479 (F--2 photos, N--2 photos). COSTA RICA: Cartago: H. Pittier 8643 (F--photo, N--photo); Tonduz 9292 (F--photo, N--photo). Limón: Holm & Iltis 394 (N, Qu). PANAMA: Bocas del Toro: Wedel 1836 (N).

AEGIPHILA FENDLERI Moldenke

Additional citations: VENEZUELA: Aragua: Karsten s.n. (F--photo, N--photo); H. Pittier 14982 [Herb. Nac. Venez. 12585] (Ve); Tamayo 1643 [Herb. Nac. Venez. 12584] (Ve).

AEGIPHILA FERRUGINEA Hayek & Spruce

Camp describes this species as a spreading shrub 2 m. tall or wide-spreading tree 15 m. tall, with white flowers, blooming in August, at 10,000 feet elevation. Asplund found it a shrub 3 m. tall, blooming in May. Camp's nos. 365 and 366 look quite different, but he notes that "intermediates between 365 and 366 seen in same colony".

Additional citations: ECUADOR: Azuay: Camp E.2211a (N), E.2211b (N). Carchi: Camp E.365 (N), E.366 (N). Pichincha: Asplund 6456 (S); Sodiro 125/22 (F--photo, N--photo); Spruce 5473 (F--photo of isotype, N--photo of isotype).

AEGIPHILA FILIPES Mart. & Schau.

The species is cited in Bol. Mus. Hist. Nat. Jav. Prado 7: 244 (1943) from Loreto, Peru. It has been collected in fruit in January. The name is sometimes written "A. filipes Mart. & Zucc."

Additional citations: COLOMBIA: Cauca: Cuatrecasas 23537 (F--1341820, F--1341821). Amazonas: R. E. Schultes 8259 (W--1996313). Magdalena: H. H. Smith 1831 (F--3 photos, N--3 photos). BRAZIL: Amazonas: Krukoff 8041 (Br), 8042 (Br); Spruce 1761 (Ec--photo, F--7 photos, N--6 photos, Es--photo, Sg--2 photos); Ule 5686 (F-photo, N--photo). BOLIVIA: El Beni: H. H. Rusby 2472 (Pa).

AEGIPHILA FLUMINENSIS Vell.

The species has been collected in anthesis also in February.

Additional citations: BRAZIL: Bahia: Guillot s.n. [Bahia] (F--photo, N--photo). Espirito Santo: Bello 592 [Herb. Rio de Janeiro 44800] (Ja). Federal District: Brade 11277 [Herb. Rio de Janeiro 44839] (N), 11404 [Herb. Rio de Janeiro 44842] (Ja). Rio de Janeiro: Guillemin 248 (F--photo); Mikan s.n. [Aquoduit] (F--photo, N--photo); Passarelli s.n. [Herb. Rio de Janeiro 44848] (N); Widgren s.n. (F--photo, N--photo); Wilkes Expedition s.n. [Rio de Janeiro] (F--photo, N--photo).

AEGIPHILA FOETIDA Sw.

The species is listed in Fawcett, Prov. List Indig. Nat. Fl. Pl. Jamaica 30 (1893).

Additional citations: JAMAICA: R. C. Alexander Prior s.n. (F-2 photos, N--2 photos).

AEGIPHILA FROESI Moldenke

Additional citations: BRAZIL: Amazonas: Fróes 20917 (F--photo of type, N--type, N--photo of type, Sg--photo of type, Z--photo of type).

AEGIPHILA GLANDULIFERA Moldenke

The species is described as a herb to 1 m. tall or a liana, with yellowish-white or pale-greenish flowers, blooming in June and December, inhabiting woods. It is listed in Barkley, Determinac. para Ejemp. Herb. Fac. Nac. Agron. Medellin 2 (1): 17 (1950). Some specimens of the Poeppig collection cited below were mis-identified in herbaria as Palicourea laxa.

Additional citations: PANAMA: Canal Zone: Hayes 74 (F--photo, N--photo), 145 (F--2 photos, N--2 photos, Sg--photo); H. Pittier 6519 (F--photo, N--photo). COLOMBIA: Antioquia: Woronow & Juzepczuk 4433 (F--photo, N--photo). Chocó: A. Fernandez 293 (W--1997959). Santander: F. W. Pennell 3865 (F--photo, Sg--photo); Scolnik, Aragua Molina, & Barkley 19S041 (N). Tolima: Goudot s.n. [Ibagué] (F--2 photos, N--2 photos, Sg--photo). BRAZIL: Amazonas: Poeppig 2760 [Herb. Reichenbach f. 294656] (F--photo, N--photo, V, V). Pará: Archer 8051 (Be--11247).

AEGIPHILA GLANDULIFERA var. PARAËNSIS Moldenke

Additional citations: BRAZIL: Pará: Burchell 10060 (F--photo of type, Sg--photo of type); Killip & Smith 30661 (F--photo, N--photo); Krukoff 5923 (Br).

AEGIPHILA GLANDULIFERA var. PYRAMIDATA L. C. Rich. & Moldenke
The variety is said to be a shrub 4 feet tall, with green flowers, blooming in January, and inhabiting woods.
Additional citations: BRAZIL: Pará: Archer 8120 (Be--12210).

AEGIPHILA GLEASONI Moldenke
This name is mis-spelled "A. gleasonii Moldenke" by Van Steenis in his Fl. Males. 1 (1): 194 (1950).

AEGIPHILA GLOMERATA Benth.
The species is listed by Little in Carib. Forester 9: 269 (1949), where he cites his no. 6693a from El Oro, Ecuador.

AEGIPHILA GLORIOSA Moldenke
Additional citations: BRAZIL: Bahia: L. Riedel 781 (F--2 photos, N--2 photos).

AEGIPHILA GRANDIS Moldenke
The Daniel and Tomás collections cited below were originally distributed as A. bogotensis (Spreng.) Moldenke and were so cited in Phytologia 2: 390 (1947). The species is said to be a small tree, 3 to 7 m. tall, growing to 2200 m. altitude. Fruit has been collected in February and May, and green rounded fruit in July. Daniel records the vernacular name "saca-ojo".
Additional citations: COLOMBIA: Antioquia: Core 723 (N); Daniel 3283 (N); Tomás 1512 (N). Cundinamarca: Goudot s.n. [Bogotá] (F--2 phoros, N--2 photos).

AEGIPHILA GRAVEOLENS Mart. & Schau.
The species is mentioned by Kuhlmann & Kühn, Flor. Dist. Ibití 116 & 180 (1947), where it is designated as a ptenophyte and described as "arbustiva no pasto atrás do cemitério..alt. 750 m...Frutos em Dezembro...M. K[uhlmann] no. 1121..espécie digna de ser levada em consideração quanto às suas presumiveis relações com a Fauna é a A. graveolens, cujas drupas, bem maiores e mais carnosas, amadurecem em Dezembro." Ule writes the name "A. graveolens Mart." It has been collected in flower in February and May, as well as December. Hoehne reports the common name "fruta de sabiá".
Additional citations: BRAZIL: Bahia: Blanchet 3651 (F--photo, N--photo); Sellow 608 (F--photo, N--photo). Rio de Janeiro: Ule 123 [Herb. Rio de Janeiro 44807] (Ja). São Paulo: W. Hoehne 431 (Wh, Wh); Lund 796 [Macbride photos 7880] (N--photo of type); Sellow 802 (F--2 photos, N--2 photos).

NOTES ON BROMELIACEAE. II

Lyman B. Smith

VENEZUELA

GUZMANIA NUBIGENA L. B. Smith, sp. nov.

A G. plumieri (Griseb.) Mez, cui valde affinis, scapi bracteis et bracteis primariis infimis longe acuminatis, sepalis majoribus differt.

Epiphytic, stemless, 85 cm. high; leaves 65 cm. long, inconspicuously lepidote, the sheaths narrowly ovate, inconspicuous, the blades linear, acuminate, 35 mm. wide; scape erect, slender; scape-bracts strict, densely imbricate, subfoliaceous, reddish; inflorescence laxly bipinnate, 20 cm. long, red; primary bracts shorter than the branches, the lower ones narrowly triangular, the upper broadly ovate; racemes spreading, 6 cm. long, short-stipitate, rather lax; floral bracts broadly ovate, apiculate, 18 mm. long, ecarinate, sparsely lepidote, rugulose on drying; flowers suberect or some downwardly secund; pedicels slender, 3 mm. long; sepals oblanceolate, subacute, 23 mm. long, ecarinate, appressed-lepidote, connate for 3 mm.; petals and stamens unknown; capsules cylindric, acute, to 4 cm. long, coma red-brown. Pl. I, fig. 1: Apex of leaf x 1; fig. 2: Lower primary bract and branch x 1; fig. 3: Sepal x 1.

Type in the U. S. National Herbarium, Nos. 2101746 and 2101747, collected in cloud forest, Rancho Grande, State of Aragua, Venezuela, altitude 1,800 meters, October 13, 1951, by M. B. Foster (No. 2739).

VRIESIA EGREGIA L. B. Smith, sp. nov.

Ramis brevissimis a bracteis primariis occultis V. drepanocarpam simulans, sed scapi bracteis et bracteis primariis amplis late rotundatisque, sepalis obovatis, retusis valde differt.

Epiphytic, 4 dm. high if the pendulous inflorescence is straightened; leaves not seen but according to Foster 20-25 cm. long, subglabrous, splashed with red, reddish green beneath, the blade 18-25 mm. wide; scape 4 mm. in diameter, glabrous; scape-bracts erect, imbricate, undoubtedly subfoliaceous, rounded at the apex and apiculate, obscurely appressed-lepidote; inflorescence subdensely cylindric, 18 cm. long, bipinnate; primary bracts sub-

erect, broadly elliptic, apiculate, to 35 mm. long, almost completely concealing the flowers, sparsely appressed-lepidote, red except for the greenish base; branches few-flowered, slender; floral bracts broadly elliptic, shorter than the sepals; flowers subsessile; sepals broadly obovate, retuse, slightly asymmetric, 14 mm. long, subcoriaceous, greenish white, sparsely lepidote; petals oblong, obtuse, 18 mm. long, white (! Foster), short-connate below the dentate scales; stamens and style included. Pl. I, fig. 4: Primary bract and branch x 1; fig. 5: Sepal x 1; fig. 6: Petal and stamen x 1.

Type in the U. S. National Herbarium, No. 2101715, collected in cloud forest, Rancho Grande, State of Aragua, Venezuela, altitude 1,800 meters, October 13, 1951, by M. B. Foster (No. 2746).

COLOMBIA

AECHMEA NIDULARIOIDES L. B. Smith, sp. nov.

Laminis foliorum ligulatis; scapo brevi sed distincto; scapi bracteis imbricatis; inflorescentia dense subglobosa; bracteis primariis imbricatis, flores fere omnino obtegentibus; floribus fasciculatis, sessilibus; sepalis connatis, breviter mucronatis; petalis liberis, ligulis dentatis auctis; pollinis granulis obscure 4-poratis.

Flowering shoot 3 dm. high, much exceeded by the leaves; leaves apparently rosulate, over 7 dm. long, densely appressed-lepidote, the sheaths broadly elliptic, 10-14 cm. long, brown-lepidote, the blades ligulate, acute with a subulate cusp, flat, 3-5 cm. wide, green, white-lepidote becoming glabrous with age, laxly serrate with broad straight spines 1-2 mm. long; scape suberect, about 15 cm. long; scape-bracts strict, densely imbricate, lanceolate, acute, pungent, green, spinulose-serrate; inflorescence densely bipinnate, subglobose, 15 cm. long; primary bracts imbricate, ovate, 7 cm. long, all but the lowest cucullate at the apex, entire, finely nerved, red, covered toward the apex with white appressed scales; branches aborted, few-flowered; floral bracts broadly elliptic, apiculate, slightly exceeded by the sepals, entire, thin, densely pale-lepidote; flowers sessile, white; sepals obovate, strongly asymmetric, short-mucronate, 23 mm. long, connate for 3 mm., prominently nerved, sparsely pale-lepidote; petals free, oblong, obtuse, cucullate, 35 mm. long, bearing 2 dentate scales at the base; stamens included, pollen-grains globose, obscurely

Plate I

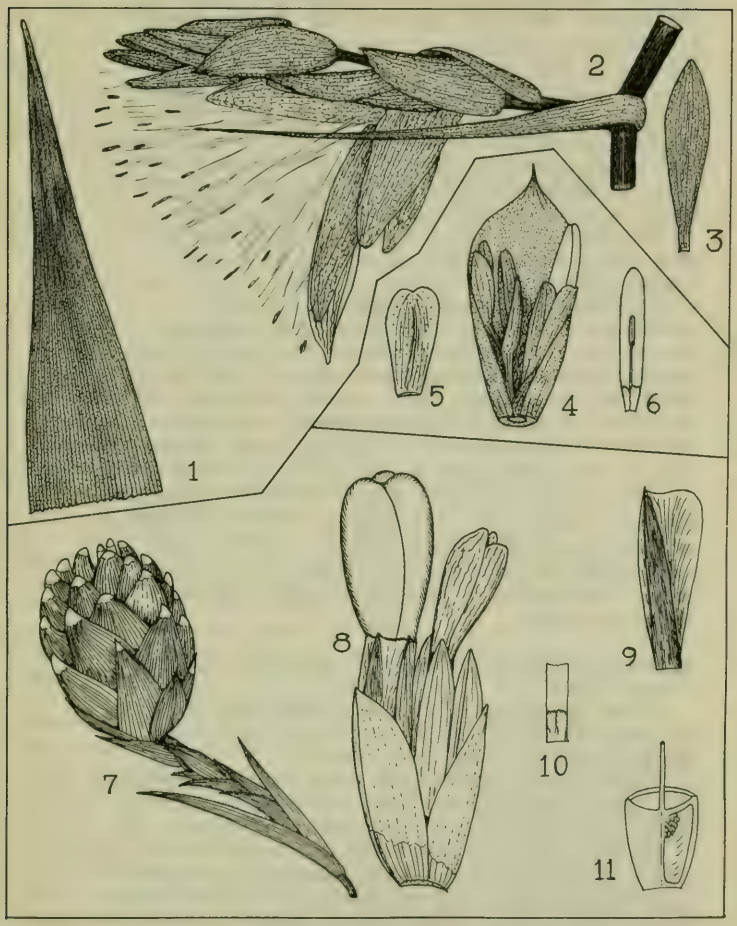

Fig. 1-3: Guzmania nubigena; fig. 4-6: Vriesia egregia; fig. 7-11: Aechmea nidularioides.

4-pored; ovary completely inferior, epigynous tube shallow but distinct, ovules apiculate, borne at the apex of the cell. Pl. I, fig. 7: Scape and inflorescence x 1/5; fig. 8: Branch of inflorescence x 1; fig. 9: Sepal x 1; fig. 10: Base of petal x 1; fig. 11: Longitudinal of ovary x 1.

Type in the U. S. National Herbarium, Nos. 1989431 and 1989432, collected along the Río Loretoyacu, Trapecio Amazónico, Territory of Amazonas, Colombia, altitude 100 meters, September 1946, by R. E. Schultes and G. A. Black (No. 8309).

COLOMBIA: PUTUMAYO: In trees by road to Urcusique, alt. 1,200 m., Nov. 23, 1946, M. B. & R. Foster 2253 (GH).

In habit, Aechmea nidularioides closely resembles the scapose species of Nidularium, although the primary bracts do not decrease in size quite so rapidly toward the center of the inflorescence and the central axis is more elongate. The cucullate primary bracts are almost identical in form and size with those of Streptocalyx tessmannii Harms. The appendaged petals indicate its affinity is with neither of these genera but with Canistrum and more especially with Aechmea subgenus Ortgiesia on account of its connate sepals. Its 4-porate pollen will require the amplification of that subgenus, but others in Aechmea already include two types of pollen.

AECHMEA SERVITENSIS André var. exigua L. B. Smith, var. nov.

A var. servitensis bracteis scapi superioribus et bracteis primariis infimis minoribus, angustioribus, obscure dentatis differt.

Differs from the typical variety in its smaller relatively narrower and less obviously dentate upper scape-bracts and lower primary bracts.

Type in the Gray Herbarium, collected at Las Mesas, Territory of Putumayo, Colombia, altitude 1,350 meters, November 22, 1946, by M. B. and R. Foster (No. 2217). Duplicate in the U. S. National Herbarium.

AECHMEA ZEBRINA L. B. Smith, sp. nov.

Acaulis, stolonibus procreans; foliis zonis transversalibus latis pictis, laminis ligulatis; scapo elongato; scapi bracteis per aetatem deciduis, ignotis, verisimiliter tenuissimis; inflorescentia bipinnata; bracteis primariis ignotis; spicis dense multifloris, longe stipitatis; rhachi valde excavata sed angusta; bracteis florigeris sepala superan-

tibus, laevibus; sepalis liberis, angustis, paulo asymmetricis, inermibus.

Stemless, spreading by stolons up to 7 dm. long, the flowering shoot 8 dm. high; leaves forming a slender infundibuliform rosette, green and very faintly striped above and inconspicuously though densely lepidote, beneath covered with two types of scales to form broad alternating cross-bands of green and white, the sheaths small and inconspicuous, the blades ligulate, rounded and apiculate, 5 cm. wide, laxly spinose-serrate; scape elongate, 8 mm. in diameter; scape-bracts unknown, evidently fragile; inflorescence bipinnate, subdense, 28 cm. long; primary bracts unknown; spikes spreading, densely 17-flowered, 18 cm. long including the 5 cm. long naked strongly flattened stipe; rhachis narrow, strongly excavated; floral bracts broadly ovate, navicular, entire, carinate near the apex, bicarinate and grooved below, 28 mm. long, exceeding the sepals, coriaceous, even, obscurely punctulate-lepidote; sepals free, lance-oblong, slightly asymmetric, muticous, 16 mm. long; ovary wholly inferior, globose. Pl. II, fig. 1: Spike x 1/2; fig. 2: Sepal x 1.

Type in the Gray Herbarium, collected at Puerto Limon on the Río Caqueta, Territory of Putumayo, Colombia, altitude 900 meters, November 24, 1946, by M. B. and R. Foster (No. 2256).

It must be noted that the leaves and flowering shoot in the above description were not attached at the time of collection so that there is some possibility of their representing different species. However, either is distinctive on its own merits. The leaves are quite unlike those of any *Aechmea* from this region, while the inflorescence resembles those of *Ae. dactylina* Baker and *Ae. tessmannii* Harms. The narrow spike-rhachis is like that of *Ae. dactylina*, but the floral bracts and sepals are much larger and the scape-bracts and primary bracts more fragile. While we can infer that the fragile scape-bracts and primary bracts are probably more like those of *Ae. tessmannii*, the narrow spike-rhachis is strikingly different.

GUZMANIA ACUMINATA L. B. Smith, sp. nov.

Acaulis; laminis foliorum linearibus, acuminatis; scapo erecto; scapi bracteis subfoliaceis, imbricatis; inflorescentia densissime digitata; bracteis primariis longe acuminatis, spicas superantibus; bracteis florigeris sepala superantibus; sepalis breviter connatis.

Epiphytic, stemless, the flowering plant 50-75 cm. high (! Foster); leaves 5 dm. long, appressed-lepidote beneath, the sheaths elliptic, 8-10 cm. long, pale brown, the blades linear, acuminate, 2 cm. wide, green, glabrous above; scape erect, slender; scape-bracts subfoliaceous, densely imbricate, the upper ones involucrate; inflorescence densely digitate, 4 cm. long; primary bracts ovate with a long foliaceous blade equaling or exceeding the spike; spikes ellipsoid, many-flowered, 3 cm. long; floral bracts ovate, equaling or exceeding the sepals, coriaceous, even, glabrous; pedicels very short; sepals 14 mm. long, connate for 4 mm., even; petals and stamens unknown. Pl. II, fig. 3: Young inflorescence x 1/2; fig. 4: Old inflorescence x 1/2; fig. 5: Posterior sepals x 1.

Type in the Gray Herbarium, collected at Pepino, near Mocoa, Territory of Putumayo, Colombia, altitude 1,200 meters, November 21, 1946, by M. B. and R. Foster (No. 2218). Duplicate in the U. S. National Herbarium.

In habit Guzmania acuminata resembles G. brachycephala (Baker) Mez but the latter has a simple inflorescence subtended by wholly stramineous bracts. The long acuminate green bracts below the inflorescence distinguish G. acuminata from other species with densely digitate inflorescences.

GUZMANIA DANIELII L. B. Smith, sp. nov.

Robusta; scapi bracteis foliaceis, dense imbricatis, lepidibus pallidis dense vestitis, laminis ligulatis; inflorescentia dense bipinnata; bracteis primariis infimis subfoliaceis; fasciculis ca. 10-floris, sessilibus; bracteis florigeris sepala subaequantibus; sepalis alte connatis.

Stemless, robust, known only by a photograph and the upper part of the flowering shoot; scape straight, nearly 2 cm. in diameter; scape-bracts closely resembling the leaves, 4 dm. long, nearly covered on both sides with pale appressed scales, red, the sheaths broadly elliptic, brown-lepidote, the blades ligulate, broadly acute and apiculate, flat, 5 cm. wide; inflorescence bipinnate, densely cylindric, 20 cm. long, 6 cm. in diameter; primary bracts densely imbricate, the lower subfoliaceous, shorter than the axis, the upper broadly ovate with a rounded apiculate reflexed apex; fascicles about 10-flowered; floral bracts elliptic, ample, about equaling the sepals, membranaceous, densely and finely appressed-lepidote; pedicels slender, 5 mm. long; sepals oblong, obtuse, 33 mm. long, connate

Plate II

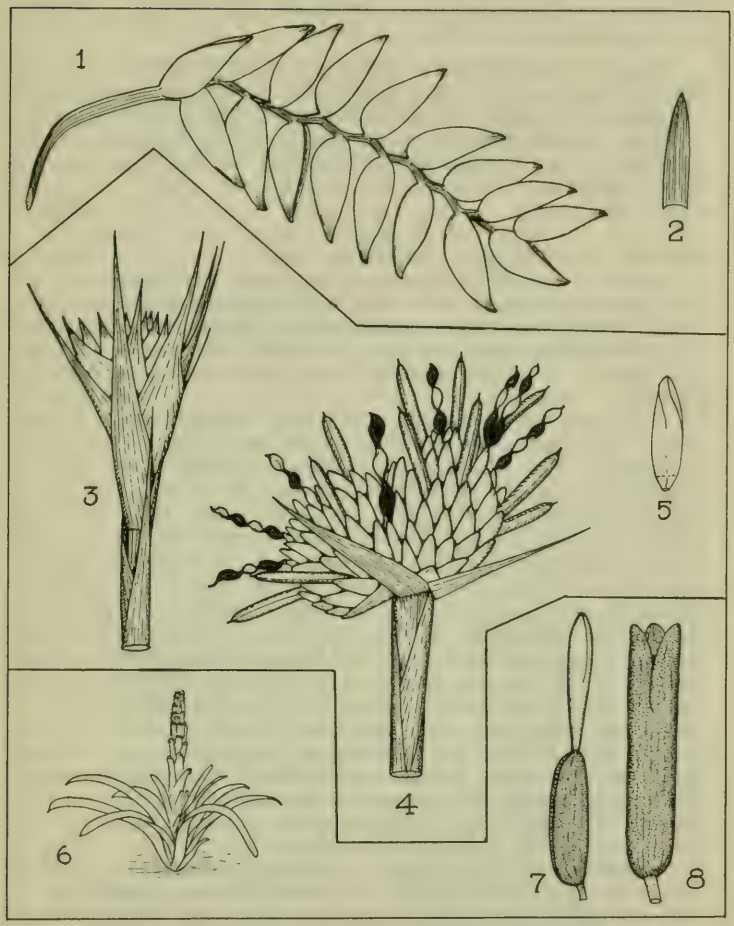

Fig. 1, 2: Aechmea zebrina; fig. 3-5: Guzmania acuminata; fig. 6-8: Guzmania danielii.

for 20 mm., the same texture as the floral bracts; petals 7 cm. long; stamens included. Pl. II, fig. 6: Habit after Daniel; fig. 7: Flower x 1/2; fig. 8: Sepals x 1.

Type in the Gray Herbarium, collected at Monte del Diablo, near La Ceja, Department of Antioquia, Colombia, July 1944, by Hermano Daniel (No. 3350).

This species appears to be closely related to G. confinis L. B. Smith, but differs from it in its robust habit and large floral bracts which about equal the sepals.

GUZMANIA GLOBOSA L. B. Smith, sp. nov.

Acaulis; vaginis foliorum atro-castaneis, laminis graminiformibus, inflorescentiam multo superantibus; scapo decurvato; scapi vaginis imbricatis; inflorescentia simplicissima, dense globosa; sepalis magnis, bracteas superantibus, tenuibus, alte connatis.

Stemless, the flowering shoot 4 dm. long; leaves 8 dm. long, the sheaths ovate, 3 cm. long, dark castaneous with a narrow green margin, sparsely and obscurely lepidote, the blades linear, 6 mm. wide, green, glabrous or obscurely lepidote; scape decurved, slender; scape-bracts erect, imbricate, ovate with long foliaceous blades, red, obscurely lepidote; inflorescence simple, densely many-flowered, globose, 8 cm. in diameter, filled with a jelly-like substance in life (! Foster); floral bracts broadly elliptic, obtuse, 30 mm. long, exceeded by the sepals, membranaceous, transparent, yellow with a red base (! Foster); pedicels obconic, 5 mm. long; sepals 37 mm. long, exceeding the petals and stamens, membranaceous, transparent, obscurely lepidote, green, fused into a cylindrical tube 23 mm. long, the lobes suborbicular; petals white. Pl. III, fig. 1: Habit after Foster; fig. 2: Floral bract, sepals and capsule x 1.

COLOMBIA: CHOCÓ: Epiphyte in dense forest, ridge along Yeraquí Valley, Corcovada Region, upper Río San Juan, alt. 200-275 m., April 24, 25, 1939, E. P. Killip 35226 (US).

EL VALLE: Epiphyte in woods below La Planta, right side of the Río Anchicayá, western slope of the Cordillera Occidental, alt. 400 m., Aug. 5, 1943, J. Cuatrecasas 14875 (F). Epiphytic, Barco, Río Cajambre, near the Pacific Coast, alt. 5-80 m., April 21-30, 1944, J. Cuatrecasas 17044 (F).

Its long grass-like leaves and thin highly connate sepals place Guzmania globosa with the group of species formerly segregated as the genus

Sodiroa. Unlike the majority of these it is stemless, and it differs from the two remaining, G. sprucei (André) L. B. Smith and G. dissitiflora (André) L. B. Smith, in its dense globose inflorescence. The species is notable for the extreme delicacy of the bracts and sepals. The jelly-like material in the inflorescence is noted in all four of the collections cited so it seems likely that it is a natural and not a pathological condition.

GUZMANIA LYCHNIS L. B. Smith, sp. nov.

Florifera submetralis; foliis subtus dense brunneo-lepidotis, laminis ligulatis, acutis; inflorescentia bipinnata, cylindrica; bracteis primariis infimis subfoliaceis sed apice inflorescentiae valde distantibus; floribus fasciculatis; bracteis florigeris quam sepala paulo brevioribus; sepalis tenuibus, connatis.

Flowering plant 9 dm. high from a long caudex completely submerged in wet soggy masses of mosses, ferns and leaf-mold (! Foster); leaves rosulate, 4-6 dm. long, densely brown-lepidote beneath, white-lepidote above, the sheaths elliptic, large, the blades spreading, ligulate, acute, flat, 4 cm. wide; scape erect or ascending; scape-bracts divergent, foliaceous, densely imbricate; inflorescence cylindric, 25 cm. long; primary bracts spreading, imbricate, the lower ones subfoliaceous but much shorter than the axis of the inflorescence, dull maroon with green apices, the upper ones broadly ovate and acute; flowers in fascicles of about 10 in the axils of the bracts, almost wholly covered; floral bracts elliptic, slightly shorter than the sepals, membranaceous, densely appressed-lepidote; flowers subsessile; sepals oblong, obtuse, 23 mm. long, membranaceous, densely lepidote; petals linear, obtuse, 4-5 cm. long. Pl. III, fig. 3: Inflorescence x 1/5; fig. 4: Branch of inflorescence x 1/2; fig. 5: Sepals x 1.

Type in the Gray Herbarium, collected in páramo cloud forest, Alto de Cruz, above Encano, Territory of Putumayo, Colombia, altitude 3,300 meters, November 1, 1946, by M. B. and R. Foster (No. 2045).

This species shows its closest affinity with Guzmania confinis L. B. Smith, from which it differs in having about three times as many flowers in each fascicle and the floral bracts only a little shorter than the sepals.

GUZMANIA SIBUNDOYORUM L. B. Smith, sp. nov.

Semimetralis; foliis rubro-striatis, obscurissime lepidotis, laminis ligulatis; inflorescentia dense bipinnata; bracteis primariis foliaceis, infimis apicem inflorescentiae superantibus; ramis fere omnino abortivis, flores 3 fasciculatos gerentibus; sepalis alte connatis, bracteas florigeras paulo superantibus.

Terrestrial or rarely epiphytic, growing in dense masses and bearing long stolons, flowering shoot 5 dm. high (! Foster); leaves 3 dm. long, very obscurely lepidote, marked with fine maroon longitudinal stripes, the sheaths elliptic, ample, the blades ligulate, acute, flat, 20-35 mm. wide; scape erect; scape-bracts foliaceous, densely imbricate; inflorescence densely bipinnate; primary bracts foliaceous, red or red-striped, the lower ones exceeding the center of the inflorescence; branches almost wholly aborted, bearing a fascicle of 3 flowers; floral bracts obovate, apiculate, slightly shorter than the sepals, thin, sparsely appressed-lepidote; sepals oblong, 12 mm. long, connate about 3/4 of their length, yellow, the lobes suborbicular; petals 25-40 mm. long, white. Pl. III, fig. 6: Primary bract x 1/2; fig. 7: Branch of inflorescence x 1/2; fig. 8: Flower x 1.

Type in the Gray Herbarium, collected on a heavy mat of branches and leaf-mold in the sun, near Buenos Aires, beyond Sibundoy, Territory of Putumayo, Colombia, altitude 2,700 meters, October 29, 1946, by M. B. and R. Foster (No. 2008).

COLOMBIA: PUTUMAYO: Near La Laguna de La Cocha, by Nariño boundary, Feb. 1942, R. E. Schultes (US). Epiphyte, Sibundoy, Valley of Sibundoy, alt. 2,225-2,300 m., May 29, 1946, R. E. Schultes & M. Villarreal 6605a (US).

At the suggestion of Mulford Foster this species is named for the Sibundoy Indians who use it to ornament their houses. From the nearly related Guzmania longipetala (Baker) Mez it differs in its greater size, dense inflorescence and more numerous flowers. Thecophyllum squarrosum Mez & Sodiro must belong to Guzmania judging by its highly connate sepals, and from this G. sibundoyorum differs in its obscurely lepidote leaves and bracts, fewer-flowered fascicles and smaller sepals.

GUZMANIA TRIANGULARIS L. B. Smith, sp. nov.

A G. conifera André, cui affinis, foliis acutioribus, sepalis minoribus, dense adpresseque lepidotis differt.

Plate III

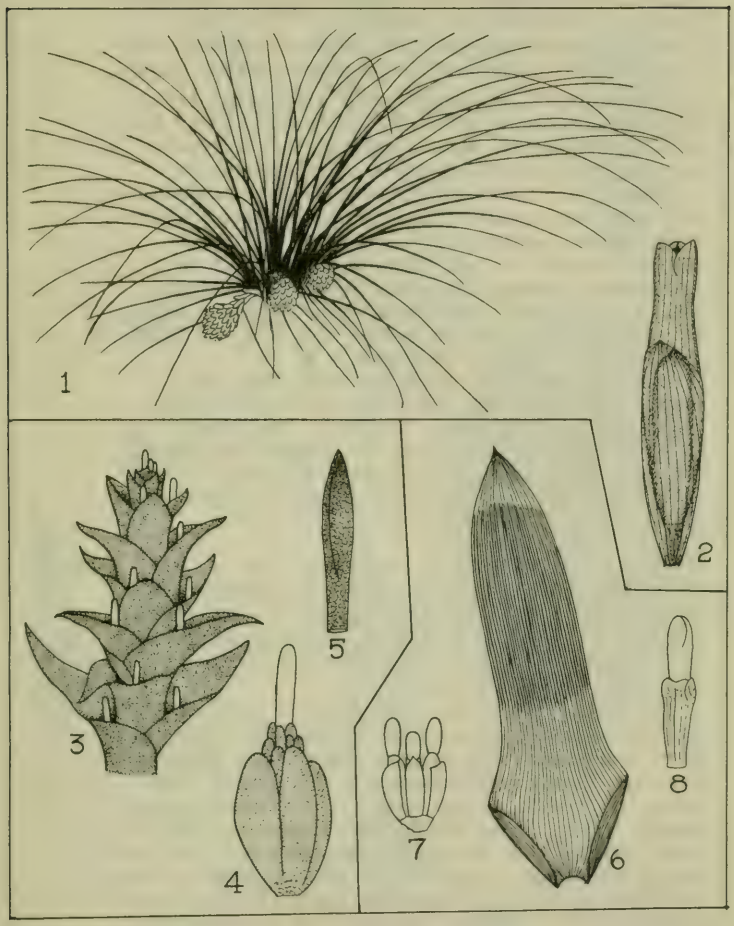

Fig. 1, 2: Guzmania globosa; fig. 3-5: Guzmania lychnis; fig. 6-8: Guzmania sibundoyorum.

About 1 meter high; leaves to 11 dm. long, the sheaths broadly ovate, dark castaneous, covered with minute appressed pale brown scales, the blades ligulate, subacute and apiculate, 4 cm. wide, green, concolorous, whitish-lepidote beneath; scape erect, stout, glabrous; scape-bracts strict, foliaceous or subfoliaceous, densely imbricate; inflorescence simple, strobilate, ellipsoid, 8 cm. long, 6 cm. in diameter, many-flowered; floral bracts strict, much exceeding the sepals, appressed-lepidote, the base broadly ovate, even, castaneous, the apex triangular, strongly nerved, green; pedicels broadly obconic, compressed, 4 mm. long; sepals obovate, 16 mm. long, connate for 6 mm., coriaceous, densely pale-lepidote; petal-blades elliptic, obtuse, about 7 mm. long, yellow-brown. Pl. IV, fig. 1: Apex of leaf x 1/2; fig. 2: Inflorescence x 1/2; fig. 3: Sepals x 1.

Type in the U. S. National Herbarium, Nos. 2048075 and 2048076, collected in a moist shady gorge, Quebrada El Pato, El Cidro, Río Pomera, 11 km. southeast of Moniquira, Department of Boyaca, Colombia, latitude 5° 47' north, longitude 73° 21' west, altitude 2,355 meters, August 20, 1944, by H. St. John (No. 20664).

GUZMANIA VERECUNDA L. B. Smith, sp. nov.

Inflorescentia dense bipinnatim paniculata; bracteis primariis erectis, magnis, flores multo superantibus; ramis abortivis, paucifloris; bracteis florigeris sepala superantibus, coriaceis; sepalis liberis, coriaceis.

Epiphytic, stemless; leaves to 45 cm. long, exceeding the inflorescence, subdensely lepidote with brown appressed scales, the sheaths elliptic, 8-10 cm. long, dark castaneous, the blades ligulate, acuminate, 25 mm. wide, flat, green; scape erect, short; scape-bracts strict, densely imbricate, foliaceous, the upper ones roseate; inflorescence bipinnate, 15 cm. long; primary bracts broadly ovate with a subtriangular blade, erect, much exceeding the flowers, roseate with a castaneous base; branches reduced to pulvini, few-flowered; floral bracts lanceolate, inflexed at the apex, exceeding the sepals, their apical third pale brown and subchartaceous, elsewhere castaneous and coriaceous; flowers subsessile; sepals like the floral bracts, 20 mm. long, free; petals naked, their claws united to form a tube. Pl. IV, fig. 4: Apex of leaf x 1; fig. 5: Inflorescence x 1/2; Fig. 6: Spike x 1.

Plate IV

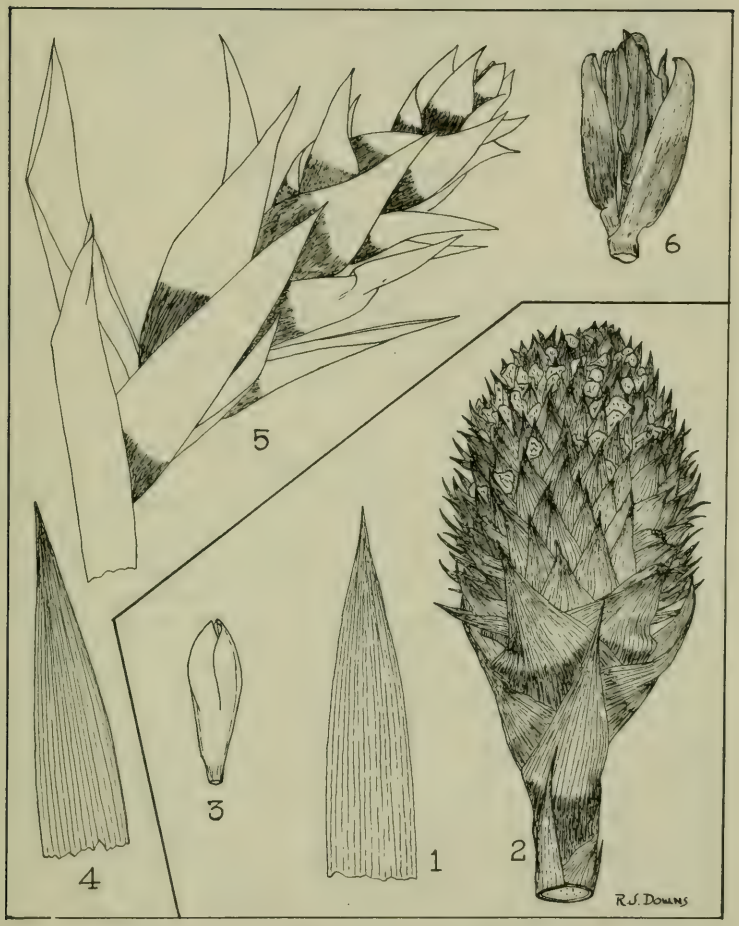

Fig. 1-3: Guzmania triangularis; Fig. 4-6: Guzmania verecunda.

Type in the Comisión de Botanica de la Secretaría de Agricultura y Fomento del Departamento del Valle del Cauca, collected on the right bank of the Río San Juan below El Queremal, between kilometers 52 and 53, basin of the Río Digua, Department of El Valle, Colombia, altitude 1,500 meters, March 19, 1947, by J. Cuatrecasas (No. 23875).

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A NEW SPECIES OF SPHENODESME

Harold N. Moldenke

SPHENODESME CLEMENSORUM Moldenke, sp. nov.

Frutex scandens; ramulis gracilibus minute puberulis; petiolis 8--12 mm. longis adpresso-puberulis; laminis chartaceis ellipticis obtuse breviterque acuminatis integris, ad basin acutis, supra glabris nitidisque, subtus dense albo-tomentellis; bracteis 6 purpureis oblanceolatis utrinque brunneo-puberulis acutis, ad basin attenuatis.

Scandent shrub; branches slender, minutely brown-puberulent; nodes obscurely annulate; principal internodes 3--5 cm. long; leaves decussate-opposite; petioles slender, 8--12 mm. long on mature leaves, densely appressed-puberulent; blades chartaceous, dark-green and brunnescent above in drying, whitish beneath, elliptic, 6.5--8 cm. long, 2.5--4 cm. wide, bluntly short-acuminate at apex, acute at base, entire, glabrous and shiny above, very densely appressed-tomentellous with whitish hairs beneath; midrib very slender, impressed above, prominent and puberulent beneath; secondaries 5--7, very slender, arcuate-ascending, indiscernible above, prominulous beneath; veinlet reticulation sparse, indiscernible above, prominulous beneath; inflorescence racemiform, 15 or more cm. long, borne singly in the upper axils, often with a few pairs of greatly reduced leaves toward the base; peduncles very slender, 2--3 cm. long, densely brown-puberulent, tetragonal; pedicels filiform, to 15 mm. long, densely brown-puberulent; bracts dull-purplish when fresh, 6 in number, borne in 2 groups of 3 each, oblanceolate, 13--25 mm. long, 4--7 mm. wide, acute at apex, long-attenuate to base, brownish-puberulent on both surfaces, with a distinct midrib and some side-veinlets; calyx campanulate, firm, about 4 mm. long and 2.5 mm. wide, conspicuously longitudinally ribbed, densely white-puberulent, its rim conspicuously 6-lobed, the lobes about 0.5 mm. long, triangular-acute, in fruit enlarged to 12 mm. and 6 mm. wide, with the lobes about 2 mm. long; corolla included or equaling the calyx; stamens barely visible beyond the corolla-mouth; anthers white.

The type of this distinctive species was collected by Joseph and Mary Knapp Clemens in a hill forest at low elevation, Gat, Upper Rejang River, Sarawak, on June 31, 1929, and is no. 5651 (herb. no. 21781), deposited in the Britton Herbarium at the New York Botanical Garden.

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HORTUS DUROBRIVENSIS II.

Bernard Harkness

ABIES, Miller - Gard. Dict. 1754
PINACEAE -- Pine Family.

Abies alba, Mill.
SILVER FIR c & s Europe

Miller - Gard. Dict. 1768

Bailey 91 (1948); Dallimore & Jackson 113 (1948)

Two trees, only, remain of plantings made of Silver Fir from 1897 to 1918, and although one has reached 50 feet in height its appearance is poor. Dry summer weather and injury from winter sun are the factors which limit their ornamental usefulness in Highland Park. Our plants all came from the Rochester nursery firm of Ellwanger and Barry and very likely were seed importations of northern origin. There may be strains better adapted to this area from its southern range in the Balkan mountains.

Abies alba f. pendula (Carr.) Rehd.
WEEPING SILVER FIR Vosges mts., France

Rehder - Bibliog. of Cult. Trees & Shrubs (1949)

Bean I,130 (1950); Hornibrook 20 (1938)

In nature this form is known only from the Vosges range in France just west of Germany's Black Forest region. The East Friesland references pertain to a forest planting near the North Sea. Two upright trees, now 25 feet high, in Durand-Eastman Park seem identifiable with the wild weeping form of Silver Fir. Its present good appearance seems to indicate a greater tolerance of an adverse climate than any strain of Silver Fir so far grown here. Weeping Silver Fir first came to Highland Park from Manda in 1905; the existing trees may have been propagated here later.

Abies amabilis, (Loud.) Forbes
CASCADE FIR B. C. to Oregon

Forbes - Pinetum Woburn. 1839

Bailey 93 (1948); Dom. For. Serv. 68 (1949)

Cascade Fir has endured rather than thrived in Rochester. It reached here by way of Veitch Nurseries, England, in several importations from 1899 to 1905. Only one tree remains in Highland Park in a protected spot. Its growth has always been noted as slow and the surviving tree is about 22 feet high.

Abies balsamea, (L.) Miller
BALSAM FIR e N. America

Miller - Gard. Dict. 1768

Bean I,120 (1950); Peattie 57 (1950)

The Balsam Fir is not long-lived when planted in Rochester. Plantings were made throughout the parks from a purchase of 100 plants in 1904 from R. Douglas Sons, Waukegan, Illinois. None of these now survive. Our oldest plants are in Durand-Eastman Park. They were received as var. macrocarpa from the Arnold Arboretum in 1920, but observation of their coning here indicates that these, at least, do not differ from the type (v. Viguié et Gaussen). Cones are produced on young trees such as were planted in Highland Park from a local nursery in 1950.

Abies cephalonica, Loud.
GREEK FIR mts. of Greece

Loudon - Gard. Mag. 1838

Viguié & Gaussen 118 (1929); Wyman 112 (1951)

Though subject to burning of the needles in severe winters, Greek Fir does make a good specimen tree. For planting in Durand-Eastman Park, several seedlings were obtained from Hick's Nurseries, Long Island, in 1922. These are now handsome trees of 25 and 30 foot heights. One tree of this lot is a hybrid. One older tree remains in Highland Park, a venerable specimen 60 feet in height, in good health and coning. The plant received here in 1905 as A. Reginae-Amaliae from the Arnold Arboretum seems not distinguishable from typical Greek Fir, although it

has been cited as the var. Apollonis (A. D. Slavin in Chittenden - Conifers in Cultivation).

Abies cilicica, (Ant. & Kotschy) Carr.
CILICIAN FIR Asia Minor, Syria

Carriere - Traite Conif. 1855

Dallimore & Jackson 125 (1948); Pardé 74 (1938)

Many plants have been received at Highland Park as Cilician Fir, but cone studies have narrowed down the correct specimens to two trees, now 20 and 32 feet tall. They are, quite possibly, the two received from Ellwanger & Barry in 1918. As generally reported, this fir suffers badly from winter burning and it cannot be recommended as an ornamental tree for this area. Though associated in nature with the hardy Cedar of Lebanon, it lacks the ability to thrive as that tree has here. Dallimore in the recent RHS Dictionary of Gardening notes that it is uncommon in cultivation.

Abies concolor, (Gord.) Hoopes
WHITE FIR w N. America

Hoopes - Book Evergr. 1868

Bailey 93 (1948); Wyman 111 (1951)

The only reservation to naming White Fir as the preferred fir to grow in this region arises from the weakness of old specimens in recent wind storms. The earliest record of acquisition is 1895 from Ellwanger and Barry. One of these now approaches 70 feet in height. One remaining tree of those labelled f. violacea has finally been rejected as not truly representative of that forma.

Abies Ernesti, Rehd.
WILSON FIR w China

Rehder in Jour. Arn. Arb. 1939
---
den Ouden 55 (1949); Pourtet et Duchaufour 97 (1944)

Though their source remains unknown, two young trees have borne cones in the past few years that seem to confirm the identification by needle characteristics of this West China fir. According to Cheng

it is widespread in the mountains of West China in the lower altitudes. First known as A. Beissneriana and not widely grown at present, it seems a fir that may well become an important ornamental. As time goes on familiar names become confused, hence Ernest Fir as proposed by Standardized Plant Names is rejected here and Wilson Fir substituted for English usage.

Abies Fargesii, Franch.
FARGES FIR c China

Franchet - Jour. de Bot. 1899

Bean I,122 (1950); Hillier in Chittenden 226 (1932)

A leaderless plant, only, remains in the Highland Park pinetum from Wilson's #4451, as distributed by the Arnold Arboretum in 1915. As Mr. Hillier notes, there is pubescence on some branchlets, especially the lesser ones where it is thick in the slight grooves of the stem. Its habit of growth seems to be in response to difficulties with our winter climate, as erect branchlets have started up only to be killed back. It is vigorous within its height limits of six feet, spreading to twelve feet.

Abies homolepis, S & Z.
NIKKO FIR Japan

Siebold & Zuccarini - Fl. Jap. 1842

Dallimore & Jackson 139 (1948); Wyman 112 (1951)

In Rochester Nikko Fir has prospered very well. It seems to be the preferable tree of the shining dark green, white-banded reverse, needled group. It is conspicuous among firs by its bark, reddish and flaking off in small patches. Our oldest tree (Veitch 1906) is now about 55 feet tall and in good condition.

Abies homolepis var. umbellata,(Mayr.) Wils.
GREENCONE NIKKO FIR Japan

Wilson - Conif. Taxads Japan. 1916

Viguié et Gaudsen 541 (1929); Slavin in Chittenden 92 (1932)

The first plantings of this variety, which appears to differ only in the color of the cones, have proved to be normal purple-coned Nikko Fir. In Durand-Eastman Park are true green-coned plants raised from seed, Wilson's #7707, from 1,500 meters elevation in the mountains at Nikko. We received small plants from the Arnold Arboretum in 1918.

Abies koreana, Wils.
KOREAN FIR Korea

Wilson in Journ. Arn. Arb. 1920

Bean I,126 (1950); den Ouden 63 (1949)

One plant received from the Arnold Arboretum in 1921 and grown in a favorable situation in Durand-Eastman Park represents this alpine species from southern Korea and the island of Quelpaert. Though it has coned for several years, our Korean Fir has reached only 15 feet in height. It has the stiff habit of a high mountain tree.

Abies lasiocarpa, (Hook.) Nutt.
ROCKY MOUNTAIN FIR w N. America

Nuttall - N. Am. Sylva.1849

Bailey 92 (1948); Dom. For. Ser. 66 (1949)

Early plantings from Veitch in 1899 were noted by John Dunbar as very hardy and quite promising. However, as with Balsam Fir, the promise of good growth in young plants never has been fulfilled by shapely mature specimens. The Veitch plants are gone, the oldest tree in Highland Park is about 30 feet tall, a narrow-columnar tree. A younger tree in Durand-Eastman Park is still good in appearance and from 1938 to 1948 grew from 8 feet to 14 feet.

Abies lasiocarpa var. arizonica, (Merriam) Lemm.
ARIZONA CORK FIR Ariz. & N. Mex. to Col.

Lemmon in Sierra Club Bull. 1897
---
den Ouden 48 (1949); Pardé 86 (1938)

European authorities recognize Arizona Cork Fir as a distinct species. If it must remain as a variety of A. lasiocarpa, its variance from typical material should be better known. Its natural adaptations to a dryer and hotter climate greatly increase

its worth as an ornamental in the Eastern states. Its light blue-green, glaucous needles are as striking as the lighter color forms of Picea pungens, and in texture and habit the fir is much to be preferred. In Europe where it has been widely tested its hardiness has been well proven. First imported from the Veitch nursery in 1906, a Highland Park tree now is 40 feet high with a half inch of corky bark developed. Younger trees in Durand-Eastman Park are perfect specimens branched to the ground.

Abies nephrolepis, (Trautv.) Maxim.
KHINGAN FIR e Sib., n China, Korea

Maximowicz in Bull. Acad. Sci. St. Petersb. 1866

Bean I,128 (1950); Dallimore & Jackson 153 (1948)

The cultural requirements of Kinghan Fir are too exacting to class it as a good ornamental. However, on a hillside with north-east exposure at Durand-Eastman Park one tree has grown from 12 feet in 1938 to nearly 40 feet in 1953, holding its lower branches in good condition. Our trees are from Korea, E. H. Wilson's # 11,252, where its habitat is in the mountains.

Abies Nordmanniana, (Stev.) Spach
NORDMANN FIR Cauc., Asia Minor, Greece

Spach - Hist. Nat. Veg. Phan. 1842

Bailey 90 (1948); Boom 93 (1949)

The esteem in which Nordmann Fir is held as an ornamental seems well deserved from the several trees in the collections here. They are approaching their mature stages in good condition. Coning seems more consistent every year on Nordmann than any other fir we grow. The first acquisition date recorded is 1902 when young plants came from the Ellwanger and Barry nursery.

Abies Nordmanniana f. tortifolia, Rehd.
TWISTLEAF NORDMANN FIR hort. form

Rehder in Jour. Arn. Arb. 1923

Bailey 91 (1948)

For a time from the Bayard Cutting estate, Oak-

dale, Long Island, surplus plants were sold by Mr. C. W. Knight under the name of Westbrook Gardens. In 1923 we received some firs from this source. A mixup in labelling followed and the name A. numidica became attached to the tree in Durand-Eastman Park now determined to be this plant. Typical Nordmann Fir cones have been borne in recent years by this fine specimen tree now about 20 feet high.

Abies procera, Rehd.
NOBLE FIR Calif. to Wash.

Rehder in Rhodora. 1940

Bailey 94 (1948); Peattie 198 (1953)

In no situation has this west coast species of fir been able to accomodate itself to the change of climate. Nor does its blue-green needled form, f. glauca, produce over the years, it has been here since 1918, anything but a stunted, poor specimen.

Abies recurvata, Mast.
MIN FIR w China

Masters in Jour. Linn. Soc. Lond. Bot. 1906

Cheng 98 (1939); Larsen 63 (1948)

This year (1953) is the first coning for Min Fir in Rochester. Seedlings received in 1914 from Vicary Gibbs of England have progressed in Durand-Eastman Park far ahead of those in Highland Park. In height they have reached 30 feet. These represent Wilson's #4051 from a western Szechuan locale near the Min River.

Abies sachalinensis, (Fr. Schmidt) Mast.
SAGHALIN FIR n Japan

Masters in Gard. Chron. 1879

Dallimore & Jackson 165 (1948): Kempe pl.10 (1940

One tree now over 20 feet high in good condition at Durand-Eastman Park indicates that we can keep Saghalin Fir in our collection; an older tree in Highland Park is in poor shape. The younger tree came from the Arnold Arboretum in 1919, a seedling from the E. H. Wilson collection #7316. A single tree in Durand-Eastman Park is labelled for the var.

nemorensis, a cone-variant only, but as no cones have been observed its authenticity is not yet established.

Abies sibirica, Ledb.
SIBERIAN FIR n Asia

Ledebour - Fl. Alt. 1833

Bailey 82 (1948); Pardé 77 (1938)

The R. Douglas Sons Nursery of Waukegan, Illinois in 1905 supplied the lone Siberian Fir which now with a 3-stemmed trunk reaches nearly 40 feet in height in Highland Park. Its condition is only fair, without lower branches, and in appearance it is not an ornamental tree.

Abies Veitchii, Lindl.
VEITCH FIR mts. of c Japan.

Lindley in Gard. Chron. 1861
---
den Ouden 79 (1949); Pardé 78 (1938)

Named for its discoverer, John Gould Veitch, on Mt. Fujiyama in 1861, and grown by the Veitch Nursery from seeds from Japan in 1879, this fir, quite fittingly, came to Highland Park as 3 good-sized (4') plants from the Veitch Nursery in 1899. They have prospered here and have reached the 60-70 foot height of mature trees in the Japanese forests. Veitch Fir has long been noted as showing the greatest contrast in firs between the green of the upper surface and the whiteness of the under surface of the needles.

Abies Veitchii var. olivaceae, Shir.
GREENCONE VEITCH FIR mts. of c Japan

Shirasawa in Bot. Mag. Tokyo. 1913

Wilson 62 (1916)

From the Wilson seed collection #7525 in the year 1914 numerous seedlings were raised but the specimens are now reduced to one tree in Durand-Eastman Park whose cones borne in some abundance this year (1953) show no purple tints at all. No other marked difference appears in the cultivated plants from typical Veitch Fir with which it is mingled in its native stands.

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1951 Wyman, D. Trees for American Gardens. New York.

NOTES ON BROMELIACEAE. III

Lyman B. Smith

VENEZUELA

NAVIA CRISPA L. B. Smith, sp. nov.

A N. glauca L. B. Smith, cui affinis, laminis foliorum margine valde crispatis, inflorescentia e spicis multis brevibus digitatim bipinnata differt.

Plant low; stem to 10 cm. long, covered with the remains of old leaves; living leaves numerous in a dense rosette at the apex of the stem, 24 cm. long, the sheaths broadly ovate, short, brown, the blades linear, acuminate, 12 mm. wide, subdensely serrulate, strongly crisped along the margin, marked with a pale median stripe, sparsely and obscurely white-pilose beneath; inflorescence sessile, subglobose, digitately bipinnate from many short spikes; outer bracts few, foliaceous but greatly reduced; floral bracts broadly ovate, acute, about equaling the sepals, subentire, thin, white, minutely pilosulous; pedicels short; sepals free, lanceolate, acute, 8 mm. long, strongly nerved, brown, pilosulous, the posterior ones narrowly alate-carinate; petals white (! Maguire); capsule shorter than the sepals; seeds naked, dark, reticulate. Pl. I, fig. 1: Leaf-blade x 1; fig. 2: Floral bract x 5; fig. 3: Posterior sepals x 5.

Type in the U. S. National Herbarium, No. 2028894, collected among boulders near northeast base of mountain, Cerro Moriche, Río Ventuari, Amazonas, Venezuela, altitude 250 meters, January 16, 1951, by Bassett Maguire, R. S. Cowan and John J. Wurdack (No. 30966).

Dr. Maguire has kindly consented to my anticipating the publication of the above species in his report in order that it may be used elsewhere in the meantime.

COLOMBIA

GUZMANIA GLOBOSA L. B. Smith, Phytologia 4:362. 1953.

Type in the Gray Herbarium, collected on mounds of moss, above El Diviso, Department of Nariño, Colombia, altitude 705 meters, November 13, 1946, by M. B. and R. Foster (No. 2152).

By an inexplicable oversight, the type reference was omitted in the original description of this species although reference was made to the observations with it in noting the jelly in the inflorescence and the color of the floral bracts.

PITCAIRNIA ECHINATA Hook. var. VALLENSIS L. B. Smith, var. nov.

A var. echinata differt petalis roseo-aurantiacis nudis.

Differs from the typical variety in its rose-orange naked petals. Also the stamens are slightly exserted contrary to what is indicated by Hooker. Mez, however, included other collections under P. echinata and called the stamens exserted (DC. Mon. Phan. 9:416; Pflanzenfam. IV. 32:244).

Plate I

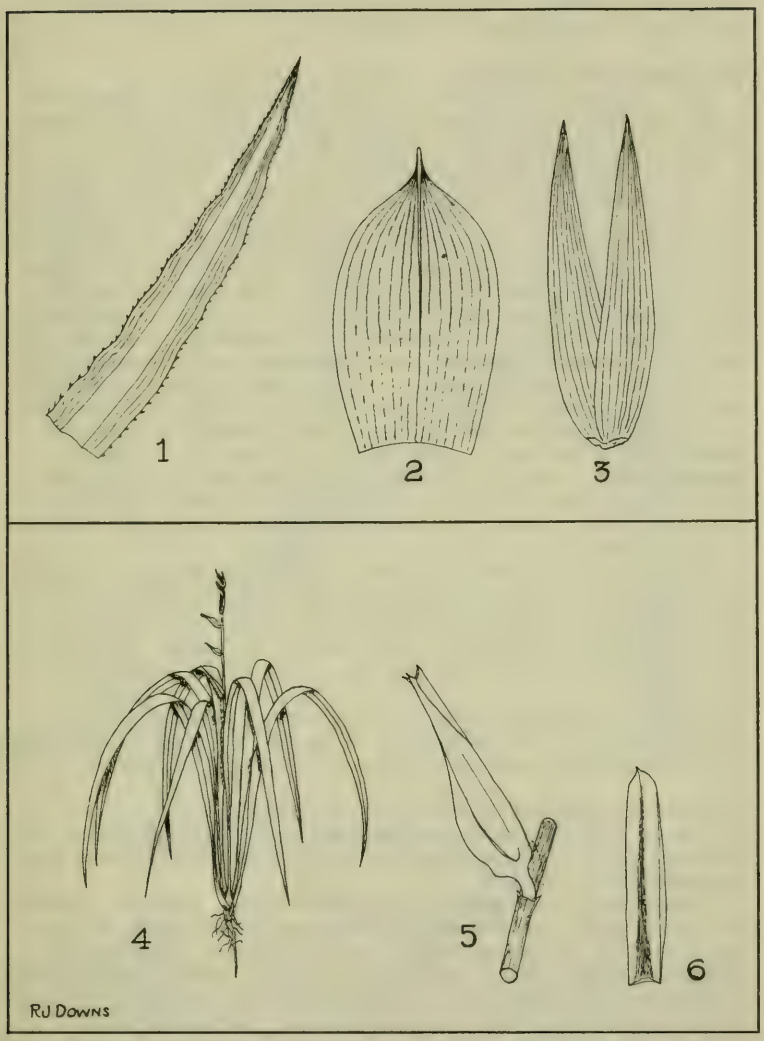


Fig. 1-3: Navia crispa; fig. 4-6: Pitcairnia occidentalis.

Type in the Chicago Natural History Museum, collected on lomas of the Cuchilla de Santa Bárbara, Cartago, Department of El Valle, Colombia, altitude 1,000-1,140 meters, November 17, 1946, by J. Cuatrecasas (No. 22963).

PITCAIRNIA OCCIDENTALIS L. B. Smith, sp. nov.

A P. reflexiflora André, cui vix affinis sed in clave Mezii juxta ponenda, inflorescentia laxe pauciflora, floribus secundis, pedicellis minoribus, sepalis majoribus differt.

Epiphytic, caulescent, flowering shoot 42 cm. high; stem 4 mm. in diameter, covered with roots and old leaf-bases; leaves all alike, fascicled at the apex of the stem, 5-6 dm. long, entire, sparsely and very obscurely brown-lepidote beneath, glabrous above, the sheaths small, ovate, the petioles short but distinct, the blades linear-lanceolate with a strong narrow median channel, flat, caudate-acuminate, to 30 mm. wide; scape erect, very slender, brown-flocculose; scape-bracts large, all but the uppermost exceeding the internodes, but divergent and very narrow so that the scape is completely exposed; inflorescence simple, very laxly 6-flowered, 12 cm. long, sparsely and obscurely flocculose when young; floral bracts ovate, acute, exceeding the pedicels, thin; pedicels 7 mm. long; flowers secund, orange; sepals oblong, broadly rounded and apiculate, 30 mm. long, ecarinate, thin; petals naked; ovary largely superior. Pl. I, fig. 4: Plant x 1/10; fig. 5: Flower x 1; fig. 6: Sepal x 1.

Type in the Comisión de Botánica de la Secretaria de Agricultura y Fomento del Departamento del Valle del Cauca, collected at Córdoba, basin of the Río Dagua, western slope of the Cordillera Occidental, Department of El Valle, Colombia, altitude 39-60 meters, November 14, 1945, by J. Cuatrecasas (No. 19849).

The flowers are so young in the only inflorescence now available that it is impossible to verify the form of the ovules or the relative length of petals and stamens at anthesis.

PITCAIRNIA VERRUCOSA L. B. Smith, sp. nov.

Planta e fragmentis solum cognita, a P. spectabili Mez, cui affinis, pedicellis fere rectis, sepalis verrucosis, petalis appendiculatis differt.

Caulescent; stem erect, probably climbing, 1 cm. in diameter, the lower part long-setose with the persistent nerves of decayed leaves; leaves all alike, entire, rigid, glabrous, the sheaths broadly ovate, encircling the stem, brown, the petioles 3 dm. long, slightly widened toward the base and apex, centrally 6 mm. wide with a strong median channel, the blades lanceoblong, flat, 3-4 dm. long, 7-8 cm. wide, acuminate, rounded at the base, bright violet beneath, green above; scape and axis of the inflorescence unknown; inflorescence probably simple; floral bracts ovate, acuminate, 17 mm. long; pedicels spreading, nearly straight, slender, 4 cm. long, verrucose and lepidote toward the apex; sepals very narrowly triangular, obtuse, 6 cm. long,

Plate II

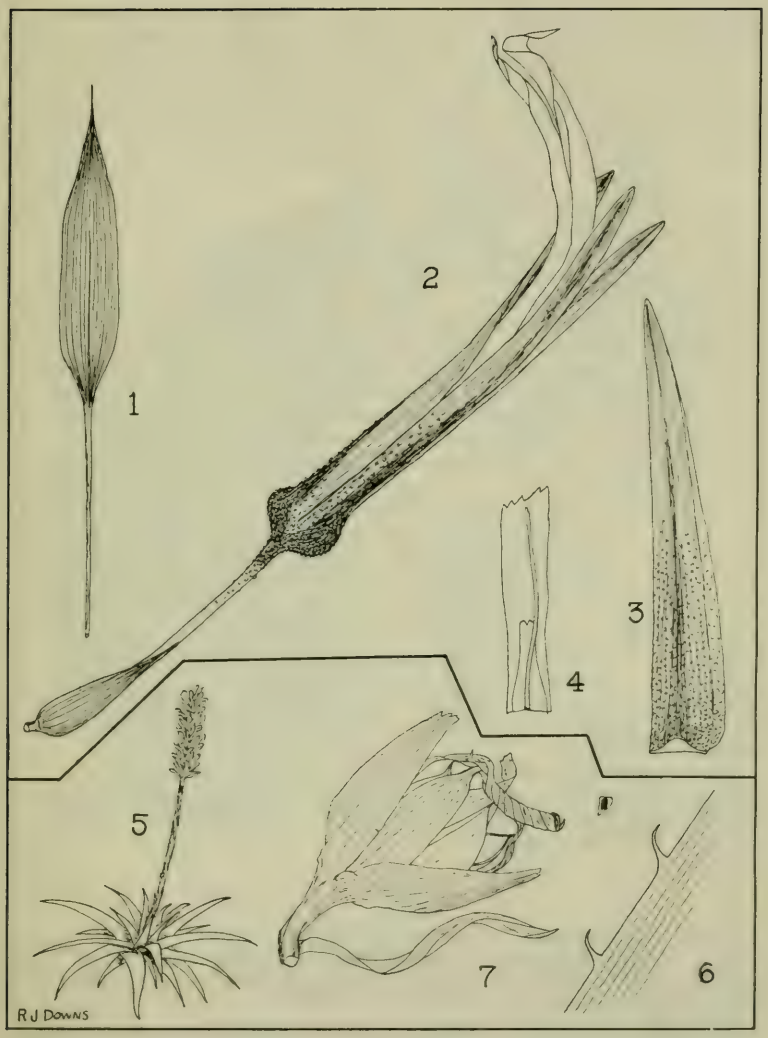


Fig. 1-4: Pitcairnia verrucosa; fig. 5-7: Puya sanctae-martae.

coarsely verrucose especially at the green base, elsewhere red-violet; petals 9 cm. long, acute, reddish yellow, at base bearing a bidentate scale 13 mm. long; ovary almost wholly superior. Pl. II, fig. 1: Leaf x 1/10; fig. 2: Floral bract and flower x 1; fig. 3: Sepal x 1; fig. 4: Base of petal x 1.

Type in the Chicago Natural History Museum, collected in a ravine by Km. 51, left bank of the Río San Juan, near Queremal, basin of the Río Digua, western slope of the Cordillera Occidental, Department of El Valle, Colombia, altitude 1,540-1,650 meters, February 25, 1947, by J. Cuatrecasas (No. 23738).

PUYA SANCTAE-MARTAE L. B. Smith, sp. nov.

A P. kuntzeana Mez, cui in clave Mezii juxta ponenda, pedicellis longioribus, sepalis multo minoribus differt.

Aggregated, flowering plant at least 7 dm. high (the top of the inflorescence missing in the single very old specimen seen); leaves many, densely rosulate, 3 dm. long, the blades narrowly triangular, 3 cm. wide, flat, laxly serrate with pale curved spines 4 mm. long, glabrous at least with age; scape erect, 15 mm. in diameter, glabrous; scape-bracts numerous, very densely imbricate, only the lowest at all foliaceous, the others thin and deciduous with age, probably reflexed but undoubtedly completely covering the scape; inflorescence simple, racemose, densely cylindric, 30-45 cm. long (! Foster), 7 cm. in diameter and glabrous in fruit; axis stout; floral bracts reflexed in age lanceolate, 5 cm. long, thin; pedicels arcuate-spreading, 15 mm. long, rather slender and slightly thickened toward apex; sepals lanceolate, about 25 mm. long, ecarinate, nerved; petals contorted in drying; seeds alate. Pl. II, fig. 5: Plant x 1/20; fig. 6: Leaf-margin x 1; fig. 7: Floral bract and flower x 1.

Type in the Gray Herbarium, collected on perpendicular rocks in full sun, mountains above Hacienda Cincinnati, Santa Marta, Department of Magdalena, Colombia, August 1946, by M. B. and R. Foster and E. Smith (No. 1408). Duplicate in the Herbario Nacional Colombiano.

Because of the extreme age of our only material of Puya sanctae-martae it is not possible to give further distinctions from P. kuntzeana although others such as the character of the indument seem very probable.

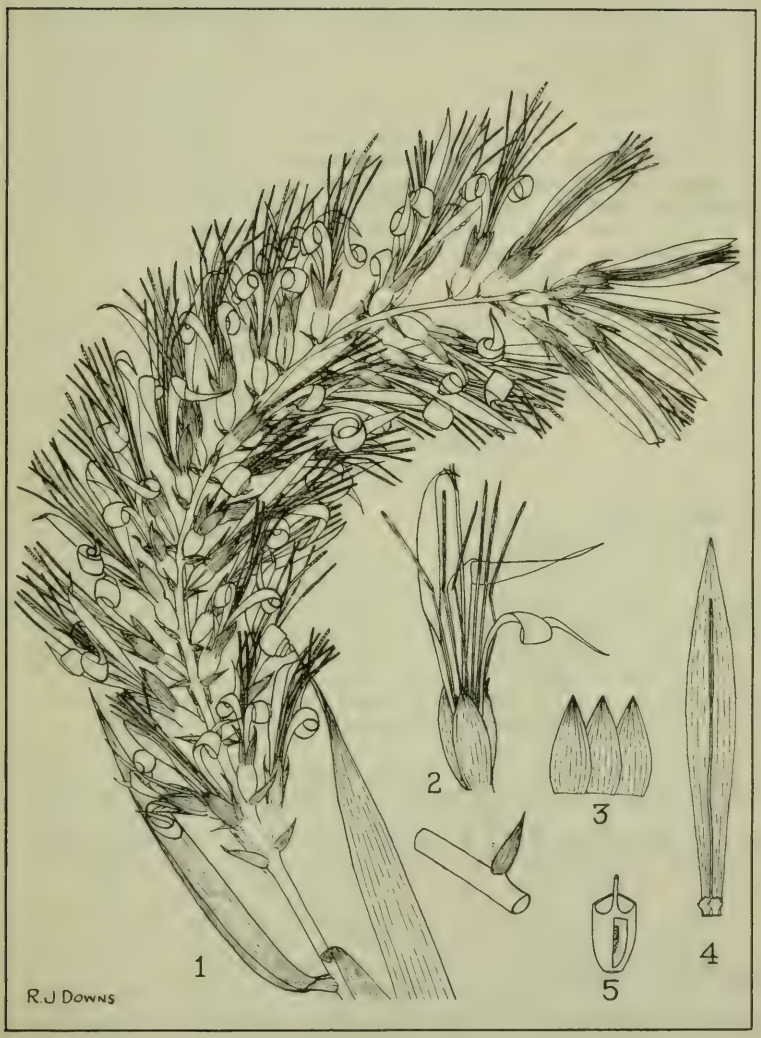
BOLIVIA

BILLBERGIA CARDENASII L. B. Smith, sp. nov.

A B. stenopetala Harms, cui affinis, bracteis florigeris quam ovario brevioribus, sepalis minoribus late acutis, tubo epigyno angusto differt.

Leaf-blade ligulate, broadly acute and apiculate, 4 dm. long, 35 mm. wide, covered on both sides with coarse cinereous appressed scales, laxly serrate with dark curved teeth 2 mm. long; scape slender, densely and very finely white-flocculose; scape-bracts lanceolate, acute, 13 cm. long, rose; inflorescence simple, densely many-flowered, its axis white-flocculose; floral

Plate III



Billbergia cardenasii

bracts ovate, acute, shorter than the ovaries, membranaceous, glabrous except at base; sepals equal, ovate, broadly acute, 10 mm. long, thin, nerved, orange, nearly glabrous; petals linear, acute, spirally recurved, 5 cm. long, yellow, bearing two broadly obovate denticulate scales at base; ovary ellipsoid, strongly trigonous, 10 mm. long, sulcate, white-flocculose, epigynous tube small and narrow. Pl. III, fig. 1: Inflorescence x1/2;fig. 2: Floral bract and flower x 1; fig. 3: Sepals x 1; fig. 4: Petal x 1; fig. 5: Longitudinal section of ovary x 1.

Type in the U. S. National Herbarium, No. 2103978, collected from material cultivated in Cochabamba and of uncertain origin, although probably from Yungas del Chapare, Department of Cochabamba, Bolivia, February 1952, by M. Cárdenas (No. 4907).

It is a pleasure to dedicate this handsome species to Dr. Martín Cárdenas who already has discovered many new and beautiful bromeliads.

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ADDITIONAL NOTES ON THE GENUS AEGIPHILA. XII

Harold N. Moldenke

AEGIPHILA Jacq.

Literature: Briquet in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1894; Junell, Symb. Bot. Upsal. 4: 83. 1934; Moldenke, Brittonia 1: 245--477. 1934; Moldenke, Phytologia 1: 182--208, 222--240, & 248--272 (1937), 1: 289--304 (1938), 1: 364--368 (1939), 2: 57--64 (1941), 2: 387--400 (1947), 2: 437--450 (1948), 3: 46--48 (1948), and 4: 347--354. 1953; Moldenke, Lilloa 4: 315--316. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 200--201. 1940; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio 37: 334. 1943; Stellfeld, Trib. Farmac. 19 (10): 163--164. 1951.

Additions and corrections to the List of Excluded Species published by me in Brittonia 1: 471--472 (1934) are as follows:

Aegiphila capitata Banks & Soland. ex Moldenke, Prelim. Alph. List Invalid Names 1, in syn. 1940 -- not verbenaceous.

Aegiphila incana Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (2): 218. 1836 = Callicarpa cubensis Urb. [not C. incana as stated previously].

Aegiphila laevigata A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 76. 1806 = Parameria laevigata (A. L. Juss.) Moldenke.

Aegiphila paludosa T. S. Brandeg., Univ. Calif. Publ. Bot. 4: 191. 1913 = Clerodendrum ligustrinum var. paludosum (T. S. Brandeg.) Moldenke [not typical C. ligustrinum as stated previously].

Aegiphila pauciflora Von Rohr ex Moldenke, Prelim. Alph. List Invalid Names 3, in syn. 1940 = Ixora ferrea (Jacq.)

Benth.?
Aegiphila viburnifolia A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 76. 1806 = Elaeodendron viburnifolium (A. L. Juss.) Merr.
Aegiphila virgata Turcz., Bull. Soc. Imp. Nat. Mosc. 36 (2): 220. 1863 = Arrabidaea corchorioides (Cham.) P. DC.
Aeguephila rugosa Hort. ex Moldenke, Prelim. Alph. List Invalid Names 4, in syn. 1940 — not verbenaceous.
Amerina triphylla (Hochst.) A. DC., Prodr. 9: 513. 1845 = Clerodendrum glabrum E. Mey.

AEGIPHILA ACULEIFERA Moldenke
Literature: Moldenke, Phytologia 1: 184--185 & 222 (1937), 1: 290 (1938), 1: 378 (1940), 2: 57--58 (1941), 2: 90 (1944), 2: 388 (1947), and 4: 347. 1953.

AEGIPHILA ALBA Moldenke
Literature: Moldenke, Phytologia 1: 185--186 (1937), 1: 290 (1938), 2: 90 (1944), 2: 388--389 (1947), and 4: 347. 1953; Little, Carib. Forester 9: 269. 1949.

AEGIPHILA ANOMALA Pittier
Literature: Pittier, Contrib. U. S. Nat. Herb. 12: 181, fig. 19. 1909; Fedde, Repert. 8: 533. 1909; Prain, Ind. Kew. Suppl. 4: 5. 1913; Bot. Gaz. 57: 426. 1914; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 288--289. 1934; Moldenke, Phytologia 1: 186--187 & 222 (1937), 1: 380 (1940), 2: 58--59 (1941), 2: 90 (1944), and 2: 389. 1947.

AEGIPHILA BRACHIATA Vell.
Literature: Vell., Fl. Flum. 38 (1825), Icones 1: 93. 1827; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 124. 1845; DC., Prodr. 11: 651. 1847; Schau. in Mart., Fl. Bras. 9: 284. 1851; Jacks., Ind. Kew. 1: 46. 1895; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 310--311. 1934; Moldenke, Phytologia 1: 189 (1937), 1: 381 (1940), 2: 59 (1941), 2: 390 (1947), 2: 433 (1948), and 4: 349. 1953; Stellfeld, Trib. Farmac. 19 (10): 170. 1951. A. triantha Schau. in DC., Prodr. 11: 650--651. 1847; Schau. in Mart., Fl. Bras. 9: 283--284. 1851; Jacks., Ind. Kew. 1: 47. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Glaz. in Bull. Soc. Bot. Franç. 58, Mém. 3: 546. 1911; Stapf, Ind. Lond. 1: 79. 1929.

AEGIPHILA CANDELABRUM Briq.
Literature: Briq., Bull. Herb. Boiss., sér. 2, 4: 1167. 1904; Chodat, Plant. Hassler. 2: 504. 1904; Prain, Ind. Kew. Suppl. 3: 4. 1908; Moldenke, Brittonia 1: 426--428. 1934; Moldenke, Phytologia 1: 192--193 (1937), 1: 381 (1940), 2: 59--60 (1941), 2: 433 (1948), and 4: 349. 1953; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 345. 1951.

AEGIPHILA CHRYSANTHA Hayek

Literature: Hayek in Engl., Bot. Jahrb. 42: 171—172. 1909; Prain, Ind. Kew. Suppl. 4: 5. 1913; Moldenke, Brittonia 1: 425—426. 1934; Moldenke, Phytologia 1: 194 (1937), 1: 290 (1938), 1: 381 (1940), 2: 60 (1941), 2: 90 (1944), 2: 390 (1947), 2: 434 (1948), and 4: 350. 1953.

Asplund states that this species is a shrub with sordid-yellow flowers, blooming in October.

Additional citations: PERU: Loreto: Asplund 14057 (S).

AEGIPHILA CRENATA Moldenke

Literature: Moldenke, Brittonia 1: 326—328. 1934; Moldenke, Phytologia 1: 196 & 223 (1937), 1: 382 (1940), 2: 61—62 (1941), 2: 434 (1948), and 4: 350. 1953; Stellfeld, Trib. Farmac. 19 (10): 170. 1951.

AEGIPHILA DEPPEANA Steud.

Literature: Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 122. 1845; DC., Prodr. 11: 655. 1847; Jacks., Ind. Kew. 1: 46. 1895; Standl., Trees & Shrubs Mex. 1253. 1924; Moldenke, Brittonia 1: 450—452. 1934; Moldenke, Phytologia 1: 197—198 & 223 (1937), 1: 291 (1938), 1: 382—383 (1940), 2: 62 (1941), 2: 90 (1944), 2: 391—392 (1947), 2: 434 (1948), and 4: 351. 1953. A. brachiata Cham. & Schlecht., Linnaea 6: 371 (1831) and 7: 110. 1832; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 122. 1845; Seemann, Bot. Voy. Herald 189. 1845-1851; Schau. in DC., Prodr. 11: 654—655. 1847; Hemsl., Biol. Cent. Am. 2: 538. 1882; An. Mus. Nac. Rep. Costa Rica 1 (2): 60. 1888; Jacks., Ind. Kew. 1: 46. 1895; Proc. Am. Acad. 33: 485. 1898; Bot. Gaz. 57: 426. 1914; Standl., Trees & Shrubs Mex. 1253. 1924. A. berteriana Schau. in DC., Prodr. 11: 654. 1847; Jacks., Ind. Kew. 1: 46. 1895. A. pacifica Greenm., Proc. Am. Acad. 33: 485. 1898; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 4. 1904; Standl., Trees & Shrubs Mex. 1253. 1924.

AEGIPHILA ELATA Sw.

Literature: Sw., Prodr. 31. 1788; Gmel., Syst. Nat. 2: 259. 1789, 1791, & 1796; Sw., Fl. Ind. Occ. 1: 254—255. 1797; Willd., Sp. Pl. 1: 616. 1797; Raeusch., Nom. Bot. 37. 1797; Gmel. (Turton), Gen. Syst. Nat. 5: 218. 1802; Poir., Encycl. Méth. Suppl. 1: 151. 1810; H.B.K., Nov. Gen. & Sp. Pl. 2: 251. 1817; Roem. & Schult., Syst, Veg. 3: 102. 1818; Willd., Nom. Bot., ed. 2, 82. 1821; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Bot. Reg. 11: 946. 1826; Maycock, Fl. Barbad. 71—72. 1830; Linnaea 7: 114—115. 1832; Dietr., Syn. Pl. 1: 430. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Paxt., Pock. Bot. Dict. 8. 1840 & 1849; Walp., Repert. 4: 119. 1845; Jacques & Hérincq, Man. Gén. Pl. 3: 504—505. 1845-1862; Schau. in DC., Prodr. 11: 653. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Schau. in Mart., Fl. Bras. 9: 287. 1851; Bocq., Adansonia 3: 190. 1862; Griseb., Fl. Brit. West Ind. 500. 1864; Pritzel, Icon, Bot. Ind. 1: 23. 1866; Griseb., Cat. Pl. Cuba 216. 1866; Hereman, Paxt. Bot. Dict. 13. 1868; Sauvalle, Fl. Cuba 113.

1868; An. Mus. Nac. Rep. Costa Rica 1 (2): 60. 1888; Kuntze, Rev. Gen. Pl. 2: 502. 1891; Bot. Gaz. 18: 7. 1893; Jacks., Ind. Kew. 1: 46. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Urb., Symb. Ant. 3: 367. 1903; Pulle, Enum. Vasc. Pl. Surinam. 403. 1906; Bot. Gaz. 57: 426. 1914; Urb., Symb. Ant. 8: 600. 1921; Stapf, Ind. Lond. 1: 79. 1929; Cañizares, Bot. Gen. y Descrip. 468. 1930; Field Mus. Publ. Bot. 10: 334. 1931; Moldenke, Brittonia 1: 462--466. 1934; Moldenke, Phytologia 1: 198--199 & 223 (1937), 1: 291 (1938), 1: 384--385 (1940), 2: 63 (1941), 2: 90 (1944), 2: 392 (1947), 2: 434 (1948), and 4: 351--352. 1953; Moldenke, Lilloa 4: 318. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 201--202. 1940; Contrib. Univ. Mich. Herb. 8: 60. 1942; Roig, Plant. Med. Cuba 411. 1945; Matuda, Am. Midl. Nat. 44: 575. 1950. Knoxia 2 P. Browne, Civ. & Nat. Hist. Jamaica 140. 1756; Willd., Sp. Pl. 1: 616. 1797; Sw., Fl. Ind. Occ. 1: 254. 1797; Gmel. (Turton), Gen. Syst. Nat. 5: 218. 1802; Poir., Encycl. Méth. Suppl. 1: 151. 1810; Roem. & Schult., Syst. Veg. 3: 102. 1818; Dietr., Syn. Pl. 1: 430. 1839; Bocq., Adansonia 3: 188. 1862; Bocq., Rév. Group. Verb. 188. 1862. Nuxia elata (Sw.) Pers., Syn. Pl. 1: 132. 1805; Pers., Sp. Pl. 1: 339. 1817; Roem. & Schult., Syst. Veg. 3: 102. 1818; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Jacks., Ind. Kew. 3: 320. 1895. Omphalococca cornifolia Willd. in Roem. & Schult., Mant. 3: 132. 1827; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 118. 1845; Schau. in DC., Prodr. 11: 653. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Schau. in Mart., Fl. Bras. 9: 287. 1851; Jacks., Ind. Kew. 3: 341. 1894. Psychotria mollis Spreng. in DC., Prodr. 4: 513. 1830; Urb., Symb. Ant. 8: 600. 1921. Aegiphila cornifolia (Willd.) Kunth, Abh. Akad. Berol. 215. 1831; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert 4: 118--119. 1845; Schau. in DC., Prodr. 11: 653. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Schau. in Mart., Fl. Bras. 9: 287. 1851; Jacks., Ind. Kew. 1: 46. 1895. A. laevis Poepp. in Walp., Repert. 4: 119. 1845; Jacks., Ind. Kew. 1: 46. 1895. A. macrophila H.B.K. ex A. Rich. in Sagra, Hist. Cuba, part 2, 11: 146. 1850. A. macrophylla Rich. apud Griseb., Cat. Pl. Cuba 216. 1866.

Roig, in the reference cited above, states that Gomez de la Maza in his "Ensayo de Farmacofitologia Cubana", p. 77 CL & CLI, reports the leaves and stems of this plant are used with good results against diarrhoea and dysentery and as a hispostenizant or neurovascular against tetanus. A decoction of the leaves is used in baths against dropsy; chopped up or in a strong decoction in the treatment of sores and ulcers. Internally an infusion of the leaves is used in treating spasms.

Additional citations: MARTINIQUE: Collector undesignated s.n. [Herb. Portenschlag] (F--photo, N--photo).

AEGIPHILA ELEGANS Moldenke

Literature: Moldenke, Brittonia 1: 458--460. 1934; Moldenke, Phytologia 1: 199--200 & 223 (1937), 1: 385 (1940), 2: 63 (1941),

2: 392 (1947), and 4: 352. 1953.

Asplund describes this plant as a shrub 5 meters tall, with subscandent branches and orange fruit in October, growing in thickets.

Additional citations: PERU: Loreto: Asplund 13975 (S).

AEGIPHILA FALCATA Donn. Sm.

Literature: Donn Sm., Bot. Gaz. 18: 7. 1893; Donn. Sm., Enum. Pl. Guat. 3: 65 & 110. 1893; Durand & Jacks., Ind. Kew. Suppl. 1: 12. 1896; Pittier, Prim. Fl. Costaric. 2: 210--211. 1898; Bot. Gaz. 57: 426. 1914; Moldenke, Brittonia 1: 363--364. 1934; Moldenke, Phytologia 1: 200 (1937), 1: 291 (1938), 1: 386--387 (1940), 2: 63 (1941), 2: 90 (1944), 2: 392 (1947), 2: 434 (1948), and 4: 352. 1953; Matuda, Am. Midl. Nat. 44: 575. 1950.

AEGIPHILA FERRUGINEA Hayek & Spruce

Literature: Hayek & Spruce in Engl., Bot. Jahrb. 42: 171. 1909; Prain, Ind. Kew. Suppl. 4: 5. 1913; Moldenke, Brittonia 1: 320--321. 1934; Moldenke, Phytologia 1: 201 & 223 (1937), 1: 290 (1938), 1: 387 (1940), 2: 64 (1941), 2: 90 (1944), 2: 393 (1947), 2: 434 (1948), and 4: 352. 1953.

AEGIPHILA FILIPES Mart. & Schau.

Literature: Schau. in DC., Prodr. 11: 652. 1847; Schau. in Mart., Fl. Bras. 9: 286. 1851; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Brittonia 1: 366--368. 1934; Moldenke, Phytologia 1: 201 & 223--224 (1937), 1: 291 (1938), 1: 387--388 (1940), 2: 64 (1941), 2: 393 (1947), 2: 436 (1948), and 4: 352--353. 1953; Bol. Mus. Hist. Nat. Jav. Prado 7: 244. 1943. A. oblongifolia Rusby, Bull. Torrey Bot. Club 27: 81. 1900; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 4. 1904.

Asplund describes this plant as a shrub 4 meters tall, with light-green flowers, blooming in October. I am not completely convinced that Rusby's plant is actually conspecific with this one. Possibly it should be given at least varietal rank.

Additional citations: PERU: Loreto: Asplund 14111 (S).

AEGIPHILA FLUMINENSIS Vell.

Literature: Vell., Fl. Flum. 38 (1825), Icones 1: 95. 1827; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 120. 1845; Schau. in DC., Prodr. 11: 650. 1847; Schau. in Mart., Fl. Bras. 9: 283. 1851; Bocq., Adansonia 3: 190. 1862; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Jacks., Ind. Kew. 1: 46. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 546. 1911; Archiv. Jard. Bot. Rio de Jan. 4: 174. 1925; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 316--318. 1934; Moldenke, Phytologia 1: 202 (1937), 1: 388 (1940), 2: 393 (1947), and 4: 353. 1953; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio 37: 334. 1943; Stellfeld, Trib. Farmac. 19 (10): 170. 1951. A. oleifera Casar., Nov. Stirp. Bras. 47. 1842; Walp., Repert. 4: 120. 1845; Schau. in DC., Prodr. 11: 650. 1847; Schau. in Mart., Fl. Bras.

9: 283. 1851; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Jacks., Ind. Kew. 1: 46. 1895.

AEGIPHILA FOETIDA Sw.

Literature: Sw., Prodr. 32. 1788; Gmel., Syst. Nat. 2: 259. 1789, 1791, & 1796; Sw., Fl. Ind. Occ. 1: 258—259. 1797; Willd., Sp. Pl. 1: 617. 1797; Raeusch., Nom. Bot. 37. 1797; Gmel. (Turton), Gen. Syst. Nat. 5: 219. 1802; Pers., Syn. Pl. 1: 132. 1805; Andr., Bot. Rep. 9: 578. 1809; Poir., Encycl. Méth. Suppl. 1: 151. 1810; Pers., Sp. Pl. 1: 339. 1817; Roem. & Schult., Syst. Veg. 3: 102. 1818; Willd., Nom. Bot., ed. 2, 82. 1821; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Kostel., Alleg. Med. Fl. 3: 829. 1834; Dietr., Syn. Pl. 1: 430. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Paxt., Pock. Bot. Dict. 8. 1840 & 1849; Walp., Repert. 4: 122. 1845; Jacques & Hérincq, Man. Gén. Pl. 3: 504. 1845-1862; Schau. in DC., Prodr. 11: 651. 1847; Griseb., Fl. Brit. W. Ind. 499. 1861; Rosenth., Syn. Pl. Diaph. 430. 1862; Bocq., Adansonia 3: 190. 1862; Hereman, Paxt. Bot. Dict. 13. 1868; Jacks., Ind. Kew. 1: 46. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Urb., Symb. Ant. 3: 366 (1903) and 5: 486. 1908; Moldenke, Brittonia 1: 357—358. 1934; Moldenke, Phytologia 1: 202 (1937), 2: 64 (1941), 2: 90 (1944), 2: 436 (1948), and 4: 353. 1953.

AEGIPHILA GLABRATA Moldenke

Literature: Moldenke, Brittonia 1: 374—375. 1934; Moldenke, Phytologia 1: 203 (1937) and 1: 388. 1940.

Asplund states that this is a shrub 5 meters tall, with pendent branches, the immature fruit orange-red in July, inhabiting forests.

Additional citations: PERU: Huánuco: Asplund 12335 (S).

AEGIPHILA GLANDULIFERA Moldenke

Literature: Moldenke, Brittonia 1: 364—366. 1934; Moldenke, Phytologia 1: 203 (1937), 1: 291 (1938), 1: 388 (1940), 2: 90 (1944), 2: 393—394 (1947), 2: 436 (1948), and 4: 353. 1953.

AEGIPHILA GLANDULIFERA var. PYRAMIDATA L. C. Rich. & Moldenke

Literature: Moldenke, Phytologia 1: 203—204 (1937), 1: 292 (1938), 2: 90 (1944), 2: 394 (1947), and 4: 354. 1953.

AEGIPHILA GUIANENSIS Moldenke

Literature: Moldenke, Brittonia 1: 340—341. 1934; Moldenke, Phytologia 1: 206 (1937), 1: 389 (1940), 2: 395 (1947), and 2: 436. 1948.

Little states that the species is a shrub or small tree to 6 meters tall, with a trunk diameter of 5 cm. at breast height and large, white, fragrant flowers, growing in the undergrowth of wet tropical forests. Schultes & López describe the fruit as orange-yellow, and Cuatrecasas says it is red. It has been found at altitudes of 900 to 1180 meters, in flower in April and Dec-

ember and in fruit in August and December.

Additional citations: COLOMBIA: Caquetá: Little 7768 (N). Cundinamarca: Triana 2084 (F--2 photos, N--2 photos). Valle del Cauca: Cuatrecasas 14846 (F--1345544). VENEZUELA: Amazonas: Schultes & López 9260 (W--1988665).

AEGIPHILA HASSLERI Briq.

Literature: Briq., Bull. Herb. Boiss., sér. 2, 4: 1166--1167. 1904; Chodat, Plant. Hassler. 2: 503--504. 1904; Prain, Ind. Kew. Suppl. 3: 4. 1908; Moldenke, Brittonia 1: 308--310. 1934; Moldenke, Phytologia 1: 206--207 (1937), 1: 389 (1940), 2: 395--396 (1947), and 2: 436. 1948; Herter, Revist. Sudam. Bot. 6: 97 (1939) and 7: 224. 1943; Moldenke, Lilloa 6: 310--311 (1941) and 10: 337. 1944; Stellfeld, Trib. Farmac. 19 (10): 170. 1951.

Herter in the first of his references cited above lists A. triantha Schau. as a synonym of this species, but I regard it as conspecific with A. brachiata Vell.

The binomial is misspelled "Aegiphylla hassleri" by Berro and "Aeghiphila hassleri" by Grüner. Emrich identified his painting, cited below, as Citharexylum solanaceum var. macrocalyx Moldenke. Grüner describes the plant as a shrub, while Jörgensen calls it a small tree 3 to 4 meters tall; Rojas calls it a shrub 2 to 2.5 meters tall, and Rambo describes it as a shrub 3 meters tall. It has been collected in woods, small secondary forests, hilly regions, on river banks, and along small streams in riverside woods, in anthesis in January, February, April, September, and November, and in fruit in September and December. The flowers are described by Grüner as lemon-yellow, by Jörgensen as sulfur-yellow, and by Rojas as greenish-white and yellowish-white. Jörgensen says the fruits are large, yellow, and abundant.

Additional citations: BRAZIL: Paraná: Gurgal s.n. [Herb. Jard. Bot. Rio 22024] (N). Rio Grande do Sul: K. Emrich s.n. [24.III. 39] (N--painting); Rambo 11251 (Rb). State undetermined: Buck 31389 [S. Feo de Paulo, Villa Oliva] (S). PARAGUAY: Anisits 122 (F--photo, N--photo); Balansa 2085 (F--photo, N--photo); Fiebrig 260 (F--2 photos, N--2 photos), 530 (F--photo, N--photo), 5923 (F--2 photos, N--2 photos); Hassler 6780 (S--cotype), 8632 (N, S, V--1210); Jörgensen 3662 [Herb. Osten 22244] (Ug); T. Rojas 1881 [Herb. Osten 13536; Herb. Hort. Parag. 10283] (Ug), 1881a [Herb. Osten 13535] (Ug). URUGUAY: Arechavaleta 43 (Ug), s.n. [Febrero 1903] (Ug, Ug), s.n. [Noviembre 1903] (Ug, Ug, Ug, Ug); Felippone 5082 (F--photo, N--photo). ARGENTINA: Misiones: Ekman 1227 (F--photo, N--photo); Grüner 373 [Nov. 13, 1930; Herb. Osten 23188] (Ug), 373 [Dec. 23, 1930; Herb. Osten 23188] (Ug), 1002 [Herb. Osten 23187] (Ug); Llamas 1523 (Ug); Niederlein 1725 (F--2 photos, N--2 photos), 2248 (F--photo, N--photo); D. Rodriguez 566 [Herb. Inst. Miguel Lillo 32532; Herb. Mus. Hist. Nat. Montev. 5989] (Ug). CULTIVATED: Uruguay: Berro 5087 (N).

AEGIPHILA HAUGHTII Moldenke
Literature: Moldenke, Phytologia 2: 8 (1941) and 2: 396. 1947.
Additional citations: PERU: Loreto: J. M. Schunke 338 (Ew).

AEGIPHILA HERZOGII Moldenke
Literature: Moldenke, Brittonia 1: 420--421. 1934; Moldenke, Phytologia 1: 224 (1937), 1: 389 (1940), 2: 396 (1947), and 2: 436. 1948.
Additional citations: BOLIVIA: Santa Cruz: Steinbach 3259 (F--photo, N--photo).

AEGIPHILA HIRSUTA Moldenke
Literature: Moldenke, Brittonia 1: 440--441. 1934; Moldenke, Phytologia 1: 224. 1937.
Additional citations: BOLIVIA: La Paz: Buchtien 1715 (F--photo of isotype, N--photo of isotype).

AEGIPHILA HIRSUTISSIMA Moldenke
Literature: Moldenke, Brittonia 1: 409--410. 1934; Moldenke, Phytologia 1: 224 (1937), 1: 389--390 (1940), and 2: 396. 1947; Barkley, Determinac. para Ejemp. Herb. Fac. Nac. Agron. Medellin 2 (1): 2. 1950.
Additional citations: COLOMBIA: Antioquia: López & Sanchez 47 (N). VENEZUELA: Miranda: H. Pittier 8257 [Herb. Nac. Venez. 12589] (Ve).

AEGIPHILA HOEHNEI Moldenke
Literature: Moldenke, Phytologia 1: 224--226 (1937), 1: 292 (1938), and 1: 390. 1940; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 345--346. 1951; F. C. Hoehne, Relat. Anual Instit. Bot. S. Paulo Sept. 1951: 139. 1952.

AEGIPHILA HOFFMANNIOIDES Standl. & Steyerm.
This species was originally described in Field Mus. Publ. Bot. 23: 227--228 (1947) where it is stated that it closely resembles A. pauciflora Standl. of British Honduras except that its calyx is abundantly strigose on the outer surface, rather than glabrous.
Citations: GUATEMALA: Huehuetenango: Steyermark 48843 (F--1132819--type, N--photo of type).

AEGIPHILA INSIGNIS Moldenke
Literature: Moldenke, Brittonia 1: 436--437. 1934; Moldenke, Phytologia 1: 226 (1937) and 2: 396--397. 1947.
Additional citations: PERU: Ancachs: Tafalla s.n. [Chicoplaya] (F--photo of type, Sg--photo of type).

AEGIPHILA INTEGRIFOLIA (Jacq.) Jacks.
Literature: Jacks., Ind. Kew. 1: 386. 1895; Moldenke, Brittonia 1: 337--340. 1934; Moldenke, Phytologia 1: 226--228 (1937), 1: 292 (1938), 1: 390 (1940), 2: 90 (1944), 2: 397--398 (1947), and 2: 436. 1948; Moldenke, Lilloa 4: 317. 1939; H. P. Veloso, Mem.

Inst. Oswaldo Cruz 44: 267 (1946) and 45: 22. 1947; Daniel, Verb. Cent. Antioq. 7. 1947; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 346. 1951; Greig-Smith, Journ. Ecology 40: 294 & 307. 1952. Callicarpa integrifolia Jacq., Enum. Syst. Pl. 12. 1760; Jacq., Select. Stirp. Amer. Hist. 15, pl. 173. 1763; Roem. & Schult., Syst. Veg. 3: 96. 1818; Dietr., Syn. Pl. 1: 429. 1839; Walp., Repert. 4: 122. 1845; Jacques & Hérincq, Man. Gén. Pl. 3: 504. 1845-1862; Schau. in DC., Prodr. 11: 649. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 959. 1848; Schau. in Mart., Fl. Bras. 9: 282. 1851; Griseb. Fl. Brit. W. Ind. 499. 1861; Jacks., Ind. Kew. 1: 386. 1895. Manabea arborescens Aubl., Hist. Pl. Guian. 1: 64--65. 1775; Lam., Tabl. Encycl. 1: 294. 1792; Vahl, Eclog. 1: 15. 1796; Willd., Sp. Pl. 1: 616. 1797; Ruíz & Pav., Fl. Peruv. 1: 50. 1798; Gmel. (Turton), Gen. Syst. Nat. 5: 219. 1802; Pers., Syn. Pl. 1: 132. 1805; Andr., Bot. Rep. 9: 578. 1809; Poir., Encycl. Méth. Suppl. 1: 150. 1810; H.B.K., Nov. Gen. & Sp. Pl. 2: 251. 1817; Pers., Sp. Pl. 1: 339. 1817; Roem. & Schult., Syst. Veg. 3: 101. 1818; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Kunth, Syn. Pl. 2: 43. 1823; Linnaea 7: 110. 1832; Dietr., Syn. Pl. 1: 429. 1839; Walp., Repert. 4: 122. 1845; Schau. in DC., Prodr. 11: 649. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 959. 1848; Schau. in Mart., Fl. Bras. 9: 282. 1851; Griseb., Fl. Brit. W. Ind. 499. 1861; Jacks., Ind. Kew. 3: 160. 1895; Stapf, Ind. Lond. 4: 217. 1930. Aegiphila arborescens (Aubl.) Gmel., Syst. Nat. 2: 259. 1789 & 1791; Lam., Illustr. 1503. 1791; Lam., Tabl. Encycl. 1: 294. 1792; Gmel., Syst. Nat. 2: 259. 1796; Vahl, Eclog. 1: 15—16, pl. 10. 1796; Willd., Sp. Pl. 1: 616. 1797; Gmel. (Turton), Gen. Syst. Nat. 5: 219. 1802; Pers., Syn. Pl. 1: 132. 1805; Poir., Encycl. Méth. Suppl. 1: 150. 1810; Pers., Sp. Pl. 1: 339. 1817; H.B.K., Nov. Gen. & Sp. Pl. 2: 251. 1817; Roem. & Schult., Syst. Veg. 3: 101. 1818; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Willd., Nom. Bot., ed. 2, 82. 1821; Kunth, Syn. Pl. 2: 43--44. 1823; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Linnaea 7: 110. 1832; Ann. Nat. Hist. 2: 449. 1839; Dietr., Syn. Pl. 1: 429. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Paxt., Pock. Bot. Dict. 8. 1840 & 1849; Walp., Repert. 4: 122. 1845; Jacques & Hérincq, Man. Gén. Pl. 3: 504. 1845-1852; Schau. in DC., Prodr. 11: 649. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 959 & 1150. 1848; Schau. in Mart., Fl. Bras. 9: 281 --282. 1851; Griseb., Fl. Brit. W. Ind. 499. 1861; Bocq., Adansonia 3: 190. 1862; Pritzel, Ic. Bot. Ind. 1: 23. 1866; Hereman, Paxt. Bot. Dict. 13. 1868; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Hemsl., Biol. Cent. Am. 2: 538. 1882; Warming, Lagoa Santa 434. 1892; Bot. Gaz. 18: 7. 1893; H. H. Rusby, Mem. Torrey Bot. Club 4: 245. 1895; Jacks., Ind. Kew. 1: 46. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; H. H. Rusby, Bull. Torrey Bot. Club 27: 81. 1900; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 546. 1911; Usteri, Fl. Umgeb. Stadt São Paulo 228. 1911; Bot. Gaz. 57: 425. 1914; Herzog, Meded. Rijks Herb. 29: 48. 1916; Stapf, Ind. Lond. 1: 79. 1929; Junell, Symb. Bot. Upsal. 4: 82 & 83. 1934. Callicarpa globiflora Ruíz & Pav., Fl. Peruv. 1: 49--50, pl. 77b. 1798; Poir., Encycl. Méth. Suppl. 2:

33. 1811; Roem. & Schult., Syst. Veg. 3: 95. 1818; Linnaea 7: 110. 1832; Schau. in DC., Prodr. 11: 649. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 959. 1848; Schau. in Mart., Fl. Bras. 9: 282. 1851; Jacks., Ind. Kew. 1: 386. 1895. Callicarpa discolor Willd. in Steud., Nom. Bot., ed. 2, 1: 29. 1840; Schau. in DC., Prodr. 11: 649. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 959. 1848; Schau. in Mart., Fl. Bras. 9: 282. 1851; Jacks. Ind. Kew. 1: 386. 1895. Aegiphila arborescens var. breviflora Schau. in DC., Prodr. 11: 650. 1847; Schau. in Mart., Fl. Bras. 9: 282. 1851.

Mendes Mapath states that this is a tree 15 to 30 meters tall, wide-spreading, the wood white "para caixotaris". The oleaginous seeds are used in popular remedies against the lesions caused by the itch mite in Brazil. Williams calls it a tree 12 meters tall, with a vernacular name of "tabaquillo". The Littles describe it as a small tree 6 meters tall, with a trunk 10 cm. in diameter at breast height, with smoothish gray bark that has thin cracks, the fruit green (in July), turning orange, occupying cleared uplands. It has been collected at altitudes of 240 to 1700 meters, often inhabiting the campos. The flowers are said to be white and have been found in March, June, July, August, and September. The Littles record the common name of "aquapan". The Bang 584 specimen in the University of Pennsylvania herbarium has been misidentified by someone as "A. intermedia (Aubl.) Moldenke".

Additional citations: TRINIDAD: R. E. D. Baker s.n. [Trin. Bot. Gard. Herb. 14143] (R); W. E. Broadway 6682 (F--photo, Ms, Ms, N--photo); Cheesman & Baker 350 [Trin. Bot. Gard. Herb. 13644] (R); Fendler 596 (Pa). COLOMBIA: Méta: M. L. Grant 10163 (N); Little & Little 8227 (N). VENEZUELA: Amazonas: Ll. Williams 13401 [Herb. Nac. Venez. 12593] (Ve), 14533 [Herb. Nac. Venez. 12595] (Ve), 15080 [Herb. Nac. Venez. 12594] (Ve), 15854 [Herb. Nac. Venez. 12590] (F--1193643, Ve), 16005 [Herb. Nac. Venez. 12591] (Ve). Zulia: H. Pittier 10626 [Herb. Nac. Venez. 12596] (Ve); Tejera 124 (F--photo, N--photo). BRITISH GUIANA: H. A. Gleason 313 (F--photo, N--photo); Jenman 1761 (F--photo, N--photo, Sg--photo), 5796 (F--photo, N--photo). ECUADOR: Napo-Pastaza: Asplund 8868 (S), 9085 (S), 10166 (S); Lugo 156 (S), 194 (S). Santiago-Zamora: Camp E.1163 (N). PERU: Cuzco: Scolnik 903 (W--2045684). Huánuco: Asplund 12193 (S); Macbride 5053 (F--photo, N--photo). BRAZIL: Amazonas: Poeppig 1615 (F--photo, N--photo). Goyaz: Burchell 8345 (F--photo, N--photo). Minas Geraes: Mendes Mapath 793 (N--photo). Rio Branco: Black 51-12725 (N). Rio de Janeiro: Saldanha 705 [Herb. Rio de Jan. 44797] (Ja). BOLIVIA: El Beni: H. H. Rusby 1722 (F--photo, N--photo), 2459 (F--photo, N--photo). La Paz: M. Bang 584 (Bz--16827, F--photo, N--photo, Pa); Buchtien 719 (F--photo, N--photo); Cardenas 2065 (F--photo, N--photo). Santa Cruz: Herzog 1571 (F--photo, N--photo); Steinbach 5498 [Herb. Osten 16807] (F--photo, N--photo,

Ug).

AEGIPHILA INTERMEDIA Moldenke

Literature: Moldenke, Brittonia 1: 341--342. 1934; Moldenke, Phytologia 1: 228 (1937), 1: 292 (1938), 1: 390 (1940), 2: 90 (1944), 2: 398 (1947), and 2: 436. 1948.

This binomial is sometimes mis-accredited to "(Aubl.) Moldenke".

AEGIPHILA LAETA H.B.K.

Literature: H.B.K., Nov. Gen. & Sp. Pl. 2: 249. 1817; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Kunth, Syn. Pl. 2: 42. 1823; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Linnaea 7: 110. 1832; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 120. 1845; Schau. in DC., Prodr. 11: 652. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Bocq., Adansonia 3: 190. 1862; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Brittonia 1: 394, in syn. 1934; Moldenke, Phytologia 1: 228--229 (1937), 1: 292 (1938), 1: 390 (1940), 2: 90 (1944), and 2: 399. 1947. A. stricta Rusby, Descr. 300 New Spp. S. Am. Pl. 107--108. 1920; Hill, Ind. Kew. Suppl. 6: 6. 1926; Moldenke, Brittonia 1: 352--353. 1934; Moldenke, Phytologia 1: 269. 1937. A. stricta var. ? Rusby, Descr. 300 New Spp. S. Am. Pl. 108. 1920; Moldenke, Brittonia 1: 352, in syn. 1934.

Additional citations: COLOMBIA: Goajira: Haught 4316 (N). Magdalena: Cy. Allen 501 (Ew); H. H. Smith 330 (F--2 photos, N--2 photos). VENEZUELA: Lará: Saer 602 [Herb. Nac. Venez. 12597] (Ve). Zulia: H. Pittier 10533 [Herb. Nac. Venez. 12598] (Ve); Plée s.n. (F--photo, N--photo).

AEGIPHILA LAEVIS (Aubl.) Gmel.

Literature: Gmel., Syst. Nat. 2: 259. 1789, 1791, & 1796; Willd., Sp. Pl. 1: 616--617. 1797; Raeusch., Nom. Bot. 37. 1797; Gmel. (Turton), Gen. Syst. Nat. 5: 219. 1802; Pers., Syn. Pl. 1: 132. 1805; Andr., Bot. Rep. 9: 578. 1809; Pers., Syn. Pl. 1: 339. 1817; Roem. & Schult., Syst. Veg. 3: 101--102. 1818; Willd., Nom. Bot., ed. 2, 82. 1821; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Spreng., Syst. Veg. 1: 422. 1825; Dietr., Syn. Pl. 1: 429. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 119--120. 1845; Jacques & Hérincq, Man. Gén. Pl. 3: 504. 1845-1862; Schau. in DC., Prodr. 11: 652. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Schau. in Mart., Fl. Bras. 9: 286. 1851; Bocq., Adansonia 3: 190. 1862; Griseb., Fl. Brit. W. Ind. 499--500. 1864; Jacks., Ind. Kew. 1: 46. 1895; Pulle, Enum. Vasc. Pl. Surinam. 403. 1906; Engl., Bot. Jahrb. 42: 172. 1909; Urb., Symb. Ant. 8: 600. 1920; Bull. Torrey Bot. Club 50: 54. 1923; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 394--397. 1934; Moldenke, Phytologia 1: 229--230 (1937), 1: 292--293 (1938), 1: 391 (1940), 2: 90 (1944), and 2: 399. 1947; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 346. 1951. Manabea laevis Aubl., Hist. Pl. Guian. 1: 66--68. 1775; Lam., Tabl.

Encycl. 1: 294. 1792; Sw., Fl. Ind. Occ. 1: 256. 1797; Willd., Sp. Pl. 1: 617. 1797; Ruíz & Pav., Fl. Peruv. 1: 50. 1798; Gmel. (Turton), Gen. Syst. Nat. 5: 219. 1802; Andr., Bot. Rep. 9: 578. 1809; Roem. & Schult., Syst. Veg. 3: 102. 1818; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Linnaea 7: 110. 1832; Dietr., Syn. Pl. 1: 429. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 119. 1845; Schau. in DC., Prodr. 11: 652. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Griseb., Fl. Brit. W. Ind. 500. 1864; Jacks., Ind. Kew. 3: 160. 1895; Stapf, Ind. Lond. 4: 217. 1930. Aegiphila lutea Lam., Illustr. 1505, pl. 70, fig. 3. 1791; Lam., Tabl. Encycl. 1: 294. 1792; Pers., Syn. Pl. 1: 132. 1805; Poir., Encycl. Méth. Suppl. 1: 150. 1810; Pers., Sp. Pl. 1: 339. 1817; Roem. & Schult., Syst. Veg. 3: 102. 1818; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 120. 1845; Jacques & Hérincq, Man. Gén. Pl. 3: 504. 1845-1862; Schau. in DC., Prodr. 11: 652. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Pritzel, Ic. Bot. Ind. 1: 23. 1866; Jacks., Ind. Kew. 1: 46. 1895; Stapf, Ind. Lond. 1: 79. 1929. A. manabea Sw., Fl. Ind. Occ. 1: 256--257. 1797; Roem. & Schult., Syst. Veg. 3: 102. 1818; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 120. 1845; Schau. in DC., Prodr. 11: 652. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Griseb., Fl. Brit. W. Ind. 500. 1864; Jacks., Ind. Kew. 1: 46. 1895; Ann. Inst. Col. Mars. 3: 466. 1896; Duss, Fl. Ant. Franç. 466. 1897.

Cuatrecasas found this species growing at altitudes of 5 to 80 meters, blooming in May.

Additional citations: COLOMBIA: Antioquia: F. W. Pennell 3696 (F--photo, N--photo). Valle del Cauca: Cuatrecasas 17567 (F--1289743). BRITISH GUIANA: Talbot s.n. (F--photo, N--photo). SURINAM: Hostmann 543 (F--3 photos, N--3 photos), 721 (F--3 photos, N--3 photos); Hostmann & Kappler 721 (F--photo, N--photo); Kappler s.n. (F--photo, N--photo); Samuels 382 (F--photo, N--photo); Wullschlägel 405 (F--photo, N--photo). FRENCH GUIANA: Leprieur s.n. (F--photo, N--photo); Martin s.n. (F--photo, N--photo); Richard s.n. (F--photo, N--photo). BRAZIL: Bahia: Sellow 1828 (F--2 photos, N--2 photos). State undetermined: Herb. Link s.n. (F--photo, N--photo).

AEGIPHILA LANCEOLATA Moldenke

Literature: Moldenke, Brittonia 1: 423--425. 1934; Moldenke, Phytologia 1: 230 (1937), 1: 391 (1940), and 2: 399. 1947.

Macedo describes this species as a scandent liana in woods and along the borders of brooks, with yellow flowers. It has been collected in anthesis in March and December.

Additional citations: BRAZIL: Espirito Santo: Glaziou 11333 (F--photo, N--photo). Guaporé: N. T. de Silva 399 (N). Minas Geraes: Macedo 619 (N), 2055 (N); Sampaio 7256 [Herb. Rio de Jan. 44830] (Ja). Rio de Janeiro: Burchell 1624 (F--2 photos, N--2

photos). São Paulo: F. C. Hoehne s.n. [Herb. Inst. Biol. 20562] (F--photo, N--photo); Löfgren s.n. [Herb. Inst. Biol. 20099] (F--photo, N--photo). PARAGUAY: Hassler 2886 (F--photo, N--photo).

AEGIPHILA LAXICUPULIS Moldenke

Literature: Moldenke, Brittonia 1: 397--399. 1934; Moldenke, Phytologia 1: 231 (1937), 1: 391 (1940), 2: 90 (1944), and 2: 399--400. 1947.

AEGIPHILA LAXIFLORA Benth.

Literature: Benth., Ann. Nat. Hist. 2: 449. 1839; Walp., Repert. 4: 120. 1845; Schau. in DC., Prodr. 11: 652. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Brittonia 1: 389--391. 1934; Moldenke, Phytologia 1: 231 (1937), 1: 293 (1938), 1: 391 (1940), 2: 400 (1947), and 2: 438. 1948; Moldenke, Lilloa 4: 322. 1939. A. laevis Griseb., Fl. Brit. W. Ind. 499--500. 1864. Moldenke, Brittonia 1: 389, in syn. 1934. A. trinitensis Britton, Bull. Torrey Bot. Club 50: 54. 1923; Hill, Ind. Kew. Suppl. 7: 6. 1929; Moldenke, Brittonia 1: 389, in syn. 1934.

Additional citations: TRINIDAD: W. E. Broadway s.n. (F--3 photos, N--3 photos); Trin. Bot. Gard. Herb. 2391 (F--2 photos, N--2 photos), 9463 (F--photo, N--photo). VENEZUELA: Bolívar: Otto 1092 (F--photo, N--photo), 1992 (F--photo, N--photo). BRITISH GUIANA: Schomburgk 401/592 (F--photo, N--photo), 592 (F--photo, N--photo).

AEGIPHILA LEHMANNII Moldenke

Literature: Moldenke, Brittonia 1: 315--316. 1934; Moldenke, Phytologia 1: 231 (1937), 1: 391--392 (1940), 2: 400 (1947), and 2: 438. 1948.

Cuatrecasas describes this plant as a small tree 10 meters tall with clear yellowish-green leaves, pale-green calyxes, and white corollas. It has been collected in anthesis in February and April, growing at altitudes of 1540 to 2600 meters.

Additional citations: COLOMBIA: Santander: Fassett 25080 (N, Z). Valle del Cauca: Cuatrecasas 23740 (F--1371571).

AEGIPHILA LHOTZKIANA Cham.

Literature: Cham., Linnaea 7: 112--114. 1832; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 121. 1845; Schau. in DC., Prodr. 11: 648. 1847; Schau. in Mart., Fl. Bras. 9: 279--280. 1851; Bocq., Adansonia 3: 190. 1862; DC., Prodr. 17: 319. 1873; Warming, Symb. Fl. Bras. Cent. 23: 711. 1877; Warming, Lagoa Santa 434. 1892; Jacks., Ind. Kew. 1: 46. 1895; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 546. 1911; Moldenke, Brittonia 1: 323--324. 1934; Moldenke, Phytologia 1: 232--233 (1937), 1: 392 (1940), 2: 400 (1947), and 2: 438. 1948; Rawitscher, Journ. Ecol. 36: 248, 250, & 251 (as A. lhotzkyana). 1948; Rawitscher, Cienc. Investig. 5: 115, fig. 9 [graph only]. 1949; Stellfeld, Trib. Farmac. 19 (10): 170. 1951; F. C. Hoehne, Ind.

Bibl. e Num. Pl. Col. Com. Rondon 346. 1951.

Rawitscher in the first of the two references cited above states that this species is a deep-rooted cerrado plant which is normally evergreen or nearly so. He compares the rate of transpiration of its leaves with that of Craniolaria integrifolia Cham., a shallow-rooted plant. In the Aegiphila the roots reach the permanently wet deeper layers of the soil and under favorable conditions it can vegetate through the entire dry season. The roots of the Craniolaria, on the other hand, depend on the variable amount of water in the upper layers of soil available only in the rainy season. The rate of cuticular transpiration was found to be 14 to 1.

Specimens have been identified as "A. villosa Lam." in some herbaria. The species is said to grow on campos and cerrados, and has been collected in flower in February, August, September, November, and December, with white flowers. Collectors describe it as a shrub or as a tree to 3 meters tall.

Additional citations: BRAZIL: Bahia: Blanchet 3399 (F--photo, N--photo); Herb. Rio de Jan. 44801 (Ja); Lhotzky s.n. (F--photo of isotype, N--photo of isotype). Goyaz: Ule 335 [Herb. Rio de Jan. 44806] (N). Maranhão: Murça Pires & Black 1754a (N). Minas Geraes: Macedo 2032 (N); Mello Barreto 3270 [Herb. Rio de Jan. 32273] (N); Mendes Magalhães 1447 [Herb. Jard. Bot. Bello Horiz. 40237] (Be--13972, N); L. Netto 338 [Herb. Rio de Jan. 44817] (Ja); Regnell I:310x (F--photo, N--photo); Sampaio 344 [Herb. Rio de Jan. 32270] (Ja); Warming s.n. (F--photo, N--photo). Pará: Black 48-3226 (Be--37717, N). State undetermined: Gusmão s.n. [Herb. Rio de Jan. 32272] (Ja); J. E. Pohl s.n. (F--photo, N--photo); Poeppig 34 (F--photo, N--photo).

AEGIPHILA LONGIFOLIA Turcz.

Literature: Turcz., Bull. Soc. Imp. Nat. Mosc. 36: 218--219. 1863; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Brittonia 1: 373-374. 1934; Moldenke, Phytologia 1: 233 (1937), 1: 293 (1938), and 2: 438. 1948.

Black describes the species as a tree with white flowers, growing in capoeira, blooming in April.

Additional citations: COLOMBIA: Santander: Engels s.n. [Ocana] (F--photo, N--photo). BRAZIL: Amazonas: Black 48-2434 (Be--33170, N).

AEGIPHILA LUSCHNATHI Schau.

Literature: Schau. in DC., Prodr. 11: 651--652. 1847; Schau. in Mart., Fl. Bras. 9: 285--286. 1851; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Jacks., Ind. Kew. 1: 46. 1895; Bull. Herb. Boiss., sér. 2, 4: 1166. 1904; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 546. 1911; Moldenke, Brittonia 1: 306--307. 1934; Moldenke, Phytologia 1: 233--234 (1937) and 2: 438. 1948.

The species has been collected in anthesis in June.

Additional citations: BRAZIL: Bahia: Blanchet 3273 (F--photo,

N--photo). Federal District: Neves Armond s.n. [Herb. Rio de Jan. 46797] (Ja). Minas Geraes: Widgren 481 (F--photo, N--photo). Rio de Janeiro: Glaziou 8832 (F--photo, N--photo); Ule 4436 [Herb. Rio de Jan. 44805] (Ja).

AEGIPHILA MACRANTHA Ducke

Literature: Ducke, Archiv. Jard. Bot. Rio de Jan. 4: 173--174. 1925; Hill, Ind. Kew. Suppl. 7: 6. 1929; Moldenke, Brittonia 1: 319--320. 1934; Moldenke, Phytologia 1: 234 (1937), 1: 392 (1940), and 2: 438 & 440. 1948; Moldenke, Lilloa 4: 316--317. 1939; Occhioni, Lilloa 17: 484. 1949.

Occhioni, in the reference cited above, states that the actual type specimen of this species is preserved in the Rio de Janeiro herbarium. Black and Foster describe the species as a scandent shrub with clear yellow corollas and enlarged calyxes, blooming in October. One sheet of their collection, cited below, has fine fruiting-calyxes and fruit, and was collected in October.

Additional citations: BRITISH GUIANA: Herb. Forest Dept. Brit. Guian. WB.441 [record no. 5855] (N, Wb). FRENCH GUIANA: Mélinon s.n. (F--photo, N--photo). BRAZIL: Pará: Black & Foster 48-3402 (Be--27912a, Be--37912).

AEGIPHILA MAGNIFICA Moldenke

Literature: Moldenke, Brittonia 1: 385--386. 1934; Moldenke, Phytologia 1: 234--235 (1937), 1: 392 (1940), and 2: 440. 1948.

Additional citations: NICARAGUA: Chinandega: C. F. Baker 2187 (F--photo, N--photo). Chontales: Seemann 87 (F--photo, N--photo).

AEGIPHILA MAGNIFICA var. PUBESCENS Moldenke

Literature: Moldenke, Phytologia 3: 261. 1950.

Citations: COSTA RICA: San José: Skutch 4139 (N--fragment of type, W--1644594--type).

AEGIPHILA MARTINICENSIS Jacq.

Literature: Jacq., Obs. Bot. 2: 3, pl. 27. 1764; L., Mant. 198. 1767; L., Pflanzensyst. 3: 124. 1773; L., Syst. Veg. 134. 1774; L., Syst. Pl. 334. 1779; Jacq., Select. Stirp. Amer. Hist. Picta 13, pl. 259, fig. 6. 1780; Lam., Encycl. Méth. 1: 46. 1783; Jacq., Ind. Plant., ed. 14, 7. 1785; Jacq., Select. Stirp. Amer. 226. 1788; Gmel., Syst. Nat. 2: 259. 1789 & 1791 & 1796; Vitm., Sum. Pl. 1: 173. 1789; Lam., Illustr. 1: 70, fig. 1. 1791; Lam., Tabl. Encycl. 1: 293. 1792; Act. Soc. Hist. Nat. Paris 106. 1792; Vahl, Eclog. 1: 14--15. 1796; Salisb., Prodr. 67. 1796; Willd., Sp. Pl. 1: 615--616. 1797; Raeusch., Nom. Bot. 37. 1797; Gmel. (Turton), Gen. Syst. Nat. 5: 218. 1802; Pers., Syn. Pl. 1: 132. 1805; Jacq., Fragm. Bot. 40--41, pl. 46, fig. 1. 1809; Poir., Encycl. Méth. Suppl. 1: 150. 1810; Pers., Sp. Pl. 1: 339. 1817; H.B.K., Nov. Gen. & Sp. Pl. 2: 249. 1817; Lodd., Bot. Cab. 2: 132. 1818; Roem. & Schult., Syst. Veg. 3: 100--101. 1818; Willd., Nom. Bot., ed. 2, 82. 1821; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Spreng., Syst. Veg., ed. 16, 1: 421. 1825; Maycock, Fl.

Barbad. 70--71. 1830; Kostel., Alleg. Med. Fl. 3: 830. 1834; Richt., Cod. Bot. Linn. 130. 1835 & 1840; Dietr., Syn. Pl. 1: 429. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Peterm., Cod. Bot. Linn. Ind. Alph. 4. 1840; Paxt., Pock. Bot. Dict. 8. 1840 & 1849; Walp., Repert. 4: 119. 1845; Seemann, Bot. Voy. Herald 189. 1845-1851; Jacques & Hérincq, Man. Gén. Pl. 3: 504--505. 1845-1862; Schau. in DC., Prodr. 11: 652--653. 1847; Sagra, Hist. Cuba 11: 145--146. 1850; Schau. in Mart., Fl. Bras. 9: 286. 1851; Griseb., Fl. Brit. W. Ind. 500. 1861; Bocq., Adansonia 3: 190, pl. 9, fig. 1--10. 1862; Rosenth., Syn. Pl. Diaph. 430. 1862; Pritzel, Ic. Bot. Ind. 1: 23. 1866; Griseb., Cat. Pl. Cuba 216. 1866; Hereman, Paxt. Bot. Dict. 13. 1868; Sauvalle, Fl. Cuba 113. 1868; Eggers, Fl. St. Croix 84. 1879; Stahl, Estud. Flor. P. Rico 6: 222. 1888; Donn. Sm., Enum. Pl. Guat. 3: 65. 1893; Fawcett, Prov. List Indig. Nat. Fl. Pl. Jamaica 30. 1893; Jacks., Ind. Kew. 1: 46. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Ann. Inst. Col. Mars. 3: 466--467. 1896; Duss, Fl. Phan. Ant. Franç. 466--467. 1897; Boldingh, Fl. Dutch W. Ind. Isls. 171. 1909; Goyena, Fl. Nicarag. 2: 566. 1911; Urb., Symb. Ant. 4: 536. 1911; Proc. Linn. Soc. Lond. 124, Suppl. Ind. Linn. Herb. 29. 1912; Boldingh, Fl. Nederl. West-Ind. Eil. 54 & 346. 1913; Bot. Gaz. 57: 426. 1914; Herzog, Meded. Rijks Herb. Leiden 37: 34. 1918; Fedde, Repert. 16: 40. 1919; Britton & Wils., Scient. Surv. P. Rico 6: 147--148. 1925; Standl. & Calderón, List Prelim. Pl. Salvador 185. 1925; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 377--382. 1934; Moldenke, Lilloa 4: 320. 1939; Moldenke, Phytologia 1: 235--237 (1937), 1: 293 (1938), 1: 393 (1940), 2: 90 (1944), and 2: 440. 1948; Roig, Plant. Med. Cuba. 410--411. 1945; Hodge, Revist. Fac. Nat. Agron. 7: 313. 1947. A. dumosa Salisb., Prodr. 67. 1796; Jacks., Ind. Kew. 1: 46. 1895. A. diffusa Andr., Bot. Rep. 9: 578. 1809; Steud., Nom. Bot., ed. 1, 1: 16 (1821) and ed. 2, 1: 29. 1840; Paxt., Pock. Bot. Dict. 8. 1840 & 1849; Walp., Repert. 4: 124. 1845; Pritzel, Ic. Bot. Ind. 1: 23. 1866; Hereman, Paxt. Bot. Dict. 13. 1868; Jacks., Ind. Kew. 1: 46. 1895; Stapf, Ind. Lond. 1: 79. 1929. A. glabra Poir., Encycl. Méth. Suppl. 1: 150. 1810; Walp., Repert. 4: 119. 1845;Schau. in DC., Prodr. 11: 653. 1847; Griseb., Fl. Brit. W. Ind. 500. 1864; Jacks., Ind. Kew. 1: 46. 1895; Ann. Inst. Col. Mars. 3: 466--467. 1896; Duss, Fl. Phan. Ant. Franç. 466--467. 1897. A. macrophylla Desf. in Steud., Nom. Bot., ed. 1, 1: 16 (1821) and ed. 2, 1: 129. 1840; Desf.. Cat. Pl. Hort. Reg. Paris., ed. 3, 391. 1829; Schau. in DC., Prodr. 11: 655. 1847; Jacks., Ind. Kew. 1: 46. 1895. A. straminea Hoffmgg., Verz. Pfl. Nachtr. 3: 18. 1826; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Jacks., Ind. Kew. 1: 47. 1895. Psychotria corymbosa Sieber in DC., Prodr. 4: 523. 1830. Aegiphila magnifolia Steud., Nom. Bot., ed. 2, 1: 29. 1840; Schau. in DC., Prodr. 11: 655. 1847; Jacks., Ind. Kew. 1: 46. 1895. A. grandifolia Walp., Repert. 4: 121. 1845; Jacks., Ind. Kew. 1: 46. 1895.

Roig, in the reference cited above, states that a diuretic medicinal tea is made from the leaves and stems of this species,

and that a syrup made from it is used against asthma. He states that this information is taken from Gomez de la Maza's "Ensayo de Farmacofitologia Cubana", page 77 CL & CLI.

The Toro collection from Colombia, cited below, greatly resembles A. glandulifera Moldenke and may actually represent that species.

Additional citations: PUERTO RICO: Heller & Heller 276 (F--photo, N--photo), 825 (F--photo, N--photo), 964 (F--photo, N--photo). ST. CROIX: Collector undesignated s.n. (F--photo, N--photo); Thompson 503 (F--2 photos, N--2 photos), 719 (F--photo, N--photo). ST. KITTS: Britton & Cowell 120 (F--photo, N--photo), 332 (F--photo, N--photo); Eggers 133 (F--photo, N--photo); Forsström s.n. (F--photo, N--photo). GUADELOUPE: Duchassaing s.n. (F--photo, N--photo); Duss 2389 (F--photo, N--photo). DOMINICA: W. H. Hodge 2443 (Ms); Imray 119 (F--photo, N--photo). MARTINIQUE: Duss 1966 (F--2 photos, N--2 photos); Plée s.n. (F--photo, N--photo). ST. LUCIA: P. Beard 1147 (S); R. A. Howard 11299 (N). ST. VINCENT: P. Beard 1348 (S); Collector undesignated s.n. (F--photo, N--photo); Smith & Smith 336 (F--photo, N--photo), 1801 (F--photo, N--photo). GRENADA: P. Beard 1243 (S); W. E. Broadway s.n. (F--2 photos, N--2 photos); Eggers 6049 (F--photo, N--photo). TRINIDAD: Sieber, Fl. Trinit. 85 (F--6 photos, N--6 photos, Sg--photo). WEST INDIES: island undesignated: Swartz s.n. (F--photo, N--photo). PANAMA: Bocas del Toro: Cooper 571 (F--photo, N--photo). COLOMBIA: Antioquia: Toro 1113 (Fn--1622). Méta: F. W. Pennell 1650 (F--photo, N--photo). VENEZUELA: Mérida: W. E. Broadway 319 (F--photo, N--photo). Zulia: H. Pittier 10533 (F--photo, N--photo). CULTIVATED: England: Palm Stove s.n. (F--photo, N--photo).

AEGIPHILA MARTINICENSIS var. OLIGONEURA (Urb.) Moldenke

Literature: Moldenke, Brittonia 1: 383. 1934; Moldenke, Phytologia 1: 237 (1937), 1: 393 (1940), and 2: 90. 1944. A. oligoneura Urb. in Fedde, Repert. 16: 40. 1919; Hill, Ind. Kew. Suppl. 6: 6. 1926.

AEGIPHILA MATTOGROSSENSIS Moldenke

Literature: Moldenke, Bol. Mus. Nac. Rio de Jan. Bot. 12: 2, fig. 2. 1950; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 346. 1951.

In Phytologia 1: 296 (1938) I cited the type collection of this species under A. vitelliniflora Klotzsch. Hoehne, in the reference cited above, comments that other numbers "correspondentes ao mesmo material" have been cited by me under "nomes differentes". The type is from Tapirapoan, collected in flower in January, 1914.

Additional citations: BRAZIL: Mattogrosso: F. C. Hoehne, Com. Rondon 5702 [Herb. Rio de Jan. 44821] (F--photo of type, Ja--type, N--fragment of type, N--photo of type, Si--photo of type, Z--photo of type).

AEGIPHILA MEDITERRANEA Vell.

Literature: Vell., Fl. Flum. 38 (1825), Icon. 1: 94. 1827; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 124. 1845; Schau. in DC., Prodr. 11: 651. 1847; Schau. in Mart., Fl. Bras. 9: 285. 1851; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Jacks., Ind. Kew. 1: 46. 1895; Bull. Herb. Boiss., sér. 2, 4: 1166 & 1167. 1904; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 546. 1911; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 331--332. 1934; Moldenke, Phytologia 1: 238 (1937), 1: 393 (1940), and 2: 440--441. 1948; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio Jan. 37: 334. 1943; Moldenke, Lilloa 10: 337. 1944. A. hirta Casar., Nov. Stirp. Bras. Dec. 47. 1842; Walp., Repert. 4: 122. 1845; Schau. in DC., Prodr. 11: 651. 1847; Schau. in Mart., Fl. Bras. 9: 285. 1851; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Lilloa 10: 337, in syn. 1944. A. cestrifolia Gardn. in Hook., Lond. Journ. Bot. 1: 184. 1842; Walp., Repert. 4: 123. 1845; Schau. in DC., Prodr. 11: 651. 1847; Schau. in Mart., Fl. Bras. 9: 285. 1851; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Brittonia 1: 331, in syn. 1934; Moldenke, Lilloa 10: 337, in syn. 1944.

Kuhlmann reports that in Espiritu Santo this species is employed as an insecticide. It has been collected in anthesis in September.

Additional citations: BRAZIL: Rio de Janeiro: Boog s.n. (F--photo, N--photo); J. E. Pohl 151 (F--photo, N--photo); Saldanha s.n. [Herb. Gab. Bot. Esc. Pol. 5337; Herb. Rio de Jan. 44796] (N); Schott 4916 (F--photo, N--photo); Swainson s.n. (F--photo, N--photo); Ule s.n. [Herb. Rio de Jan. 31557 & 31558] (Ja, Ja); Widgren 1151 (F--photo, N--photo).

AEGIPHILA MEDULLOSA Moldenke

Literature: Moldenke in Fedde, Repert. 33: 132. 1933; Moldenke, Brittonia 1: 297. 1934; Moldenke, Phytologia 1: 238 (1937), 1: 393 (1940), and 2: 442. 1948.

Additional citations: BRAZIL: Rio de Janeiro: Riedel & Lund 0,30 (F--2 photos, N--2 photos).

AEGIPHILA MEMBRANACEA Turcz.

Literature: Turcz., Bull. Soc. Imp. Nat. Mosc. 36: 219. 1863; Jacks., Ind. Kew. 1: 46. 1895; Pulle, Enum. Vasc. Pl. Surinam. 403. 1906; Moldenke, Brittonia 1: 370--371. 1934; Moldenke, Phytologia 1: 238--239 (1937) and 2: 442. 1948.

The species has been collected at an altitude of 500 meters, in fruit in December.

Additional citations: COLOMBIA: Méta: Philipson, Idrobo, & Fernandez 1556 (Bm), 1666 (Bm, W--2026170). VENEZUELA: Falcón: Jahn 384 (F--photo, N--photo). SURINAM: Hostmann 89 (Ec--photo of isotype, F--2 photos of isotypes, N--2 photos of isotypes, Sg--photo of isotype); Hostmann & Kappler 87 [Herb. Reichenbach f. 210173] (V), 89 (F--photo of isotype, N--photo of isotype). FRENCH GUIANA: Mélinon 433 (F--photo, N--photo), s.n. [Maroni,

1877] (Bz--16828, F--photo, N--photo).

AEGIPHILA MINASENSIS Moldenke

Additional citations: BRAZIL: Minas Geraes: Sampaio 888 [Herb. Rio de Jan. 25665] (F--photo of type, Ja--type, N--fragment of type, N--photo of type, Si--photo of type, Z--photo of type).

AEGIPHILA MOLLIS H.B.K.

Literature: H.B.K., Nov. Gen. & Sp. Pl. 2: 250, pl. 130. 1817; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Kunth, Syn. Pl. 2: 43. 1823; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Cham., Linnaea 7: 110. 1832; Dietr., Syn. Pl. 1: 430. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 123. 1845; Schau. in DC., Prodr. 11: 654. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Pritzel, Ic., Bot. Ind. 1: 23. 1866; Jacks., Ind. Kew. 1: 46. 1895; Pulle, Enum. Vasc. Pl. Surinam. 403. 1906; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 403--406. 1934; Moldenke, Phytologia 1: 239--240 (1937), 1: 293 (1938), 1: 394 (1940), 2: 90 (1944), and 2: 442--444. 1948; Daniel, Verb. Cent. Antioq. 7. 1947. A. mutisii H.B.K., Nov. Gen. & Sp. Pl. 2: 250, pl. 131. 1817; Steud., Nom. Bot., ed. 2, 1: 16. 1821; Kunth, Syn. Pl. 2: 43. 1823; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Cham., Linnaea 7: 110. 1832; Kostel., Alleg. Med. Fl. 3: 829. 1834; Dietr., Syn. Pl. 1: 430. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 122--123. 1845; Schau. in DC., Prodr. 11: 654. 1847; Schau. in Mart., Fl. Bras. 9: 288--289. 1851; Bocq., Adansonia 3: 190. 1861; Pritzel, Ic. Bot. Ind. 1: 23. 1866; Jacks., Ind. Kew. 1: 46. 1895; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 403, in syn. 1934. A. salutaris H.B.K., Nov. Gen. & Sp. Pl. 2: 249. 1817; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Kunth, Syn. Pl. 2: 43. 1823; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Cham., Linnaea 7: 110. 1832; Ann. Nat. Hist. 2: 449. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 123. 1845; Schau. in DC., Prodr. 11: 654. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 1150. 1848; Schau. in Mart., Fl. Bras. 9: 289. 1851; Rosenth., Syn. Pl. Diaph. 430. 1862; Baill., Hist. Pl. 11: 87. 1891; Jacks., Ind. Kew. 1: 47. 1895; Pittier, Pl. Usual. Venez. 416. 1926; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 403, in syn. 1934. A. pubescens Willd. in Steud., Nom. Bot., ed. 2, 1: 29, in syn. 1840; Rosenth., Syn. Pl. Diaph. 430. 1862; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Brittonia 1: 403, in syn. 1934. A. mutisii var. grandiflora Schau. in DC., Prodr. 11: 654. 1847; Schau. in Mart., Fl. Bras. 9: 288. 1851; Moldenke, Brittonia 1: 403, in syn. 1934. A. mutisii var. parviflora Schau. in DC., Prodr. 11: 654. 1847; Schau. in Mart., Fl. Bras. 9: 288. 1851; Moldenke, Brittonia 1: 403, in syn. 1934.

The D'Orbigny 1086 cited by me in Phytologia 1: 239 (1937) as this species is actually A. steinbachii Moldenke. The Apolinar-María 122 from Sasaima, cited by me in Phytologia 2: 444 (1948) as from "Department undetermined", is actually from Cundinamarca.

Jaramillo collected the species at an altitude of 1000 meters and records the common name of "amarilleto de gorro".

Additional citations: COLOMBIA: Cauca: H. Pittier 626 (F--photo, N--photo). Cundinamarca: Hartweg s.n. [Fusagasuga, near Bogotá] (F--photo, N--photo). Magdalena: H. H. Smith 868 (F--photo, N--photo), 870 (F--photo, N--photo), 1860 (F--photo, N--photo); Purdie s.n. [Santa Marta] (F--photo, N--photo). Méta: Philipson 2279 (Bm). Tolima: Haught 6357 (W--2045960). Valle del Cauca: Duque Jaramillo 1127 (F--1292474, F--1293928). VENEZUELA: Anzoategui: Otto 856 (F--2 photos, N--2 photos). Aragua: Fendler 843 (F--photo, N--photo), 2052 (F--photo, N--photo); Lasser 791 [Herb. Nac. Venez. 12587] (Ve), 905 [Herb. Nac. Venez. 12586] (Ve); Ll. Williams 10222 [Herb. Nac. Venez. 12588] (Ve), 10314 [Herb. Nac. Venez. 12605] (Ve). Bolívar: Cardona 799 [Herb. Nac. Venez. 12601] (Ve). Carabobo: H. Pittier 7910 [Herb. Nac. Venez. 12607] (Ve). Federal District: H. Pittier 7855 [Herb. Nac. Venez. 12606] (Ve). Guarico: Chardon 117 [Herb. Nac. Venez. 12602] (Ve). State undetermined: Eggers 13464 (F--photo, N--photo).

AEGIPHILA MONSTROSA Moldenke

Literature: Moldenke, Trop. Woods 25: 12--14. 1931; Moldenke, Brittonia 1: 298--299. 1934; Moldenke, Phytologia 1: 240 (1937), 1: 293 (1938), 1: 394 (1940), 2: 90 (1944), amd 2: 445. 1948; Moldenke, Carnegie Inst. Wash. Publ. 525: 202--203. 1940.

Additional citations: GUATEMALA: Izabal: P. C. Standley 25114 (F--photo, N--photo). HONDURAS: Atlántida: P. C. Standley 52717 (F--photo, N--photo).

AEGIPHILA MONTICOLA Moldenke

Literature: Moldenke, Phytologia 1: 248--249 (1937) and 1: 394--395. 1940.

The Schimpff 267, cited by me in Phytologia 1: 188 (1937) as A. bogotensis, is actually A. monticola.

AEGIPHILA MULTIFLORA Ruíz & Pav.

Literature: Ruíz & Pav., Fl. Peruv. 1: 50, pl. 76. 1798; Pers., Syn. Pl. 1: 132. 1805; Poir., Encycl. Méth. Suppl. 1: 151. 1810; Pers., Sp. Pl. 1: 339. 1817; Roem. & Schult., Syst. Veg. 3: 103. 1818; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Dietr., Syn. Pl. 1: 430. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 118. 1845; Schau. in DC., Prodr. 11: 640. 1847; Bocq., Adansonia 3: 190. 1862; Rosenth., Syn. Pl. Diaph. 1130. 1862; Pritzel, Ic. Bot. Ind. 1: 23. 1866; Jacks., Ind. Kew. 1: 46. 1895; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 295--296. 1934; Moldenke, Phytologia 1: 250--251 (1937), 1: 395 (1940), 2: 90 (1944), and 2: 445--446. 1948; Moldenke, Holmbergia 4: 148. 1945. Clerodendron bolivianum Britton ex Rusby, Bull. Torrey Club 27: 82. 1900.

The type collection of Clerodendron bolivianum is H. H. Rusby 2619. The species is described as a shrub, 3 to 5 meters tall, or a "tall tree", 4 meters in height, the flowers dark- or wine-red. It has been collected in anthesis in September, November, and December, growing at altitudes of 2440 to 3900 meters.

Additional citations: PERU: Huánuco: Asplund 13580 (S); Ruíz & Pavon s.n. [Huassachuass & Pallao] (F--photo of isotype, N--photo of isotype). Puno: Vargas 6948 (W--1997730), 9644 (S). BOLIVIA: El Beni: Buchtien s.n. [XI.1910; Herb. Osten 6878] (Ug); H. H. Rusby 2619 (Pa).

AEGIPHILA NOVOFRIBURGENSIS Moldenke

Literature: Moldenke in Fedde, Repert. 33: 134. 1933; Moldenke, Brittonia 1: 350. 1934; Moldenke, Phytologia 1: 251 (1937) and 2: 446. 1948.

Additional citations: BRAZIL: Rio de Janeiro: P. Clausen 194 (F--photo of type, N--photo of type).

AEGIPHILA OBDUCTA Vell.

Literature: Vell., Fl. Flum. 38 (1825), Icon. 1: 97. 1827; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 124. 1845; Schau. in DC., Prodr. 11: 655. 1847; Schau. in Mart., Fl. Bras. 9: 289--290. 1851; Warming, Symb. Fl. Bras. Cent. 23:713. 1877; Jacks., Ind. Kew. 1: 46. 1895; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 547. 1911; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 454--456. 1934; Moldenke, Phytologia 1: 252 (1937), 1: 395 (1940), 2: 439, fig. 3, and 2: 446--447. 1948; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio 37: 334. 1943; Hoehne, Kuhlmann, & Handro, O Jard. Bot. São Paulo 576--577. 1941; F. C. Hoehne, Relat. Anual Inst. Bot. 87. 1947; Stellfeld, Trib. Farmac. 19 (10): 170. 1951. A. lanuginosa Gardn. in Lond. Journ. Bot. 4: 134. 1845; Walp., Repert. 4: 121--122. 1845; Schau. in DC., Prodr. 11: 655. 1847; Schau. in Mart., Fl. Bras. 9: 289. 1851; Warming, Symb. Fl. Bras. Cent. 23: 713. 1877; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Btittonia 1: 454, in syn. 1934.

The Rambo 50296 and 50333, cited below, are both representatives of the "A. lanuginosa" form, a form which may prove worthy of subspecific recognition. The Kuhlmann collection, also cited below, consists of cleaned seeds only. It was collected in the Jardim Botanico at São Paulo and the collector states "nativa nas capoeiras, frutos carnosos". Mello Barreto states that it grows in the "matta", while Rambo says it is found in primeval woods where, he says, it assumes a reclining form. The same species, he says, but much more dwarf in stature, grows in the Araucaria woods at Vila Oliva, near Caxias, Rio Grande do Sul. Mendes Magalhães also records it from the capoeira. Mello Barreto states that it becomes a tree 3 meters tall, graowing on granitic rocks. The flowers are uniformly described as white and odoriferous. The species has been collected in anthesis in March and from June through October, and in fruit in October, November, and

December. A synonym is Aegiphila obducta Schau., in herb.

Additional citations: BRAZIL: Federal District: Brade 10542 [Herb. Rio de Jan. 22947] (N); Ule 785 [Herb. Rio de Jan. 32274] (F--photo, N, N--photo). Minas Geraes: P. Clausen s.n. [Aug.--April 1840] (Br); Duarte 3083 [Herb. Rio de Jan. 71923] (N); Mello Barreto 9109 [Herb. Rio de Jan. 44813] (Ja), 9111 [Herb. Jard. Bot. Belo Horiz. 23285; Herb. Rio de Jan. 44812] (Ja, N); Mendes Magalhães s.n. [11-VIII-937] (Be--14054); Riedel 452 (Br--photo, Ec--photo, Es--photo, F--photo, Ml--photo, N--photo, S--photo, Sg--photo); Sellow 5930 (F--2 photos, N--2 photos). Paraná: Dusén 379a (F--photo, N--photo). Rio de Janeiro: Brade 10916 [Herb. Jard. Bot. Rio 44838] (N), 11480 [Herb. Jard. Bot. Rio 44843] (N); Glaziou 4160 (F--3 photos, N--3 photos), 6652 (F--photo, N--photo), 11338 (F--photo, N--photo), 11339 (F--photo, N--photo), 18394 (F--2 photos, N--2 photos), 19722 (F--photo, N--photo); Mello Barreto 15007 [Herb. Jard. Bot. Belo Horiz. 45136] (N); Moldenke & Moldenke 19612 (Ms, N, No, Ot, Pn, Sm), 19991 (Mg, N, No, Ot, Sm); Saldanha s.n. [Gab. Bot. Esc. Pol. 8391; Herb. Jard. Bot. Rio 44793] (Ja). Santa Catharina: Hatschbach 1927 (N); Rambo 3258 (Rb), 50296 (N, S), 50333 (N); Reitz & Klein 801 (N); Reitz & Rambo 4098 (Z); Schwacke IV.184 [Herb. Jard. Bot. Rio 32271] (N). São Paulo: Herb. Jard. Bot. Rio 32268 (Ja); W. Hoehne 1290 (Mg, N, No, Wh, Wh), s.n. [18/6/1946] (Wh, Wh, Wh, Wh, Wh, Wh); M. Kuhlmann s.n. [10/11/1948] (N, Sp); Moldenke & Moldenke 19626 (Es, Lg, N). State undetermined: Collector undesignated 23 (F--photo, N--photo); Gusmão s.n. [Herb. Jard. Bot. Rio 31720] (N); Herb. Jard. Bot. Rio de Jan. 32267 (Ja), 44875 (Ja).

AEGIPHILA OBOVATA Andr.

Literature: Andr., Bot. Rep. 9: 578. 1908; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Paxt., Pock. Bot. Dict. 8. 1840 & 1849; Hereman, Paxt. Bot. Dict. 13. 1868; Jacks., Ind. Kew. 1: 46. 1895; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 391, in syn. 1934; Moldenke, Phytologia 1: 252--253 (1937) and 2: 90. 1944; Moldenke, Lilloa 4: 319. 1939; Greig-Smith, Journ. Ecology 40: 290, 294, & 307. 1952. A. dubia Moldenke in Fedde, Repert 33: 120. 1933; Moldenke, Brittonia 1: 391--393. 1934; Moldenke, Phytologia 1: 252, in syn. 1937; Moldenke, Lilloa 4: 319, in syn. 1939.

Additional citations: TRINIDAD: Cheesman & Baker 237 [Trin. Bot. Gard. Herb. 13658] (R); Finlay s.n. [Trin. Bot. Gard. Herb. 2386] (F--photo, N--photo), s.n. [Trin. Bot. Gard. Herb. 2389] (F--photo, Sg--photo); Greig-Smith 1112 (N), 1180 (N), 1229 (N); Trin. Bot. Gard. Herb. 2388 (F--photo, N--photo); R. O. Williams s.n. [Trin. Bot. Gard. Herb. 12026] (F--photo, N--photo), s.n. [Trin. Bot. Gard. Herb. 12163] (F--photo, N--photo).

AEGIPHILA ODONTOPHYLLA Donn. Sm.

Literature: Donn. Sm., Bot. Gaz. 25: 157. 1898; Pittier, Prim. Fl. Costaric. 2: 211--212. 1898; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 4 1904; Bot. Gaz. 57: 426. 1914; Moldenke, Brittonia 1: 351--352. 1934; Moldenke, Phytologia 1: 254 (1937), 1: 395 (1940), and 2: 447. 1948. A. fusca Ørst. ex Moldenke, Brittonia 1: 351, in syn. 1934; Moldenke, Phytologia 1: 254. 1937. A. furia Ørst. ex Moldenke, Phytologia 1: 254, in syn. 1937.

Additional citations: COSTA RICA: Cartago: Stork 2230 (F--photo, N--photo).

AEGIPHILA PANAMENSIS Moldenke

Literature: Moldenke, Trop. Woods 25: 14--16. 1931; Moldenke, Brittonia 1: 375--376. 1934; Moldenke, Phytologia 1: 254 (1937), 1: 293 (1938), 1: 395--396 (1940), 2: 90 (1944), and 2: 447. 1948; Matuda, Am. Midl. Nat. 44: 575. 1950.

The specimens cited below collected by my wife and myself were collected on Barro Colorado Island - the first record of the species from this island. Wedel describes it as a tree 5 feet tall; Allen found it along a fencerow at sea-level, while León collected it at an altitude of 600 meters. The yellow or pale-yellow flowers have been found in July, October, and November.

Additional citations: COSTA RICA: Limón: J. León 1719 [Herb. Inst. Interamer. Turrialba 905] (W--2021495). Puntarenas: P. H. Allen 5346 (N). PANAMA: Bocas del Toro: Cooper & Slater 117 (F--photo, N--photo); Dunlap 407 (F--photo, N--photo); Wedel 1221 (N). Canal Zone: Moldenke & Moldenke 19896 (Lg, N). Panamá: Heriberto 163 (F--photo, N--photo); P. C. Standley 28155 (F--photo, N--photo).

AEGIPHILA PANICULATA Moldenke

Literature: Moldenke, Trop. Woods 25: 16--17. 1931; Moldenke, Brittonia 1: 386--388. 1934; Moldenke, Phytologia 1: 254--255 (1937), 1: 396 (1940), and 2: 447. 1948; Matuda, Am. Midl. Nat. 44: 575. 1950.

Dodge and Allen describe the plant as a small tree with orange fruits in January.

Additional citations: PANAMA: Canal Zone: Dodge & Allen 17471 (E--1121185); P. C. Standley 29232 (F--photo, N--photo).

AEGIPHILA PARAGUARIENSIS Briq.

Literature: Briq., Bull. Herb. Boiss., sér. 2, 4: 1166. 1904; Chodat, Plant. Hassler. 2: 502--503. 1904; Prain, Ind. Kew. Suppl. 3: 4. 1908; Moldenke, Brittonia 1: 324--326. 1934; Moldenke, Phytologia 1: 255 (1937), 1: 293 (1938), 1: 396 (1940), and 2: 447. 1948; Stellfeld, Trib. Farmac. 19 (10): 170. 1951.

The species is described by collectors as a tree to 4 meters tall, growing in fields and cerrado, with white or yellow flowers collected in January, February, May, and September through December. Specimens have been mis-identified in herbaria as A. lhotzkiana Cham. and A. sellowiana Cham.

Additional citations: BRAZIL: Mattogrosso: Malme 2463 [Herb. Rio de Jan. 28268] (Ja); Smith s.n. [Herb. Rio de Jan. 32269] (Ja). Minas Geraes: Macedo 434 (N); Mello Barreto 10307 [Herb. Rio de Jan. 44811] (Ja); Mendes Magalhães 976 (Be--13916); Sampaio 6915 & 6917 [Herb. Rio de Jan. 44828] (N). Paraná: Dusén 15963 (F--photo, N--photo); Löfgren 95 (F--photo, N--photo), 99 (F--photo, N--photo). Rio de Janeiro: Glaziou 11334 (F--photo, N--photo). PARAGUAY: Hassler 1921 (F--photo, N--photo), 4498 (S--cotype), 5056 (S--cotype), 6931 (S--cotype, V--332--cotype); T. Rojas 12768 (Si).

AEGIPHILA PARVIFLORA Moldenke

Literature: Moldenke in Fedde, Repert. 33: 135. 1933; Moldenke, Brittonia 1: 328--329. 1934; Moldenke, Phytologia 1: 255 (1937) and 2: 447--448. 1948.

Additional citations: VENEZUELA: Angostura: Grosourdy Cat. 13 s.n. [Guyana] (F--photo, N--photo). BRAZIL: Pará: Spruce 589 (F--photo of isotype, N--photo of isotype).

AEGIPHILA PENDULA Moldenke

Literature: Moldenke in Fedde, Repert. 33: 135. 1933; Moldenke, Brittonia 1: 383--384. 1934; Moldenke, Phytologia 1: 256--257 (1937) and 1: 396. 1940.

Camp describes this as a tree 6 meters tall, with leaves deep-green above, pale-green beneath and fruit terminal on branch-ends, ripening orange in June, growing at altitudes of 1000 to 1250 feet.

Additional citations: VENEZUELA: Zulia: H. Pittier 10645 [Herb. Nac. Venez. 12608] (Ve--isotype). ECUADOR: Guayas, Cañar, Chimborazo, & Bolívar: Camp E.3827 (N).

AEGIPHILA PERNAMBUCENSIS Moldenke

Literature: Moldenke, Phytologia 1: 257--258 (1937), 1: 396 (1940), and 2: 448. 1948.

The species is called "cafeeiro de cabra" and has been found in "capoeira de logares altos", blooming in February, March, April, and October. Specimens have been mis-identified as A. lhotzkiana Cham.

Additional citations: BRAZIL: Ceará: Freire Allemão 1177 [Herb. Rio de Jan. 31757 & 44810] (Ja, N). Parahyba: J. M. Vasconcelos 455 [Herb. Esc. Agronom. Nordeste 39] (Sf), 841 [Herb. Esc. Agronom. Nordeste 392] (Sf), 853 [Herb. Esc. Agronom. Nordeste 414] (N, Sf). Pernambuco: Pickel 526 [Herb. Rio de Jan. 24258] (Ja).

AEGIPHILA PERPLEXA Moldenke

Literature: Moldenke in Fedde, Repert. 33: 136. 1933; Moldenke, Brittonia 1: 388--389. 1934; Moldenke, Phytologia 1: 258 (1937), 1: 397 (1940), 2: 90 (1944), and 2: 448. 1948; Moldenke, Lilloa 4: 321. 1939.

Additional citations: TOBAGO: Eggers 5540 (F--photo, N--photo). TRINIDAD: R. E. D. Baker s.n. [Trin. Bot. Gard. Herb. 13989] (R); Fendler 571 (F--photo, N--photo), 592 (Pa).

AEGIPHILA PERUVIANA Turcz.

Literature: Turcz., Bull. Soc. Imp. Nat. Mosc. 36: 219. 1863; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Brittonia 1: 368--370. 1934; Moldenke, Phytologia 1: 259 (1937), 1: 294 (1938), 1: 397 (1940), 2: 90 (1944), and 2: 448. 1948.

The specific name in this binomial is sometimes upper-cased.

Additional citations: PERU: San Martín: Mathews s.n. [Moyobamba] (F--photo, N--photo, Sg--photo); Ll. Williams 5480 (Ec--photo, F--photo, N--photo, Sg--photo), 5588 (F--photo, N--photo), 6152 (F--photo, N--photo), 6291 (F--photo, N--photo), 6860a (F--photo, N--photo), 7334 (F--photo, N--photo). BOLIVIA: El Beni: H. H. Rusby 2473 (F--4 photos, N--4 photos, Pa, Sg--photo).

AEGIPHILA PLATYPHYLLA Briq.

Literature: Briq., Bull. Herb. Boiss., sér. 2, 4: 1167--1168. 1904; Chodat, Plant. Hassler. 2: 504--505. 1904; Prain, Ind. Kew. Suppl. 3: 4. 1908; Brittonia 1: 428--429. 1934; Moldenke, Phytologia 1: 259 (1937) and 2: 448. 1948.

Additional citations: PARAGUAY: Hassler 8056 (S--isotype).

AEGIPHILA PUBERULENTA Moldenke

Literature: Moldenke in Fedde, Repert. 33: 137. 1933; Moldenke, Brittonia 1: 412--413. 1934; Moldenke, Phytologia 1: 259 (1937), 1: 397 (1940), 2: 90 (1944), and 2: 448--449. 1948.

Cuatrecasas collected the species at an altitude of 235 meters and found it blooming in October.

Additional citations: COLOMBIA: Atlántico: Elias 581 (F--photo, N--photo). Méta: Cuatrecasas 3543 (F--1329861).

AEGIPHILA PURPURASCENS Moldenke

Literature: Moldenke, Phytologia 4: 173--175. 1953.

Additional citations: ECUADOR: Azuay: Camp E.4338 (N--type), E.4388 (N), E.4419 (N).

AEGIPHILA QUINDUENSIS (H.B.K.) Moldenke

Literature: Moldenke in Fedde, Repert. 33: 138. 1933; Moldenke, Brittonia 1: 415--416. 1934; Moldenke, Phytologia 1: 260 (1937), 1: 294 (1938), 1: 397 (1940), and 2: 449. 1948. Petitia quinduensis H.B.K., Nov. Gen. & Sp. Pl. 2: 248. 1818; Schau. in DC., Prodr. 11: 652. 1847; Bocq., Adansonia 3: 188. 1862; Jacks., Ind. Kew. 3: 477. 1894; Moldenke, Brittonia 1: 415, in syn. 1934; Moldenke, Phytologia 1: 294, in syn. 1938. Petitia tenuifolia Willd. ex Roem. & Schult., Syst. Veg. Mant. 3: 50. 1827; Schau. in DC., Prodr. 11: 652. 1847; Jacks., Ind. Kew. 3: 477. 1894; Moldenke, Brittonia 1: 415, in syn. 1934; Moldenke, Phytologia 1: 294, in syn. 1938. Aegiphila humboldtii Schau. in DC., Prodr. 11: 652. 1847; Jacks., Ind. Kew. 1: 47. 1895; Mol-

denke, Brittonia 1: 415, in syn. 1934.

Specimens of this species have been mis-identified in herbaria as A. membranacea Turcz.

Additional citations: VENEZUELA: Aragua: Delgado 115 [Herb. Nac. Venez. 12612] (Ve); H. Pittier 14993 [Herb. Nac. Venez. 12599 (Ve), 15550 (N); Ll. Williams 10251 [Herb. Nac. Venez. 12609] (Ve), 10391 [Herb. Nac. Venez. 12611] (Ve). Carabobo: Karsten s.n. [Puerto Cabello] (F--photo, N--photo); H. Pittier 8806, in part [Herb. Nac. Venez. 12613] (F--photo, N--photo, Ve). Federal District: H. Pittier 10404 [Herb. Nac. Venez. 12610] (F--photo, N--photo, Ve).

AEGIPHILA RACEMOSA Vell.

Literature: Vell., Fl. Flum. 37 (1825), Icon. 1: 88. 1827; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 119 & 124. 1845; Schau. in DC., Prodr. 11: 653. 1847; Schomb., Vers. Fauna & Fl. Brit. Guian. 959. 1848; Schau. in Mart., Fl. Bras. 9: 287. 1851; Jacks., Ind. Kew. 1: 47. 1895; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 447--449. 1934; Moldenke, Phytologia 1: 260--261 (1937), 1: 397 (1940), 2: 90 (1944), and 2: 441, fig. 4, & 449. 1948; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio 37: 334. 1943. A. mollis var. foliis basi vix angustatis Miq. ex Moldenke, Brittonia 1: 447, in syn. 1934.

Specimens of this species have been mis-identified as A. cuspidata Mart. and have been collected in woods, near rivers' edges and along roadsides, in anthesis in January, February, March, October, and November. It is described by Archer and by Murça Pires and Black as a liana or vine with yellow or pale yellow-green flowers.

Additional citations: BRITISH GUIANA: De la Cruz 3627 (F--photo, N--photo); Jenman 1993 (F--photo, N--photo); Schomburgk 146 (F--photo, N--photo), 615 (F--2 photos, N--2 photos). SURINAM: B.W. 2850 (N); Kappler 1717 (F--photo, N--photo). FRENCH GUIANA: Mélinon 174 (F--photo, N--photo), 424 (F--photo, N--photo); Sagot 473 (F--2 photos, N--2 photos). BRAZIL: Amazonas: Xavier 97 [Herb. Rio de Jan. 46792] (Ja). Guaporé: Cordeiro & Silva s.n. [Porto Velho, 1952] (N). Pará: Archer 8141 (Be--12239), 8278 (Be--12109); Burchell 9726 (F--photo, N--photo); Guedes 1242 [Herb. Rio de Jan. 31581] (Ja); Killip & Smith 30278 (F--photo, N--photo, Sg--photo); Murça Pires & Black 443 (Be--17484, N), 654 (Be--17630); A. Silva 93 (Be--13128).

AEGIPHILA RIEDELIANA Schau.

Literature: Schau. in DC., Prodr. 11: 649. 1847; Schau. in Mart., Fl. Bras. 9: 282--283. 1851; Jacks., Ind. Kew. 1: 47. 1895; Moldenke, Brittonia 1: 311--313. 1934; Moldenke, Phytologia 1: 261 (1937), 1: 397 (1940), 2: 91 (1944), and 2: 449. 1948: Sampaio & Peckolt, Arquiv. Mus. Nac. Rio 37: 334. 1943. A. serrata Vell., Fl. Flum. 38 (1825), Icon. 1: 92. 1827; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 124. 1845; Schau. in

DC., Prodr. 11: 651. 1847; Schau. in Mart., Fl. Bras. 9: 284. 1851; Jacks., Ind. Kew. 1: 47. 1895; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 311, in syn. 1934; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio 37: 334, in syn. 1943; Moldenke, Phytologia 2: 449. 1948.

The species is said to be a tree to 20 feet tall similar to A. sellowiana Cham. in appearance or a shrub 3 meters tall, found in thickets along streams. The corollas are cream-colored, blooming in January, September, and October, fruiting in June.

Additional citations: BRAZIL: Minas Geraes: Mendes Magalhães 4563 [Herb. Jard. Bot. Belo Horiz. 45704] (N). Rio Grande do Sul: Moldenke & Moldenke 19682 (Es, Lg, Mg, N, Ot, Sm); Rambo 29169 (S), 37330 (N), 40320 (Rb).

AEGIPHILA SALTICOLA Moldenke

Literature: Moldenke in Fedde, Repert. 37: 211--212. 1934; Moldenke, Phytologia 1: 263--264 (1937), 1: 294 (1938), 1: 397 (1940), and 2: 450. 1948.

Specimens of this species are often mis-identified as A. villosa (Aubl.) Gmel. in herbaria. The species has been found in anthesis in June.

Additional citations: BRAZIL: Pará: Huber 809 [Herb. Rio de Jan. 5436](Ja); Mexia 5922 (En--isotype). SÃO LUIZ ISLAND: Fróes 11738 (S).

AEGIPHILA SCANDENS Moldenke

Literature: Moldenke, Phytologia 1: 264--265 (1937), 1: 294 (1938), and 2: 450. 1948; Moldenke in Fedde, Repert. 37: 212. 1934.

The Schultes & López collection cited below exhibits mature calyxes that are deeply lobed. It seems possible that this condition may obtain during anthesis, too, although the type collection has plainly subtruncate calyx-rims. The type collection is described as having yellow corollas, but the Murça Pires specimen cited below is said to have white flowers. It was at first mis-identified as A. chrysantha Hayek, and was collected in anthesis in April.

Additional citations: BRAZIL: Amazonas: Murça Pires 386 (Be--28343, N); Schultes & López 8953 (W--1996657).

AEGIPHILA SCHIMPFFII Moldenke

Literature: Moldenke, Phytologia 1: 265--266 (1937), 1: 294 (1938), and 2: 450 [as A. schimpfii]. 1948; Svenson, Am. Journ. Bot. 33: 480 [as A. schimpfii]. 1946; Moldenke, Known Geogr. Distrib. Verbenac. 69 & 175 [as A. schimpfii]. 1949.

Camp describes this species as a shrubby tree 2.5 meters tall, with arching branches, or a wide-branched tree 5 meters tall. The leaves are deep-green above, pale-green beneath, the calyx pale yellow-green, the corolla greenish-yellow, and the fruit bright-orange in June. He found it at altitudes of 1000 to 1250 feet.

Additional citations: ECUADOR: Guayas, Cañar, Chimborazo, & Bolívar: Camp E.3733 (N), E.3737 (N).

AEGIPHILA SELLOWIANA Cham.

Literature: Cham., Linnaea 7: 111--112. 1831; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 121. 1845; Schau. in DC., Prodr. 11: 648--649. 1847; Schau. in Mart., Fl. Bras. 9: 281. 1851; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Jacks., Ind. Kew. 1: 47. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 546. 1911; Usteri, Fl. Umgeb. Standt São Paulo 228. 1911; Hayek, Denkschr. Kaiser. Akad. Wissensch. Math.-nat. 79 (1): 296. 1908; Luetzelburg, Estudo Bot. Nordéste 3: 224 [as Aegyphila sellowiana]. 1923; Moldenke, Brittonia 1: 332--335. 1934; Moldenke, Phytologia 1: 266--267 (1937), 1: 294 (1938), 1: 398 (1940), 2: 91 (1944), 2: 450 (1948), and 3: 46. 1948; Hoehne, Kuhlmann, & Handro, O Jard. Bot. São Paulo 577. 1941; F. C. Hoehne, Relat. Anual Inst. Bot. 87. 1947; Kuhlmann & Kühn, Fl. Dist. Ibiti 116 & 180. 1947; Stellfeld, Trib. Farmac. 19 (10): 170 & 171. 1951. A. sellowiana var. subglabrata Cham. ex Moldenke, Brittonia 1: 332, in syn. 1934.

Mendes Magalhães describes the plant as a tree 4 meters tall, but Mello Barreto says it is a tree 8 to 30 meters tall. Kuhlmann & Kühn describe it as a ptenophyte. In addition to the dates of anthesis given in my monograph, it has been collected in flower in June. The vernacular names of "briaúva", "capoeira branca", "fôlha larga", "fruta de sabiá", and "tamanqueiro" are recorded by Kuhlmann & Kühn, who state that in December and January the flowers are much visited by "Abelha domestica" and other insects. Klein records the name "pau de gaiola". Koscinsky found the plant in woods. Luetzelburg records it from Leopoldina in Espirito Santo; the Campos Novaes collection cited by Hayek is probably also from that state.

Additional citations: BRAZIL: Bahia: H. P. Velloso 958 [Herb. Rio de Jan. 41550] (N). Federal District: Brade 11293 [Herb. Rio de Jan. 44840] (N); Vidal & Valle I.22 [Herb. Rio de Jan. 44822] (Ja). Minas Geraes: P. Clausen s.n. [Herb. Rio de Jan. 32229] (Ja); Henschen I.184 (F--photo, N--photo); Macedo 2850 (N); Mello Barreto 4012 [Herb. Jard. Bot. Belo Horiz. 16867; Herb. Rio de Jan. 44814] (Ja, N); Mendes Magalhães 1371 [Herb. Jard. Bot. Belo Horiz. 40045] (Be--14012, N); Regnell I.184 (F--2 photos, N--2 photos); Sampaio 6967 [Herb. Rio de Jan. 44829] (N), 7356 [Herb. Rio de Jan. 32265] (N), 11228 (F--photo, N--photo), 16669 (F--photo, N--photo), 17362 (F--photo, N--photo), s.n. [Passo, March 18, 1904; Herb. Rio de Jan. 44819] (Ja), s.n. [Jaguariahyva] (F--2 photos, N--photo, Sg--photo); Hatschbach 2615 (N). Rio de Janeiro: C. V. Freire s.n. [Herb. Rio de Jan. 31521] (N); Glaziou 808 (F--photo, N--photo); Peckolt 223 (F--photo, N--photo); Saldanha s.n. [Herb. Gab. Bot. Esc. Pol. 5160; Herb. Rio

de Jan. 44796] (N), s.n. [Herb. Gab. Bot. Esc. Pol. 6938; Herb. Rio de Jan. 44794] (Ja); Sellow s.n. (F--6 photos of cotypes, N--5 photos of cotypes, Sg--photo of cotype). Rio Grande do Sul: Dutra 818 [Herb. Rio de Jan. 44820] (Ja); Malme 799 [Herb. Rio de Jan. 28157] (Ja); Rambo 38582 (N), 38921 (N); Theissen s.n. [Herb. Rambo 7843; Herb. Inst. Bot. S. Paulo 50979] (Sp). Santa Catharina: R. Klein 132 (Z, Z), 442 (N). São Paulo: Brade 7464 [Herb. Rio de Jan. 22889] (Ja), 7922 [Herb. Rio de Jan. 22890] (Ja), 12120 [Herb. Rio de Jan. 44845] (Ja); W. Hoehne 244 (N, Wh), s.n. [17/5/1932] (Wh), s.n. [4/1/1933] (Wh); Koscinsky 598 (Sf); Moldenke & Moldenke 19660 (N); Mosén 3035 (F--photo, N--photo), 4323 (F--photo, N--photo); Navarro de Andrade 76 [Herb. Rio de Jan. 31585] (Ja); Pickel 961 (Sf); Tamandaré & Brade 7463 [Herb. Rio de Jan. 22888] (Ja). State undetermined: Barboza 115b [Herb. Rio de Jan. 5888] (Ja); Herb. Rio de Jan, 32251 (Lg, N); Vecchi s.n. [Herb. Rio de Jan. 16301] (Ja)= BOLIVIA: La Paz: M. Bang 1332 (Pa).

AEGIPHILA SESSILIFLORA Moldenke

Literature: Moldenke, Brittonia 1: 301--302. 1934; Moldenke, Phytologia 1: 267 (1937), 1: 398 (1940), and 3: 46--47. 1948.

The Garcia y Barriga 12494, cited by me in Phytologia 3: 47 (1948), proves to be A. truncata Moldenke instead. Core describes A. sessiliflora as a tree to 50 feet tall, growing in the open, at altitudes of 1500 meters, blooming in January.

Additional citations: COLOMBIA: Antioquia: A. Lopez s.n. [Archer 392] (Fn--1665--isotype). Cauca: E. L. Core 206 (W--2059687).

AEGIPHILA SETIFORMIS Rusby

Literature: Rusby, Mem. Torrey Bot. Club 4: 245. 1895; Durand & Jacks., Ind. Kew. Suppl. 1: 12. 1896; Moldenke, Brittonia 1: 433--435. 1934; Moldenke, Phytologia 1: 267--268 (1937) and 1: 398--399. 1940. A. densiflora Rusby, Mem. Torrey Bot. Club 6: 107. 1896; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 4. 1904; Moldenke, Brittonia 1: 433, in syn. 1934.

Additional citations: BOLIVIA: La Paz: M. Bang 878a, in part (Pa--isotype), 1732 (Pa).

AEGIPHILA SKUTCHII Moldenke

Literature: Moldenke, Geogr. Distrib. Verbenac. 13 & 15, nom. nud. 1939; Moldenke, Phytologia 1: 399--400. 1940; Matuda, Am. Midl. Nat. 44: 575. 1950; Moldenke, Phytologia 3: 47. 1948.

Matuda describes this as a tree 5 meters tall, growing in wet mixed forest at an altitude of 4834 meters, blooming in July.

Additional citations: MEXICO: Chiapas: Matuda 18062 (N).

AEGIPHILA SMITHII Moldenke

Literature: Moldenke, Brittonia 1: 191--192 (1932) and 1: 419-420. 1934; Moldenke, Phytologia 1: 268 (1937), 1: 294 (1938),

and 3: 47. 1948.

Asplund describes this plant as a shrub 5 meters tall, with orange fruits in October.

Additional citations: PERU: Loreto: Asplund 14048 (S); Klug 1460 (F--photo, N--photo), 1490 (F--photo, N--photo).

AEGIPHILA SPICATA (Rusby) Moldenke

Literature: Moldenke in Fedde, Repert. 33: 139. 1933; Moldenke, Brittonia 1: 432--433. 1934; Moldenke, Phytologia 1: 268 (1937) and 3: 47. 1948. Citharexylon spicatum Rusby, Bull. Torrey Bot. Club 27: 81. 1900; Thiselt.-Dyer, Ind. Kew. Suppl. 2. 1904; Moldenke, Brittonia 1: 432, in syn. 1934. Aegiphila bangii Moldenke, Brittonia 1: 432, in syn. 1934.

Additional citations: BOLIVIA: La Paz: M. Bang 878a (F--photo, N--photo).

AEGIPHILA SPLENDENS Schau.

Literature: Schau. in DC., Prodr. 11: 648. 1847; Schau. in Mart., Fl. Bras. 9: 280--281. 1851; Jacks., Ind. Kew. 1: 47. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Moldenke, Brittonia 1: 344--345. 1934; Moldenke, Phytologia 1: 268 (1937), 2: 91 (1944), and 3: 47. 1948. Aegyphylla splendens Schau. ex Moldenke, Suppl. List Invalid Names 1, in syn. 1941.

AEGIPHILA STEINBACHII Moldenke

Literature: Moldenke, Phytologia 2: 9 (1941) and 3: 48. 1948.

The isotype cited below from the Montevideo herbarium states on its label that it was collected at Palometilla Pampa, altitude 400 meters, Sara, November 16, 1916. I_t is said to be a small tree 4 to 5 meters tall, with greenish-yellow flowers.

The D'Orbigny 1086 cited below was recorded by me in Phytologia 1: 239 (1937) as A. mollis H.B.K. in error.

Additional citations: BOLIVIA: Santa Cruz: D'Orbigny 1086 (Cb); Steinbach 3168 [Herb. Osten 14781] (F--photo of isotype, N--photo of isotype, Ug--isotype).

AEGIPHILA STEYERMARKII Moldenke

Additional citations: VENEZUELA: Bolívar: Steyermark 59960 (N--type, S--isotype).

AEGIPHILA STEYERMARKII var. OBTUSIFOLIA Moldenke

Additional citations: VENEZUELA: Bolívar: Steyermark 60113 (N--type, S--isotype).

AEGIPHILA SUFFLAVA Moldenke

Literature: Moldenke, Brittonia 1: 193 (1932) and 1: 461--462. 1934; Moldenke, Phytologia 1: 269 (1937), 1: 295 (1938), and 3: 48. 1948.

Additional citations: PERU: Loreto: Tessmann 5155 (F--photo, N--photo); Ll. Williams 8225 (F--photo of type, N--photo of type)

AEGIPHILA SURFACEANA Moldenke

Literature: Moldenke, Bull. Torrey Bot. Club 58: 462—463. 1931; Moldenke, Brittonia 1: 406—408. 1934; Moldenke, Phytologia 1: 269 (1937), 1: 400 (1940), and 3: 48. 1948. A. velutina Huber ex Moldenke, Brittonia 1: 406, in syn. 1934.

Additional citations: BRITISH GUIANA: Schomburgk 981 (F—photo, N—photo). BRAZIL: Pará: Huber 2022 (F--photo, N—photo).

AEGIPHILA TERNIFOLIA (H.B.K.) Moldenke

Literature: Moldenke in Fedde, Repert. 33: 141. 1933; Moldenke, Brittonia 1: 280—282. 1934; Moldenke, Phytologia 1: 270 (1937), 1: 400 (1940), and 3: 48. 1948. Ehretia ternifolia H.B.K., Nov. Gen. & Sp. Pl. 3: 66. 1818; Spreng., Syst. Veg., ed. 16, 1: 647. 1825; DC., Prodr. 9: 513. 1845; Bocq., Adansonia 3: 187. 1862; Jacks., Ind. Kew. 2: 823. 1895; Moldenke, Brittonia 1: 280, in syn. 1934. Amerina ternifolia (H.B.K.) P. DC., Prodr. 9: 513. 1845; Bocq., Adansonia 3: 188. 1862; Jacks., Ind. Kew. 1: 106. 1895; Moldenke, Brittonia 1: 280, in syn. 1934; Moldenke, Phytologia 1: 270, in syn. 1937.

According to Pittier, in a personal communication to me, the type of this species was collected in the state of Miranda, Venezuela.

AEGIPHILA TRIFIDA Sw.

Literature: Sw., Prodr. 32. 1788; Gmel., Syst. Nat. 2: 259. 1789, 1791, & 1796; Sw., Fl. Ind. Occ. 1: 260. 1797; Willd., Sp. Pl. 1: 617. 1797; Raeusch., Nom. Bot. 37. 1797; Gmel. (Turton), Gen. Syst. of Nat. 5: 219. 1802; Pers., Syn. Pl. 1: 132. 1805; Andr., Bot. Rep. 9: 578. 1809; Poir., Encycl. Méth. Suppl. 1: 151. 1810; Pers., Sp. Pl. 1: 339. 1817; Roem. & Schult., Syst. Veg. 3: 102—103. 1818; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Willd., Nom. Bot., ed. 2, 82. 1821; Spreng., Syst. Veg. 1: 422. 1825; Dietr., Syn. Pl. 1: 430. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Paxt., Pock. Bot. Dict. 8. 1840 & 1849; Walp., Repert. 4: 120. 1845; Jacques & Hérincq, Man. Gén. Pl. 3: 504. 1845-1862; Schau. in DC., Prodr. 11: 648. 1847; Schau. in Mart., Fl. Bras. 9: 284. 1851; Griseb., Fl. Brit. W. Ind. 499. 1861; Hereman, Paxt. Bot. Dict. 13. 1868; Fawcett, Prov. List Indig. Nat. Fl. Pl. Jamaica 30. 1893; Jacks., Ind. Kew. 1: 47. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Urb., Symb. Ant. 3: 364—366. 1903; Britton & Wils., Scient. Surv. Porto Rico 6: 148. 1925; Moldenke, Brittonia 1: 356—357. 1934; Moldenke, Phytologia 1: 270 (1937), 1: 295 (1938), and 1: 400. 1940. A. trifida var. affinis Urb. ex Moldenke, Brittonia 1: 356, in syn. 1934. A. 3-fida Sw. ex Moldenke, Phytologia 1: 270, in syn. 1937.

Additional citations: JAMAICA: N. L. Britton 4053 (F--photo, N--photo); W. Harris 6144 (Ec—photo, F—photo, N—photo, Sg—photo), 6273 (F—photo, N—photo), s.n. [Whitfield Coffee Plantation, May 25, 1897] (F); Swartz s.n. [Jamaica] (F—633323—photo of isotype, F—642160, in part--photo of type, I—photo of

type, S--isotype).

AEGIPHILA TRUNCATA Moldenke

Literature: Moldenke in Fedde, Repert. 33: 141. 1933; Moldenke, Brittonia 1: 289--290. 1934; Moldenke, Phytologia 1: 271. 1937; Moldenke, Phytologia 2: 91. 1944.

García y Barriga records the common names of "tatumo" and "queso fresco" and says it is a tree 3 to 8 meters tall, leafy, with white, very aromatic, few flowers, blooming in January, August, and December. The fruit, collected in December, is sparse and black. The tree is said to grow in coffee plantations at altitudes of 1120 to 1820 meters. García y Barriga's 12494 was originally mis-identified as A. sessiliflora Moldenke.

Additional citations: COLOMBIA: Cundinamarca: García y Barriga 10941 (W--1852169), 11009 (N), 12494 (N); Mutis 5191 [Macbride photos 30133] (F--photo of isotype, Kr--photo of isotype, N--photo of isotype). Tolima: García y Barriga 8386 (W--1774157).

AEGIPHILA VALERII Standl.

Literature: Standl., Journ. Wash. Acad. Sci. 15: 481. 1925; Hill, Ind. Kew. Suppl. 7: 6. 1929; Moldenke, Brittonia 1: 290--292. 1934; Moldenke, Phytologia 1: 272 (1937), 2: 91 (1944), and 2: 443, fig. 5. 1948; Standl., Field Mus. Publ. Bot. 18: 998. 1938; Matuda, Am. Midl. Nat. 44: 575. 1950.

Standley and Matuda add the following characters to the composite description of the species: trunk to 35 cm. in diameter; branchlets pale-tomentose; leaves opposite, short-petiolate; leaf-blades rather densely short-pilose beneath; cymes all axillary, sessile or short-pedunculate; pedicels very short or none; calyx puberulent; corolla-tube 3.5 mm. long. Matuda states that the tree is 7 to 8 meters tall, with a trunk to 60 cm. in diameter. It has been collected in anthesis in January and July and in fruit in January. It inhabits advanced forests at an altitude of about 1200 meters. It has been mis-identified as A. monstrosa Moldenke.

Additional citations: MEXICO: Chiapas: Matuda 2017 (F--918213, Mh, Mi, N), 4876 (Ld, Me, Me, Mh, N). COSTA RICA: Guanacaste: Standley & Valerio 45236 (F--642154); J. Valerio 148 (F--633311-photo of type).

AEGIPHILA VALLENSIS Moldenke

Literature: Moldenke, Phytologia 2: 129--130. 1946.

Additional citations: COLOMBIA: Valle del Cauca: Cuatrecasas 15115 (N), 15564 (N--type).

AEGIPHILA VENEZUELENSIS Moldenke

Steyermark describes this species as a shrub 15 feet tall, the membranous leaves dark-green above and dull pale-green beneath, growing in scrubby woods on mesas at an altitude of 1615 meters, fruiting in November.

Additional citations: VENEZUELA: Bolívar: Steyermark 60036 (F-1205149--isotype, N--type, N--photo of isotype, Si--photo of

isotype, Z--photo of isotype), 60263 (N, S).

AEGIPHILA VERRUCOSA Schau.

Literature: Schau. in DC., Prodr. 11: 650. 1847; Karst., Ausw. Neu. Sch. Gew. Venez. 31--32. 1848; Bocq., Adansonia 3: 188. 1862; Benth. & Hook., Gen. Pl. 2: 1151. 1876; Jacks., Ind. Kew. 1: 47. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Pittier, Pl. Usual. Venez. 416. 1926; Moldenke, Brittonia 1: 286--288. 1934; Moldenke, Phytologia 1: 272 (1937) and 2: 91. 1944; Pittier, Supl. Plant. Usual. Venez. 54. 1939. Lycium grandifolium Willd. ex Karst., Ausw. Neu. Sch. Gew. Venez. 32, in syn. 1848; Moldenke, Brittonia 1: 286, in syn. 1934. Brückea grandifolia (Willd.) Klotzsch & Karst. in Karst., Ausw. Neu. Sch. Gew. Venez. 32--33, pl. 10. 1848; Jacks., Ind. Kew. 1: 345. 1895; Moldenke, Brittonia 1: 286, in syn. 1934. Brückea eglandulosa Klotzsch & Karst. ex Moldenke, Brittonia 1: 286, in syn. 1934. Brückea verrucosa (Schau.) Klotzsch & Karst. ex Moldenke, Brittonia 1: 286, in syn. 1934. Brueckea eglandulosa Klotzsch & Karst. apud Hill, Ind. Kew. Suppl. 9: 41, in syn. 1938; Moldenke, Prelim. Alph. List Invalid Names 8, in syn. 1940. Brueckea verrucosa Klotzsch & Karst. apud Hill, Ind. Kew. Suppl. 9: 41, in syn. 1938; Moldenke, Prelim. Alph. List Invalid Names 8, in syn. 1940.

Steyermark describes the species as a shrub or tree 20 to 30 feet tall, the leaves ascending, subcoriaceous, dark-green above and pale-green beneath, the calyx pale-green with brownish excrescences, and the fruit roundish and pale-green in December. He says it grows in the lower woods on west- and southwest-facing slopes of mountains. Killip & Smith found it on scrubby slopes, fruiting in February. It has been collected at altitudes of 1675 to 2600 meters. Pittier lists the common name "chicharra". The label on the Macbride photos cited below says "Colombia" and "Moritz 896" in error. The Karsten collection also has "Columbien" on its labels in error.

Additional citations: COLOMBIA: Santander: Killip & Smith 19295 (W--1354567). VENEZUELA: Aragua: Allart 426 (F--photo, N--photo); Jahn 444 (F--photo, N--photo); Karsten s.n. [Colonia Tovar] (F--2 photos, N--2 photos); Moritz 897 [Macbride photos 28389] (F--photo of isotype, Kr--photo of isotype, N--photo of isotype); H. Pittier 9347 [Herb. Nac. Venez. 12616] (F--photo, N--photo, Ve). Federal District: Steyermark 55055 (N, S).

AEGIPHILA VERTICILLATA Vell.

Literature: Vell., Fl. Flum. 38 (1825), Icon. 1: 91. 1827; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 118 & 124. 1845; Schau. in DC., Prodr. 11: 648. 1847; Schau. in Mart., Fl. Bras. 9: 280. 1851; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Jacks., Ind. Kew. 1: 47. 1895; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 329--331. 1934; Moldenke, Phytologia 1: 272 (1937) and 1: 295--296. 1938; Moldenke, Prelim. List Invalid Names 4. 1940; Moldenke, Suppl. List Invalid Names 3. 1941.

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A NEW BYRSONIMA FROM PUERTO RICO

Elbert L. Little, Jr.

A distinct undescribed tree species of Byrsonima Rich. (family Malpighiaceae) has been noted during the preparation of an illustrated work on the trees of Puerto Rico by Frank H. Wadsworth and myself. Its formal publication with description from fresh specimens follows.

BYRSONIMA WADSWORTHII Little, sp. nov. (Subg. Macrozeugma Niedenzu, Sect. Acrotheca Niedenzu, Subsect. Brachyceras Niedenzu.) Arbor parva 5-8 m. alta, trunco 15-25 cm. diametro, multum ramificata, sempervirens. Ramuli grisei, dense adpresse tomentulosi demum glabri et fissiles. Stipulae basi connatae, ovatae, 2-3 mm. longae, acutae, adpresse tomentulosae. Folia opposita, petiolata, petiolis 3-10 (12) mm. longis, crassis, griseis, adpresse tomentulosis; laminae ellipticae interdum obovatae, 4-6 (3-8) cm. longae, 2.5-3 (2-5) cm. latae, basi rotundatae vel cuneatae, apice leviter retusae vel obtusae, coriaceae, margine revolutae, supra virides vel atrovirides, leviter nitidae, novellae leviter tomentosae adultae glabrae nisi ad costam et basim versus, venis primariis plerumque 4-6 utrinque, his cum costa paullo impressis, subtus griseae et dense adpresse tomentulosae. Racemi terminales, 3-7 cm. longi, pedicellis 5-10 mm. longis; rachis adpresse tomentulosa basim versis pilis griseis et pilis brunneis apicem versus atque in pedicellis; bractae 1-2 mm. longae, acutae, pilis brunneis. Flores 10-12 mm. lati. Sepala 5, ovata, 4 mm. longa, acuta, pilis brunneis, persistentia, basim 2 glandulas oblongas albas demum brunneas gerentia. Petala 5, 5-6 mm. longa, ungue et lamina fere aequalibus, reniformia, denticulata, alba demum rosea, patentia et leviter recurva. Torus pilis brunneis 2 mm. longis. Stamina 10, 4 mm. longa, filamentis 3 mm. longis, roseis, basim versus pilosis; antherae loculi pallide flavi, glabri, mucronulati; connectivum plus quam 1 mm. longum, oblongum, flavum, antheras loculos fere duplo superans. Ovarium ovoideum, plus quam 2 mm. longum, brunneum, triangulare, adpresse tomentulosum, 3-loculare; styli 3, gracili, 2 mm. longi, albi. Drupa globoso-ovoidea, 10-12 mm. longa, 8 mm. lata, rosea vel rubra, apicem acutum versus adpresse tomentulosa, leviter succulenta; putamen ovoideum 6-7 mm. longum et latum, apice acuto, verrucosum, albidum, osseum, 3 seminibus 4 mm. longis. Fig. 1.

Small tree 5-8 m. high, 15-25 cm. in trunk diameter, much branched, evergreen. Twigs gray, densely appressed tomentulose, at length glabrous and fissured. Stipules connate at base, ovate, 2-3 mm. long, acute, appressed tomentulose. Leaves opposite, petioled, with petioles 3-10 (12) mm. long, thick, gray, appressed tomentulose; blades elliptical or sometimes obovate, 4-6 (3-10) cm. long, 2.5-3 (2-5) cm. broad, base rounded or cuneate, apex slightly retuse or obtuse, coriaceous, margins revolute, above green or dark green, slightly shiny, when young slightly tomentulose but when mature glabrous except on midrib and toward base, primary veins usually 4-6 on each side, these with midrib slightly impressed, beneath gray and densely appressed tomentulose. Racemes terminal, 3-7 cm. long, with pedicels 5-10 mm. long; rachis appressed tomentulose with gray hairs toward base and with brown hairs toward apex and on pedicels; bracts 1-2 mm. long, acute, with brown hairs. Flowers 10-12 mm. broad. Sepals 5, ovate, 4 mm. long, acute, brown hairy, persistent, bearing 2 oblong glands 1 mm. long at base, white but at length brown. Petals 5, 5-6 mm. long, with claw and blade nearly equal, reniform, denticulate, white but at length pink, spreading and slightly recurved. Receptacle with brown hairs 2 mm. long. Stamens 10, 4 mm. long, filaments 3 mm. long, pink, hairy toward base, anther locules pale yellow, glabrous, mucronulate, connective more than 1 mm. long, oblong, yellow, nearly twice as long as anther locules. Ovary ovoid, more than 2 mm. long, brown, 3-angled, appressed tomentulose, 3-celled; styles 3, slender, 2 mm. long, white. Drupe globose-ovoid, 10-12 mm. long, 8 mm. broad, pink or red, appressed tomentulose near the acute apex, slightly fleshy; stone ovoid, 6-7 mm. long and broad with acute apex, verrucose, whitish, bony, with 3 seeds 4 mm. long. Fig. 1.

The compact dense crown of dark green foliage varies from broad and spreading to narrow. The bark is brown or dark brown, with many small fissures or slightly furrowed, 5 mm. or more in thickness. Inner bark is red streaked in outer part and pinkish beneath, bitter. The wood is light brown and hard. Flowering in summer (June to August) and maturing fruit in autumn (September and October).

Almendrillo is the common name generally applied to this tree. Another common name, used also for other species of the genus, is maricao.

It is a pleasure to associate with this well-defined species the name of Frank Howard Wadsworth, who first called my attention to it as an unidentified species of Byrsonima occurring on sample plots and who collected specimens from the type tree with

me in 1950 and 1952. Dr. Wadsworth, an authority on forestry in Puerto Rico, has been in charge of forest research at the Tropical Region, United States Forest Service, Río Piedras, Puerto Rico, since 1942.

Byrsonima Rich. is a tropical American species of more than 100 species of trees and shrubs. Niedenzu (Pflanzenreich Heft 91, 93, 94 (IV. 141), 870 p., illus. 1928) in his thorough monograph of family Malpighiaceae accepted 104 species of Byrsonima with additional varieties. A few other species have been published since. According to Niedenzu's key, Byrsonima wadsworthii belongs in Subg. Macrozeugma, Sect. Acrotheca, Subsect. Brachyceras, in which only 4 species were placed, including B. trinitensis Juss. and B. martinicensis Krug & Urban in the West Indies and 2 others of South America. The new species would be near the same 2 species in a separate key to the West Indian species of this genus published the same year by Niedenzu (Repert. Spec. Novarum Regni Veg. 24: 249-252. 1928) and in the key of the earlier monograph by Small (No. Amer. Fl. 25: 166-171. 1910).

Byrsonima wadsworthii is readily distinguished from the 5 species of this genus recorded from Puerto Rico by Britton and Wilson (Sci. Surv. P. R. 5: 446-448. 1924) by its elliptical coriaceous leaves densely and finely gray hairy beneath. The white petals turning pink separate it from all except B. lucida (Mill.) Rich., as the other 4 species have yellow flowers.

This new species has been collected in four separated mountainous areas of Puerto Rico and may be sought in others. Byrsonima wadsworthii is distributed chiefly in the dwarf forests on ridges along the mountain summits at elevations between 2,500 and 3,000 feet but sometimes occurs in mountain forests on slopes at slightly lower elevations. The main center of distribution is Luquillo Mountains, an isolated mountainous area in the northeastern part of the island and the home of many endemic species. There it has been collected at several places within the Luquillo Division of the Caribbean National Forest, including near La Mina Ranger Station (the type locality) in the central part of these mountains and in the northwestern part south of Río Grande and El Verde Ranger Station. One specimen was from Toro Negro Division of the Caribbean National Forest in mountains of the central part of Puerto Rico about 75 kilometers west of Luquillo Mountains.

In 1952 I collected it also within forests of the Commonwealth of Puerto Rico in two other parts of the island. One was at Bosque de Carite more than 30 kilometers southwest of Luquillo

Mountains, south of Caguas and also in the eastern mountains. The other was at Bosque de Guilarte, about 75 kilometers farther west, near Adjuntas and in the western mountains of Puerto Rico. On short field trips I found trees at two different localities in each of these two Commonwealth forests.

This new species is rare and scattered. Associated tree species in the dwarf forests of Luquillo Mountains include Clusia krugiana Urban, Micropholis garcinifolia Pierre, Tabebuia rigida Urban, and Hirtella rugosa Pers.

Puerto Rico has been so thoroughly explored by botanists in the past that a new species of trees is unexpected. However, this species remained undetected until recent years, after the mountainous areas have been made more accessible by automobile highways. The late flowering of this species in summer may account in part for its absence in collections made by botanists visiting the island in winter and spring.

In March 1934, Claud L. Horn, of the United States Department of Agriculture, then with the Forest Service, collected specimens in the Luquillo Mountains of the Caribbean National Forest. A duplicate sent to the New York Botanical Garden was "identifield by P. Wilson as probably a new species."

The National Herbarium of the United States National Museum contained one specimen of this species, collected by F. H. Sargent in the same area on July 4, 1938.

On July 7, 1939, Dr. Leslie R. Holdridge, while with the United States Forest Service, collected specimens also on the Luquillo Division and noted on the label that this species was not in Britton and Wilson's Botany of Porto Rico and the Virgin Islands. Luis E. Gregory, then with the U. S. Forest Service also, on Sept. 14 of the same year found this species on the Toro Negro Division of the Caribbean National Forest, in the central part of the island.

Mrs. Frances W. Horne, artist and botanist who has made numerous beautiful paintings of the plants of Puerto Rico, found this species on July 13, 1939, in Luquillo Mountains south of Río Grande. She reported seeing it near Maricao on July 29 of the same year. (Previously she had discovered another new species, Byrsonima horneana Britton & Small, near Mayaguez.) After making a painting of this unidentified species, she sent a specimen to Percy Wilson (1879-1944) at the New York Botanical Garden. He replied that it was a new species and that he was forwarding the specimen to Franz Niedenzu (1857-1937), of Germany,

the recognized authority on the family Malpighiaceae. However, Niedenzu was no longer living, and Wilson, whose health was declining, retired in 1939 also and died in 1944. The large Berlin Herbarium was destroyed in the late war, and the new species remained undescribed.

The specimens examined are cited below. Duplicates are being deposited in herbaria of the U. S. National Museum (US), U. S. Forest Service at Washington, D. C. (FS), U. S. Forest Service at Río Piedras, Puerto Rico (TR), and New York Botanical Garden (NY), and will be distributed to other herbaria.

PUERTO RICO. Caribbean National Forest, Luquillo Division: C. L. Horn 42 (NY, TR), March 1934, Río Blanco—Río La Mina ridge; F. H. Sargent 546 (US), July 4, 1938, El Yunque; L. R. Holdridge 57 (NY, TR), July 7, 1939, Pizá; F. H. Wadsworth Aug. 28, 1944 (TR), Pizá; D. B. Fanshawe 814 (TR), El Verde; E. L. Little, Jr., and F. H. Wadsworth 13575 (US, FS, TR), Aug. 9, 1950, on trail about 1 km. east of La Mina Ranger Station, from type tree; E. L. Little, Jr., 14799 (US, FS, TR), June 13, 1952, same locality; E. L. Little, Jr., 14802 (US—HOLOTYPE, FS, TR, NY), June 13, 1952, same locality, from type tree; E. L. Little, Jr., and F. H. Wadsworth 14900 (US, FS, TR), Aug. 23, 1952, same locality, from type tree.

Caribbean National Forest, Toro Negro Division: L. E. Gregory 42 (NY), Sept. 14, 1939, Matrullas Road.

Bosque de Carite (near Cayey): E. L. Little, Jr., 14872 (US, FS, TR), Aug. 19, 1952.

Bosque de Guilarte (near Adjuntas): E. L. Little, Jr., 14853 (US, FS, TR), Aug. 5, 1952.

Figure 1 is a drawing made from a fresh specimen by Francisco Roena Santiago.

Forest Service, United States Department of Agriculture,
Washington, D. C., and
Facultad de Ciencias Forestales, Universidad de Los Andes,
Mérida, Venezuela.

Byrsonima wadsworthii Little

NEW GRASSES FROM GUATEMALA

Jason R. Swallen

TRISETUM ALTUM Swallen, sp. nov.

Culmi erecti, 135 cm. alti, glabri; vaginae retrorse scabrae; ligula hyalina, 5-8 mm. longa; laminae usque ad 30 cm. longae, firmae, infra scabrae, supra sparse pilosae; panicula 22 cm. longa, 4 cm. lata, ramis fasciculatis adscendentibus, inferioribus usque ad 10 cm. longis; glumae subaequales, acutae vel acuminatae 7-8 mm. longae; lemma infimum 8 mm. longum, scabrum, minute dentatum, arista geniculata, contorta, 6 mm. longa, supra basin 1/2 inserta.

Perennial; culms erect, 135 cm. high, glabrous; sheaths much shorter than the internodes, rather prominently retrorsely scabrous; ligule hyaline, 5-8 mm. long; blades as much as 30 cm. long, 3-4 mm. wide, firm, strongly nerved, very scabrous on the under surface, sparsely pilose with long hairs on the upper; inflorescence 22 cm. long, about 4 cm. wide, the branches in somewhat distant fascicles, ascending, the lower ones as much as 10 cm. long with shorter ones intermixed; glumes narrow, acute or acuminate, scabrous on the keel, the first 7 mm. long, 1-nerved, the second 8 mm. long, 3-nerved; lower lemma 8 mm. long, scabrous, minutely toothed, awned from just above the middle of the back, the awn about 6 mm. long, twisted and contorted in the lower part.

Type in the U. S. National Herbarium, No. 1,935,005, collected in pine woods east of Finca Piamonte, El Progresso, Guatemala, Feb. 11, 1952, by Julian A. Steyermark (No. 43,836).

TRISETUM ANGUSTUM Swallen, sp. nov.

Culmi erecti vel adscendentes, 12-24 cm. alti; vaginae glabrae vel inferiores pubescentes; laminae 3-8 cm. longae, 1 mm. latae, glabrae vel sparse pilosae, inferiores dense pilosae; paniculae 4-8 cm. longae, angustae, ramis distantibus appressis; spiculae 2-florae; glumae acutae vel acuminatae, 1-nerves, prima 3.5-4 mm. longa, secunda latior 4-5 mm. longa; lemma inferius 4.5 mm. longum, scaberulum, minute dentatum, mucronatum.

Perennial; culms slender, densely tufted, erect or ascending, 12-24 cm. high; sheaths glabrous or the lower ones pubescent; blades 3-8 cm. long, 1 mm. wide, those of the innovations densely pilose, those of the culm glabrous or sparsely pilose; panicles 4-8 cm. long, very narrow, the few rather distant branches closely appressed; spikelets 2-flowered; glumes acute or acuminate, 1-nerved, the first narrow, 3.5-4 mm. long, the second broader, 4-5 mm. long; lower lemma 4.5 mm. long, scaberulous, the tip minutely and irregularly toothed, the midnerve excurrent in a very short mucro.

Type in the herbarium of the Chicago Natural History

Museum, No. 1,046,546, collected on top of dry ridge in pine forest, between San Sebastian and summit of Volcán Tajumulco, San Marcos, Guatemala, Feb. 13, 1940, by Julian A. Steyermark (No. 35,525).

TRISETUM PINETORUM Swallen, sp. nov.

Culmi graciles, erecti vel adscendentes, 35-70 cm. alti, glabri; vaginae glabrae, suprema elongata; ligula hyalina, 2-3 mm. longa; laminae lineares, elongatae, 1-2 mm. latae, scaberulae; paniculae 8-15 cm. longae, angustae, plus minusve densae, interruptae, ramis inferioribus ca. 3 cm. longis; spiculae 3-florae; glumae subaequales, acutae; lemma inferius 6 mm. longum summo scabrum, dentatum, arista geniculata contorta 10-12 mm. longa supra basin 1/2 inserta.

Perennial; culms slender, tufted, erect or ascending, 35-70 cm. high, glabrous; sheaths mostly shorter than the internodes, the uppermost elongate, glabrous; ligule hyaline, 2-3 mm. long; blades linear, elongate, 1-2 mm. wide, scaberulous; panicles 8-15 cm. long, narrow, rather dense, somewhat interrupted, the lower branches about 3 cm. long, appressed; spikelets 2-flowered; glumes subequal, acute, the first 1-nerved, the second 3-nerved; lower lemma 6 mm. long, smooth below, scabrous above, the tip lacerate-toothed, the awn inserted about the middle of the back, 10-12 mm. long, geniculate, twisted below the bend.

Type in the herbarium of the Chicago Natural History Museum, No. 1,048,257, collected on pine-abies-clad slope, Volcán Santo Tomás, Quezaltenango, Guatemala, Jan. 22, 1940, by Julian A. Steyermark (No. 34,824).

This species resembles Trisetum evolutum, but differs in having glabrous culms and sheaths and the second glume 3-nerved.

CALAMAGROSTIS VULCANICA Swallen, sp. nov.

Culmi caespitosi, erecti, 40-80 cm. alti; vaginae glabrae; ligula brevissima; laminae convolutae, firmae, infra glabrae vel scaberulae supra dense pilosae; paniculae 8-14 cm. longae ramis gracilibus divergentibus, inferioribus usque ad 7 cm. longis in parte inferiore nudis; glumae aequales, 6-7 mm. longae, acuminatae; lemma 5 mm. longum, scabrum, nervis excurrentibus, arista 10 mm. longa, geniculata, pilosa, supra basin 1/2 inserta; calli pili 2 mm. longi; rachilla 2 mm. longa dense villosa pilis 2 mm. longis.

Perennial; culms densely tufted, erect, 40-80 cm. high; sheaths smooth or nearly so, usually longer than the internodes, the lower ones crowded; ligule very short, not visible from the side on the lower leaves; blades convolute, firm, up to 40 cm. long, more or less curved, smooth or scaberulous on the under surface, strongly nerved and rather densely pilose above, especially toward the base; panicles pyramidal, 8-14 cm. long, the slender, spreading to recurved branches in rather distant

fascicles, the lower ones as much as 7 cm. long, naked below the middle; spikelets 6-7 mm. long, the glumes equal, acuminate, 3-5-nerved; lemma 5 mm. long, scabrous, the tip hyaline, the nerves excurrent, awned from about the middle of the back, the awn about 10 mm. long, geniculate, tightly twisted below the bend, appressed pilose; callus hairs dense, about 2 mm. long; rachilla 2 mm. long, densely hairy, the hairs about 2 mm. long.

Specimens of this species were formerly referred to C. junciformis, but are readily distinguished by the short ligule, pilose blades, and pilose awn.

Type in the U. S. National Herbarium, No. 1,637,886, collected on Volcán Santa Maria, Quezaltenango, Guatemala, by Alexander F. Skutch (No. 836).

DIGITARIA OBTUSA Swallen, sp. nov.

Culmi erecti vel geniculati, ca. 50 cm. alti; vaginae internodia aequantes, glabrae vel inferiores marginibus sparse pilosae; laminae 9-13 cm. longae, 3-4 mm. latae, acuminatae, glabrae vel sparse pilosae; racemi 5, 8-10 cm. longi; spiculae densae, 2.2 mm. longae, sparse vel dense pilosae; gluma prima nulla; gluma secunda fructo 1/3-1/2 brevior, 3-nervis; lemma sterile fructum aequans, 5-nerve; fructus acutus, striatus, brunneus.

Perennial; culms erect, geniculate at the lower nodes, about 50 cm. high; sheaths about as long as the internodes, glabrous, or the lower ones sparsely pilose on the margins; blades 9-13 cm. long, 3-4 mm. wide, flat, acuminate, glabrous, or sparsely pilose toward the base; racemes 5, 8-10 cm. long, stiffly ascending, spikelet-bearing to the base, pilose in the axils; spikelets mostly in 3's, crowded, 2.2 mm. long; first glume wanting; second glume and sterile lemma sparsely to rather densely pilose between the nerves with capitate hairs, the glume obtuse, 3-nerved, 1/2-2/3 as long as the fruit, the lemma 5-nerved, equalling the fruit; fruit acute, dark brown, striate.

Type in the U. S. National Herbarium, No. 795,987, collected at Coban, Alta Verapaz, Guatemala, August 1912, by H. von Turckheim (No. 3,793).

This species has been referred to Digitaria villosa (Walt.) Muhl. which differs in having the racemes naked or nearly so at the base, less crowded spikelets, and longer, acute second glume. Several specimens from southern Mexico also may be referable to this species.

ICHNANTHUS BREVIVACINATUS Swallen, sp. nov.

Culmi decumbentes ramis adscendentibus 20-30 cm. longis; vaginae internodiis multo breviores, dense pilosae; laminae lanceolatae, acuminatae, usque ad 9 cm. longae, 15 mm. latae, infra scabrae, supra glabrae; paniculae terminales et axillares, 4-7 cm. longae, ramis appressis vel adscendentibus; spiculae 4 mm. longae; gluma prima acuta, spicula 1/2 brevior, vel

acuminata spiculam aequans; gluma secunda acuminata, lemmati sterili paulo longior; fructus 2.5 mm. longus, acutus, basi appendicibus nullis.

Annual; culms widely decumbent-spreading, the ascending flowering branches 20-30 cm. long; sheaths mostly 15-20 mm. long, much shorter than the internodes, usually rather densely pilose; blades lanceolate, as much as 9 cm. long, 15 mm. wide, acuminate, scabrous below, smooth above, the cells readily visible with a lens on the under surface; panicles terminal and sometimes axillary from the upper sheath, 4-7 cm. long, the branches appressed or ascending, the branchlets and spikelets appressed; spikelets 4 mm. long; first glume acute, about half as long as the spikelet to acuminate or attenuate and nearly as long as the spikelet, scabrous on the keel; second glume acuminate, usually longer than the acute sterile lemma; fruit 2.5 mm. long, acute, the wings reduced to scars.

Type in the U. S. National Herbarium, No. 1,867,601, collected on high ridge, Swasey Branch, Monkey River, Toledo District, British Honduras, March 14, 1942, by Percy H. Gentle (No. 3,971).

The only other species of Ichnanthus having the cells plainly visible on the under surface of the blades is I. axillaris which has shorter and broader ovate blades.

ICHNANTHUS GRACILIS Swallen, sp. nov.

Culmi graciles, decumbentes, elongati, ramis adscendentibus ca. 15 cm. longis; vaginae glabrae vel sparse pilosae, marginibus ciliatae; laminae 3-5.5 cm. longae, 4-7 mm. latae, lanceolatae, supra sparse papilloso-hispidae; paniculae ca. 3 cm. longae, angustae, pauciflorae; spiculae 3 mm. longae; gluma prima abrupte acuminata glumam secundam aequans vel paulo brevior; gluma secunda et lemma sterile subaequalia, gluma acuta, lemma subobtusum; fructus 2 mm. longus, lucidus, basi appendicibus nullis.

Annual?; culms slender, creeping, branching, elongate, glabrous, the flowering branches ascending, mostly about 15 cm. long; sheaths glabrous or sparsely pilose, the margins ciliate; blades 3-5.5 cm. long, 4-7 mm. wide, lanceolate, acute, scabrous on the margins, sometimes sparsely papillose-hispid on the upper surface toward the base; panicles about 3 cm. long, narrow, few-flowered, short-exserted or partly enclosed in the sheath; spikelets 3 mm. long; first glume abruptly acuminate, equaling the second glume or a little shorter, scabrous on midnerve; second glume and sterile lemma subequal, the glume acute, the lemma sub-obtuse; fruit 2 mm. long, smooth and shining, the wings reduced to scars.

Type in the herbarium of the Chicago Natural History Museum, No. 1,045,455, collected on top of ridge of Loma de la Poloma, above Finca El Porvenir, San Marcos, Guatemala, March 8, 1940, by Julian A. Steyermark (No. 37,293).

LASIACIS LINEARIS Swallen, sp. nov.

Culmi vagantes, ramis adscendentibus ca. 75 cm. longis; vaginae dense villosae internodiis longiores; ligula 2-4 mm. longa; laminae lineares, acuminatae, 16-22 cm. longae, 5-9 mm. latae, scabrae vel sparse pilosae; panicula 30 cm. longa, ramis gracilibus, solitariis, scabris, anguste adscendentibus, paucifloris; spiculae 4 mm. longae, pedicellis longis, erectis.

Culms relatively slender, straggling, the flowering branches about 75 cm. long; sheaths densely villous, as long as or longer than the internodes; ligule 2-4 mm. long, brown; blades linear, acuminate, narrowed toward the base, 16-22 cm. long, 5-9 mm. wide, scabrous, sometimes sparsely pilose; panicle about 30 cm. long, the slender scabrous branches rather narrowly ascending, solitary, distant, bearing a few long-pedicellate spikelets; spikelets 4 mm. long, usually erect.

Type in the herbarium of the Chicago Natural History Museum, No. 1,044,422, collected in pine-covered canyon bordering Río Lima, Sierra de las Minas, below Finca Alejandria, Zacapa, Guatemala, Oct. 14, 1939, by Julian A. Steyermark (No. 30,046).

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ADDITIONAL NOTES ON THE GENUS AEGIPHILA. XIII

Harold N. Moldenke

AEGIPHILA Jacq.

To the List of Excluded Species should be added Aegiphila triflora Moldenke, Suppl. List Invalid Names 1, in syn. = Clerodendrum tessmanni Moldenke.

An additional synonym of Aegiphila virgata Turcz. is Cornutia brasiliensis Miers ex Turcz., Bull. Soc. Nat. Mosc. 36 (2): 220, in syn. 1863; Moldenke, Prelim. Alph. List Invalid Names 23, in syn. 1940. Since Aegiphila virgata Turcz. is based on a Miers specimen from Rio de Janeiro and Cornutia brasiliensis Miers is synonymous with it, and since Cornutia brasiliensis Mart. is a synonym of Arrabidaea corchorioides (Cham.) P. DC. [see Fedde, Repert. 40: 196. 1936] in the Bignoniaceae, it seems very probable that Aegiphila virgata, long a perplexing name [see Brittonia 1: 469--470. 1934] is also synonymous with Arrabidaea corchorioides. The original description of Aegiphila virgata agrees very well with the characters of Arrabidaea corchorioides.

Line 97a on page 271 of my key to the species and varieties of Aegiphila in Brittonia 1 (1934) should read: 97a. Branchlets tomentulose-puberulent, puberulent, furfuraceous, or pulverulent. Line 114 on page 273 should lead to: 79. A. laxicupulis.

So many persons have asked me to explain the sense in which I use various descriptive terms for leaves and flowers in my publi-

cations on the Verbenaceae and other groups, that my good friend, Mr. Fred Oswald, has, at my request, kindly prepared two plates of figures to illustrate my conception of the meaning of some of these terms.

Explanation of Plate I

1. Infundibular corolla
2. Hypocrateriform corolla
3. Corolla with reflexed limb
4. Narrow-tubular calyx
5. Obconic calyx
6. Campanulate calyx, constricted above the ovary
7. Campanulate calyx, narrowed toward the base
8. Cyathiform calyx
9. Broad-tubular calyx
10. Cupuliform calyx
11. Truncate entire calyx-rim
12. Subtruncate apiculate calyx-rim
13. Subtruncate mucronate calyx-rim
14. Subtruncate aristate calyx-rim
15. Repand-sinuate calyx-rim
16. Dentate calyx-rim
17. Lobed calyx-rim
18. Parted calyx-rim
19. Cucullate calyx
20. Female-predominant flower
21. Male-predominant flower

Explanation of Plate II

1. Rounded leaf-apex
2. Acute leaf-apex
3. Acuminate leaf-apex
4. Caudate leaf-apex
5. Apiculate leaf-apex
6. Cordate or emarginate leaf-apex
7. Cordate leaf-base
8. Rounded leaf-base
9. Acute leaf-base
10. Acuminate leaf-base
11. Cuneate leaf-base

AEGIPHILA ACULEIFERA Moldenke

This species may be inserted in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by the following corrections and interpolations after line 48a on page 266:

48'. Branchlets and peduncles armed with prickles..... 49a. A. aculeifera.

48'a. Branchlets and peduncles unarmed.

49. Branchlets glabrate, yellowish, shiny.....53. A. laeta.

AEGIPHILA BREVIFLORA (Rusby) Moldenke

Literature: Moldenke, Phytologia 1: 95 (1934), 1: 190--192

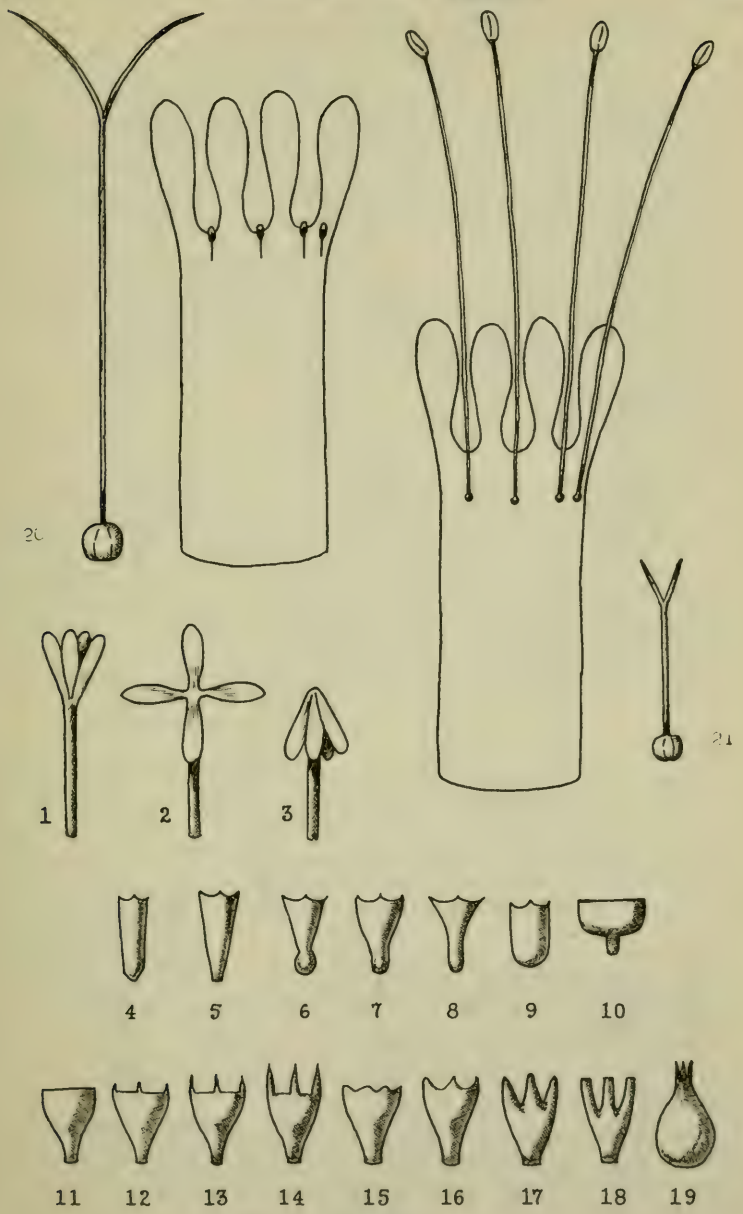
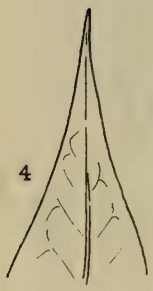


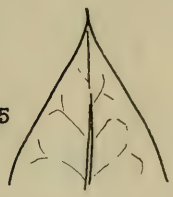
Plate I


1


2


3


4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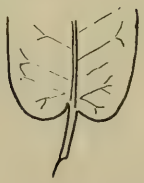
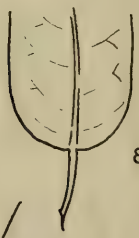

7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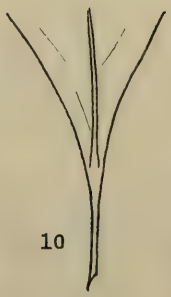
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11

Plate II

(1937), and 4: 349. 1953. Pseudaegiphila breviflora Rusby, Mem. N. Y. Bot. Gard. 7: 341. 1927; Moldenke, Phytologia 1: 95, in syn. (1934) and 1: 190, in syn. 1937.

This species may be inserted in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by placing the following corrections and interpolations after line 60a on page 267:

62. Blades dentate or sinuate along the margins.
  62'. Blades callous-dentate along the margins..... 39a. A. breviflora.
  62'a. Blades not callous-dentate.
    63. Blades conspicuously and sharply serrate throughout.
      64. Branchlets and blades granulose or furfuraceous-pubescent; Costa Rican.....52. A. odontophylla.
      64a. Branchlets and blades variously pubescent, but not granulose or furfuraceous; South American..... 42. A. integrifolia.
    63a. Blades obtusely crenate or sinuate.....35. A. crenata.

AEGIPHILA CANDELABRUM Briq.

This species should be inserted in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by the following corrections and interpolations after line 135a on page 276:

137. Inflorescence more or less conglobate-capitate.
  137'. Lower leaf-surface densely subvelutinous-pubescent; calyx densely spreading-pubescent.....99. A. candelabrum.
  137'a. Lower leaf-surface more or less densely or very sparsely short-pilose or even subglabrate; calyx sparsely appressed-pubescent or pilose.

AEGIPHILA CONTURBATA Moldenke

Literature: Moldenke in Fedde, Repert. 37: 210. 1934; Moldenke, Phytologia 1: 194--195 (1937), 2: 61 (1941), and 2: 434. 1948.

This species may be inserted in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by the insertion of the following corrections and interpolations after line 66 on page 268:

67. Brazilian species.
  68. Petioles 7 mm. long or less; leaf-blades with short, straight, strigose pubescence beneath; calyx densely pubescent.....44. A. intermedia.
  68a. Petioles 15--25 mm. long; leaf-blades densely incanous-tomentose beneath; calyx densely villous..... 44b. A. conturbata.

67a. Guianan species.
  68'. Branchlets densely villous-lanate with long hairs; petioles densely villous; leaf-blades densely villous-lanate or -tomentose beneath even in age; calyx 6--7.5 mm. long, densely tomentose or villous.....45. A. villosa.

68'a. Branchlets densely villous with very short hairs; petioles canescent-pubescent; mature leaf-blades lanate-tomentose or merely canescent and densely punctate beneath; calyx ca. 3 mm. long, densely strigose..... 43. A. guianensis.

AEGIPHILA GLANDULIFERA var. PYRAMIDATA L. C. Rich. & Moldenke

This variety may be inserted in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by the insertion of the following corrections and interpolations after line 90a on page 270:

91. Branchlets short-pilose or strigillose.
  92. Blades densely impressed-punctate beneath, not glanduliferous; pubescence on branchlets, petioles, and lower leaf-surfaces spreading, not at all appressed; leaves usually undate in drying, thin-membranous..... 65. A. membranacea.
  92a. Blades marked with numerous black glandular disks along the midrib beneath, not impressed-punctate; pubescence on branchlets, petioles, and lower leaf-surfaces appressed-strigillose; leaves not undate, thin-chartaceous..... 62b. A. glandulifera var. pyramidata.

AEGIPHILA GRAVEOLENS Mart. & Schau.

Literature: Schau. in A. DC., Prodr. 11: 651. 1847; Schau. in Mart., Fl. Bras. 9: 284 & 285. 1851; Jacks., Ind. Kew. 1: 46. 1895; Moldenke, Brittonia 1: 304--305. 1934; Moldenke, Phytologia 1: 205--206 (1937), 1: 292 (1938), 1: 389 (1940), 2: 395 (1947), and 4: 354. 1953; Kuhlmann & Kühn, Flor. Distr. Ibiti 116 & 180. 1947.

AEGIPHILA HOEHNEI Moldenke

Literature: Moldenke, Phytologia 1: 224--226 (1937), 1: 292 (1938), and 1: 390. 1940; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 345--346. 1951.

The species may be inserted in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by the insertion of the following corrections and interpolations after line 132a on page 275:

130a. Blades not as described above.
  132'. Blades setose above with stiff bulbous-based hairs 1-2.5 mm. long.....115a. A. hoehnei.
  132'a. Blades not setose above, merely scabrous or short strigose-hirtous.

AEGIPHILA LANCEOLATA Moldenke

The F. C. Hoehne 5702 cited by me in Brittonia 1: 473 (1934) as A. vitelliniflora Klotzsch and in Phytologia 1: 296 (1938) as A. lanceolata, is now the type collection of A. mattogrossensis.

AEGIPHILA MATTOGROSSENSIS Moldenke

The type collection of this species was originally cited by me in Brittonia 1: 473 (1934) as A. vitelliniflora Klotzsch and in Phytologia 1: 296 (1938) as A. lanceolata Moldenke.

AEGIPHILA MOLLIS H.B.K.

The d'Orbigny 1086 cited by me in Phytologia 1: 239 (1937) as this species is actually A. steinbachii Moldenke.

AEGIPHILA MONTICOLA Moldenke

This species may be inserted in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by the insertion of the following corrections and interpolations after line 62a on page 267:

65. Leaf-blades acute at base, not noticeably attenuate into the slender petiole.
  65'. Petioles to 4 mm. long; calyx 2--4 mm. long and ca. 3 mm. wide; Brazilian.....33. A. lhotzkiana.
  65'a. Petioles 12--15 mm. long; calyx ca. 5.7 mm. long and 4.1 mm. wide; Ecuadorian.....32a. A. monticola.
65a. Leaf-blades acuminate or cuneate at base, attenuate into the often stout petiole.

AEGIPHILA NERVOSA Urb.

Literature: Urb., Symb. Ant. 3: 366--367. 1903; Prain, Ind. Kew. Suppl. 3: 4. 1908; Urb., Symb. Ant. 8: 600. 1921; Moldenke, Brittonia 1: 467--468. 1934; Moldenke, Phytologia 1: 251 (1937) and 2: 446. 1948. A. subopposita Urb. & Ekm., Archiv Bot. 22a (17): 109. 1929; Moldenke, Brittonia 1: 467, in syn. 1934.

Dr. A. C. Smith, on February 26, 1932, kindly examined for me in the Urban Herbarium at Berlin the Swartz s.n. from Jamaica and the Ekman 472 and 518, Picarda 171 and 1418, Buch 1239 and 1949, and Christ 1946, 1992, and 2229 from Haiti. He reported as follows: "The Haiti specimens are certainly conspecific. Concerning their identity with the fragment from Jamaica I am less certain. The young leaf of the fragment is similar to those of [the] Haiti specimens. The remaining calyx of the fragment is a trifle less pilose than [that of the] others; however, I conclude that all the above specimens are one species."

AEGIPHILA RACEMOSA Vell.

This species should also be included in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by the insertion of the following corrections and interpolations after line 134a on page 276:

141. Venation very prominent beneath.
  141'. Petioles 3--5 mm. long; leaf-blades mostly broadest slightly above the middle; Jamaican and Haitian..... 125. A. nervosa.
  141'a. Petioles 6 mm. long or longer; leaf-blades mostly broadest below the middle; from Colombia to Brazil..... 115. A. racemosa.

141a. Venation not especially prominent beneath.

AEGIPHILA SALTICOLA Moldenke

This species may be inserted in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by the insertion of the following corrections and interpolations after line 67a on page 268:

66a. Branchlets incanous, sericeous, or appressed-pubescent.
69. Leaf-blades very large, to 35 cm. long and 15 cm. wide; peduncles 2--5 cm. long; calyx 5--8 mm. long..... 42. A. integrifolia.
69a. Smaller throughout; leaf-blades to 19 cm. long; peduncles 1--2 cm. long; calyx 4--5 mm. long.
69'. Petioles to 1.2 cm. long, mostly much shorter; leaf-blades not punctate above; inflorescence axillary; fruiting-calyx lightly pubescent, canescent, or glabrescent.
70. Leaf-blades with numerous black glandular disks beneath; secondaries 7 or 8 pairs; cymes corymbose; calyx about 5 mm. long, densely villous..... 34. A. paraguariensis.
70a. Leaf-blades without glandular disks; secondaries 10--15 pairs; cymes conglobate or capitate; calyx about 4 mm. long, canescent or subsericeous..... 39. A. sellowiana.
69'a. Petioles to 3.5 cm. long; leaf-blades densely punctate with minute elevated punctae above; inflorescence supra-axillary; fruiting-calyx densely subvillous..... 44a. A. salticola.

AEGIPHILA SCANDENS Moldenke

This species may be inserted in my key to the species and varieties of Aegiphila as published in Brittonia 1 (1934) by the insertion of the following interpolations after line 106a on page 272:

106'. Branchlets furfuraceous-puberulent.....63a. A. scandens.
106'a. Branchlets not furfuraceous.

AEGIPHILA VERTICILLATA Vell.

Literature: Vell., Fl. Flum. 38 (1825), Icon. 1: 91. 1827; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 118 & 124. 1845; Schau. in A. DC., Prodr. 11: 648. 1847; Schau. in Mart., Fl. Bras. 9: 280. 1851; Warming, Symb. Flor. Bras. Cent. 23: 712. 1877; Jacks., Ind. Kew. 1: 47. 1895; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 329--331. 1934; Moldenke, Phytologia 1: 272 (1937) and 1: 295--296. 1938; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio Jan. 37: 334, in syn. 1943; Stellfeld, Trib. Farmac. 19 (10): 170. 1951; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 346. 1951. A. tomentosa Cham., Linnaea 7: 110--111. 1832; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 121. 1845; Schau. in A. DC., Prodr. 11: 648. 1847; Schau. in Mart., Fl. Bras. 9: 279--281. 1851; Warming,

Symb. Fl. Bras. Cent. 23: 712. 1877; Jacks., Ind. Kew. 1: 47. 1895; Rusby, Mem. Torr. Bot. Club 6: 107. 1896; Rusby, Bull. Torr. Bot. Club 27: 81. 1900; Hayek, Denkschr. Kaiser. Akad, Wissensch. Math.-nat. 79 (1): 296. 1908; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 546. 1911; Usteri, Flor. Umgeb. Staat São Paulo 228. 1911; Donn. Sm., Bot. Gaz. 57: 426. 1914; F. C. Hoehne, Alb. Secc. Bot. Mus. Paul. 130 & 144. 1925; Moldenke, Brittonia 1: 329, in syn. 1934; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio Jan. 37: 334. 1943. A. rotundifolia Sellow ex Moldenke, Brittonia 1: 329, in syn. 1934. A. lanata Casar. ex Moldenke, Phytologia 1: 272, in syn. 1937. Egiphila lanata Casar. ex Moldenke, Suppl. List Invalid Names 3, in syn. 1941.

Pickel describes this species as a shrub growing on high campos, producing white flowers; Mello Barreto calls it a cespitose shrub 50 cm. tall. It has been collected in flower in April, November, and December, and in fruit in March and April. The W. Hoehne s.n. collection cited below consists of cleaned seeds only. The trinomial Aegiphila tomentosa var. silvestris Regnell, cited as a synonym of this species by me in Brittonia 1: 329 (1934), is actually a synonym of A. sellowiana Cham., as has already been indicated by me in my Prelim. Alph. List Invalid Names 4 (1940).

Additional citations: BRAZIL: Minas Geraes: Casaretto 2624 [Macbride photos 24615] (F--686353, F--772035--photo, Kr--photo, N--photo); P. Clausen s.n. (F--photo, N--photo); Mello Barreto 11013 [Herb. Jard. Bot. Belo Horiz. 35312] (It, N, N); Regnell I.310 [1867] (Lu), s.n. [Herb. Rio de Jan. 44824] (Ja); Saldanha 7477 [Herb. Rio de Jan. 44823] (Ja). Paraná: Dusén 2450 [Herb. Rio de Jan. 44818] (Ja), 2484 [Herb. Rio de Jan. 31756] (Ja), 7236 (F--668478), s.n. [Jaguariahyva, May 1914] (Lu); Jönsson 405a (Br--photo, I--photo, Mi--photo). São Paulo: Brade 12099 [Herb. Rio de Jan. 44844] (Ja), 12122 [Herb. Rio de Jan. 44846] (Ja), 12396 [Herb. Rio de Jan. 44847] (Ja); Costa & Kiehl s.n. [Herb. Inst. Agron. Est. S. Paulo 4028a; Herb. Dept. Bot. Est. S. Paulo 42083] (Sp); A. Gehrt s.n. [Herb. Inst. Biol. S. Paulo 5489] (F--895963); Grotta 2383 (N); Guillemin 515 (F--photo, N--photo); W. Hoehne 852 (Mg, N), 2254 (N), 2381 (N), 2382 (N), s.n. [23/3/1946] (N, Sp); Hoehne & Gehrt s.n. [Herb. Inst. Biol. S. Paulo 36883] (N); Moldenke & Moldenke 19659 (Es, Lg, Mg, Mr, N, No, Ot, S, Sm); Pickel 2457 (N, Sf); Roth L. 920 [Herb. Inst. Bot. S. Paulo 51910] (N); Schwacke s.n. [Herb. Rio de Jan. 44803] (Ja); Sellow 5122 [Macbride photos 17589] (F--663018--photo, Kr--photo, N--photo). PARAGUAY: Hassler 11260 (F--photo, N--photo).

AEGIPHILA VILLOSA (Aubl.) Gmel.

Literature: Gmel., Syst. Nat. 2: 259. 1789, 1791, & 1796; Lam., Illustr. 1504, pl. 70, fig. 2. 1791; Lam., Tabl. Encycl. Méth. 1: 294. 1792; Vahl, Eclog. 1: 16. 1796; Willd., Sp. Pl. 1:

616. 1797; Raeusch., Nom. Bot. 37. 1797; Gmel. [Turton], Gen. Syst. Nat. 5: 219. 1802; Pers., Syn. Pl. 1: 132. 1805; Andr., Bot. Rep. 9: 578. 1809; Poir., Encycl. Méth. Suppl. 1: 150--151. 1810; Pers., Sp. Pl. 1: 339. 1817; Roem. & Schult., Syst. Veg. 3: 101. 1818; Steud., Nom. Bot., ed. 1, 1: 16. 1821; Willd., Nom. Bot., ed. 2, 82. 1821; Spreng., Syst. Veg., ed. 16, 1: 422. 1825; Dietr., Syn. Pl. 1: 429. 1839; Steud., Nom. Bot., ed. 2, 1: 29. 1840; Walp., Repert. 4: 121. 1845; Schau. in A. DC., Prodr. 11: 649--650. 1847; Bocq., Adansonia 3: 190. 1862; Pritzel, Icon. Bot. Ind. 1: 23. 1866; Jacks., Ind. Kew. 1: 47. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 546. 1911; van Wijk, Dict. Pl. Names 1911 & 1916; Stapf, Ind. Lond. 1: 79. 1929; Le Cointe, Amaz. Bras. III. Arv. e Pl. Uteis 83. 1934; Moldenke, Brittonia 1: 342--343. 1934; Martyn, Ind. Phan. Jenman Herb. 461, mss. 1937; Moldenke, Phytologia 1: 296 (1938) and 2: 91. 1944. Manabea villosa Aubl., Hist. Pl. Guian. 1: 62--63. 1775; Lam., Tabl. Encyc. Méth. 1: 294. 1792; Vahl, Eclog. 1: 16, in syn. 1796; Willd., Sp. Pl. 1: 616, in syn. 1797; Ruíz & Pav., Fl. Peruv. 1: 50. 1798; Pers., Syn. Pl. 1: 132, in syn. 1805; Andr., Bot. Rep. 9: 578, in syn. 1809; Poir., Encycl. Méth. Suppl. 1: 150--151, in syn. 1810; Pers., Sp. Pl. 1: 339, in syn. 1817; Roem. & Schult., Syst. Veg. 3: 101, in syn. 1818; Willd., Nom. Bot., ed. 2, 82, in syn. 1821; Spreng., Syst. Veg., ed. 16, 1: 422, in syn. 1825; Cham., Linnaea 7: 110, in syn. 1832; Dietr., Syn. Pl. 1: 429, in syn. 1839; Walp., Repert 4: 121, in syn. 1845; Schau. in A. DC., Prodr. 11: 649, in syn. 1847; Jacks. Ind. Kew. 3: 160, in syn. 1895; Stapf, Ind. Lond. 4: 217. 1930; Moldenke, Brittonia 1: 342, in syn. 1934. Manabaea villosa Aubl. ex Gmel. [Turton], Gen. Syst. Nat. 5: 219, in syn. 1802; Steud., Nom. Bot., ed. 1, 1: 16, in syn. 1821; Steud., Nom. Bot., ed. 2, 1: 29, in syn. 1840; Moldenke, Brittonia 1: 342, in syn. 1934. Manabea tomentosa Perrottet ex Moldenke, Phytologia 1: 296, in syn. 1938. Aegiphila verbascifolia L. C. Rich. ex Moldenke, Prelim. Alph. List Invalid Names 4, in syn. 1940.

Van Wijk in the reference cited above records the vernacular name "bois de tabac", while Le Cointe records "camarà", "bois tabac", "camará", and "cambará". The Kuhlmann specimen cited below has its leaves smaller than usual for this species; the collector describes the plant as a tree 2 m. tall, with white flowers blooming in March. Fanshawe calls it a soft-wooded straggly second-growth tree to 20 feet tall, found in burned forest land on brown sand, all parts of the plant being white-woolly, the flowers in axillary corymbose cymes, pale-yellow, the calyx woolly, and the leaves soft-pubescent above, woolly beneath, blooming in September.

Additional citations: BRITISH GUIANA: Fanshawe 6327 [Herb. Forest Dept. Br. Guiana 6327; F.2997] (N, S, Z); Jenman 4068 (F-photo, N--photo), 6869 (F--photo, N--photo). FRENCH GUIANA: Mélinon 145 (Bz--16830), 372 (Bz--16831); Poiteau s.n. (F--photo, N--photo). BRAZIL: Pará: J. G. Kuhlmann s.n. [Herb. Rio de Jan.

22547] (N).

AEGIPHILA VITELLINIFLORA Klotzsch

Literature: Walp., Repert. 4: 123. 1845; Schau. in A. DC., Prodr. 11: 653, in syn. 1847; Schomb., Vers. Fauna & Fl. Br. Guian. 959. 1848; Schau. in Mart., Fl. Bras. 9: 287, in syn. 1851; Walp., Ann. Bot. Syst. 5: 710. 1860; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Warming, Lagoa Santa 434. 1892; Jacks., Ind. Kew. 1: 47. 1895; Engl., Bot. Jahrb. 42: 172. 1909; Moldenke, Brittonia 1: 421--423. 1934; Moldenke, Phytologia 1: 296--297 (1937) and 2: 91. 1944; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 345. 1951. Aegiphila elata Cham., Linnaea 7: 114 (1832) apud Schau. in Mart., Fl. Bras. 9: 287, in syn. 1851 [not A. elata Sw., 1788]; Warming, Symb. Fl. Bras. Cent. 23: 713. 1877; Moldenke, Brittonia 1: 421, in syn. 1934. Distigma vitelliniflorum Klotzsch in Walp., Repert. 4: 123, in syn. 1845; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Moldenke, Brittonia 1: 421, in syn. 1934. Aegiphila cuspidata Mart. ex Schau. in A. DC., Prodr. 11: 653. 1847; Schomb., Vers. Fauna & Fl. Br. Guian. 959. 1848; Schau. in Mart., Fl. Bras. 9: 287--288 & 307. 1851; Bocq., Adansonia 3: 190. 1862; Pritzel, Icon. Bot. Ind. 1: 23. 1866; Warming, Symb. Fl. Bras. Cent. 23: 712. 1877; Jacks., Ind. Kew. 1: 46. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 166. 1895; Pulle, Enum. Vasc. Pl. Surinam. 403. 1906; Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 547. 1911; Herzog, Meded. Rijks Herb. Leid. 29: 48. 1916; Stapf, Ind. Lond. 1: 79. 1929; Moldenke, Brittonia 1: 421, in syn. 1934; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 345, in syn. 1951. Aegiphila cuspidata Mart. & Schau. ex Chodat, Pl. Hassler. 2: 504. 1904; Briq., Ann. Conserv. Jard. Bot. Genèv. 7-8: 318. 1904; Bull. Herb. Boiss., sér. 2, 4: 1167. 1904. Aegiphila cuspidata Rusby, Mem. Torrey Bot. Club 6: 107, nom. nud. 1896. Aegiphila cuspidata Klotzsch ex Hayek in Engl., Bot. Jahrb. 42: 172, in syn. 1909. Aegiphila cuspidata var. parviflora Schau. in A. DC., Prodr. 11: 653. 1847; Schau. in Mart., Fl. Bras. 9: 288. 1851; Moldenke, Brittonia 1: 421, in syn. 1934. Aegiphila cuspidata var. grandiflora Schau. in Mart., Fl. Bras. 9: 288. 1851; Moldenke, Brittonia 1: 421, in syn. 1934. Aegiphila aequinoctialis Mart., Fl. Bras. 9: 288, in syn. 1851; Moldenke, Brittonia 1: 421, in syn. 1934. Aegiphila compacta Mart. ex Moldenke, Phytologia 1: 296, in syn. 1937. Aegiphila stricta Sellow ex Moldenke, Prelim. Alph. List Invalid Names 4, in syn. 1940 [not A. stricta Rusby, 1920].

The species has been collected in the "mata", on the litoral, at the edge of lakes, and in thickets, in anthesis in July and from January through April. The Klug 2104 and 2204 cited by me as this species in Brittonia 1: 423 (1934) are actually A. chrysantha Hayek; likewise, the vernacular name "fetoró-ey", recorded by me in Brittonia 1: 423 (1934), Alph. List Common Names 12 (1939)m and Phytologia 2: 91 (1944), refers to A. chrysantha

rather than this species. The Balansa 2094 cited by Briquet in Ann. Conserv. Jard. Bot. Genèv. 7-8: 318 (1904) as A. cuspidata is actually A. lanceolata Moldenke. The Economic Herb. Oakes Ames 8224, cited below, has a label reading "Aegiphila Martinicensis Lam. India occid. Portorico, Adjuntas, in sylvis. XI.87. Sintenis. Lignum durum utile." It is stamped "Correct as to scientific name. Other data open to question."

Additional citations: BRAZIL: Bahia: Blanchet 3269 (F--2 photos, N--2 photos); Luschnath s.n. [Herb. Martius 1041] (F--633360--photo); H. P. Velloso 878 [Herb. Rio de Jan. 41486] (Ja). Ceará: Ducke 1459 [Herb. Rio de Jan. 5435] (Ja); Freire Allemão 1178 [Herb. Rio de Jan. 44809] (Ja). Espirito Santo: Bello 591 [Herb. Rio de Jan. 44799] (N), 628 [Herb. Rio de Jan. 44798] (Ja). Federal District: Brade 10588 [Herb. Rio de Jan. 44837] (N), 11403 [Herb. Rio de Jan. 44841] (N); Dalibôr Hafis s.n. [Herb. Rio de Jan. 44849] (N); Herb. Rio de Jan. 32252 (Ja); Rosa s.n. [Herb. Rio de Jan. 36511] (N). Minas Geraes: Sampaio 7272 [Herb. Rio de Jan. 44831] (Ja). Pernambuco: G. Gardner s.n. [1838] (F--photo, N--photo); Pickel 1084 (F--753743, Mi), Rio de Janeiro: Glaziou 807 (F--photo, N--photo); Sampaio 69 [Herb. Rio de Jan. 44825] (Ja), 3347 [Herb. Rio de Jan. 44826] (Ja), 7946 [Herb. Rio de Jan. 44833] (N), 7988 [Herb. Rio de Jan. 44834] (Ja), 8199 [Herb. Rio de Jan. 44835] (N), 8996 [Herb. Rio de Jan. 44836] (Ja); Schüch s.n. (F--photo, N--photo). State undetermined: Herb. Rio de Jan. 32252 (Ja), 44802 [Siqueira nas matas próximo de Inhomerim] (Ja). BOLIVIA: Santa Cruz: d'Orbigny 509 (F--photo, N--photo), 554 (F--photo, N--photo). CULTIVATED: Germany: Lystler s.n. [Cult. Hort. Berol. Sept. 1839] (F--642156 --photo of isotype, F--photo of type, N--photo of type), s.n. [June 1831] (F--photo, N--photo). LOCALITY OF COLLECTION UNDETERMINED: Economic Herb. Oakes Ames 8224 (Oa--8224).

AEGIPHILA WIGANDIOIDES Lundell

Literature: Lundell, Contrib. Univ. Mich. Herb. 8: 81--82. 1942; Moldenke, Known Geogr. Distrib. 28 & 175. 1949; Matuda, Am. Midl. Nat. 44: 575. 1950.

The species is said to grow in advanced forests, at an altitude of 1600 m., flowering in June. It is related to A. deppeana Steud., from which it may be distinguished by its denser persistent indumentum and larger calyx. It has a marked superficial resemblance to the genus Wigandia of the Hydrophyllaceae.

Additional citations: MEXICO: Chiapas: Matuda 4253 (Mh--isotype, N--isotype).

ADDITIONAL NOTES ON THE GENUS CHASCANUM. II

Harold N. Moldenke

CHASCANUM E. Mey.

Literature: L., Mant. 2: 251. 1771; Houtt., Handleid. Pl. & Kruidk. 9: 542--543, pl. 58, fig. 2. 1778; L. f., Suppl. Pl. 277 & 288. 1781 [and Japanese reprint, 1936]; L. f., Pflanzensyst., ed. Houtt., 8: 129--130. 1782; L. f., Syst. Veg., ed. 14 by J. A. Murray, 571. 1784; L. f., Syst. Veg., ed. 15 [14, revised] by Murray & Persoon, 608. 1797; Thunb., Prodr. Pl. Cap. 100. 1800; R. Br. in Salt, Voyage Abyss., append. lxiii ["lxii"]. 1814; Thunb., Fl. Cap., ed. Schultes, 466. 1823; E. Mey., Comment. Pl. Afr. Austr. 1 (1): lxiv (1836) and 1 (2): 275--277. 1837; Raf., Fl. Tellur. 2: 104. 1837; Schlecht., Linnaea Litt.-Bericht 11: 3--5. 1837; Harv., Gen. S. Afr. Pl., ed. 1, 269. 1838; Endl., Gen. Pl. 634. 1838; Walp., Linnaea 13: 451. 1839; Maund & Henslow, Botanist 4: 196. 1840; Hochst., Flora Intelligenzbl. 24, 1: 42. 1841; Meissn., Journ. Bot. Lond. 5: 60. 1843; Hochst., Flora 28: 68. 1845; Walp., Repert. 4: 38--39. 1845; Bot. Zeit. 3: 587. 1845; Schau. in A. DC., Prodr. 11: 557--560. 1847; Wight, Icon. Pl. Ind. Orient. 4 (3): 10, pl. 1461. 1849; Sonder, Linnaea 23: 86--87. 1850; Harv., Thesaur. Cap. 1: 18, pl. 28 (1859) and 2: 57--58, pl. 190. 1863; T. Anders., Journ. Proc. Linn. Soc. 5, Suppl. 28. 1860; Bocq., Adansonia 3: 235--237, pl. 16. 1863; R. Br., Miscel. Bot. Works 1: 93. 1866; Benth., Proc. Linn. Soc. Lond. 1866-1867: xvi. 1867; Harv., Gen. S. Afr. Pl., ed. 2, 290. 1868; Pritzel, Thesaur. Lit. Bot. 317, etc. 1872; Vatke, Linnaea 43: 529. 1882; Oliv. in Hook., Icon. Pl. 15: 37, pl. 1446. 1883; C. B. Clarke in Hook., Fl. Brit. Ind. 4: 564. 1885; Terrac., Bull. Soc. Bot. Ital. 1892: 421. 1892; Engl., Über Hochgeb. Trop. Afr. 355. 1892; Jacks., Ind. Kew. 1: 327, 507, & 733 and 2: 504, 564, & 567. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 149 & 153--154. 1895; Natur. Novit. 17: 121. 1895; Kuntze, Rev. Gen. Pl. 3 (2): 250 & 561. 1898; Kuntze, Jahrb. Königl. Bot. Gart. Berlin 4: 271. 1900; J. G. Baker in Thiselton-Dyer, Fl. Trop. Afr. 5: 281--283. 1900; Gürke, Notizbl. Königl. Bot. Gart. Berlin 3: 75--76. 1900; Durand & Jacks., Ind. Kew. Suppl. 1: 61. 1901; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 197--206. 1901; Post & Kuntze, Lexic. 167. 1903; Kuntze, Deutsch. Bot. Monatschr. 21: 173. 1903; Thiselton-Dyer, Ind. Kew. Suppl. 2: 28 & 57. 1904; Zahlbr., Annal. K. K. Naturhist. Hofmus. Wien 20: 45. 1905; H. H. W. Pearson, Trans. S. Afr. Philos. Soc. 15 (4): 176--180. 1905; Barnhart, Torreya 7: 177--182. 1907; Dalla Torre & Harms, Gen. Siphonog. 673 & 715. 1907; Prain, Ind. Kew. Suppl. 3: 27. 1908; Chiov., Annal. Bot. Roma 9: 127. 1911; J. M. Wood, Natal Pl. 6 (3): pl. 571. 1911; Jacks., Prod. Linn. Soc. Lond. 124, Suppl. Ind. Linn. Herb. 116. 1912; Prain, Ind. Kew. Suppl. 4: 28. 1913; Druce in Rep. Bot. Exch. Club Brit. Isles 1916: 610. 1917; Prain, Ind. Kew. Suppl. 5: 35. 1921; A. W. Hill,

Ind. Kew. Suppl. 6: 28. 1926; Grenz., Ann. Mo. Bot. Gard. 13: 17--100, pl. 8--12. 1926; Dinter in Fedde, Repert. Beiheft 53: 53. 1928; Stapf, Ind. Lond. 1: 484 (1929) and 2: 164. 1930; Moldenke, Phytologia 1: 18. 1933; A. W. Hill, Ind. Kew. Suppl. 8: 31. 1933; Moldenke, Torreya 34: 8--9. 1934; Junell, Symb. Bot. Upsal. 4: 21--30. 1934; Briq., Internat. Rules Bot. Nomen., ed. 3, 13--14. 1935; Moldenke in Fedde, Repert. 41: 129--143. 1936; Moldenke in Fedde, Repert. 45: 113--156, 45: 300--319, and 46: 1--12. 1938; Moldenke, Revist. Sudam. Bot. 6: 15--30. 1939; Moldenke, Prelim. Alph. List Invalid Names 7, 8, 15, 24, 26, 36, & 39. 1940; Ertdman, Svensk Bot. Tidsk. 39: 281--284. 1945; Moldenke, Suppl. List Invalid Names 2. 1941; Moldenke, Alph. List Invalid Names 6, 7, 12, 13, 23, 25, 36, & 39. 1942; Moldenke, Known Geogr. Distrib. 109, 110, 114, 116--121, 123, 124, 157, & 178. 1949.

Synonymy: Chascanum E. Mey., Comment. Pl. Afr. Austr. lxiv, nom. nud. (1836), 1: 275. 1837. Plexipus Raf., Fl. Tellur. 2: 104. 1837. Cascanum Maund & Henslow, Botanist 4: pl. 196, sphalm. 1840. Pleurostigma Hochst., Flora 24, Intell. 1: 42, nom. nud. 1841. Denisia Post & Kuntze ex Jacks., Ind. Kew. 1: 733. 1895. Deniseia Neck. ex Kuntze, Rev. Gen. Pl. 3 (2): 250 & 561. 1898. Deniseia Kuntze ex Post & Kuntze, Lexic. 167. 1903. Denisia Neck. ex Post & Kuntze, Lexic. 167. 1903. Gisania Ehrenb. ex Moldenke in Fedde, Repert. 45: 114, in syn. 1938. Marulea Schrad. ex Moldenke in Fedde, Repert. 45: 114, in syn. 1938. Marrulea Schrad. ex Moldenke in Fedde, Repert. 45: 114, in syn. 1938. Choscanum E. Mey. ex Moldenke in Fedde, Repert. 45: 114, in syn. 1938. Ragusia Schrad. ex Moldenke, Revist. Sudam. Bot. 6: 16, in syn. 1939. Ragasia Schrad. ex Moldenke, Revist. Sudam. Bot. 6: 16, in syn. 1939. Rhagasia Schrad. ex Moldenke, Revist. Sudam. Bot. 6: 16, in syn. 1939. Gizania Ehrenb. ex Moldenke, Prelim. Alph. List Invalid Names 26, in syn. 1940.

Erdtman in Svensk Bot. Tidsk. 39: 281--284 (1945) agrees with me in the segregation of this genus from the American genus Bouchea Cham. on the basis of the pollen morphology. In Chascanum he finds that the pollen grains are tricolporate, while in Bouchea they are triporate and of a very strange shape.

CHASCANUM ADENOSTACHYUM (Schau.) Moldenke

Literature: Moldenke, Torreya 34: 8. 1934; Moldenke in Fedde, Repert. 45: 140--142. 1938; Moldenke, Revist. Sudam. Bot. 6: 16. 1939; Moldenke, Prelim. Alph. List Invalid Names 7 & 15. 1940; Moldenke, Alph. List Invalid Names 6, 7, & 12. 1942; Moldenke, Known Geogr. Distrib. 110, 119, 121, & 178. 1949. Bouchea adenostachya Schau. in A. DC., Prodr. 11: 560. 1847; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 199. 1901. Bouchea longipetala H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 199. 1901. Chascanum longipetalum (H. H. W. Pearson) Moldenke, Phytologia 1: 18. 1933.

CHASCANUM AFRICANUM Moldenke

Literature: Moldenke in Fedde, Repert. 45: 136--138. 1938; Moldenke, Revist. Sudam. Bot. 6: 16. 1939; Moldenke, Known Geogr. Distrib. 110, 116, 117, & 178. 1949.

Additional citations: KENYA: Hildebrandt 2737 (P).

CHASCANUM CAESPITOSUM (H. H. W. Pearson) Moldenke

Literature: Moldenke, Torreya 34: 8. 1934; Moldenke in Fedde, Repert. 45: 319 & 46: 1. 1938; Moldenke, Revist. Sudam. Bot. 6: 16. 1939; Moldenke, Prelim. Alph. List Invalid Names 7. 1940; Moldenke, Alph. List Invalid Names 6. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea caespitosa H. H. W. Pearson, Trans. A. Afr. Phil. Soc. 15: 178. 1905.

CHASCANUM CERNUUM (L.) E. Mey.

Literature: E. Mey., Comm. Pl. Afr. Austr. 1: 276. 1837; Hochst., Flora 1845: 68. 1845; Schau. in A. DC., Prodr. 11: 559, in syn. 1847; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 203, in syn. 1901; Moldenke in Fedde, Repert. 45: 313--315. 1938; Moldenke, Revist. Sudam. Bot. 6: 17. 1939; Moldenke, Prelim. Alph. List Invalid Names 7 & 8. 1940; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Buchnera cernua L., Mant. 2: 251. 1771 [not B. cernua Houtt., 1778]; Thunb., Prodr. Pl. Cap. 100. 1800; Thunb., Fl. Cap., ed. Schultes, 466. 1823; Schau. in A. DC., Prodr. 11: 559, in syn. 1847; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 203, in syn. 1901; Moldenke in Fedde, Repert. 45: 313 & 314, in syn. 1938; Moldenke, Prelim. Alph. List Invalid Names 8, in syn. 1940; Moldenke, Alph. List Invalid Names 7, in syn. 1942. Buchnera cernua L., Syst. Veg., ed. 14, 571. 1784; Moldenke in Fedde, Repert. 45: 313, in syn. 1938. Chascanum cernnum E. Mey., Comm. Pl. Afr. Austr. lxiv, nom. nud. 1836; Moldenke in Fedde, Repert. 45: 313, in syn. 1938. Buechnera cernua L. ex E. Mey., Comm. Pl. Afr. Austr. 1: 276, in syn. 1837; Moldenke in Fedde, Repert. 45: 313, in syn. 1938. Bouchea cernua (L.) Schau. in A. DC., Prodr. 11: 559. 1847; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 203. 1901.

Acock states that the flowers of this species are white, blooming in September, and that the plant is found on the slopes of limestone hills.

Additional citations: UNION OF SOUTH AFRICA: Cape of Good Hope: Acock 1504 (S), 2555 (S); Collector undesignated 149 (S); Thunberg s.n. [1773] (S).

CHASCANUM DEHISCENS (L. f.) Moldenke

Literature: Houtt., Handleid. Pl. Kruidk. 9: 542--543, pl. 58, fig. 2. 1778; L. f., Suppl. Pl. 277 & 288. 1781; L. f., Syst. Veg., ed. 14, 571 (1784) and ed. 15, 608. 1797; Thunb., Prod. Pl. Cap. 100. 1800; Thunb., Fl. Cap., ed. Schultes, 466. 1823; E. Mey., Comm. Pl. Afr. Austr. lxiv (1836) and 1: 276. 1837; Raf., Fl. Tellur. 2: 104. 1837; Maund & Henslow, Botanist 4: pl.

196. 1840; Walp., Repert. 4: 38. 1845; Schau. in A. DC., Prodr. 11: 559. 1847; Harv., Thesaur. Cap. 18. 1851; Kuntze, Rev. Gen. Pl. 3 (2): 250 & 254. 1893; Jacks., Ind. Kew. 1: 350 & 733. 1895; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 201--202. 1901; Thiselton-Dyer, Ind. Kew. Suppl. 2: 57. 1904; Jacks., Ind. Linn. Herb. 116. 1912; Druce, Rep. Bot. Exch. Club Brit. Isles 1916: 610. 1917; Moldenke, Torreya 34: 9. 1934; Moldenke in Fedde, Repert. 45: 148--153. 1938; Moldenke, Revist. Sudam. Bot. 6: 17. 1939; Moldenke, Prelim. Alph. List Invalid Names 7, 8, 15, 24, 36, & 39. 1940; Moldenke, Alph. List Invalid Names 6, 7,12, 23, 36, & 39. 1942; Moldenke, Known Geogr. Distrib. 121, 157, & 178. 1949.

Synonymy: Buchnera cernua Houtt., Handleid. Pl. Kruidk. 9: 542--543, pl. 58, fig. 2. 1778 [not B. cernua L., 1771]. Phryma dehiscens L. f., Suppl. Pl. 277. 1781. Büchnera cuneifolia L.f., Suppl. Pl. 288. 1781. Phryma dehiscens L. apud Thunb., Prod. Fl. Cap. 100. 1800. Buchnera cuneifolia L. apud Thunb., Prod. Fl. Cap. 100. 1800. Chascanum cuneifolium (L. f.) E. Mey., Comm. Pl. Afr. Austr. lxiv, nom. nud. (1836), 1: 276. 1837. Buechnera cuneifolia Thunb. apud E. Mey., Comm. Pl. Afr. Austr. 1: 276, in syn. 1837. Plexipus cuneifolius (L. f.) Raf., Fl. Tellur. 2: 104. 1837. Buechnera cernua Houtt. apud E. Mey., Comm. Pl. Afr. Austr. 1: 276, in syn. 1837. Cascanum cuneifolium E. Mey. apud Maund & Henslow, Botanist 4: pl. 196. 1840. Buchnera cuneifolia Thunb. apud Walp., Repert. 4: 38, in syn. 1845. Bouchea cuneifolia (L. f.) Schau. in A. DC., Prodr. 11: 559. 1847. Deniseia dehiscens (L. f.) Kuntze, Rev. Gen. Pl. 3 (2): 250. 1898. Denisaea dehiscens Kuntze apud Thiselton-Dyer, Ind. Kew. Suppl. 2: 57, in syn. 1904. Phryma hians L. ex Jacks., Ind. Linn. Herb. 116, nom. nud. 1912. Bouchea dehiscens (L. f.) Druce, Rep. Bot. Exch. Club Brit. Isles 1916: 610. 1917. Marulea crassifolia Schrad. ex Moldenke in Fedde, Repert. 45: 149, in syn. 1939. Marrulea crassifolia Schrad. ex Moldenke in Fedde, Repert. 45: 149, in syn. 1938. Ragusia cuneifolia Schrad. ex Moldenke, Revist. Sudam. Bot. 6: 17, in syn. 1939. Ragasia cuneifolia Schrad. ex Moldenke, Revist. Sudam. Bot. 6: 17, in syn. 1939. Bouchia cernua Houtt., in herb.

The two unnumbered Thunberg collections cited below are probably cotypes of Büchnera cuneifolia L. f., as is the Thunberg 303 cited by me in Fedde, Repert. 45: 151 & 153 (1938). Wood describes the flowers of this species as white, and says that it grows at altitudes of 2000 feet.

Additional citations: UNION OF SOUTH AFRICA: Cape of Good Hope: Collector undesignated s.n. (S); Ecklon & Zeyher s.n. [33.10] (Gg--31961); Thunberg s.n. [1775] (S), s.n. [1781] (S); Verreaux s.n. [C. B. S.] (Du--166400); E. Wall 12, in part (Ew), s.n. [Alexandria distr., 9/11/1938] (S). Natal: J. M. Wood 11664 (Vt). LOCALITY OF COLLECTION UNDESIGNATED: Herb. Mus. Nac. Hist.

Nat. Chile 68284 (Sg).

CHASCANUM GARIPENSE E. Mey.

Literature: E. Mey., Comm. Pl. Afr. Austr. lxiv (1836) and 1: 277. 1837; Schau. in A. DC., Prodr. 11: 560. 1847; Kuntze, Jahrb. Königl. Bot. Gart. Berlin 4: 271. 1900; J. G. Baker in Thiselton-Dyer, Fl. Trop. Afr. 5: 282. 1900; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 203--204. 1901; Moldenke, Torreya 34: 9. 1934; Junell, Symb. Bot. Upsal. 4: 21--30 & 172--173, figs. 27 & 36, pl. 1m fig. 2. 1934; Moldenke in Fedde, Repert. 45: 309--313. 1938; Moldenke, Revist. Sudam. Bot. 6: 17--18. 1939; Moldenke, Prelim. Alph. List Invalid Names 7 & 15. 1940; Moldenke, Alph. List Invalid Names 6 & 12. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949.

Synonymy: Chascanum garipense E. Mey., Comm. Pl. Afr. Austr. lxiv, nom. nud. (1836), 1: 277. 1837. Bouchea garepensis Schau. in A. DC., Prodr. 11: 560. 1847. Bouchea garipensis var. microphylla Kuntze, Jahrb. Königl. Bot. Gart. Berlin 4: 271. 1900. Bouchea garepensis var. microphylla Kuntze apud J. G. Baker in Thiselton-Dyer, Fl. Trop. Afr. 5: 282. 1900. Bouchea glanduliferа H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 204. 1901. Chascanum glanduliferum (H. H. W. Pearson) Moldenke, Torreya 34: 9. 1934. Bouchea gariepensis Schau. ex Moldenke in Fedde, Repert. 45: 309, in syn. 1938. Bouchea gariepina Schau. ex Moldenke in Fedde, Repert. 45: 309, in syn. 1938. Bouchea garipensis (E. Mey.) Schau. ex Moldenke in Fedde, Repert. 45: 309, in syn. 1938. Chascanum gariepensis E. Mey. ex Moldenke in Fedde, Repert. 45: 309, in syn. 1938.

The species is said to inhabit dry mountains, at altitudes of 3500 to 4000 feet, blooming in May, September, and October. Junell, in the reference cited above, gives detailed information about the gynoecium morphology of this species.

Additional citations: UNION OF SOUTH AFRICA: Cape of Good Hope: Haptrom 1117 (S), 1167 (S); G. Lindeberg s.n. [17 September 1936] (S); F. R. R. Schlechter 11410 (Br, F--686752), s.n. [Stickhand, 17.V.1898] (Br, F--686751); Wahlberg s.n. [Zwartzopf river, 1854] (S); E. Wall 12, in part [22/938] (Ew, Go), s.n. [22/9/1938] (S).

CHASCANUM GILLETTII Moldenke

Literature: Moldenke, Revist. Sudam. Bot. 6: 18--19. 1939; Moldenke, Known Geogr. Distrib. 110 & 178. 1949.

Additional citations: BRITISH SOMALILAND: Gillett 4934 (Br--isotype).

CHASCANUM GÜRKEANUM (Loes.) Moldenke, comb. nov.

Bouchea gürkeana Loes. ex Dinter in Fedde, Repert. 15: 352, hyponym. 1918.

This species is mentioned also in Fedde, Repert. 38: 256 and is apparently based on Dinter 390, collected in 1917 at Judaea

by Hiachanas, in Namaland, Southwest Africa.

CHASCANUM HANNINGTONII (Oliv.) Moldenke

Literature: Oliv. in Hook., Icon. Pl. 15: 37, pl. 1446. 1883; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 283. 1901; Moldenke, Torreya 23: 9. 1934; Moldenke in Fedde, Repert. 45: 155--156. 1938; Moldenke, Prelim. Alph. List Invalid Names 7, in syn. 1940; Moldenke, Alph. List Invalid Names 6, in syn. 1942; Moldenke, Known Geogr. Distrib. 116 & 178. 1949. Bouchea hanningtonii Oliv. in Hook., Icon. Pl. 15: 37, pl. 1446. 1883.

CHASCANUM HEDERACEUM (Sond.) Moldenke

Literature: Sond., Linnaea 23: 86. 1850; Jacks., Ind. Kew. 1: 327. 1893; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 200. 1901; Moldenke, Torreya 34: 9. 1934; Moldenke in Fedde, Repert. 45: 144--147. 1938; Moldenke, Revist. Sudam. Bot. 6: 19. 1939; Moldenke, Prelim. Alph. List Invalid Names 7 & 8. 1940; Moldenke, Alph. List Invalid Names 6 & 7. 1942; Moldenke, Known Geogr. Distrib. 119, 121, & 178. 1949.

Synonymy: Bouchea hederacea Sond., Linnaea 23: 86. 1850. Chascanum hederaceum (Sond.) Moldenke, Torreya 34: 9. 1934. Bouchea adenostachya var. cuneata H. H. W. Pearson ex Moldenke in Fedde, Repert. 45: 144, in syn. 1938. Bouchea sphenophylla H. H. W. Pearson ex Moldenke in Fedde, Repert. 45: 144, in syn. 1938. Buchea hederacea Sond. ex Moldenke in Fedde, Repert. 45: 144, in syn. 1938. Bauchea hederacea Sond. ex Moldenke in Fedde, Repert. 45: 144, in syn. 1938.

West describes this species as a small herb, 8 inches tall, common in grasslands. He says the flowers are white, blooming in December.

Additional citations: SOUTHERN RHODESIA: Brain 10868 (Rh--10610); O. West 2280 (Rh--25392), 2452 (Rh--26549). UNION OF SOUTH AFRICA: Cape of Good Hope: J. P. H. Acock 8453 (S). Natal: Gerstner 3169 (Gg--310908). Transvaal: E. E. Galpin 281m [40429] (N).

CHASCANUM HEDERACEUM var. NATALENSE (H. H. W. Pearson) Moldenke

Literature: Gürke, Notizbl. Bot. Gart. Berlin 3: 74. 1900; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 200. 1901; Kuntze, Deutsch. Bot. Monatschr. 21: 173. 1903; Prain, Ind. Kew. Suppl. 4: 28. 1913; Moldenke, Phytologia 1: 18. 1933; Moldenke, Torreya 34: 9. 1934; Moldenke in Fedde, Repert. 45: 147--148. 1938; Moldenke, Revist. Sudam. Bot. 6: 19. 1939; Moldenke, Prelim. Alph. List Invalid Names 7, 8, 15, & 24. 1940; Moldenke, Suppl. List Invalid Names 2 & 11. 1941; Moldenke, Alph. List Invalid Names 6, 7, 12, 13, & 23. 1942; Moldenke, Known Geogr. Distrib. 119, 120, 121, & 178. 1949.

Synonymy: Bouchea wilmsii Gürke, Notizbl. Bot. Gart. Berlin 3: 74. 1900. Bouchea hederacea var. natalensis H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 200. 1901. Denisia wilmsii

(Gürke) Kuntze, Deutsch. Bot. Monatschr. 21: 173. 1903. Chascanum wilmsii (Gürke) Moldenke, Phytologia 1: 18. 1933. Chascanum hederaceum var. natalense (H. H. W. Pearson) Moldenke, Torreya 34: 9. 1934. Chascanum hederaceum var. natalensis (H. H. W. Pearson) Moldenke, Prelim. Alph. List Invalid Names 7. 1940.

Bolus collected this species at an altitude of 1500 feet, blooming in January. Schlechter collected it at 1560 meters altitude.

Additional citations: SWAZILAND: H. Bolus 12228 (Br). UNION OF SOUTH AFRICA: Cape of Good Hope: E. Wall 57 (Ew). Transvaal: F. R. R. Schlechter 3707 (Br), 11771 (Br, F--876752).

CHASCANUM HUMBERTI Moldenke

Literature: Moldenke, Phytologia 3: 262 & 294. 1950.

The species is described as a small shrub or subshrub, 1 m. tall, with violet, rose, or pale-rose flowers (or white and pinkish), growing on limestone hills and in rocky places, in tropophilous forests and xerophilous bush, at altitudes of 10 to 300 m. It has been collected in anthesis in January, April, August, September, and November.

Additional citations: MADAGASCAR: Decary 9890 (P); Humbert 11548 (F--photo of type, It--photo of type, N--photo of type, P--type, Z--photo of type), 19813 (P), 19904 (N, P); Humbert & Perrier de la Bâthie 2520 (P); Poisson 511 (N, P), 526 (P).

CHASCANUM INCISUM (H. H. W. Pearson) Moldenke

Literature: Moldenke, Phytologia 1: 18. 1933; Moldenke in Fedde, Repert. 45: 307--309. 1938; Moldenke, Revist. Sudam. Bot. 6: 19--20. 1939; Moldenke, Prelim. Alph. List Invalid Names 7. 1940; Moldenke, Alph. List Invalid Names 6. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea incisa H. H. W. Pearson, Trans. S. Afr. Phil. Soc. 15: 180. 1905 [not B. incisa Rusby, 1907].

The species has been collected at an altitude of 830 m., in flower and fruit in March.

Additional citations: UNION OF SOUTH AFRICA: Transvaal: F. R. R. Schlechter 4594 (Ca--299099--isotype).

CHASCANUM INSULARE Moldenke

Literature: Moldenke in Fedde, Repert. 45: 131--132. 1938; Moldenke, Known Geogr. Distrib. 123 & 178. 1949.

The species is said to be suffrutescent, 5--10 dm. tall, the leaves chartaceous (not thin-membranous), sometimes slightly lighter beneath, to 2.7 cm. long and 1.4 cm. wide, the spikes to 20 cm. long, and the corollas rose or pinkish-white, tinted deeper rose in the throat, blooming from November to January. It grows in xerophilous bush on gneiss at altitudes of 400 to 900m.

Additional citations: MADAGASCAR: Decary 9397 (N, P); Humbert 12851 (P), 12920 (P).

CHASCANUM INSULARE var. CANESCENS Moldenke

Literature: Moldenke, Phytologia 3: 263 & 294. 1950.
Additional citations: MADAGASCAR: Humbert 19952 (F--photo of type, It--photo of type, N--photo of type, P--type, Z--photo of type).

CHASCANUM INSULARE var. HUMBERTI Moldenke
Literature: Moldenke, Phytologia 3: 263 & 294. 1950.
The variety is said to be suffrutescent, 5--10 dm. tall, growing on gneiss in rocky places at altitudes of from 40 to 1500 m., blooming from November through January. The corllla is described as rose, pale-rose, or pinkish-white, tinted deeper rose at the mouth, in the throat, and on the tube.
Additional citations: MADAGASCAR: Humbert 12086 (N, P), 12851 (P), 12920 (P), 13290 (F--photo of type, It--photo of type, N--photo of type, P--type, P--isotype, Z--photo of type).

CHASCANUM INSULARE var. TRIANGULARE Moldenke
Literature: Moldenke, Phytologia 3: 263 & 294. 1950.
The flowers are said to be pinkish-white, blooming in August.
Additional citations: MADAGASCAR: Decary 9890 (N, P); Humbert & Swingle 5493 (F--photo of type, It--photo of type, N--photo of type, P--type, Z--photo of type).

CHASCANUM INTEGRIFOLIUM (H. H. W. Pearson) Moldenke
Literature: Moldenke, Phytologia 1: 18. 1933; Moldenke in Fedde, Repert. 45: 315--317. 1938; Moldenke, Revist. Sudam. Bot. 6: 20. 1939; Moldenke, Prelim. Alph. List Invalid Names 7. 1940; Moldenke, Alph. List Invalid Names 6. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea integrifolia H. H. W. Pearson, Trans. S. Afr. Phil. Soc. 15: 179. 1905.

CHASCANUM KROOKII (Gürke) Moldenke
Literature: Moldenke, Phytologia 1: 18. 1933; Moldenke in Fedde, Repert. 45: 153--155. 1938; Moldenke, Revist. Sudam. Bot. 6: 20. 1939; Moldenke, Prelim. Alph. List Invalid Names 7. 1940; Moldenke, Alph. List Invalid Names 6. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea krookii Gürke ex Zahlbr., Ann. Nat. Hofmus. Wien 20: 45. 1905.
The species has been collected in anthesis in October.
Additional citations: UNION OF SOUTH AFRICA: Natal: Wahlberg s.n. [Port Natal, Oct. 1841] (S).

CHASCANUM LATIFOLIUM (Harv.) Moldenke
Literature: Moldenke, Phytologia 1: 18. 1933; Moldenke in Fedde, Repert. 45: 300--302. 1938; Moldenke, Revist. Sudam. Bot. 6: 20. 1939; Moldenke, Prelim. Alph. List Invalid Names 7. 1940; Moldenke, Alph. List Invalid Names 6. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea latifolia Harv., Thes. Cap. 2: 57, pl. 190. 1863; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 202. 1901.
Additional citations: UNION OF SOUTH AFRICA: Natal: J. M.

Wood s.n. [MacOwan 1511] (F--686761, Vt).

CHASCANUM LATIFOLIUM var. GLABRESCENS (H. H. W. Pearson) Moldenke

Literature: Moldenke in Fedde, Repert. 45: 302--303. 1938; Moldenke, Revist. Sudam. Bot. 6: 20. 1939; Moldenke, Prelim. Alph. List Invalid Names 7. 1940; Moldenke, Alph. List Invalid Names 7. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea latifolia var. glabrescens H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 203. 1901.

The variety has been collected at an altitude of 5600 feet, blooming in August and December. Sidey describes it as a spreading plant with an underground rootstock and mauve-white flowers. The Bolus 12228 specimen cited below is a mixture of this and C. hederaceum var. natalense.

Additional citations: SWAZILAND: H. Bolus 12228, in part (Br), 12229 (Br). UNION OF SOUTH AFRICA: Transvaal: Sidey 1504 (N, S).

CHASCANUM LIGNOSUM (Dinter) Moldenke

Literature: Moldenke in Fedde, Repert. 46: 2--3. 1938; Moldenke, Revist. Sudam. Bot. 6: 20--21. 1939; Moldenke, Prelim. Alph. List Invalid Names 8. 1940; Moldenke, Alph. List Invalid Names 7. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea lignosa Dinter in Fedde, Repert. Beiheft 53: 53, in obs. 1928. Bouchea namaquana var. latifolia L. Bolus ex Moldenke in Fedde, Repert. 46: 3, in syn. 1938.

CHASCANUM MARRUBIIFOLIUM Fenzl

Literature: R. Br. in Salt, Voyage Abyss. append. lxiii ["lxii"]. 1814; Hochst., Flora 24, Intell. 1: 42. 1841; Walp., Repert. 4: 38. 1845; Schau. in A. DC., Prodr. 11: 558. 1847; Wight, Icon. Plant. Ind. Orient. 4 (3): pl. 1461. 1849; Kuntze, Rev. Gen. Pl. 2: 502. 1891; Jacks., Ind. Kew. 1: 507. 1895; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 282. 1901; Moldenke in Fedde, Repert. 45: 132--136. 1938; Monod, Soc. Biogéogr. 6: 368 & 370. 1938; Moldenke, Revist. Sudam. Bot. 6: 21. 1939; Moldenke, Prelim. Alph. List Invalid Names 8, 15, 26, 36, & 42. 1940; Moldenke, Alph. List Invalid Names 7, 12, 25, 36, & 42; Moldenke, Phytologia 2: 95. 1944; Erdtman, Svensk Bot. Tidsk. 39: 281--283, fig. 3. 1945; Moldenke, Known Geogr. Distrib. 109, 110, 114, 117, 123, 124, 157, & 178. 1949; Monod, Contrib. Etude Sahara occid. 2: 113, 114, & 170, pl. 21; Xavier Louis & Monod, Bull. l'Agence Génér. Colon. 27: 605 & 626.

Synonymy: Stachytarpheta cinerea R. Br. in Salt, Voyage Abyss. append. lxiii ["lxii"], nom. nud. 1814. Pleurostigma subrotundum Hochst., Flora 24, Intell. 1: 42, nom. nud. 1841. Chascanum marrubiifolium Fenzl ex Walp., Repert. 4: 38. 1845. Bouchea marrubiifolia (Fenzl) Schau. in A. DC., Prodr. 11: 558. 1847. Bouchea marrubifolia (Fenzl) Schau. apud Wight, Icon. Plant.

Ind. Orient. 4 (3): pl. 1461. 1849. Lafuentea ovalifolia Battand. & Trabut, Bull. Soc. Bot. Franç. 53: xxix--xxx. 1907. Chascanum affine Stocks ex Moldenke in Fedde, Repert. 45: 132, in syn. 1938. Gisania crucianella Ehrenb. ex Moldenke in Fedde, Repert. 45: 132, in syn. 1938. Bouchea marrubiifolia DC. ex Moldenke in Fedde, Repert. 45: 132, in syn. 1938. Bouchéa marrubiifolia Schau. ex Moldenke in Fedde, Repert. 45: 132, in syn. 1938. Chascanum marrubiifolium Walp. ex Sprague in Fedde, Repert. 46: 80. 1939. Chascanum marrubifolium Fenzl ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940. Chascanum marrubiifolium (Scan) Moldenke, in herb.

Erdtman, in the reference cited above, gives important data concerning the pollen morphology of this species. Monod records the common name of "khachim al-'amma", and states that the plant is eaten by all grazing animals (camels eat it green or dry), but it is inedible to human beings. The genus Lafuentea, which occurs in the synonymy above, is a member of the Scrophulariaceae. The "L. ovalifolia Lag." to which Battand. and Trabut compare their plant is probably an error for L. rotundifolia Lag. Their species was based on an immature plant collected by Chudeau in southern Algeria.

Additional citations: FRENCH WEST AFRICA: Tibesti: Monod 7353 bis (N). FRENCH EQUATORIAL AFRICA: Chad Territory: A. Chevalier 10070 (Br). ANGLO-EGYPTIAN SUDAN: Kordofan: Kotschy 32 (F--686746--isotype). ABYSSINIA: Schimper s.n. [Abyssinia, 1870] (Vt)

CHASCANUM NAMAQUANUM (H. Bolus) Moldenke

Literature: Moldenke, Phytologia 1: 18. 1933; Moldenke in Fedde, Repert. 46: 1--2. 1938; Moldenke, Revist. Sudam. Bot. 6: 21--22. 1939; Moldenke, Prelim. Alph. List Invalid Names 8. 1940; Moldenke, Alph. List Invalid Names 7. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea namaquana H. Bolus ex H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 204--205. 1901.

CHASCANUM PINNATIFIDUM (L. f.) E. Mey.

Literature: E. Mey., Comm. Pl. Afr. Austr. lxiv, nom. nud. (1836) & 1: 277. 1837; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 205. 1901; Moldenke in Fedde, Repert. 45: 303--306. 1938; Moldenke, Revist. Sudam. Bot. 6: 22. 1939; Moldenke, Prelim. Alph. List Invalid Names 8. 1940; Moldenke, Alph. List Invalid Names 7. 1942; Moldenke, Known Geogr. Distrib. 119, 121, & 178. 1949. Büchnera pinnatifida L. f., Suppl. Pl. 288. 1781. Buchnera pinnatifida L. apud Thunb., Prod. Pl. Cap. 100. 1800. Buechnera pinnatifida Thunb. apud E. Mey., Comm. Pl. Afr. Austr. 1: 277, in syn. 1837. Bouchea pinnatifida (L. f.) Schau. in A. DC., Prodr. 11: 560. 1847. Buchnera pinnatifida Thunb. ex Schau. in A. DC., Prodr. 11: 560, in syn. 1847.

Wall collected this species in the mountains at an elevation

of 4500 feet; Rattray found it in red soil, fruiting in December. The flowers are said to be white.

Additional citations: SOUTHERN RHODESIA: Rattray 148 (Rh). UNION OF SOUTH AFRICA: Cape of Good Hope: J. P. H. Acock 5408 (S); Haptrom 789 (S, S). Transvaal: E. E. Galpin 508m (Br, Br, Br); Haptrom & Acock 1318 (S, S); E. Wall 12 [Warmbad, 2/1038] (Ew), 12, in part [Letaba, 22/1038] (Ew), s.n. [2/10/1938] (S), s.n. [22/10/1938] (S).

CHASCANUM PINNATIFIDUM var. RACEMOSUM Schinz & Moldenke

Literature: Moldenke in Fedde, Repert. 45: 306--307. 1938; Moldenke, Revist. Sudam. Bot. 6: 22. 1939; Moldenke, Prelim. Alph. List Invalid Names 8. 1940; Moldenke, Alph. List Invalid Names 7. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea pinnatifida var. racemosa Schinz ex Moldenke in Fedde, Repert. 45: 306, in syn. 1938.

This variety has been found in forests at an altitude of 3500 feet. Its flowers are said to be white, blooming in October.

Additional citations: SOUTHERN RHODESIA: Herb. Queen Victoria Mus. 1142 (Rh). UNION OF SOUTH AFRICA: Cape of Good Hope: E. Wall 12, in part (Go). Transvaal: F. R. R. Schlechter 4593 (Br--isotype); E. Wall s.n. [5/10/1938] (S).

CHASCANUM PUMILUM E. Mey.

Literature: E. Mey., Comm. Pl. Afr. Austr. lxiv, nom. nud. (1836) and 1: 277. 1837; Moldenke in Fedde, Repert. 45: 317--319. 1938; Moldenke, Revist. Sudam. Bot. 6: 22. 1939; Moldenke, Prelim. Alph. List Invalid Names 8. 1940; Moldenke, Alph. List Invalid Names 7. 1942; Moldenke, Known Geogr. Distrib. 118, 121, & 178. 1949. Bouchea pumila (E. Mey.) Schau. in A. DC., Prodr. 11: 560. 1847; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 205. 1901. Bouchea pubescens Schau. in A. DC., Prodr. 11: 560. 1847. Bouchea pumila var. subcanescens Sond., Linnaea 23: 86. 1850. Bouchea pumila var. brühliana Gürke ex Moldenke in Fedde, Repert. 45: 317, in syn. 1938.

The "Index Kewensis" cites the binomial Bouchea pumila Schau. to page 558 of DeCandolle's Prodromus -- actually it was published on page 560. The species is said to have cream-colored flowers, blooming in February and November. It has been collected on the sand-veld and at altitudes of 2200 feet.

Additional citations: BECHUANALAND PROTECTORATE: Rodin 3577 (S). UNION OF SOUTH AFRICA: Cape of Good Hope: H. Bolus 12230 (Br).

CHASCANUM RARIFLORUM (A. Terrac.) Moldenke

Literature: Moldenke, Phytologia 1: 167. 1935; Moldenke in Fedde, Repert. 45: 129--130. 1938; Moldenke, Prelim. Alph. List Invalid Names 8 & 26. 1940; Moldenke, Alph. List Invalid Names 7 & 25. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Hebenstreitia rariflora A. Terrac., Bull. Soc. Bot. Ital. 1892:

424. 1892. Bouchea rariflora (A. Terrac.) Chiov., Ann. Bot. Roma 9: 127. 1911.

CHASCANUM SCHLECHTERI (Gürke) Moldenke

Literature: Moldenke, Phytologia 1: 18. 1933; Moldenke in Fedde, Repert. 45: 130--131. 1938; Moldenke, Revist. Sudam. Bot. 6: 23. 1939; Moldenke, Prelim. Alph. List Invalid Names 8. 1940; Moldenke, Alph. List Invalid Names 7. 1942; Moldenke, Known Geogr. Distrib. 121 & 178. 1949. Bouchea schlechteri Gürke, Notizbl. Bot. Gart. Berlin 3: 75. 1900; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 201. 1901. Denisia schlechteri (Gürke) Kuntze, Deutsch. Bot. Monatschr. 21: 173. 1903.

Additional citations: UNION OF SOUTH AFRICA: Transvaal: F. R. R. Schlechter 11764 (Br--isotype, F--876753--isotype).

CHASCANUM SESSILIFOLIUM (Vatke) Moldenke

Literature: Moldenke, Phytologia 1: 18. 1933; Moldenke in Fedde, Repert. 45: 143--144. 1938; Moldenke, Prelim. Alph. List Invalid Names 8. 1940; Moldenke, Alph. List Invalid Names 7. 1942; Moldenke, Known Geogr. Distrib. 110 & 178. 1949. Bouchea sessilifolia Vatke, Linnaea 43: 529. 1882; H. H. W. Pearson in Thiselton-Dyer, Fl. Cap. 5 (1): 283. 1901.

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THE KNOWN GEOGRAPHIC DISTRIBUTION OF THE MEMBERS OF THE VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND ERIOCAULACEAE. SUPPLEMENT 11

Harold N. Moldenke

Since the publication of the last previous installment of these notes, material sent to me for identification has brought to light 3 new county records, 33 new state, province, department, or territory records, 18 new island records, and 13 new country records. These are listed herewith as follows:

UNITED STATES OF AMERICA:

Florida:

Syngonanthus flavidulus (Michx.) Ruhl. [Okeechobee County]

South Dakota:

Verbena hastata L. [Brown County]

Wyoming:

Verbena bracteata Lag. & Rodr. [Goshen County]

TRES MARIAS ISLANDS:

Aegiphila deppeana Steud.

CUBA:

Callicarpa cubensis var. parviflora Moldenke is the correct orthography of this trinomial

Syngonanthus wilsonii Moldenke [Pinar del Río]

VENEZUELA:
Syngonanthus gracilis var. aureus Ruhl. [Falcón]
Syngonanthus humboldtii var. glandulosus Gleason [Bolívar]
Vitex orinocensis var. multiflora (Miq.) Huber [Monagas]
ECUADOR:
Callicarpa acuminata H.B.K. [Los Ríos]
Citharexylum montanum Moldenke [Napo-Pastaza]
Citharexylum poeppigii Walp. [Napo-Pastaza]
Clerodendrum fragrans var. pleniflorum Schau. [Guayas]
Cornutia microcalycina var. pulverulenta Moldenke [Los Ríos]
Cornutia odorata (Poepp. & Endl.) Poepp. [Napo-Pastaza]
Lantana cujabensis Schau. [Napo-Pastaza]
Lantana sprucei Hayek [Tunguragua]
Tonina fluviatilis Aubl. [Imbabura]
Verbena litoralis H.B.K. [Los Ríos]
PERU:
Aegiphila glabrata Moldenke [Huánuco]
Lantana svensonii f. albiflora Moldenke [Lambayeque]*
Lantana tiliaefolia Cham. [Huánuco & Lima]
Petrea macrostachya Benth. [Loreto]
Priva lappulacea (L.) Pers. [Huánuco]
Stachytarpheta cayennensis (L. C. Rich.) Vahl [Huánuco]
Verbena occulta f. alba Moldenke [Junin]
BRAZIL:
Aegiphila racemosa Vell. [Guaporé]
Lantana tiliaefolia Cham. [Santa Catharina]
Paepalanthus planifolius (Bong.) Körn. [Santa Catharina]
Syngonanthus vernonioides var. minor (Kunth) Ruhl is the correct orthography of this trinomial
Tonina fluviatilis Aubl. [Rio Branco]
Verbena catharinae Moldenke [Santa Catharina]*
Verbena hirta var. gracilis Dusén [Santa Catharina]
Verbena peruviana (L.) Britton [Santa Catharina]
Verbena peruviana f. alba Moldenke [Santa Catharina]*
Verbena tenuisecta var. glabrata Moldenke [Santa Catharina]*
CHILE:
Castelia cuneato-ovata Cav. [Antofagasta]
Lampaya medicinalis R. A. Phil. [Antofagasta]
SOUTHWEST AFRICA:
Chascanum gürkeanum (Loes.) Moldenke*
Lantana namaensis Loes.*
JAPAN:
Callicarpa japonica f. albifructa Hara -- delete the asterisk
LIUKIU ISLANDS:
Avicennia marina (Forsk.) Vierh. [Iriomote]
Callicarpa iriomotensis Masam. [Iriomote]*
Callicarpa japonica f. albifructa Hara [Okinawa]

Clerodendrum bungei Steud. [Okinawa]
Clerodendrum inerme (L.) Gaertn. [Okinawa]
Clerodendrum trichotomum Thunb. [Iriomote]
Lantana camara var. aculeata (L.) Moldenke [Okinawa]
Phyla nodiflora (L.) Greene [Okinawa]
Premna corymbosa var. obtusifolia (R. Br.) Fletcher [Ishigaki & Okinawa]
Verbena officinalis L. [Okinawa]
Verbena rigida Spreng. [Okinawa]
Vitex trifolia var. bicolor (Willd.) Moldenke [Iriomote]
Vitex trifolia var. heterophylla (Mak.) Moldenke [Iriomote]
Vitex trifolia var. simplicifolia Cham. [Okinawa]

SARAWAK:
Sphenodesme clemensorum Moldenke*

BORNEO:
Sphenodesme winkleri H. Hallier is to be deleted

CULTIVATED:
Aloysia sellowii (Briq.) Moldenke [Brazil]
Clerodendrum calamitosum L. [Sarawak]
Clerodendrum japonicum (Thunb.) Sweet [Okinawa]
Clerodendrum thomsonae Balf. f. [Sarawak]
Duranta repens L. [Okinawa]
Nyctanthes arbor-tristis L. [Sarawak]
Petrea volubilis L. [Sarawak]

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ADDITIONAL NOTES ON THE GENUS AMASONIA. IV

Harold N. Moldenke

AMASONIA L. f.

Literature: Aubl., Hist. Pl. Guian. Franç. 2: 625, pl. 252. 1775; L. f., Suppl. Pl. 48 & 294. 1781; Murr., Syst. 581. 1784; A. L. Juss., Gen. Pl. 119--123 & 418. 1789; Neck., Elem. Bot. 1: 362--389. 1790; Schreb., Gen. 2: 427. 1791; Gmel., Syst. 965. 1791; Vahl, Eclog. Amer. 2: 51, pl. 20. 1791; Lam., Illustr. 3: pl. 543. 1797; Pers., Syst. Pl. 618. 1797; Willd., Sp. Pl. 3: 394. 1800; Batsch, Tab. 193. 1802; Mirbel, Hist. Nat. Pl., ed. 3, 15: 231. 1805; Lam., Encycl. Méth. Bot., ed. Poir., 7: 556. 1806; Pers., Ench. 2: 141. 1807; Spreng., Anal. 2 (1): 423. 1817; H.B.K., Nov. Gen. & Sp. Pl. 2: 253. 1818; Kunth, Syn. 2: 45. 1823; Spreng., Syst. Veg. 2: 765. 1825; Reichenb., Consp. 117. 1828; Dumort., Anal. Fam. Pl. 22. 1829; Bartl., Ord. Nat. Pl. 180. 1830; Spreng., Gen. 2: 481. 1831; Lindl., Nat. Syst. Bot., ed. 2, 278. 1836; Endl., Gen. Pl. 637--638. 1838; P. DC., Prodr. 7: 306. 1838; Benth., Ann. Nat. Hist. 2: 450--451. 1839; Steud., Nom. Bot., ed. 2, 1: 74. 1840; Spach, Veg. Phan. 9: 227. 1840;

Meisn., Pl. Vasc. Gen. 290--292. 1840; Endl., Ench. 312. 1841; Reichenb., Nom. 108. 1841; Walp., Repert. 4: 124. 1845; Blanco, Fl. Filip., ed. 2, 337. 1845; Schau. in A. DC., Prodr. 11: 524--525 & 677--678. 1847; Lindl., Veg. Kingd. 664. 1847; Schau. in Mart., Fl. Bras. 9: 291--293, pl. 48. 1851; Wittstein, Etymol.-bot. Handwört. 34--35. 1852; Baill., Adansonia 2: pl. 5, figs. 11--18. 1861--1862; Bocq., Rev. Verbenac. pl. 5. 1861-1862; Griseb., Fl. Brit. W. Ind. 501. 1864; Pfeiff., Nom. Bot. 135. 1873; Benth. in Benth. & Hook. f., Gen. Pl. 2: 1132--1136 & 1147. 1876; Meehan, Gard. Month. & Hort. 27: 300--301. 1885; Ill. Gartenzeit. Stuttgart 29: pl. 26. 1885; Handelsblad voor den Tuinboun Semperv. 14: 204. 1885; Journ. Hort., ser. 3, 10: 436. 1885; Garden 27: 130. 1885; Catalogue of Dammann and Comp., St. Giovanni a Teduccio, near Naples, Italy, in 1886 or before, illustr.; Gartenfl, 35: 336--338, fig. 35. 1886; Hook. f. in Curtis, Bot. Mag. 113: pl. 6915. 1887; Veitch's Cat. Pl. 27. 1889; Wien. Illustr. Gartenzeit. 15: 68--69, fig. 9. 1890; Kuntze, Rev. Gen. Pl. 2: 509. 1891; Jacks., Ind. Kew. 1: 103. 1893; Seghers, Rev. Hort. Belg. 20: 13--15. 1894; Müllers Deutsche Gärt.-Zeit. 9: 141--142. 1894; Hook. f. in Curtis, Bot. Mag. 121: pl. 7445. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 144 & 156--157. 1895; Bullett. Soc. Toscana di Orticult. 22: 232, pl. 10. 1897; Pulle, Enum. Vasc. Pl. Surinam 402. 1906; Veitch, Hort. Veitch. 226. 1906; Glaz., Bull. Soc. Bot. Franç. Mém. 3: 546. 1911; Swingle, Journ. Wash. Acad. Sci. 2: 211--212 & 220--222. 1912; Stapf, Ind. Lond. 1: 164. 1929; Stapf, Ind. Lond. 6: 255. 1929; Mappo do Estado do Amazonas, Brasil, 1926--1929. 1929; Gleason, Bull. Torrey Bot. Club 58: 463. 1931; Moldenke, Torreya 34: 8. 1934; Moldenke in Fedde, Repert. 37: 213--214. 1934; Junell, Symb. Bot. Upsal. 4: 107, 202, & 213--214. 1934; Briq., Internat. Rules Bot. Nomen., ed. 3, 106. 1935; Martyn, Ind. Phan. Jenman Herb. 461--462, mss. 1937; Moldenke, Lilloa 4: 304--305. 1939; Moldenke in Fedde, Repert. 46: 193--228. 1939; Moldenke, Prelim. Alph. List Invalid Names 4--5 & 42. 1940; Moldenke, Alph. List Invalid Names 4, 23, & 43. 1942; Moldenke, Phytologia 2: 91 (1944), 2: 198--199 (1946), and 2: 502. 1948; Moldenke, Known Geogr. Distrib. 30, 32, 33, 36, 40, 71, & 86 (1942) and 57, 59, 62, 65, 67, 68, 71, 75, 98, 156, & 176. 1949; Stellfeld, Trib. Farmac. 19 (10): 171. 1951.

Synonymy: Taligalea Aubl., Pl. Guian. 2: 625, pl. 252, nom. rejic. 1775. Amasonia L. f., Suppl. Pl. 48, nom. conserv. 1781. Diphystema Neck., Elem. 1: 382. 1790. Diplostemma Neck. apud P. DC., Prodr. 7: 306, sphalm. 1838. Amazonia L. f. ex Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 546, sphalm. 1911. Hassleria Briq. ex Moldenke in Fedde, Repert. 46: 194, in syn. 1939.

AMASONIA ANGUSTIFOLIA Mart. & Schau.

Literature: Schau. in A. DC., Prodr. 11: 678. 1847; Schau. in Mart., Fl. Bras. 9: 294. 1851; Moldenke in Fedde, Repert. 46: 206--208. 1939; Moldenke, Prelim. Alph. List Invalid Names 4, 5, & 42. 1940; Moldenke, Alph. List Invalid Names 4 & 43. 1942;

Moldenke, Phytologia 2 (199) and 2: 502. 1948; Moldenke, Geogr. Distrib. 75 & 176. 1949. Taligalea angustifolia (Mart. & Schau.) Kuntze, Rev. Gen. Pl. 2: 509. 1891. Amasonia sulphurea Spruce ex Moldenke in Fedde, Repert. 46: 206, in syn. 1939. Amasonia angustifolia Mart. ex Moldenke in Fedde, Repert. 46: 206, in syn. 1939; Moldenke, Prelim. Alph. List Invalid Names 4, in syn. 1940. Taligalea angustifolia (Mart. & Schau.) Gardn. ex Moldenke in Fedde, Repert. 46: 206, in syn. 1939; Moldenke, Prelim. Alph. List Invalid Names 42, in syn. 1940.

Ducke states that the plant grows among herbaceous vegetation along the banks of the Rio Negro, has scarlet bracts and pale-yellow corollas, blooming in February.

Additional citations: BRAZIL: Amazonas: Ducke 1903 (Be--12513, N).

AMASONIA ARBOREA H.B.K.

Literature: H.B.K., Nov. Gen. & Sp. Pl. 2: 253. 1818; Schau. in Mart., Fl. Bras. 9: 292. 1851; Gleason, Bull. Torrey Bot. Club 58: 463. 1931; Moldenke in Fedde, Repert. 46: 220--222. 1939; Moldenke, Phytologia 2: 199. 1946; Moldenke, Known Geogr. Distrib. 62, 65, 67, 68, 75, & 176. 1949; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 346. 1951. Amasonia arborea (Aubl.) Moldenke, in herb.

The species is described by collectors as a shrub 0.6 to 2 m. tall, with red bracts and yellow flowers, blooming in April, May, and October, growing on low land and in secondary forests.

Additional citations: VENEZUELA: Amazonas: Cardona 166 [Herb. Nac. Venez. 12627] (Ve), 2199 (W--1932182); Ll. Williams 13981 [Herb. Nac. Venez. 12620] (Ve), 14184 (F--1187915), 15175 [Herb. Nac. Venez. 12619] (Ve), 16076 [Herb. Nac. Venez. 12622] (Ve), 16112 [Herb. Nac. Venez. 12624] (Ve). BRAZIL: Amazonas: Fróes 22084 (Be--28661). Maramhão: Fróes 24276 (Be--43212).

AMASONIA CAMPESTRIS (Aubl.) Moldenke

Literature: Moldenke, Torreya 34: 8. 1934: Moldenke, Lilloa 4: 305--306. 1939; Moldenke in Fedde, Repert. 46: 210--216. 1939; Moldenke, Alph. List Invalid Names Suppl. 1: 2. 1947; Moldenke, Phytologia 2: 200 (1946) and 2: 502. 1948; Moldenke, Known Geogr. Distrib. 57, 62, 65, 67, 68, 75, 156, & 176. 1949; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 346. 1951. Taligalea campestris Aubl., Hist. Pl. Guian. 2: 625, pl. 252. 1775. Amasonia erecta L. f., Suppl. Pl. 294. 1781; Junell, Symb. Bot. Upsal. 4: 107, pl. 7, fig. 2. 1934. Amasonia punicea Vahl, Eclog. Amer. 2: 51. 1798; Schau. in Mart., Fl. Bras. 9: 291. 1851; Gleason, Bull. Torrey Bot. Club 58: 463. 1931. Taligalea punicea (Vahl) Poir. in Lam., Encycl. Méth. 7: 556. 1806. Amasonia taligalea Auct. ex Steud., Nom. Bot., ed. 2, 1: 74. 1840. Amasonia velutina Schau. in A. DC., Prodr. 11: 677. 1847; Schau. in Mart., Fl. Bras. 9: 292--293. 1851. Taligalea velutina (Schau.) Kuntze, Rev. Gen. Pl. 2: 509. 1891. Amasonia erecta

var. latebracteata Hook. f. in Curtis, Bot. Mag. 121: pl. 7445. 1895. Taligalea campestris var. punicea (Vahl) Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 157. 1895. Amasonia erecta var. punicea (Vahl) Briq. ex Pulle, Enum. Pl. Surinam. 402. 1906. Amasonia coccinea Liebm. ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939. Amasonia erecta var. sylvatica Sagot ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939. Amasonia erecta var. sylvestris Sagot ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939. Taligalea canescens Poit. ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939. Taligalea guianensis Aubl. ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939. Taligalea campestria Aubl. ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939; Moldenke, Prelim. Alph. List Invalid Names 42, in syn. 1940. Amazonia erecta L. f. ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939; Moldenke, Prelim. Alph. List Invalid Names 5, in syn. 1940. Amasonia erecta L. ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939; Moldenke, Alph. List Invalid Names Suppl. 1: 2, in syn. 1947. Amasonia erecta Miq. ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939; Moldenke, Alph. List Invalid Names Suppl. 1: 2, in syn. 1947. Amasonia erecta Willd. ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939; Moldenke, Alph. List Invalid Names Suppl. 1: 2, in syn. 1947. Amasonia panicea Vahl ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939. Amasonia erecta var. punicea (Vahl) Pulle ex Moldenke in Fedde, Repert. 46: 210, in syn. 1939; Moldenke, Prelim. Alph. List Invalid Names 4, in syn. 1940.

Collectors describe this as a perennial plant growing in woods and fields and at the edge of airports and along roadsides. Some call it an herb 1 m. tall. The floral bracts are described as red, crimson, or vermillion, and the corollas as cream, greenish-cream, yellow, or pale-yellow. It has been collected in anthesis from February to April, June, August, and September. The fruits are said to be purple-black, the seeds poisonous. Vernacular names include "mendoca", "mendóca", and "rabo de arara". The plant is said to be medicinal, used as a rinse and for stomach inflammations.

Additional citations: VENEZUELA: Anzoategui: Garroni 75 [Herb. Nac. Venez. 12617] (Ve); Alicia Hernandez 38 [Herb. Nac. Venez. 12623] (Ve); H. Pittier 15089 [Herb. Nac. Venez. 12621] (Ve). Bolívar: Ll. Williams 13420 [Herb. Nac. Venez. 12618] (Ve). Guárico: Lasser 123 [Herb. Nac. Venez. 12626] (Ve). Monagas: H. Pittier 14379 [Herb. Nac. Venez. 12625] (Ve). TRINIDAD: Fendler 555 (Pa). BRITISH GUIANA: Herb. Forest Dept. Br. Guian. WB.256 (N). SURINAM: Kuyper 95 (N). BRAZIL: Amapá: Black & Lobato 50-9434 (N); Fróes 25939 (N). Ceará: Dias da Rocha 57 [Herb. Inst. Bot. S. Paulo 4079] (Sp). Pará: Archer 7606 (Be--11605, N), 8234 (Be--12103); Black 48-3232 (Be--37723); A. Silva 187 (Be--12982), 260 (Be--12870).

AMASONIA HIRTA Benth.

Literature: Benth., Ann. Nat. Hist. 2: 451. 1839; Schau. in Mart., Fl. Bras. 9: 293. 1851; Moldenke, Lilloa 2: 451. 1939; Moldenke, Prelim. Alph. List Invalid Names 42. 1940; Moldenke, Alph. List Invalid Names 43. 1942; Moldenke, Phytologia 2: 502. 1948; Moldenke, Known Geogr. Distrib. 75, 98, & 176. 1949; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 347. 1951. Taligalea hirta (Benth.) Kuntze, Rev. Gen. Pl. 2: 509. 1891.

Collectors describe the floral bracts as reddish, and the plants as blooming in January and April.

Additional citations: BRAZIL: Minas Geraes: Macedo 195 [Herb. Inst. Bot. S. Paulo 51546] (Sp), 1611 (N). Pará: Archer 8337 (Be--12290).

AMASONIA LASIOCAULOS Mart. & Schau.

Literature: Schau. in A. DC., Prodr. 11: 678. 1847; Schau. in Mart., Fl. Bras. 9: 293 & 307, pl. 48. 1851; Hayek, Denkschr. Kaiser. Akad. Wissensch. Math.-nat. 79 (1): 296. 1908; Moldenke in Fedde, Repert. 46: 208--210. 1939; Moldenke, Prelim. Alph. List Invalid Names 5 & 42. 1940; Moldenke, Alph. List Invalid Names 4 & 43. 1942; Moldenke, Phytologia 2: 91. 1944; Moldenke, Known Geogr. Distrib. 59, 75, & 176. 1949; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 347. 1951. Amasonia lasiocaulon Mart. & Schau. apud Jacks., Ind. Kew. 1: 103, sphalm. 1893. Amazonia lasiocaulos Mart. & Schau. apud Glaz., Bull. Soc. Bot. Franç. 58, Mém. 3: 545, sphalm. 1911. Taligalea lasiocaulos (Mart. & Schau.) Hayek ex Moldenke in Fedde, Repert. 46: 208, in syn. 1939.

The plant has been collected in "capoeira alta" and in deep ravines, blooming in January and April. Murça Pires & Black call it an herb with vermillion floral bracts and cream-yellow corollas, but Allard describes it as 6 to 8 feet tall, with purplish-red flowers (by "flowers" he probably means bracts).

Additional citations: COLOMBIA: Méta: Galen Smith & Idrobo 1452 (W--2047718). PERU: San Martín: Allard 20522 (W--1999766). BRAZIL: Mattogrosso: J. G. Kuhlmann 1337 [Herb. Inst. Bot. S. Paulo 31984] (Sp). Pará: Murça Pires & Black 1499 (Be--28066, N).

AMASONIA OBOVATA Gleason

Literature: Gleason, Bull. Torrey Club 58: 463. 1931; Moldenke in Fedde, Repert. 46: 216--217. 1939; Moldenke, Known Geogr. Distrib. 62 & 176. 1949.

AMASONIA SPRUCEANA Moldenke

Literature: Moldenke in Fedde, Repert. 37: 213--214 (1934) and 46: 222--224. 1939; Moldenke, Phytologia 2: 502. 1948; Moldenke, Known Geogr. Distrib. 59, 62, 75, 156, & 176. 1949.

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NOVELTIES IN THE BOMBACACEAE

José Cuatrecasas*

These descriptions and nomenclatural transfers of several species of South American Bombacaceae, are extracted from my paper "Disertaciones sobre Bombacáceas" to appear in the forthcoming number 35 of the Revista de la Academia Colombiana de Ciencias Exactas Físicas y Naturales, Bogotá, where further comments will be found.

SPIROTHECA RHODOSTYLA Cuatr., sp.nov.

Arbor grandis circa 25 met.alta, trunco 40 cm.diam. cortice crasso griseo lacerato-squamoso spinis conicis robustis munito, ligno fibroso molle lutescenti. Ramuli terminales teretes rugulosi grisei glaberrimi sparse tuberculato-spinosi.

Folia alterna digitata 5-7-foliolata. Petiolus 5-10 cm.longus rigidus patulus glaber basi incrassatus apice capitato-dilatatus. Foliola subcoriacea atroviridia elliptico-oblanceolata basi cuneato-angustata breviter petiolulata apice acuminata vel breviter acuta vel subrotundata abrupteque apiculata, margine integerrima, minora circa 3 cm.longa 1.4 cm.lata, maxima 9 cm.longa 2.8 cm.lata, supra glaberrima costa angusta prominenti nervis secundariis paulo prominulis parum visibilibus superficie argute scrobiculata, subtus minutissime papillosula et minutis squamis rubescentibus sparsis munita costa elevata nervis secundariis prominulis numerosis 3-4 mm.inter eos distantibus parallelis patulis ad marginem arcuato connatis, venulis prominulis laxe reticulatis.

Flores pauci ad terminationem ramusculorum aggregati, pedunculo crasso 10-12 mm.longo parce squamuloso puberulo. Calyx cupularis coriaceus basi rotundatus margine breviter 5-lobatus extus viridis in sicco brunneis sparsissime puberulus intus tomentoso-sericeus 15-20 mm.altus et latus lobulis 3-4 mm.longis subrotundatis mucronulatis. Petala 5 rubella vel ochraceo-rubella oblonga apice subrotundata basi paulo angustata crassa rosea vel ochraceo-rosea intus minute stellato-tomentella subvelutina extus dense tomentoso-velutina, 7-8 cm.longa 1.6-2 cm.lata. Stamina in columnam cylindricam coriaceam articulatam 20-22 mm.longam connata; inferiore parte cylindrica crassa dense velutina margo liberi laevi circa 15 mm. longa; superiore parte angustiori glaberrima 6-7 mm. longa. Filamenta 5 parte liberi 4 cm.longa crassa

flavescentia glaberrima biantherifera. Antherae binae superpositae lineares connectivo crasso paulo flexuosae in alabastro collective spiraliter contoae, thecis parallelis locis linearibus marginalibus, superiores 10-12 mm.longae apice bilobatae inferiores 16-18 mm.longae profunde bifidae. Ovarium tomentosissimum. Stylus ruber crassus rigidus filamenta paulo brevior glaber basim versus hirsutulus.

Typus: Colombia, Dep. Valle; bosque la Guarida, filo de la Cordillera Occidental junto a la Carbonera, entre Las Brisas y Albán (línea Cartago-Nóvita), 2000 m.alt., colect. 24-X-1946 J. Cuatrecasas 22502. Holotypus,F. Other specimen Id. id.; El Cairo, entre Darién y Mediacanoa (alto Calima), 1650-1750 m.alt., colect. 6-I-1943 J. Cuatrecasas 13870.

SPIROTHECA PASSIFLOROIDES Cuatr., sp.nov.

Ramuli grisei glabri aculeati.

Folia alterna digitata 6-7-foliolata petiolo teneri glabro striolulato basi paulo dilatato apice capitato-incrassato 4-8 cm.longo. Foliola subcoriacea viridia anguste obovato-oblonga basim versus breviter in petiololum angustata cuneata apice obtusa vel rotundata emarginata, margine laevis, 4-8 cm.longa 12-25 mm.lata; supra glabra costa filiformi prominenti nervis lateralibus paulo notatis, nervulis venulisque minute prominuleque reticulatis; subtus costa crassiuscula elevata, nervis secundariis prominulis ad marginem arcuato-anastomosatis nervulis pallidioribus vix prominulis minute reticulatis superficie minute papillosula.

Flores pauci vel solitarii ad ramusculorum terminationes, pedunculo 12-18 mm.longo glabro. Calyx cupularis basi turbinatus margine truncatus, crassiuscule coriaceus circa 8-10 mm.altus 12 mm.latus, extus glaber intus tomentoso-sericeus. Petala membranacea verisimiliter rubra postanthesim reflexa, oblonga apice acutiuscula vel obtusa utrinque longitudinaliter dimidia parte glabra cetera puberula intus basim versus tomentosa 5.5 cm.longa 1-1.5 cm.lata. Stamina in tubum elongatum articulatum circa 3 cm.longum connata; parte inferiore cylindrica crassiore tomentosa 4-5 mm.longa; parte superiore basi conoidea tomentosa sursum angustiore tubulosa apice glabra. Filamenta parte liberi 5 crassa glabra postanthesi valde patula 10-14 mm.longa biantherifera. Antherae binae superpositae connectivo valde crasso lineales vix flexuosae, superiores 7-9 mm.longae subintegrae, inferiores 10-15 mm.longae longe bifidae. Ovarium tomentosum. Stylus erectus crassus laevis apicem versus glaber.

Typus: Brasil, Paraná; regio litoralis Serra da Prata 22-7-1914 collect. P.Dusen 15316. Holotypus,F. Paraná: Porto de Cima, in silva primaeva. Collect. 4-VI-1910 P.Dusen 9883. Paratypus, F.

SPIROTHECA RIMBACHII Cuatr., sp.nov.

Ceiba Rimbachii Standley in schedula.

Arbor ramulis terminalibus badiis subglabris verisimiliter spinulosis.

Folia alterna digitata 7-9-foliolata, petiolo 6-12 cm.longo glabro striolato basi bulboso dilatato apice capitato-incrassato. Foliola coriacea rigida oblanceolata basi in brevem petiolum cuneato-attenuata apice subite angustata acutissime cuspidata, margine integra, 5-9 cm.longa, 1.5-2.5 cm.lata; supra nervo medio angusto prominuli secundariis parum notatis superficie scrobiculata; subtus in sicco ochracea aspectu velutina costa eminenti nervis secundariis paulo prominulis copiosis 3-3.5 mm.inter eos distantibus cum tertiis brevioribus alternantibus venulis laxe reticulatis vix visibilibus superficie dense velutino-papillosa pilis squamosis rubris copiosis munita.

Pedunculus floralis 2 cm.longus valde robustus cicatricoso-rugosus. Calyx cupularis basi rotundatus margine breviter 5 lobatus, crasse coriaceus extus glaber intus tomentoso-sericeus, 2 cm.altus, lobis subrotundatis mucronulatis circa 4 mm.profundis. Petala oblonga apice obtusa crassa albida 10 cm.longa 2-2.5 cm.lata supra stellato-tomentulosa subtus tomentoso-velutina. Stamina in columnam cylindricam crassam articulatam 4-4.5 cm.longam connata; parte inferiore valde crassiore velutino-tomentosa margine liberi laevi 3 cm.longa; parte superiore subite angustata glabra 12-15 mm.longa. Filamenta parte liberi 5 crassiuscula 4-4.5 cm.longa glabra biantherifera. Antherae binae superpositae lineares crassiusculae paulo flexuosae, bithecae superiores 11-12 mm. longae subintegrae inferiores 18-20 mm.longae dimidia parte bifidae. Stylus glaber filamentis brevior. Ovarium tomentosum.

Typus: Ecuador: Valle del río Pastaza, cerca de Baños 1936. "Planted as living fence. Said to grow wild in neighboring montana. Tree, Flw. large white. Fruit said to be capsule with cotton." Collect. an. 1936 by Rimbach 737. Holotypus, F.

SPIROTHECA MICHAELI Cuatr., sp.nov.

Arbor ramis terminalibus glabris fuscis, cicatricibus griseis copiosis munitis.

Folia alterna digitata 5-7-foliolata. Petiolus glaber vulgo 14-22 cm.longus basi incrassatus apice

subcapitatus, paulo striatus. Foliola coriacea rigida petiolulo 3-10 mm.longo; lamina oblongo-subelliptica basi attenuata cuneata apice abrupte angustato-acuminata in juvenili folio acutissima, margine integerrima 7-16 cm.longa, 3.6-5.6 cm.lata (folia terminalia breviora); supra glabra nervo medio elevato, secundariis filiformibus, nervulis prominulis minutum elegantem reticulum formantibus, subtus in sicco ochracea aspectu subvelutina superficie minutissime papillosula et sparsis pilis squamulosis rubescentibus munita, costa prominenti nervis secundariis pallidioribus prominulis patulis 6-5 mm.inter eos distantibus marginem versus arcuato-anastomosatis, nervis tertiis brevioribus et clathratis reliquis venulis laxe reticulatis.

Flores solitarii vel parci ad terminationem ramulorum, pedunculo valde crasso apicem versus dilatato glabro parce cicatricoso, 15-18 mm.longo. Calyx coriaceus cupuliformis subrotundatus basi supra petiolum decurrens circa 18 mm.altus, lobulis 5 latissime rotundatus subite mucronulatus sinibus 6 mm.profundis extus glaber et sparse papilloso-granulosus, intus dense sericeus. Petala 5 rubescentia crassiuscula lineari-oblonga 12 cm.longa 18 mm.lata apice obtusa utrinque sed subtus densiore stellato-tomentulosa. Tubus staminorum integer cylindricus coriaceus laevis 3.5 cm.longus circa 0.7 cm.diam. molliter stellato-tomentellus apice glabro abrupte contracto. Filamenta staminalia parte libera circa 4 cm.longa glabra subtenera brachiata apice biantherifera. Antherae lineares angustae per pares superpositae subflexuosae superiores 12-14 mm.longae extremo (in 4-5 mm.extensione) liberae, inferiores 18-20 mm.longae extremo longiter (in 12 mm.extensione) liberae, thecis parallelis duobus loculis polliniferis linearibus marginalibus instructis. Ovarium tomentosissimum ferruginosum oblongum. Stylus rigidus glaber crassiusculis stamina subaequilongus.

Typus: Colombia, Comisaría del Putumayo; Valle de Sibundoy, 2200-2300 met.alt. in Jan. 1942 colect. Fray Miguel de Ipiales 25-B. Holotypus, F.

BOMBAX VARGASII Cuatr., sp.nov.

Arbuscula ramulis terminalibus badiis glabris in sicco leve rugulosis nodis paulo incrassatis.

Folia decidua ad terminationem ramulorum pauca, alterna 5-palmato-composita. Petiolus 5-6.5 cm.longus gracilis rigidis glaber basi incrassatus apice in discum pentagonum breviter ampliatus. Foliola sessilia cum pedunculo articulata, subherbacea laeteviridia lanceolata basi attenuata subobtusa vel acuta apice longe acutissimeque acuminata, margine serrulata 6-11

cm.longa, 1.8-2.8 cm.lata, medium quam inferioribus paulo majus, utrinque minutis squamulis granulosis sparsis munita; supra subnitida nervo medio impresso bene conspicuo lateralibus reticuloque paulo notatis; subtus costa eminenti nervis secundariis filiforme prominentibus patulis parallelis 1.5-2 mm.inter eos distantibus venulis prominulis reticulatis.

Inflorescentiae in cymulis brevibus (ad 10 floribus) terminalibus ramorum exfoliatorum. Pedicelli 3-5 mm.longi crassiusculi glabri saepe 3 bracteolis triangularibus squamosis minutis praediti. Calyx brevis cupularis crassiusculus 3 mm.longus extus glaber viridis intus basi longe barbatus margine obsolete 5-denticulatus. Petala 5 libera sed basi staminorum tubi adnata, praefloratione contorta lineari-oblonga obtusiuscula circa 27 mm.longa 3.5-4 mm.lata crassiuscula albida pubescentia extus densius, anthesi quarta parte inferiori tubuloso-conniventia cetera parte reflexa. Tubus stamineus 6-7 mm.longus glaber apice paulo incrassatus; filamentis circa 90 tenuibus petalis brevioribus; antheris reniformi-capitatis. Ovarium ovoideum sericeum 5 loculis polyspermis. Stylus filiformis circa 16 mm.longus glaber. Stigma laeve.

Typus: Peru; Dep.Cuzco, Prov.Anta: Sisal, 2100 m. alt. valle xerofito. Arbusto 6 met., colect. junio 1938 César Vargas 1087. Holotypus,F.

BOMBAX WEBERBAUERI Cuatr., sp.nov.

Arbuscula. Ramuli robusti cicatricibus incrassatis fusci glabri.

Folia decidua ad terminationem ramulorum alterna 5 palmato-composita. Petiolus in specimine unico 5.2 cm.longus basi incrassatus apice in discum pentagonum paulo ampliatus glabratus. Foliola obovato-oblonga basim angustata cuneata apice obtusa breviterque mucronata margine superiore parte serrulata basim versus integra 4-6.5 cm.longa 2.2-2.6 cm.lata; supra copiosis pilis brevibus simplicibus vel fasciculatis patulis munita costa filiformis impressa reliquis nerviis obsoletis; subtus pilis stellatis gracilibus adpressis copiosissimis praedita costa elevata nervis secundariis parallelis ascendentibus 2.5-3 mm.inter eos distantibus nervulis reticulatis obsoletis.

Flores in paniculis terminalibus axi robusto exfoliato 2-7 cm.longo stellato-pubescenti ramulis 1-5 robustiusculis patulis ad 4 cm.longis stellato-pubescentibus ad terminationem paucis floribus breviter pedicellatis dispositis. Bracteolis ovalibus minutis scariosis. Pedicelli 0.1-4 mm.longi pubescenti. Calyx cupularis 3 mm.altus truncatus (obsolete denticulatus)

extus tomentosus intus sericeus. Petala 5 libera sed basi staminorum tubo breviter adnata aestivatione contorta lineari-oblonga obtusiuscula 20-22 mm.longa 3.5-4 mm.lata crassiuscula extus dense villoso-hirsuta siccitate luteolo-albida intus pubescentia siccitate sordide salmonea. Tubus stamineus 6 mm.longus glaber supra basim ventricosus apice cupuliforme dilatatus; filamentis 40-60 gracilibus glabris petalis paulo brevioribus; antheris reniformi-capitatis. Ovarium ovoideo-oblongum apicem versus hirsutum. Stylus filiformis apice plus minusve 3-5 fissis.

Typus: Peru, Dep.Apurimac, 2500-2600 m.alt. (without definite locality in Chicago Nat.Hist.Mus.), collected between 1909 and 1914 by A. Weberbauer 5849 (distributed as Bombax Ruizii K.Schum.). Holotypus,F.

BOMBAX ROSEORUM Cuatr., sp.nov.

Arbor mediocris, ramulis terminalibus crassis cicatricosis glabris.

Folia decidua alterna longe petiolata 5-palmato-composita. Petiolus 28 cm.longus rigidus glaber vel sparse papillosulus, basi paulo incrassatus, apice pentagonalis. Foliola subcoriacea obovata basim attenuata cuneata apice subite acutata margine integerrima 14 cm.longa 6.5 cm.lata (specimine unico), supra glaberrima nervo medio secundariis filiformibus notatis; subtus costa angusta eminenti, nervis secundariis prominentibus 14-15 utroque latere curvato ascendentibus marginem versus evanescenti-reticulatis, nervulis obsoletis vel prominulis reticulatis, superficie papillis squamulosis copiosis sparse praedita.

Inflorescentiae paniculatae subterminales ad 12 cm. longae graciles flexuosae axi mediocri ramulisque pilis minutis squamulosis sparsis munitis, floribus longe pedicellatis. Pedicelli subteneres 3-5 cm.longi erecti vel flexuosi sparse puberuli apicem versus 2-3 minutas bracteas circa 1 mm.longas ferentes. Calyx cupularis 3.5 mm.altus margine obsolete 5 dentatus, extus puberulus pilis minutis squamulosis munitus, intus sericeus ad basim anullo densiore barbato praeditus. Petala 5 libera sed basi tubo staminorum breviter adnata in sicco sordide pallida lineari-oblonga circa 26 mm.longa 4.5 mm.lata, extus dense pubescentia intus pubescentia. Tubus stamineus 10 mm.altus 3 mm. diamitens inflatus membranaceus glaber apice sub 5-lobatus subclausus ore angusto paulo invaginato. Filamenta 22-26 inaequalia subcrassiuscula glabra petalis breviora. Antherae ellipticae 1 mm.longae dorso supra basim insertae. Ovarium ovatum crassum tomentosum. Stylus gracilis filiformis. Stigma minute papillosulum simplex.

Capsula 5 valvis coriaceis 12 mm.longis 3 mm.latis

in sicco involutis lanam copiosam includens. Semina subovoidea circa 10-11 mm.longa. Columella centralis cõpiose lanata. Lana pallide cinnamomea. Pedunculus fructifer robustus rigidus circa 5 cm.longus.

Typus: Ecuador, Vicinity of Portovelo, Oct.1918 collect.J.N.Rose & George Rose 23371, "Polo-polo". Flowers. Holotypus,US;isotypus,F. Vicinity of Ayapamba,Oct.1918 collected J.N.Rose & George Rose 23455 (one leaf and fruit); Paratypus, US. Provincia del Oro, between Portovelo (Gold Mine near Zaruma) and El Tambo, 600-1000 m.alt.,Sept.1923 collected A.S.Hitchcock 21292.

PSEUDOBOMBAX SQUAMIGERUM Cuatr., sp.nov.

Arbor magna, 40 met.alt., trunco basi robustis elatisque radicibus tabularibus munito, ad altitudinem 2 metrorum 0.60 met.diaminenti, cortice griseo-brunneo, crassissimo (3 cm.) lacerato-rugoso, ligno submolli albo vel roseo.

Folia alterna composita 5-7-digitata. Petiolus robustus rigidus leviter striatus paulo granulosus vel sublaevis glaber fuscus 5-12 cm.longus, basi apiceque incrassatus. Foliola petiolulata rigida coriacea; petiolulo 6-8 mm.longo basim versus incrassato fusco glabro; lamina subelliptica utrinque attenuata basi obtuse cuneata apice breviter apiculata vel subrotundata margine integra, minimis 8 cm.longa 4 cm.lata, maximis 16 cm.longa 8.5 cm.lata, supra atroviridis in sicco fusco-brunnescenti glabra costa impressa nervisque secundariis notatis venulis minute reticulatis, subtus viridi-ferruginea in sicco brunnescenti minutis squamis rubescentibus copiosis tecta, costa valde eminenti nervis secundariis prominentibus circa 17 utroque latere parallelis ad marginem tenuioribus anastomosantibus nervulis transversis prominulis laxe reticulatis.

Fructus longe pedunculatus, pedunculo lignoso robusto angulato circa 7 mm.longo subapicem valde incrassato. Capsula maturitate globosa apiculata circa 6.5-7 cm.alta et 5.5 cm.lata in 5 valvas ligneas valde crassas elongato-acuminatissimas, 7.5-9 cm.longas (4.5-6.5 cm.longas, in statu curvato) circa 3 cm. latas, 7-8 mm.crassas dehiscens, extus tomentosa intus copiosissime densissimeque lanata, endocarpio subcoriaceo 5 parietes placentarias angustas formantibus quam vidi 5 seminibus. Semen globoso-reniforme vel polygonale 15 x 12 x 9 mm., testa coriacea brunnea cotyledonibus crassis contortuplicatis.

Typus: Colombia, Dep.Valle, río Calima (región del Chocó) margen derecha: Aguaclara, 40 met.alt., colect. 21-V-1946 J.Cuatrecasas 21157. Holotypus,F.

HAMPEA PUNCTULATA Cuatr., sp.nov.

Arbor circa 8-metralis ramulis terminalibus pallide viridi-ochraceis adpresse tomentosis pilis fasciculatis dense tectis.

Folia simplicia integra alterna longe petiolata membranacea. Petiolus 17-22 cm.longus leviter striatus pallidus adpresse tomentosus. Lamina latissime ovato-rotundata basi cordata apice rotundata vel obtusissima margine integra 12-24 cm.longa, 14-24 cm. lata (et verisimiliter valde major): supra laetevirens 7 nervis principalibus palmatis angustis stellato-puberulis conspicuis nervis secundariis remotis minus notatis, cetera superficie glabra sublente minuto reticulo plus minusve visibili et copiosis punctis opacis elevatis valde conspicuis; subtus cinerea pilis stellatis adpressis dense tecta, nervis principalibus 7 elevatis secundariis paucis paulo prominulis reticulo obsoleto.

Flores (6-10) in fasciculis axillaribus copiosis dispositi. Pedicelli 1.5-2 cm.longi crassiusculi striolati subochraceo-tomentosi erecti vel paulo flexuosi. Calyx oblongo-cupularis circa 9 mm.altus basi subrotundatus apice truncatus, margine irregulariter breviterque fisso-denticulata vel erosa, extus pallidus adpresse tomentosus intus glaber nigro-punctatus. Petala alba lamina elliptico-oblonga 23-26 mm.longa 9-10 mm.lata supra glabra et minute nigro-punctata, subtus pilis fasciculatis minutis crassiusculis dense tecta. Tubus stamineus circa 8 mm.longus extus glaber apice dense barbatus, filamentis ad 10 mm.longis teneribus glabris sparse nigro-punctatis, antheris 1 mm. longis. Pistillum in specimine dessunt.

Typus: Colombia; Antioquia: Turbo, "on Quebrada Mercedes east of Turbo, alt. about 75 m. Small tree, about 8 m.high, wood white very soft. Flowers white with peculiar rather unpleasant odor. Common here, along streams" collect. 14-VII-1946 Oscar Haught 4968. Holotypus, US.

HAMPEA ROMEROI Cuatr., sp.nov.

Arbor circa 12 met.alta. Ramuli dense tomentosi brunnei.

Folia simplicia integra alterna submembranacea. Petiolus 10-15 cm.longus graciliter rigidus striolatus supra sulcatus brunneo stellato-tomentosus. Lamina rotundato-ovoidea basi cordata apice deltoidea margine integra, 10-15.5 cm.longa, 9-14.5 cm.lata; supra sparsis pilis lepidoto-stellatis minutis valde adpressis munita nervis principalibus filiformibus conspicuis reliquis nervulis paulo impressis reticulatis; subtus pilis stellatis densis adpressis tecta, nervis principalibus 7 prominentibus magis tomentulosis, nervis

transversis subparallelis bene prominulis reliquis nervulis obsoletis laxe reticulatis.

Pedunculi fructiferi 2-3 cm.longi mediocres rigidi vel paulo curvati striolulati dense tomentosi. Calyx fructifer conicus 7-9 mm.longus margine irregulariter erosus extus adpresse stellato-tomentosus, intus glaber. Capsula oblongo-elliptica bi-trivalva 3 cm.longa 1.3-1.4 cm.lata loculis 2-3 seminibus. Semina subovata circa 10 mm.longa laevia arillo albo crasso munita. Pericarpium crassum (1-1.5 mm.) extus rugulosum adpresse tomentulosum, intus glabrum.

Typus: Colombia, El Chocó: Juradó, colect. 14 oct. 1946 Rafael Romero Castañeda 495. Holotypus,F.

QUARARIBEA FOENIGRAECA Cuatr., sp.nov.

Arbor 30 met.alta, caule 50-60 cm.diam. cortice sordide albo-griseo ligno albo, tantum parte superiore ramosa ramis verticillatis (precipuae 5) horizontalibus vel extremis reclinatis. Ramuli brunnescentes nitidi glabri vel extremis valde juvenilibus minute parcissime puberulis.

Folia pendula vel horizontalia simplicia alterna subcoriacea pinnatinervia in vivo intense viridia in sicco pallida. Lamina ovato-oblonga vel oblongo-elliptica basi obtusa vel rotundata saepe breviter emarginata apice attenuata acutiuscula vel paulo acuminata, margine integra, 11-30 cm.longa 4.5-14 cm.lata, utrinque prospectu glabra sed minutissimis sparsissimisque pilis lepidotis adpressis munita, supra costa bene notata nervis secundariis conspicuis reticulo venulorum paulo prominulo, subtus costa crassa eminenti nervis secundariis 7-9 utroque latere eminentibus arcuato-ascendentibus marginem versus subdecurrentibus tenuioribus anastomosatis, nervulis venulisque prominulis reticulatis.

Flores solitarii actinophili supra ramulos terminales erecti. Pedunculi mediocres 12-16 mm.longi teneres rigidi apice paulo incrassati tertio inferiore articulati 3 bracteolis ovatis acutis 1 mm.longis muniti, lepidibus minutis adpressis tecti. Alabastra subpyriformia 8-10 mm.longa apice mucronulata adpresse squamuloso-vestita. Calyx coriaceus crassus conico-campanulatus 12-14 mm.longus, 3-4 irregulariter lobatus lobis obtusis vel rotundatis 3-4 mm.longis, viridis vel luteolo-viridis adpresse minuteque piloso-lepidotus, intus dense villoso-sericeus. Petala 5 libera alba membranacea linearia subspathulato-oblonga vel obovato-oblonga apice rotundata vel obtusa dimidia inferiore parte valde unguiculato angustata 30-35 mm. longa 5-7 mm.lata, dense stellato-pilosa tomentella. Staminorum columna crassiuscula alba calycem valde excedens circa 25 mm.longa tomentella stellato-pilosa

ad apicem (5 mm.longitudine) dilatata margine lobata lobis crassis linearibus 2-3 mm.longus. Antherae bilobatae aspectu glomeratae sed pro dente octo longitudinaliter biseriatae, thecis ellipticis 1.2 mm.longis paribus superioribus cruciatim dispositis. Stylus tubum staminorum paulo excedens linearis dense pubescens apice dilatatus subtruncatus stigmate rugoso ovario biloculari loculis uniovulatis. Fructus ovatus obtuse apiculatus circa 22-24 mm.longus 18 mm. latus pericarpio coriaceo extus lutescenti minutissime lepidoto-tomentello endocarpio tenuiter fibroso-coriaceo bilocularis bispermus seminibus crassis oleiferis plano-convexis 15-18 mm.longis 13-14 mm.latis. Calyx fructiferus coriaceus conicus irregulariter eroso-lobatus 15 mm.longus minutissime lepidulatus. Tota planta intensissimum odorem Trigonella foenum-graeci L.similem exhalat.

Typus: Colombia, Dep.Valle, Hoya del río Dígua, lado izquierdo: Piedra de Moler, bosques 900-1180 m. alt., colect. 19-VIII-1943, J.Cuatrecasas 14890. Holotypus, F.

QUARARIBEA LORETOYACUENSIS Cuatr., sp.nov.

Rami horizontales vel plus minusve penduli cortice griseo-virides rugulosi glabri.

Folia simplicia alterna subcoriacea in sicco cinereo-viridia. Petiolus brevis stellato-tomentulosus 6-15 mm.longus. Lamina obovato-elliptica basi rotundata vel obtusissima apice subrotundata subite breviter obtuseque apiculata vel obtusa, margine integra sed irregulariter leviterque repanda, 10-22 cm.longa, 5-16 cm.lata; supra sparsis pilis minutissimis stellatis munita costa angusta depressa stellulato-puberula nervis secundariis filiformibus reliquis venulis paulo conspicuis; subtus praecipue supra nervationem copiosis pilis stellatis, costa eminenti nervis secundariis 5 utroque latere prominentibus arcuato-ascendentibus marginem versus decurrentibus anastomosatis, nervis tertiis transversis bene prominulis cum venulis prominulis in reticulum anastomosatis.

Flores solitarii in ramulis brevibus foliosis nascentes breviter pedunculati. Pedunculi 5-6 mm.longi inferiore parte articulati 3-bracteolati, crassi apicem versus gradatim incrassati parce striati dense tomentosi, pilis crassiusculis stellatis ramulis valde brevibus congestis. Calyx conico-tubulosus circa 20 mm.longus apice inaequaliter 3-4 lobatus lobis ad 5 mm.longis intus densissime villoso-sericeus extus parce striolatus dense ochraceo-tomentosus, pilis crassiusculis stellulatis ramulis brevibus congestis tectus. Petala membranacea late linearia ad 45 mm.longa apicem versus 8-9 mm.lata, apice rotundata basim

versus angustata unguiculata utrinque longis pilis stellatis subtus densioribus tecta. Staminorum tubus crassus petala subaequilongus dense tomentosus apice quinque dentatus subapicem antheris bilobatis plus minusve 5-seriatis tribus (6 thecis) in quaque serie dispositis. Stylus gracilis tomentosus apice stigmate valde ampliato bilobato. Calyx fructiferus coriaceus rigidus 25 mm.longus. Fructus oblongo-ovalis 3 cm. longus 1.5 cm.latus.

Typus: Colombia, Trapecio Amazónico; Loretuyacu River alt. about 100 m., collect.Oct.1946,R.E.Schultes & George A.Black 8550. Holotypus,F.

QUARARIBEA VELUTINA Cuatr., sp.nov.

Arbor 6 m.alt.. Ramuli grisei rugulosi terminationibus juvenilibus tomentosi denique glabri.

Folia simplicia alterna subcoriacea in sicco cinereo- vel pallido-viridia. Petiolus brevis tomentulosus 5-7 mm.longus. Lamina subelliptica vel oblongo-elliptica vel leviter obovata margine integra basi inaequilatera obtusa vel subrotundata apice obtusa vel obtuse apiculata 9-14 cm.longa 4-6 cm.lata; supra minutis pilis stellatis sparsis, costa filiformi magis pilosa nervis secundariis visibilibus reliquis nerviis minus conspicuis; subtus sparse stellato-pilosa costa elevata nervis secundariis praecipue 5 utroque latere prominentibus ascendentibus paulo arcuatis marginem versus subdecurrenti-anastomosatis nervis tertiis transversis cum reliquis in prominulum reticulum anastomosatis. Stipulae lineari-lanceolatae acutissimae striolatae tomentellae 10-12 mm.longae, deciduae.

Flores solitarii. Pedunculi crassi circa 10 mm. longi supra basim 2-3 bracteolati apicem versus gradatim incrassati conici, velutino-tomentosi. Calyx tubuloso-conicus circa 16 mm.longus subtrilobatus lobis inaequalibus 2-5 mm.longis rotundatis intus villoso-sericeus extus dense molliterque velutinus, pilis fasciculatis longis gracilis patulis adpressis instructus. Petala alba membranacea linearia apice rotundata 38-40 mm.longa subapicem 8-10 mm.lata, basim versus sine sensu valde angustata utrinque tomentulosa stellato-pilosa. Columna staminorum crassiuscula circa 35 mm.longa quam petala breviora stellato-tomentosa apice breviter 5-lobata lobulis obtusis crassis circa 2 mm. longis. Antherae 5-seriatae bilobatae thecis plus minusve separatis, 6 thecis ellipticis in quaque serie laxe dispositis. Stylus teneris pubescens apice valde conico-incrassatus, stamina paulo superans. Ovarium biloculare loculis biovulatis.

Typus: Peru; Dept.Loreto: Gamitanacocha, Río Mazán, alt.100-125 met., collect.Febr.12, 1935 José M. Schunke 235. Holotypus,F.

MATISIA IDROBOI Cuatr., sp.nov.

Arbor mediocris vel magna. Rami grisei. Ramuli hornotini ferruginei stellulato-tomentosi.

Folia simplicia alterna subcoriacea. Petiolus robustus 10-16 mm.longus rigidus tomentosus pilis minutis crassiusculis fasciculatis munitus. Lamina obovato-oblonga basi rotundata interdum breviter emarginata apice angustata acuminata vel cuspidata margine integra; supra in sicco griseo-viridula minutis pilis stellulatis (fasciculatis) praecipue supra costam munitis, costa nervis secundariis pallidis conspicuis reticulo nervulorum prominulo vel obsoleto; subtus copiosis pilis valde minutis fasciculatis adspersis munita, basi triplinervis costa bene prominenti nervis secundariis eminentibus 4-5 utroque latere ascendentibus marginem versus arcuatis inferioribus remotis; nervis tertiis paulo prominulis reticulatis. Radii pilorum breves numerosi congesti.

Flores solitarii oppositifolii pedunculo rigido crassiusculo 2-3.5 cm.longo ferrugineo dense tomentoso apice paulo conico-dilatati 3 bracteas ovato-lanceolatas acutas tomentosas 8-15 mm.longas 3.5-5 mm.latas ad calycem adnatas ferenti. Calyx subcoriaceus turbinato-tubulosus 11-15 mm.longus apice breviter lobatus extus 10 costato-angulatus, costis alatis, alis crassiusculis dorsalibus ad 2 mm.amplis apice rotundatis commisuralibus brevioribus angustioribus (1 mm.latae). Calyx intus sericeus extus viridi-ochraceus tomentosus. Pili pedunculorum bractearum sepalorumque stellato-fasciculati radiis numerosis brevibus congestis, aspectu granulati. Petala membranacea alba lineari-obovato-oblonga apice rotundata basim versus angustata 25 mm.longa ungui ad 5 mm.lato limbo 9 mm.lato, supra glabra infra tenuiter stellato-tomentosa pilis radiis tenuibus longis intricatis. Staminorum columna 20-25 mm.longa crassa (1.5-2 mm.) dimidia inferiore parte glabra superiore pilis crassiusculis minute capitatis patentibus copiose munita, apice in 5 lacinias antheriferas lineares crassiusculas circa 5 mm.longas pilosas producta; laciniis antherarum sex loculis ellipticis 1.5 mm.longis instructis, sed duobus horum loculis parte superiore tubi vel basi laciniis concrescentibus. Stylus crassiusculus androceum subaequilongus tomentosus stigmate crasso-capitato. Ovarium pubescens 5 loculis 2-ovulatis.

Typus: Colombia, Meta: Cordillera La Macarena (extremo nordeste) macizo Renjifo, cumbre y alrededores, alt.1300-1900 m. Jan.1951. colect.Jesús M.Idrobo & R. Evans Schultes 1001. Holotypus,US.

MATISIA HUALLAGENSIS Cuatr., sp.nov.

Ramuli terminales robusti sulcati sparse stellato-

pilosi.

Folia simplicia alterna petiolata coriacea. Petiolus rigidus 18-23 mm.longus tomentulosus. Lamina glabra oblongo-elliptica basi rotundato-cordata margine integra, circa 24 cm.longa 11-13.5 cm.lata, supra costa crassiuscula plana nervis secundariis paulo depressis conspicuis nervulis in reticulo conspicuo; subtus costa valde eminenti nervis lateralibus prominentibus circa 6 utroque latere arcuato-ascendentibus marginem versus evanescenti anastomosatis, nervulis reticulum prominulum formantibus.

Flores oppositifolii solitarii longe pedicellati. Pedunculus 5 cm.longus crassiusculus parce rugosus (in sicco) apicem versus gradatim crassioribus dense ochraceo-tomentosus, pilis stellatis fasciculatisque tectus. Alabastra elliptico-oblonga circa 3 cm.longa apice 4 alato-auriculata, auriculis 2-3 mm.longis erectis basim decurrentibus. Calyx dense tomentosus paulo striolato rugosus coriaceus crassus 30-32 mm. longus 9-10 mm.latus cylindraceus basi attenuatus apice irregulariter 4-lobatus lobis 5-6 mm.longis rotundatis commisuris paulo plicatoalatis, aliis 4-5 mm. longis 1-2 mm.latis. Petala 46-50 mm.longa lineari-oblonga superiore parte dilatata ad 8-10 mm.lata apice obtusa, inferiore parte sine sensu cuneatim angustata, crassiuscula intus glabra extus dense stellato-tomentosa. Columna staminifera crassiuscula laevis tantum puberula petala subaequilonga apice in 5 lacinias antheriferas crassas lineares 8-10 mm.longas producta quaque lacinia 3-4thecis bilocularibus linearibus 4-5 mm.longis ferenti. Fructus rotundato-depressus praesumpte 5-locularibus basi rotundatus apice planus extus adpresse tomentosus 4.8 cm.latus 2-8 cm.altus, seminibus subellipticis circa 24 mm.longis 10 mm.latis. Calyx fructiferus persistens subcupuliformis coriaceus, pedunculo robusto valde incrassato, in sicco rugoso-striato.

Typus: Peru, Dept.Loreto: Lower río Huallaga, San Ramón, Yurimaguas, alt.155-210 m.,Oct.-Nov. 1929 collect.Llewelyn Williams 4572. Holotypus,F.

MATISIA STENOPETALA Standley et Cuatr., sp.nov.

Arbor parva. Ramuli terminales stellato-tomentosi. Stipulae subulatae crassiusculae tomentosae 10-12 mm. longae deciduae.

Folia crasse membranacea simplicia alterna magna. Petiolus in specimine typo 26 cm.longus striolatus hirsutulo-tomentosus pilis stellatis radiis patentibus copiose tectus, basi in sicco angustatus aspectu articulatus. Lamina ambitu orbicularis basi profunde fisso-cordata auriculis latis rotundatis sinum angustum 11 cm.longum obtegentibus, apice rotundata, mar-

gine inferiore parte laevis sursum sublaevis 3 brevissimos lobos deltoideos obsoletos sinuatos, 38 cm.longa lateque; supra viridis nervis principalibus tomentulosis notatis ceteris nervulis parum conspicuis superficie pilis stellatis tenuis valde sparsis munita; subtus pubescens pilis tenuis stellatis praecipue supra nervationem copiosissimis, nervis principalibus 10 palmatis prominentibus ad marginem abrupte arcuatis anastomosatisque nervis secundariis clathratis prominentibus ceteris nervis venulisque reticulum prominulum formantibus.

Flores longe pedicellati fasciculati ex tuberculis trunci prodeuntes. Pedicelli 2.5-3 cm.longi graciles sed rigidi stellato-tomentosi in specimine ebracteolati. Calyx tubulosus 1.5 cm.longus 5 mm.latus basi obtusus margine breviter inaequaliterque 3-4 lobatus intus sericeus extus ochraceus subvelutino-tomentosus pilis tenuibus stellatis intricatis dense tectus. Petala rubro-violacea membranacea intus glabra extus pubescentia pilis crassis simplicibus, in statu evoluto valde exserta, 5 cm.longa, extremo spathulato-rotundata 6-7 mm.lata, jam versus partem mediam in longissimum angustissimum ungem coarctata. Staminorum columna gracilis erecta longissime exserta tomentosa ad 4 cm.longa, extremo on 5 lacinias antheriferas lineares crassiusculas 8-9 mm.longas producta; laciniis sex antherarum loculis oblongis 2-3 mm.longis contiguis munitis. Stylus gracilis pilis tenuibus stellato-setosis subcopiosis munitus. Stigma capitatum lobatum. Pedunculus fructifer robustus 4.5 cm.longus. Calyx fructifer cupularis coriaceus 1.5 cm.altus lobatus extus tomentosus intus villosus. Fructus globosus tomentosus 3 cm.diam. (statu praematuritate), 5 locularis 5-spermus.

Typus: Peru, Dept.Loreto: Balsapuerto, alt. about 320 met. forest clearing manch "Tree 4 met., fls. red-violet born on main stems", collect.G.Klug 2972. Holotypus,F.

MATISIA RHOMBIFOLIA Cuatr., sp.nov.

Quararibea rhombifolia Standley in schaeda,Bol.Mus. Hist.Nat.,Lima 4: 476 (1940) nomen.

Arbor mediocris. Ramuli terminales ferrugineo-tomentosi.

Folia simplicia alterna subcarthacea. Petiolus circa 6 cm.longus, ferrugineis pilis congeste stellatis adpresse tomentoseque tectus. Lamina ambitu subobovata basi cordata lateraliter pandurato-contracta apice deltoidea margine integra 20-26 cm.longa, 14-6 cm.lata; supra atroviridis pilis minutis stellulatis sparsis munita nervis principalibus tomentellis tantum notatis; subtus viridis 9 nervis basilaribus

palmatis eminentibus subochraceis dense adpresseque stellato-tomentosis pilis minutis dense tectis, nervis secundariis transversis prominentibus pilis simplicibus vel fasciculatis tenuibus patentibus munitis ceteris nervulis in reticulo prominulo sparse hirtulo-pubescenti.

Fructus in ramulis exaxillares pedunculo crasso 2.5 cm.longo, circa 3.5 cm.in diametro subglobosi epicarpio subruguloso (in vivo aureo-brunneo velutino) basi breviter contracti apice subite grosse mucronati, endocarpio 5 pyrenis monospermis; seminibus circa 16 mm. longis 7 mm.latis.

Typus: Peru, Depart.Huanuco, Shapajilla, jungle 630 m.alt., collect.12-I-1939 Felix Woytkowski 2. Holotypus,F.

MATISIA BOLIVARII subsp. OCCIDENTALIS Cuatr., nov. comb.

Quararibea bolivarii subsp. occidentalis Cuatr., Lloydia 11:189 (1948), Colombia.

MATISIA INAEQUILATERA Cuatr., nov.comb.

Quararibea inaequilatera Cuatr., Lloydia 11:187 (1948), Colombia.

MATISIA LEPTANDRA Cuatr., nov.comb.

Quararibea leptandra Cuatr., Lloydia 11:185 (1948), Colombia.

MATISIA LOMENSIS Cuatr., nov.comb.

Quararibea lomensis Cuatr., Lloydia 11:187 (1948), Colombia.

MATISIA MURICATA Cuatr., nov.comb.

Quararibea muricata Cuatr., Bot.Mut.Leafl. Harv. Univ.15:53 (1951), Colombia.

MATISIA PUTUMAYENSIS Cuatr., nov.comb.

Quararibea putumayensis Cuatr., Lloydia 11:186 (1948), Colombia.

MATISIA SAMARIENSIS Cuatr., nov.comb.

Quararibea samariensis Cuatr., Lloydia 11:188 (1948), Colombia.

MATISIA SCHULTESII Cuatr., nov.comb.

Quararibea Schultesii Cuatr., Bot.Mus.Leafl. Harv. Univ. 14:31 (1949), Colombia.

MATISIA SULCATA Cuatr., nov.comb.
Quararibea sulcata Cuatr., Lloydia 11:188 (1948), Colombia.

MATISIA URIBEI (Garcia Barriga & Hernandez) Cuatr., nov.comb.
Quararibea Uribei Garcia Barriga et Hernandez,"MUTISIA" n.2:1-5 et illustr.(1952), Colombia.

OCHROMA LAGOPUS Swartz var.OCCIGRANATENSIS Cuatr., var.nov.
Lamina foliorum magna firmis subrotundata basi cordata apice paulo acuminata, margine subintegra, supra glabra subtus ferrugineo-tomentosa, nervis principalibus hirtis subtus valde elevatis, nervis secundariis transversis parallelis magis prominentibus, 24-40 cm. longa et lata. Flores circa 15 cm.longi, lobulis calycis oblongis. Fructus grandis, 20 cm.longus.
Typus: Colombia, Dep.Valle, Hoya del río Digua: Piedra de Moler, 900-1180 m.alt., colect.25-VIII-1943 J.Cuatrecasas 15143. "Gran árbol, ramificado a escasa altura en grandes y esbeltas astas. Hojas semicoriáceas, quebradizas, verdes en el haz, pálidas envés con nervios rojizos." "balso". Holotypus,F.

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FIVE NEW SPECIES OF BRUNELLIA

José Cuatrecasas*

BRUNELLIA MOLLIS Cuatr., sp.nov.

Arbor ad 20 m.alta cortice griseo sublaeve. Rami terminales dense tomentelli pilis minutis crispis intricatis adpressisque tecti. Stipulae subulatae 4-5 mm.longae dense tomentosae deciduae.

Folia opposita imparipinnata plerumque 3-jugis. Petiolus 7-10 cm.longus subteres adpresse minuteque tomentosae. Foliola coriacea petiolulata, petiolulo 2-3 mm.longo terminali ad 2 cm.longo; lamina oblongo-elliptica vel lanceolato-elliptica basi obtusissima valde inaequilatera apice paulo angustata acutaque vel obtusiuscula, margine levissime repandoque crenato-serrulata, 7-16 cm.longa 3-6 cm.lata; supra juventute ochraceo-tomentosa denique nervo medio excepto glabra, nervis secundariis leviter notatis reticulo venulorum paulo conspicuo; subtus molliter denseque cinereo-tomentosa pilis minutis tenuissimis crispis adpresse intricatis obtecta, costa crassa eminenti nervis secundariis 9-12 utroque latere prominentibus obtuse ascendentibus prope marginem furcatis ceteris nervis reticulatis plus minusve conspicuis.

Inflorescentiae axillares breviter pedunculatae vel sessiles profuse ramosae ramis ramulisque dense tomentosis pilis tenuibus crispis intricatis et patulis praeditae. Flores viriduli hermaphroditi subsessiles vel breviter pedicellati pedicellis ad 1 mm.longis. Sepala 5 crassiuscula ovato-triangularia 2.5 mm.longa extus tomentosa intus villosa. Stamina 10 filamentis inferiore parte villosis, antheris exsertis ellipticis 1 mm.longis. Carpella plerumque 5 villosa biovulata stylo glabro. Interdum flores hexameri. Folliculi ovoidei apice abrupte apiculati, valvis 5 mm.longis extus tomentulosis et hirtis, monospermi. Semen 3 mm. longum ellipticum rubrum nitidum.

Typus: Colombia, Dep. Huila; Finca Encanto, 30 km. NW of Palermo, 7200 feet alt. Tree 10 m.high 20 cm. DBH. Bark gray, smooth lichen patches. Patch of forest along small stream. Flowers greenish. Common in secondary forest after cutting. Collect. E.L.Little 8797. Holotypus,F.

Id. id. 30 km. NW of Palermo, 7500 feet alt. Tree 20 m.high 25 cm. DBH. Bark gray slightly fissured. Common in wet temperate forest. Collect. E.L.Little 8729. Paratypus,F.

B. mollis is closely related to B. comocladifolia H. & B., from which it is distinguished by the short

tomentum formed by minute curled hairs and not, as in B. comocladifolia, by long and straight hairs forming a hirsute and lax pubescence on the nerves and branchlets. In B. mollis, the tomentum is dense and adpressed on the branchlets and thicker on the leaves beneath, but never hirsute or villous; besides, this species has larger fruits, more separated nerves on the leaflets, which are larger, more elliptical, very asymmetric at the base and have longer petiolules. The same features separate this species from B. sibundoyensis Cuatr., a more tomentose plant with larger leaves and fruits than in B. comocladifolia.

BRUNELLIA LITTLEI Cuatr., sp.nov.

Arbor circa 12 met.alta cortice griseo laevi. Rami terminales robusti glaberrimi nodosi lenticellati ultimis internodiis compressis sulcatis.

Folia opposita imparipinnata 14-35 cm.longa, 4-7-juga glabra; stipulis dentiformibus minutis ramum insertis. Petiolus 3-5.5 cm.longus paulo carinatus triquetusque, basi parce incrassatus. Foliola coriacea opposita longe petiolulata, petiolulo 5-8 mm.longo rigido supra sulcato, lamina elliptico-oblonga basi cuneata plerumque asymmetrica apice obtusa vel rotundata vel acutiuscula margine serrulato-crenulata leviter revoluta, 5-12 cm.longa 1.8-4 cm.lata; supra viridi nervo medio filiformi impresso nervis secundariis paulo notatis reticulo subobsoleto; subtus pallida costa bene elevata nervis secundariis tenuibus patulis reticulo venulorum minuto haud elevato; basi petioluli stipellis minutis glandiformibus ad rhachem adnatis.

Inflorescentiae axillares dichasiales sessiles 3-6 cm.longae, ramis angulatis glabris, pedicellis 1-1.5 mm.longis glabris, bracteis lanceolato-linearibus brevissimis. Alabastra mascula rotundata subglabra, 5 sepalis ovatis acutis crassiusculis 3 mm.longis extus glabris intus densissime villosis; staminibus 10, filamentis brevibus antheris oblongis cordatis, carpellis 4. Folliculi 3-4 ovati apiculati compressiusculi 7-8 mm.longi 4 mm.lati pericarpio subcoriaceo extus minute denseque tomentoso et longe strigoso hispido, endocarpio corneo 2-spermo. Semina ovato-oblonga brunneo-rubescentia nitida 3 mm.longa.

Typus: Colombia, Dep. Huila; mula trail from La Jironda to El Salado, 15 km. NE of Algeciras, 8000 feet alt. Tree 12 m.high 20 cm.DBH. Bark gray smooth. Clustered fruits. Wet temperate forest. Collect. Elbert L. Little 7506. Holotypus,F.

Colombia, Dep. Huila, from Hacienda Balsillitas (Meta) to El Cedral, alt. 8800 feet. Tree 10 m.high 10 cm. DBH. Bark gray, many small fissures. Common

in wet temperate forest. Collect. Elbert L. Little 8058. Paratypus,F.

B. littlei is related to the Cundinamarcan species B. racemifera Tul., but it differs from it by its long-petiolulate, narrower leaflets with obsolete secondary nerves and a not prominent reticulation, by its sessile inflorescence formed by glabrous branchlets and ending in very short pedicels, and by its somewhat smaller flowers and fruits. For the same features, except the not prominent nervature, B. littlei is also related to the Peruvian B. ternata Loes.

BRUNELLIA SUBSESSILIS Killip & Cuatr., sp.nov.

Arbor mediocris ramulis terminalibus compressis sulcatis parce puberulis.

Folia opposita imparipinnata 25-40 cm.longa 8-9-jugis; stipulis minutis villosis. Petiolus robustus subtus carinatus, supra plano sulcatus sicut rhachi sparse puberulus, 5-10 cm.longus. Foliola rigide coriacea opposita breviter petiolulata stipellata, plerumque plicata, petiolulo 1-4 mm.longo puberulo, stipellis patulis supra rhachem insertis dentiformibus acutissimis 1 mm.longis. Lamina lanceolato-elliptica oblonga basi rotundata inaequalis apice attenuata acuta, margine leviter serrato-crenulata, 7-14 cm.longa 3-6 cm.lata; supra viridis glaberrima, costa angusta impressa nervis lateralibus et reticulo venulorum leviter prominulis; subtus breviter tomentello-pubescenti viridi-ochracea, costa prominenti robustaque magis tomentella, nervis secundariis circa 24 utroque latere patulis prominulis praecipue rubescentibus ad marginem arcuatis anastomosantibusque, reliquis nervulis reticulum minutissimum prominulumque rubescentem vel pallidum formantibus.

Inflorescentiae axillares paniculatae breves. Pedunculo robusto brevi ramisque tomentoso-hirsutis. Alabastra glomerata sessilia 6 sepalis extus tomentosis intus glabrescentibus 12 staminibus, 6 carpellis minutis liberis. Fructus breviter pedicellatus vel sessiles pedicello ad 2 mm.longo, pericarpio ovato paulo compresso abrupte acuminato 5 mm.longo, acumine (stylo) 1 mm.longo, dense breviterque tomentoso et strigoso. Semen unicum ovoideum rubescens nitidum circa 2 mm.longum. Sepala persistentia ovato-acuminata 2.5 mm.longa.

Typus: Colombia, Antioquia; Along road from Medellín to Ríonegro 2500 m.alt. Tree 7 m. high. Edge of woods. Collect. E.P.Killip & F.A.Barkley & Bo.Daniel 39885. Holotypus,F.

Other specimens: Id. id. Alto de Sabana, collect. Daniel Guarín s.n. (F)

Brunellia subsessilis is close to B. occidentalis Cuatr., but differs by its sessile or subsessile, larger and thicker leaflets which usually are strongly folded along the midrib. Besides, the leaflets of the new species are more attenuate towards the apex, the secondary nerves less prominent, and the reticulation is less close than in B. occidentalis, in which the leaflets are commonly obtuse and the veins of the reticulation so close that it forms small and deep alveoles. B. subsessilis has larger fruits and longer pedicels.

BRUNELLIA ACOSTAE Cuatr., sp.nov.

Arbor ramulis terminalibus paulo compressis puberulis.

Folia opposita imparipinnata in specime trijuga 30-35 cm.longa. Stipulae subulatae circa 4 mm.longae puberulae. Petiolus 8-9 cm.longus mediocris subteres breviter pubescens basi paulo incrassatus. Foliola opposita longe petiolulata tenuiter coriacea, petiolulo 4-8 mm.longo supra sulcato recto vel flexuoso. Stipellae supra rhachem insertae acutissimae 2 mm. longae. Lamina elliptico-oblonga sublanceolata basi obtuse attenuata apice angustato-acuminata, margine levissime subobsoleteque crenato-denticulata, 10-14 cm.longa, 3-4.5 cm.lata; supra plumbeo-viridis glabra vel sparsis obsoletis pilis strigosis, costa filiformi impressa strigulosa nervis secundariis parallelis visibilibus ceteribus venulis obsoletis; subtus pallide viridi-ochracea costa crassiuscula eminenti breviter villosula, nervis secundariis angustis prominentibus copiosis 3-7 mm. inter se distantibus subascendentibus (angulo 40°), ad marginem curvatis, minute villosulis; venulis prominentibus in minutum reticulum breviter villosulum anastomosantibus reliqua superficie minutissime tomentella.

Inflorescentia subterminalis laxe paniculata folia subattingens, longe pedunculata, ramis elongatis flexuosis; pedunculo mediocri 9-11 cm.longi ramulisque puberulis. Pedicelli teneres 1-2 mm.longi sicut alabastra 1.5 mm. diamitentia rubescenti villosulique. Sepala 4 crassiuscula ovata acutiuscula 2 mm.longa 1.3-1.6 mm.lata extus villosula rubescentia intus albi-tomentella. Flores masculi: 8 stamina (4 sepala opposita magis evoluta) filamentis glabris 1 mm.longis antheris fertilibus 0.8 mm.longis ellipticis; 4 carpellis rudimentaribus liberis. Flores feminei: 8 stamina filamentis 0.5 mm.longis antheris 0.6 mm.longis (fertilibus?); 4 carpellis liberis hirsutis biovulatis in stylum flexuosum productis.

Typus: Ecuador; prov. Pichincha, Cord. Occid:

Saloya, km. 50-70 carret. Alt. 1800 m. "pequeño árbolde flores pequeñas. Hojas blanquecinas al envés. Habita asociada a Cinchona". Colect. 11-VIII-45 M. Acosta Solís 10955. Holotypus,F.

Brunellia acostae is close to B.occidentalis Cuatr. and to B. subsessilis, but it differs from both by its leaves with less numerous leaflets which are thinner, larger, acuminate and longer petiolate, with ascending secondary nerves, and less prominent and less dense reticulum on the under side. It differs, furthermore, by its slender flexuose and looser inflorescence, and by its pedicellate, tetramerous flowers.

BRUNELLIA GLABRA Cuatr., sp.nov.

Arbor parva. Ramuli terminales trigoni fusci glabri.

Folia ternata simplicia petiolata rigide coriacea glaberrima. Stipulae minutae dentiformes. Petiolus 1-2 cm.longus robustus supra sulcatus basi paulo incrassatus ampliatusque. Lamina oblongo-lanceolata basi longe attenuata supra petiolum anguste decurrens apicem versus angustata acuta, margine serrato-crenulata, 11-18 cm.longa 3-6 cm.lata; supra viridis nitida costa impressa nervis secundariis filiformibus depressis reliquis nervulis obsoletis; subtus costa crassa eminentique nervis secundariis 11-12 utroque latere valde eminentibus in angulo acuto ascendentibus prope marginem furcatis anastomosantibusque, nervulis venulisque in reticulum minutum bene conspicuum anastomosantibus.

Inflorescentiae cymoso-paniculatae longe pedunculatae, pedunculo robusto sicut ramulis glaberrimo. Flores masculi breviter pedicellati, pedicello crasso 1-2 mm.longo glabro in receptaculum incrassato. Calyx 6 sepalis crassulis ovato-oblongis acutis 4 mm.longis (supra receptaculum), intus dense villosis extus subglabris (sparsissime puberulis). Stamina 12, filamentis basi hirsutulis, antheris crassis ellipticis 1.5 mm.longis 1 mm.latis. Carpellis 6 liberis stylis elongatis glabris ovariis hirsutis sterilibus. Discus crassus tomentoso-hirsutus.

Typus: Colombia, Dep. Cauca; Cordillera Occidental: Monte El Trueno, 2700-3000 m.alt., paramillo, collect. F. W. Pennell 7515. Holotypus,F.

B. glabra is characterized by its being completely glabrous. Its closest species is B. ovalifolia H. & B. from Ecuador, which has ovate, obtuse leaves, pubescent on the under side, and pentamerous flowers with 4 or 5 carpels. Besides, in the Ecuadorian plant the sepals are larger, narrower, and villous outside, the branchlets and the longer pedicels pubescent.

ADDITIONAL NOTES ON THE GENUS BOUCHEA. I

Harold N. Moldenke

Explanation of the abbreviations employed for the names of herbaria in these and subsequent notes will be found in my booklet entitled "A list showing the location of the principal collections of Verbenaceae and Avicenniaceae", pp. 1--3 (1942), and its Supplement 1, pp. 1--2 (1947), and in Phytologia 3: 179--180 (1949), 3: 321 & 382 (1950), 3: 491 (1951), and 4: 295 (1953).

BOUCHEA Cham.

Synonymy: Denisaea Neck., Elem. 1: 306, nom. rejic. 1790. Bouchéa Cham., Linnaea 7: 252 & 771. 1832. Lomake Raf., Aut. Bot. 73. 1840. Bonchea Cham. ex Small, Man. Southeast. Fl. 1141 & 1517, sphalm. 1933. Bouchia Cham. ex Moldenke, Prelim. Alph. List Invalid Names 8, in syn. 1940. Bruechea Shafer and Buechea Shafer ex Moldenke, Alph. List Invalid Names Suppl. 1: 3, in syn. 1947.

Literature: Pluk., Alm. 382, pl. 32, fig. 1. 1696; Sloane, Catalog. 1696; Sloane, Hist. Jamaica 1: 172, pl. 107, fig. 2. 1707; L., Sp. Pl., ed. 1, 19. 1753; Jacq., Icon. Plant. Rar. 2: pl. 208. 1788; Jacq., Collect. 2: 301. 1788; Gött. Gel. Anzeiger, p. 1600, Oct. 3, 1789; Neck., Elem. Bot. 1: 306. 1790; Lam., Tabl. Encycl. Méth. Bot. 1: 59. 1791; Willd., Sp. Pl. 1: 116. 1797; Vahl, Enum. Pl. 1: 209. 1804; Poir. in Lam., Encycl. Méth. Bot. 8: 844. 1808; J. E. Sm. in Rees, Cyclop., ed. London, 33 & ed. Philad., 35. 1816; H.B.K., Nov. Gen. & Sp. Pl. 2: 268, pl. 132. 1818; Vell., Fl. Flum. 17. 1825; A. St. Hil., Pl. Usuel. Bras. 1--4, pl. 40. 1826; Vell., Fl. Flum. Icon. 1: pl. 38. 1827; Cham., Linnaea 7: 252--254 & 771. 1832; E. Mey., Comm. Pl. Afr. Austr. 1: 275--277. 1835; Raf., Fl. Tellur. 2: 104. 1836; Endl., Gen. Pl. 1: 633--634. 1838; Harv., Gen. S. Afr. Pl., ed. 1, 269. 1838; Benth., Pl. Hartweg. 21. 1839; Meisn., Pl. Vasc. Gen. 2: 198. 1839; Maund & Henslow, Botanist 4: pl. 196. 1840; Hochst. in Schnitzl., Flora 1842, Beibl. 1: 144. 1842; Raf., Aut. Bot. 73. 1840; D. Dietr., Syn. Pl. 3: 370. 1843; Walp., Repert. 4: 11-12 & 38--39. 1845; Bot. Zeit. 3: 587. 1845; Gard. Chron. 495. July 19, 1845; Hochst., Flora 28: 68. 1845; Schau. in A. DC., Prodr. 11: 524--525, 556--569, & 572. 1847; Wight, Icon. Pl. Ind. Orient. 4 (3): pl. 1461. 1849; C. Gay, Hist. Fis. Chile Bot. 5: 25--26, Atlas 1: pl. 55. 1849; Sonder, Linnaea 23: 86. 1850; Schau. in Mart., Fl. Bras. 9: 195--197, pl. 33. 1851; Wittstein, Etymol.-bot. Handwörterb. 117 & 270. 1852; A. Gray, Amer. Journ. Sci., ser. 2, 16: 98. 1853; Torr. in Emory, Rep. U. S. & Mex. Bound. Surv. 2: 126. 1859; Bocq., Rev. Verbenac. 139, pl. 16. 1861--1863; Harv., Thes. Cap. 2: 57, pl. 190. 1863; Bocq., Adansonia 3: 236. 1863; Lange, Ind. Sem. Hort. Haun. 31. 1870; Lange, Bot. Tidsk. 8: [ser. 2, 4:] 3--5, pl. 2. 1874; Benth. in Benth. & Hook. f., Gen. Pl. 2: 1132--1136 & 1144. 1876; Bot. Mag. 102:

pl. 6221. 1876; Vatke, Linnaea 43: 529. 1882; Oliv. in Hook., Icon. Pl. 15: 37, pl. 1446. 1883; A. Gray, Syn. Fl. N. Amer., ed. 2, 2 (1): 334--335. 1886; S. Wats., Proc. Amer. Acad. Sci. 24: 68. 1889; Kuntze, Rev. Gen. Pl. 2: 502. 1891; Coult., Contrib. U. S. Nat. Herb. 2: 326. 1892; Jacks., Ind. Kew. 1: 327, 349, & 753. 1893; Jacks., Ind. Kew. 2: 504 (1894) and 2: 1178. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 144 & 153--154, fig. 59 A & B. 1895; Jacks., Attempt Ascert. Actual Dates Publ. Rees Cycl. 1895; Engl., Pflanzenwelt Ost-afr. A:44. 1895; Kuntze, Rev. Gen. Pl. 3 (3): 250, 254, & 561. 1898; K. Schum. in Just, Bot. Jahresb. 26 (1): 396. 1900; Kuntze, Jahrb. Königl. Bot. Gart. Berlin 4: 271. 1900; Gürke, Notizbl. Bot. Gart. Berlin 3: 64--76. 1900; H. H. Rusby, Bull. Torrey Bot. Club 27: 80. 1900; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 281--282. 1900; Durand & Jacks., Ind. Kew. Suppl. 1: 61. 1901; H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5 (1): 199--207. 1901; Post & Kuntze, Lexicon 167. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 28. 1904; Dalla Torre & Harms, Gen. Siphonog. 430. 1904; H. H. W. Pearson, Trans. S. Afr. Philos. Soc. 15: 176--180. 1905; Jacks., Gloss. Bot. Terms 219 & 247. 1905; Knuth, Handb. Blütenbiol. 3 (2): 72. 1905; Gürke ex Zahlbr., Ann. K. K. Nat. Hofmus. Wien 20: 45. 1905; Millsp., Field Columb. Mus. Publ. Bot. 2: 178. 1906; H. H. Rusby, Bull. N. Y. Bot. Gard. 4: 432. 1907; Dalla Torre & Harms, Gen. Siphonog. 673 & 715. 1907; Prain, Ind. Kew. Suppl. 3: 27. 1908; J. M. Wood, Natal Pl. 6: pl. 571. 1911; Glaz., Bull. Soc. Bot. Franç. Mém. 3: 543. 1911; Chiov., Ann. Bot. Roma 9: 127. 1911; Jacks., Proc. Linn. Soc. Lond. 124, Suppl. Ind. Linn. Herb. 149. 1912; Prain, Ind. Kew. Suppl. 4: 28. 1913; Herzog, Meded. Rijks Herb. Leid. 29: 46. 1916; Druce, Rep. Bot. Soc. & Exch. Club Brit. Isles 1916, Suppl. 2: 610. 1917; Prain, Ind. Kew. Suppl. 5: 35. 1921; A. W. Hill, Ind. Kew. Suppl. 6: 28. 1926; Grenz., Ann. Mo. Bot. Gard. 13: 71--100, pl. 8--19. 1926; Knuth in Fedde, Repert. Beih. 43: 603. 1927; Dinter in Fedde, Repert. Beih. 53: 53. 1928; Epling, Journ. Bot. 67: 12. 1929; Stapf, Ind. Lond. 1: 452. 1929; Stapf, Ind. Lond. 6: 429--431. 1931; Willis, Dict. Flow. Pl. & Ferns, ed. 6, 90. 1931; Grey & Hubbard, List Plants Grow. Bot. Gard. Atkins Instit. 31 & 244. 1933; Moldenke, Phytologia 1: 18. 1933; M. E. Jones, Extr. Contrib. West. Bot. 18: 67. 1933; Small, Man. Southeast. Fl. 1141 & 1517. 1933; A. W. Hill, Ind. Kew. Suppl. 8: 31. 1933; Moldenke in Fedde, Repert. 37: 214--216. 1934; Moldenke, Torreya 34: 8--9. 1934; Lundell, Symb. Bot. Upsal. 4: 21--30, 172--173, & 213--214, figs. 29, 44, 46, 49, & 53. 1934; Briq., Internat. Rules Bot. Nomencl., ed. 3, 24 & 106. 1935; Moldenke in Fedde, Repert. 41: 25 & 129--143. 1936; Lundell, Carnegie Inst. Wash. Publ. 478: 42, 75, 109, & 183. 1937; Dahlgren, Svensk Bot. Tidsk. 32: 231. 1938; A. W. Hill, Ind. Kew. Suppl. 9: 39. 1938; Moldenke in Fedde, Repert. 45: 113-156 & 300--319. 1938; Moldenke in Fedde, Repert. 46: 1--12. 1938; Moldenke, Geogr. Distrib. 1, 3, 4, 6--9, 11--13, 15, 16, 18--20, 22, 23, 25, 28, 29, & 35. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 175--176. 1940; Moldenke in Fedde, Repert. 48: 16--29 & 49: 91--139. 1940; Moldenke, Prelim. Alph. List Invalid Names

7--8 & 24. 1940; Moldenke, Suppl. List Invalid Names 1. 1941; Moldenke, Alph. List Invalid Names 6--7 & 23. 1942; Moldenke, Known Geogr. Distrib., [ed. 1], 5, 12, 14--16, 19--22, 24--34, 36, 40--42, 71, & 86. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 66--67. 1942; Moldenke, Phytologia 2: 93. 1944; Erdtman, Svensk Bot. Tidsk. 39: 281 & 283. 1945; Reko, Bol. Soc. Bot. Mex. 4: 35. 1946; Irmão Augusto, Fl. Rio Grande do Sul 217, 225--226, & 235. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 3. 1947; Salisb., Ind. Kew. Suppl. 10: 33. 1947; Moldenke, Known Geogr. Distrib., [ed. 2], 10, 21, 25, 26, 28, 34, 36, 38, 42, 46, 47, 49--52, 57--59, 62, 69, 75, 96, 102, 156, & 176. 1949; Razi, Ecology 31: 284. 1950; Salisb., Ind. Kew. Suppl. 11: 34. 1953.

Chamisso, founder of the genus, in Linnaea 7: 252--253 & 771 (1832) writes the name of the genus both "Bouchéa" and "Bouchea". He uses the former spelling at the head of his generic description and in the index, but in the generic portion of the binomials which he accepts, he uses the latter orthography. I am accepting the unaccented orthography, as has also been done by most workers since that date.

Necker in Elem. Bot. 1: 296 (1790) states that his genus Denisaea was named in honor of "Ludovicis Denis" [=Denis Dodart (1634--1707)]. Razi in Ecology 31: 284 (1950) states that seed dissemination in Bouchea is endozoic. The pollen morphology of the genus is compared critically with that of Chascanum by Erdtman in Svensk Bot. Tidsk. 39: 281 & 283 (1945).

BOUCHEA AGRESTIS Schau.

Synonymy: Bouchea agrestis Schau. & Mart. ex Schau. in Mart., Fl. Bras. 9: 197. 1851.

Literature: Schau. in A. DC., Prodr. 11: 558. 1847; Schau. in Mart., Fl. Bras. 9: 197. 1851; Jacks., Ind. Kew. 1: 327. 1893; Grenz., Ann. Mo. Bot. Gard. 13: 85. 1926; Moldenke, Geogr. Distrib. 25. 1939; Moldenke, Prelim. Alph. List Invalid Names 7. 1940; Moldenke in Fedde, Repert. 49: 92--94. 1940; Moldenke, Alph. List Invalid Names 6. 1942; Moldenke, Known Geogr. Distrib., [ed. 1], 36 & 86. 1942; Irmão Augusto, Fl. Rio Grande do Sul 235. 1946; Moldenke, Known Geogr. Distrib., [ed. 2], 75 & 176. 1949.

Additional citations: BRAZIL: Bahia: Blanchet 3731 [Macbride photos 7851, in part] (Kr--photo of cotype, N--photo of cotype), 3907 [Macbride photos 7851, in part] (Kr--photo of cotype, N--photo of cotype).

BOUCHEA BOLIVIANA (Kuntze) Moldenke

Synonymy: Valerianodes bolivianum Kuntze, Rev. Gen. Pl. 3 (2): 254. 1898. Stachytarpheta boliviana (Kuntze) K. Schum. ex Just, Bot. Jahresb. 26 (1): 396. 1900. Valerianoides boliviana Kuntze ex Thiselt.-Dyer, Ind. Kew. Suppl. 2: 190. 1904. Bouchea pseudogervaô f. pilosa Herzog, Meded. Rijks Herb. Leid. 29: 46. 1916. Bouchea mollis Standl. ex Moldenke, Prelim. Alph. List Invalid Names 8, in syn. 1940. Valerianodes boliviana Kuntze ex

Moldenke, op. cit. 43, in syn. 1940.

Literature: Kuntze, Rev. Gen. Pl. 3 (3): 254. 1898; K. Schum. in Just, Bot. Jahresb. 26 (1): 396. 1900; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 190. 1904; Herzog, Meded. Rijks Herb. Leid. 29: 46. 1916; Moldenke, Phytologia 1: 18. 1933; Moldenke, Geogr. Distrib. 28. 1939; Moldenke, Prelim. Alph. List Invalid Names 8, 41, & 43. 1940; Moldenke in Fedde, Repert. 49: 111--113. 1940; Moldenke, Lilloa 6: 313. 1941; Moldenke, Alph. List Invalid Names 7, 42, & 44. 1942; Moldenke, Known Geogr. Distrib., [ed. 1], 40 & 86. 1942; Moldenke, Lilloa 10: 339. 1944; Moldenke, Known Geogr. Distrib., [ed. 2], 96, 102, & 176. 1949.

Cárdenas has collected this species in sandy loam at 300 m. altitude and describes the flowers as blue. It has been misidentified in herbaria as "Stachytarpheta sp." and "Stachytarpheta cayennensis Vahl". In addition to the months recorded in my monograph, it has been collected in anthesis in December and February. The Rusby collection cited below, from the junction of the Beni and Madre de Díos rivers, was cited by me in Fedde, Repert. 49: 123 (1940) as B. fluminensis, but seems rather to belong here. The remaining specimens of this collection ought to be re-examined.

Additional citations: BOLIVIA: El Beni: H. H. Rusby 915, in part (C). Oriente: Cárdenas 2770 (F--756445). Santa Cruz: Cárdenas 4418 (N). ARGENTINA: Salta: D. Rodriguez 174 [Herb. Inst. Miguel Lillo 32439] (N); Schreiter 3516 [Herb. Inst. Miguel Lillo 32447] (N).

BOUCHEA BOYACANA Moldenke

Literature: Moldenke, Bull. Torrey Bot. Club 68: 498--499. 1941; Moldenke, Known Geogr. Distrib., [ed. 1], 31 & 86 (1942) & [ed. 2], 59 & 176. 1949.

The species has been found at altitudes of 1800 to 2130 m., on arid slopes, blooming in September.

Additional citations: COLOMBIA: Boyacá: Cuatrecasas 1017 (N--type), 1954 (F--1327946).

BOUCHEA CHASCANOIDES Moldenke

Literature: Moldenke, Phytologia 3: 58--59. 1949; Moldenke, Known Geogr. Distrib., [ed. 2], 75 & 176. 1949.

Additional citations: BRAZIL: Minas Geraes: Markgraf, Mello Barreto, & Brade 3399 [Herb. Jard. Bot. Rio de Jan. 40068] (F--photo of type, N--type, N--photo of type, Sg--photo of type, Z--photo of type).

BOUCHEA CIPOËNSIS Moldenke

Literature: Moldenke, Phytologia 3: 261--262 & 286. 1950.

Citations: BRAZIL: Minas Geraes: Mendes Magalhães 4313 [Herb. Jard. Bot. Belo Horiz. 45118] (N--type).

BOUCHEA DISSECTA S. Wats.

Synonymy: Bouchea dissecta var. violacea Rose ex Moldenke,

Prelim. Alph. List Invalid Names 7, in syn. 1940. Bouchea palmeri S. Wats. ex Moldenke, op. cit. 8, in syn. 1940.

Literature: S. Wats., Proc. Amer. Acad. 24: 68. 1889; Zoe 5: 219. 1900; Durand & Jacks., Ind. Kew. Suppl. 1: 61. 1901; Grenz., Ann. Mo. Bot. Gard. 13: 84. 1926; Moldenke, Geogr. Distrib. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 7 & 8. 1940; Moldenke in Fedde, Repert. 49: 124--126. 1940; Moldenke, Alph. List Invalid Names 6 & 7. 1942; Moldenke, Known Geogr. Distrib., [ed. 1], 15 & 86 (1942) & [ed. 2], 28 & 176. 1949.

Specimens of this species have been collected in shady dry llanos and fields, on hillslopes, and in pebbly slightly red soil, at altitudes of from 200 to 960 m., blooming in August and September, fruiting in September. The flowers are described as pink, lavender, or blue. Gentry says that it grows "in scattered colonies, flowers bright-pink, falling before midday". Wiggins & Rollins describe it as an "erect annual". Hinton reports it as "very rare" in Guerrero, but "frequent" in Michoacán; in fact, he says "I have seen acres of it at Apatzingas, Mich." It has been misidentified in herbaria as Verbena supina L. and V. neomexicana (A. Gray) Small.

Additional citations: MEXICO: Guerrero: Hinton 6492 (Au, F--938031, Fs, Me, Me, N, Ur). Michoacán: Hinton 12019 (Au, Du--290384, N, N), 12062 (Gg--310913, N, N, N, N, N, N), 12114 (Au, N, N); W. C. Leavenworth 508 (N, Ur). Sinaloa: H. S. Gentry 6133 (Ge, N). Sinaloa or Nayarit: J. Gonzalez Ortega 96 [San Ignacio] (Me). Sonora: M. E. Jones 22361 (Po--152315); Edw. Palmer 259 (Pa--isotype); Shreve 6684a (Fs); Wiggins 7120a (Du--263364), 7262 (Du--263363, Mi), 7292 (Mi); Wiggins & Rollins 305 (Du--295053). State undetermined: Conzatti s.n. (Me); Sessé, Mociño, Castillo, & Maldonado 117 ["98"] (F--844945).

BOUCHEA FLABELLIFORMIS M. E. Jones

Literature: M. E. Jones, Extr. Contrib. West. Bot. 18: 67. 1933; Moldenke, Geogr. Distrib. 13. 1939; Moldenke in Fedde, Repert. 49: 123--124. 1940; Moldenke, Known Geogr. Distrib., [ed. 1], 15 & 86 (1942) & [ed. 2], 28 & 176. 1949; Morton, Contrib. U. S. Nat. Herb. 29 (2): 114. 1945.

Additional citations: MEXICO: Baja California: M. E. Jones 27439 (N--photo of type, Po--192762--type, Z--photo of type).

BOUCHEA FLUMINENSIS (Vell.) Moldenke

Original publication: Bouchea fluminensis (Vell.) Moldenke, Alph. List Common Names 13 & 32, hyponym (Aug. 31, 1939); Geogr. Distrib. 22, 23, 25, 28, & 29, nom. nud. (Sept. 20, 1939); Prelim. Alph. List Invalid Names 8, 42, & 46, hyponym (March 17, 1940); Fedde, Repert. 49: 117. Dec. 20, 1940.

Synonymy: Verbena fluminensis Vell., Fl. Flum. 17 (1825), Icon. 1: pl. 38. 1827. Verbena pseudogervaõ A. St. Hil., Pl. Usuel. Bras. 1--4, pl. 40. 1826. Bouchea pseudogervaõ (A. St. Hil.) Cham., Linnaea 7: 253. 1832. Bouchea pseudogervao (St.

Hil.) Cham. ex Schau. in A. DC., Prodr. 11: 556. 1847. Bouchea pseudo-gervao (St. Hil.) Cham. ex Jacks., Ind. Kew. 2: 1178. 1895. Verbena pseudo-gervao A. St. Hil. ex Jacks., loc. cit. 1178, in syn. 1895. Bouchea pseudogervaô var. pubescens Mathews ex Moldenke, Prelim. Alph. List. Invalid Names 8, in syn. 1940. Bouchea pseudo-gervão (St. Hil.) Cham. and Bouchea pseudogervaô (St. Hil.) Schau. ex Moldenke, loc. cit. 1940. Stachytarpheta fluminensis A. DC. and Stachytarpheta grandiflora Pohl ex Moldenke, op. cit. 42, in syn. 1940. Stachytarpheta psilostachya A. DC. and Verbena leptostachys Mart. ex Moldenke in Fedde, Repert. 49: 117, in syn. 1940. Stachytarpheta alegrensis Loes. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941.

Literature: Vell., Fl. Flum. 17. 1825; A. St. Hil., Pl. Usuel. Bras. 1—4, pl. 40. 1826; Vell., Fl. Flum. Icon. 1: pl. 38. 1827; Cham., Linnaea 7: 253--254. 1832; Schau. in A. DC., Prodr. 11: 556--557 & 449. 1847; Schau. in Mart., Fl. Bras. 9: 195. 1851; Jacks., Ind. Kew. 1: 327 (1893) & 2: 1178. 1895; H. H. Rusby, Bull. N. Y. Bot. Gard. 4: 432. 1907; J. M. Wood, Natal Pl. 6: pl. 571. 1911; Molfino, Not. Bot. 2: 102. 1923; Grenz., Ann. Mo. Bot. Gard. 13: 85. 1926; Moldenke, Alph. List Common Names 13 & 32. 1939; Moldenke, Geogr. Distrib. 22, 23, 25, 28, & 29. 1939; Moldenke, Prelim. Alph. List Invalid Names 8, 42, & 46. 1940; Moldenke in Fedde, Repert. 49: 117--123. 1940; Moldenke, Lilloa 6: 313--314. 1941; Moldenke, Suppl. List Invalid Names 7. 1941; Moldenke, Alph. List Invalid Names 7 & 42. 1942; Moldenke, Known Geogr. Distrib., [ed. 1], 33, 34, 36, 40--42, & 86 (1942) & [ed. 2], 69, 71, 75, 96, 100, 102, 156, & 176. 1949; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio de Jan. 37: 392. 1943; Bol. Mus. Hist. Nat. Javier Prado 7: 244. 1943; Moldenke, Phytologia 2: 93. 1944; Moldenke, Lilloa 10: 339. 1944; Erdtman, Svensk Bot. Tidsk. 39: 281 & 283. 1945; Svenson, Amer. Journ. Bot. 33: 419 & 480. 1946; Irmão Augusto, Fl. Rio Grande do Sul 226, fig. 109. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 2. 1947; Rambo, Anais Bot. Herb. Barbosa Rod. 3: 72 & 78. 1951; Stellfeld, Trib. Farmac 19 (10): 169 & 172. 1951; F. C. Hoehne, Ind. Bibl. e Num. Pl. Col. Com. Rondon 347. 1951.

It is of interest to note that although Chamisso, when he founded this genus in Linnaea 7: 252 (1832), wrote the generic name "Bouchéa" — and it is so written also in the index to the volume on p. 771 -- yet when he proposed the binomial Bouchea pseudogervaô on p. 253 he did not use the accent. It is rather evident that he intended the accent mark only as an indication of how to pronounce the word, not as an integral part of the name itself.

The species is often described by collectors as a shrub about 1 m. tall, found growing on riverbanks, in forests, thickets, or matorral, at the edges of woods, among grass along sunny forest paths, and in open clay or limestone soil, at altitudes of 300 to 1000 m. It has been collected in anthesis in every month of the year from April through February, and in fruit in January. Klug (on the labels of his no. 2839) says that it was collected

"on tree", but if he means to imply by this that the plant was epiphytic or not is not clear. Killip & Smith describe it as an herb 3--5 feet tall, the main branches prostrate, the flowering branches erect, and the "corolla white at base, blue at apex" (no. 25023), "corolla-tube white to pale blue, lobes deep blue" (no. 23397), "corolla pinkish-blue, paler without" (no. 25001), or "corolla light blue" (no. 26625). Klug says of the corollas that they are "violet and white" (no. 4206), "light-blue" (no. 2839), or "white" (no. 3904). Oliveira, on the labels of both of his collections cited below, also describes the corolla as white. It is possible that these last three collections represent an albino form of the species and may be worthy of a form name. Other collectors have described the flowers as blue, violet, lilac, or pink, while Hoehne (Herb. Inst. Bot. S. Paulo 23307) calls them red. Sandeman says they are "Parme violet" and that the stems of the plant are purplish-brown. Svenson reports it as growing 2--4 feet tall, common in open places near sea-level, with purplish-pink flowers. Rojas calls it a subshrub 1--2 m. tall, with rose-lilac flowers. One spike of the Mello Barreto specimen cited below is conspicuously galled at the base, with fruit-like galls.

Notes on the pollen morphology of this plant are given by Erdtman in Svensk Bot. Tidsk. 39: 281 & 283 (1945). Svenson in Amer. Journ. Bot. 33: 480 (1946) states that the binomial, Bouchea fluminensis (Vell.) Moldenke, was firts published in "Phytologia 1: 265. 1937", but this is an error, for the name does not appear there. Stellfeld reports that the plant is employed medicinally as a pectoral, but his "Bouchea fluminensis" in Trib. Farmac. 19 (10: 172 (1951) is actually Aloysia lycioides Cham. On the other hand, Irmão Augusto, Fl. Rio Grande do Sul 226, fig. 109 (1946) misidentified our plant as "Bouchea agrestis Mart. & Schau." It has often been misidentified as a species of Stachytarpheta. The Columbia University specimen of Rusby 915 has proved to be B. boliviana, so the rest of the material of this collection cited by me as B. fluminensis here and in Fedde, Repert. 49: 123 (1940) ought to be re-examined. The Troll 636 cited by me on the same page of my monograph as from "Department undetermined" is actually from Cochabamba, Bolivia. "Gervao de folha grande" and "gervao de folha larga" are recorded as common names.

Additional citations: ECUADOR: Guayas: Svenson 11498 (N). Loja: R. Espinosa 2311 (N). PERU: Cuzco: Soukup 800 (F--922336). Junín: Killip & Smith 23397 (F--632670), 25001 (F--616688), 25023 (F--632016), 26625 (F--616156); Sandeman 4970 (K); Soukup 2865 (N), 3419 (N, N). Loreto: Klug 2839 (F--685000, W--1457224). San Martín: Ferreyra 4500 (W--1998921), 4701 (W--1998959), 5078 (W--2028048), 7784 (W--2028466); Klug 3904 (F--766332, Gg--247837, W--1458310), 4206 (F--865683, S, W--1458629); Woytkowski 35004 (S). Department undetermined: Soukup 1137 (F--1011715). BRAZIL: Minas Geraes: F. C. Hoehne s.n. [Herb. Inst. Bot. S. Paulo 2767]

(Sp); Macedo 2044 (N, Ug); Mello Mattos s.n. [Herb. Rio de Jan. 46763] (Ja); Mexia 5268 (En, Gg--286695, W--1572302); J. E. Oliveira 231, in part (N), 1311 [Herb. Jard. Bot. Belo Horiz. 45101] (N); A. Saint-Hilaire 947 [Macbride photos 17583] (Kr--photo, N--photo); G. Santos s.n. [Herb. Rio de Jan. 46776] (Ja); Widgren 1218 (Br); L. O. Williams 6988 (G, N). Paraná: Dusén 3008 [Herb. Rio de Jan. 32302] (Ja), 7567 (Ca--501683), 9504 (G); F. C. Hoehne s.n. [Herb. Inst. Bot. S. Paulo 23307] (Sp). Rio Grande do Sul: Henz s.n. [Rambo 35480] (N); Eugenio Leite 638 (N); Rambo 37900 (N); Reineck s.n. [Macbride photos 17604] (Kr--photo, N--photo). Santa Catharina: F. C. Hoehne s.n. [Herb. Inst. Bot. S. Paulo 24423] (Sp); Reitz C.167 [S.F.51360] (Rd). São Paulo: Edwall s.n. [Herb. Comm. Geogr. e Geol. 1751; Herb. Inst. Bot. S. Paulo 15640] (Sp); Löfgren s.n. [Herb. Comm. Geogr. e Geol. 1475; Herb. Inst. Bot. S. Paulo 15637] (Sp); Löfgren & Edwall s.n. [Herb. Comm. Geogr. e Geol. 2790; Herb. Inst. Bot. S. Paulo 15634] (Sp); A. Russel 200 [Herb. Inst. Bot. S. Paulo 20087] (Sp); A. Saint-Hilaire 789 (F--977108). State undetermined: Mello Barreto 10008 [Itamarandiba; Herb. Jard. Bot. Belo Horiz. 24111] (F--948140). BOLIVIA: El Beni: H. H. Rusby 915, in part (F--166116, Pa, Pr). La Paz: Krukoff 10461 (N). ARGENTINA: Jujuy: Dinelli s.n. [Herb. Inst. Miguel Lillo 32440] (N). Misiones: T. Rojas s.n. [Herb. Osten 8074] (Ug). Salta: D. Rodriguez s.n. [Herb. Mus. Argent. Cienc. Nat. 23987] (N). CULTIVATED: Brazil: Stellfeld 1227 [Herb. Mus. Parana. 2336] (N).

BOUCHEA FLUMINENSIS var. PILOSA Moldenke

Literature: Moldenke, Phytologia 2: 408. 1948; Moldenke, Known Geogr. Distrib., [ed. 2], 75, 102, & 176. 1949; Stellfeld, Trib. Farmac. 19 (10): 169. 1951.

This plant should not be confused with "Bouchea pseudogervaß f. pilosa Herzog", based on Herzog 1504 from Santa Cruz, Bolivia, which is by me regarded as B. boliviana (Kuntze) Moldenke. Sandeman describes our plant as a weak-growing shrub with rosy-lilac flowers and ovate-acuminate, alternate, deeply serrate leaves, growing in shade and semi-shade, the flowers fading and dropping very rapidly after being gathered. Oliveira says it is a shrub 1 m. tall with white flowers. Henz found it at the edge of primeval forests in a region of 1.8 m. rainfall and 10--35° temperature. Schwarz describes the flowers as violet. It has been collected at altitudes of 120--200 m., flowering in January, February, May, and October.

Additional citations: BRAZIL: Minas Geraes: J. E. Oliveira 231, in part (N). Paraná: Hatschbach 745 (N). Rio Grande do Sul: Henz 35480 (S). ARGENTINA: Misiones: T. Meyer 11864 (N); Sandeman 4776 (K--type); G. J. Schwarz 3990 (N).

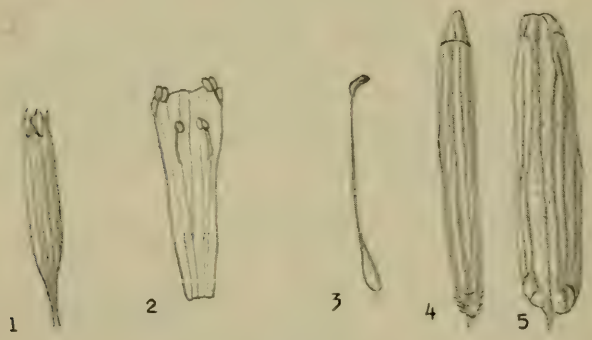
BOUCHEA INOPINATA Moldenke

Literature: Moldenke in Fedde, Repert. 37: 214--215. 1934; Moldenke, Geogr. Distrib. 25. 1939; Moldenke in Fedde, Repert. 49: 94--95. 1940; Moldenke, Known Geogr. Distrib., [ed. 1], 36 & 86 (1942) & [ed. 2], 75 & 176. 1949.

Additional citations: BRAZIL: State undetermined: Schüch s.n. [Macbride photos 34325] (F--976274--photo of type, Kr--photo of type, N--photo of type).

BOUCHEA LINIFOLIA A. Gray

Literature: A. Gray, Amer. Journ. Sci., ser. 2, 16: 98. 1853; Torr. in Emory, Rep. U. S. & Mex. Bound. Surv. 2: 126. 1859; Jacks., Ind. Kew. 1: 327. 1893; Coult., Contrib. U. S. Nat. Herb. 2: 326. 1894; Grenz., Ann. Mo. Bot. Gard. 13: 87. 1926; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Moldenke, Geogr. Distrib. 3 & 13. 1939; Moldenke in Fedde, Repert. 49: 127--129. 1940; Moldenke in Lundell, Fl. Texas 3 (1): 69--70. 1942; Moldenke, Known Geogr. Distrib., [ed. 1], 12, 15, & 86 (1942) & [ed. 2], 21, 25, 28, & 176. 1949; Erdtman, Svensk Bot. Tidsk. 39: 281 & 283. 1945.



1 -- calyx, x 2.1

2 -- corolla-tube spread open, x 2.1

3 -- pistil, x 2.1

4 -- coccus, dorsal view, x 5.6

5 -- schizocarp, lateral view, x 5.6

6 -- corolla and calyx, x 2.1

The species has been collected on shrub-covered valley-floors, blooming and producing fruit in July and September. Erdtman, in the reference cited on the previous page, points out that the pollen morphology of this species and of B. spathulata is so different from that of the rest of the species in the genus that these two may well constitute a separate subgenus. The Havard s.n. [W. of Taelingra], cited by me in Fedde, Repert. 49: 129 (1940) as from "County undetermined", is actually from Brewster County, Texas. The Clemens & Clemens 502 distributed as this species in the Pomona College herbarium is actually Verbena halei Small.

Additional citations: TEXAS: Presidio Co.: Tharp s.n. [Marfa, July 1928] (Mi, N, S), s.n. [Marfa-Shafter road, July 1928] (Au, Au, Au, Gg--316190, N). Sutton Co.: Parks & Cory 9966 (Tr). Uvalde Co.: E. J. Palmer 13007 (Gg--31963, Po--220203). Valverde Co.: Cory 3404 (Po--192295), 41687 (Au). NEW MEXICO: County undetermined: Le Roy s.n. (Pa). MEXICO: Coahuila: Herb. Inst. Biol. Univ. Nac. Mex. 7148, in part (Me); Wynd & Mueller 409 (Fs, Ur, Ur).

BOUCHEA NELSONII Grenz.

Synonymy: Bouchea nelsonii Greenm. ex Moldenke, Prelim. Alph. List Invalid Names 8, in syn. 1940.

Literature: Grenz., Ann. Mo. Bot. Gard. 13: 83--84. 1926; A. W. Hill, Ind. Kew. Suppl. 8: 31. 1933; Moldenke, Geogr. Distrib. 13 & 15. 1939; Moldenke, Prelim. Alph. List Invalid Names 8. 1940; Moldenke in Fedde, Repert. 49: 95--97. 1940; Moldenke, Alph. List Invalid Names 7. 1942; Moldenke, Known Geogr. Distrib. [ed. 1], 15, 19, & 86 (1942) & [ed. 2], 28, 34, & 176. 1949; Matuda, Amer. Midl. Nat. 44: 575. 1950.

This is said to be an erect herb, common in damp thickets and chaparral, at altitudes of 14 to 65 m., blooming in July, August, and October, fruiting in July and August. The flowers are described as pink or rose-purple.

Additional citations: MEXICO: Guerrero: Hinton 10862 (N); Webster, Rowell, & Barkley 17M718 (N). Oaxaca: G. L. Fisher 35472 (F--782580), s.n. [Ixtepec, Aug. 17, 1935] (Fs); Matuda 164 (Mi). GUATEMALA: Zacapa: P. C. Standley 74608 (N).

BOUCHEA NOTABILIS Moldenke

Literature: Moldenke in Fedde, Repert. 37: 215. 1934; Moldenke, Geogr. Distrib. 18. 1939; A. W. Hill, Ind. Kew. Suppl. 9: 39. 1938; Moldenke, Known Geogr. Distrib., [ed. 1], 31 & 86 (1942) & [ed. 2], 59 & 176. 1949.

BOUCHEA PRISMATICA (L.) Kuntze

Synonymy: Verbena spicata jamaicana Pluk., Alm. 382, pl. 32, fig. 1. 1696. Verbena prismatica L., Sp. Pl., ed. 1, 19. 1753. Verbena prismatica Jacq. ex Lam., Tabl. Encycl. Méth. Bot. 1: 59, in syn. 1791. Zapania prismatica (L.) Lam., Tabl. Encycl. Méth.

Bot. 1: 59. 1791. Stachytarpheta prismatica (L.) Vahl, Enum. Pl. 1: 209. 1804. Bouchea ehrenbergii Cham., Linnaea 7: 253--254. 1832. Lomake brachiata Raf., Aut. Bot. 73. 1840. Stachytarpha prismatica Vahl ex Schau. in A. DC., Prodr. 11: 572, in syn. 1847. Bouchea prismatica (L.) Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 154. 1895. Denisaea prismatica (L.) Kuntze, Rev. Gen. Pl. 3 (2): 254. 1898. Bouchea prismatica (Jacq.) Kuntze ex Grenz., Ann. Mo. Bot. Gard. 13: 78. 1926. Valerianoides jamaicense Millsp. apud Standl., Field Mus. Publ. Bot. 3: 399, in syn. 1930 [not Valerianodes jamaicense (L.) Kuntze, 1891]. Bonchea prismatica (Jacq.) Kuntze ex Small, Man. Southeast. Fl. 1141. 1933. Bouchea ehrenbergii Cham. & Schlecht. and Bouchea ehrenbergii var. fol. lanceolatis Ervend. ex Moldenke, Prelim. Alph. List Invalid Names 7, in syn. 1940. Verbena bifurca Benth. ex Moldenke, op. cit. 44, in syn. 1940. Verbena prismatica Willd. and Verbena prismatifolia Pers. ex Moldenke, op. cit. 48, in syn. 1940. Fovearia prismatica (L.) L. C. Rich. ex Moldenke in Fedde, Repert. 49: 97, in syn. 1940. Bonchea ehrenbergii Cham. and Bouchea ervendbergii Schau. ex Moldenke, Suppl. List Invalid Names 1, in syn. 1941. Bouchea herenbergii Cham. ex Ramirez Cantu, Anal. Inst. Biol. Mex. 14: 406. 1943. Bouchea ehrenbergii Schau., Bouchea ehrenbergui Cham., Bruechea prismatica (L.) Kuntze, and Buechea prismatica (L.) Kuntze ex Moldenke, Alph. List Invalid Names Suppl. 1: 3, in syn. 1947; Stachytarpheta prismatica L. ex Moldenke, op. cit. 21, in syn. 1947. Stachytarpheta prismatica R. & S., in herb.

Literature: Pluk., Alm. 382, pl. 32, fig. 1. 1696; L., Sp. Pl. ed. 1, 19. 1753; Jacq., Collect. 2: 301. 1788; Jacq., Icon. Plant. Rar. 2: pl. 208. 1788; Gött. Gel. Anzeig. 1600, Oct. 3, 1789; Lam., Encycl. Méth. Bot. 1: 59. 1791; Willd., Sp. Pl. 1: 116. 1797; Vahl, Enum. Pl. 1: 209. 1804; Poir. in Lam., Encycl. Méth. Bot. 8: 844. 1808; J. E. Sm. in Rees, Cyclop., ed. London, 33. 1816; Steud., Nom. Bot., ed. 1, 873. 1821; Cham., Linnaea 7: 253--254. 1832; Benth., Pl. Hartweg. 21. 1839; Raf., Aut. Bot. 73. 1840; Walp., Repert. 4: 11--12. 1845; Schau. in A. DC., Prodr. 11: 556 & 558. 1847; Torr. in Emory, Rep. U. S. & Mex. Bound. Surv. 2: 126. 1859; Bocq., Rev. Verbenac. pl. 16. 1863; A. Gray, Syn. Fl. N. Amer., ed. 2, 2 (1): 334. 1886; Kuntze, Rev. Gen. Pl. 2: 502. 1891; Fawcett, Prov. List Indig. Nat. Fl. Pl. Jamaica 30. 1893; Jacks., Ind. Kew. 1: 327. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 153--154, fig. 59 A & B. 1895; Jacks., Attempt Ascert. Actual Dates Rees Cyclop. 1895; Kuntze, Rev. Gen. Pl. 3 (3): 254. 1898; H. H. Rusby, Bull. Torrey Bot. Club 27: 80. 1900; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 28. 1904; Knuth, Handb. Blütenbiol. 3 (2): 72. 1905; Millsp., Field Columb. Mus. Publ. Bot. 2: 178. 1906; Britton & Millsp., Bahama Fl. 366. 1920; Grenz., Ann. Mo. Bot. Gard. 13: 78--80 & 90. 1926; Knuth in Fedde, Repert. Beih. 43: 603. 1927; Epling, Journ. Bot. 67: 12. 1929; Standl., Field Mus. Publ. Bot. 3: 399.

1930; Stapf, Ind. Lond. 6: 430. 1931; Grey & Hubbard, List Pl. Atkins Instit. 31. 1933; Carnegie Inst. Wash. Publ. 478: 42, 75, 109, & 183. 1937; Moldenke, Geogr. Distrib. 4, 6--9, 12, 13, 15, 16, 18, 20, 22, 25, & 35. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 176--177. 1940; Moldenke in Fedde, Repert. 49: 97--104. 1940; Moldenke, Prelim. Alph. List Invalid Names 7, 8, 24, 44, 47, 48, & 55. 1940; Moldenke, Suppl. List Invalid Names 1 & 3. 1941; Moldenke, Alph. List Invalid Names 6, 7, 23, 24, 42, 45, 49, 50, & 57. 1942; Moldenke, Known Geogr. Distrib., [ed. 1], 14, 15, 19, 22, 24--28, 30--33, 36, 71, & 86. 1942; Ramirez Cantu, Anal. Inst. Biol. Mex. 14: 404--406. 1943; F. Miranda, Anal. Inst. Biol. Mex. 14: 414--415. 1943; Moldenke, Phytologia 2: 93. 1944; Erdtman, Svensk Bot. Tidsk. 39: 281--284, fig. 8. 1945; Hodge, Revist. Fac. Nat. Agron. 7: 313. 1947; Daniel, Verb. Cent. Antioq. 3. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 3 & 21. 1947; Moldenke, Known Geogr. Distrib., [ed. 2], 26, 28, 34, 38, 42, 46, 47, 49--52, 57--59, 62, 69, 75, 156, & 176. 1949.

Although Chamisso, when he proposed this genus, wrote the name "Bouchéa" at the head of his generic description and in the index of the volume, yet he wrote the name without an accent mark in the binomials which he proposed in the same article. It seems obvious, therefore, that he intended the accent mark merely to help indicate pronunciation and not as an integral part of the name. I am, therefore, not following Meissner [Plant. Vasc. Gen. 2: 198 (1839)] nor Walpers [Repert. 4: 11 (1845)] in retaining this orthography.

The species has been collected at altitudes of from 30 to 1230 m., blooming in June, July, October, and November, and fruiting in July, September, and November. The flowers are described by collectors as blue, lilac, pink, purple, lavender, clear-violet, and red-violet. Haught describes the species as an erect annual herb. to 70 cm. tall, in open bush land, with light purplish-red flowers. Cuatrecasas says that it is a slender pale-green herb 1 m. tall, with lilac-blue flowers. Fosberg describes it as a weed in banana patches, wet river-bottoms, and pastures on adjacent slopes, with bright-purple flowers. The pollen morphology is discussed by Erdtman in Svensk Bot. Tidsk. 39: 281--284 (1945). The plant has also been found in moist soil on riverbanks and in waste soil along roadsides. Britton & Millspaugh call it the "narrow-fruited vervain", while Duque Jaramillo calls it "verbena blanca flori rosada".

The Kearney & Peebles 14439, cited below, is anomalous, and the Cuatrecasas 15347a is a mixture of this species and Stachytarpheta cayennensis (L. C. Rich.) Vahl. The Read s.n. [Alembique] cited by me in Fedde, Repert. 49: 102 (1940) as from "Province undetermined" is actually from Camagüey, Cuba, and the Botteri specimens [Cerro del Bongo], cited on page 104 of the same work, are probably from Cerro del Borrego, near Orizaba, Veracruz, Mexico. Specimens of this species have been misidentified in herbaria as Stachytarpheta jamaicensis (L.) Vahl.

Additional citations: ARIZONA: Santa Cruz Co.: Kearney & Peebles 14439 (N, To). MEXICO: Michoacán: W. C. Leavenworth 479 (Ld). Yucatán: G. F. Gaumer 1160 (Gg--163106); Gaumer & sons 1139 (Gg--160520). State undetermined: C. A. Ehrenberg 112 [Macbride photos 17582] (Kr--photo, N--photo). CUBA: Oriente: Alain & Chrysogone A.1083 (N); Clément 6123 (N). HISPANIOLA: Dominican Republic: Howard & Howard 9506 (N); Türckheim 2532 (F--298535, Io--70574). PUERTO RICO: A. A. Heller 6109 (F--129301); Sintenis 2117 (F--79580, Io--75558). ST. THOMAS: Eggers s.n. [St. Th. Novb. 80] (Pa). ST. CROIX: L. A. Ricksecker 409 (F--71061). WEST INDIES: Island undesignated: Krebs s.n. (Bz--17243). MARGARITA ISLAND: Miller & Johnston 205 (F--126784, Po--124013). COLOMBIA: Antioquia: Gutierrez Villegas 1107 (Fn--3215, N); Tomas Alberto 58 (N), 885 (N); Toro Toro 1289(Fn--1626). Atlántico: Elias 1068 (N). Bolívar: L. H. Bailey 265 (Ba); Engstedt 51 (S). Cundinamarca: Antonio C. s.n. [Apolinar-María 151] (F--1007406). Huila: H. L. Mason 13846 (W--2047920). Magdalena: Haught 4455 (N). Tolima: Cuatrecasas 10521 (W--1796545). Valle del Cauca: Cardeñosa Barriga, Murgueitio Posso, & Barkley 17C916 (Fn--3224, N); Cuatrecasas 15347a (N), 22128 (N), 22696 (N), 22806 (F--1280036); Duque Jaramillo 1434 (F--1292587); Fosberg 20528 (N); Moldenke & Moldenke 19796 (Es, Mg, N, No, Ot, Sm); Pérez Arbeláez & Cuatrecasas 6444 (W--1774218); Toro Toro 324 (Fn--1625). VENEZUELA: Aragua: Lasser 847 [Herb. Nac. Venez. 12639] (Ve), 931 [Herb. Nac. Venez. 12638] (Ve). Carabobo: Saer d'Heguert 887 (N, W--1831270). Federal District: Moldenke & Moldenke 19564 (Lg, N); H. Pittier 7887 [Herb. Nac. Venez. 12637] (Ve), 9720 [Herb. Nac. Venez. 12641] (Ve). CULTIVATED: Spain: Collector undesignated 80 (Q).

BOUCHEA PRISMATICA var. BREVIROSTRA Grenz.

Synonymy: Stachytarpheta bifurca Benth., Pl. Hartweg. 21. 1839. Stachytarpha bifurca Benth. ex Schau. in A. DC., Prodr. 11: 572, in syn. 1847. Melasanthus bifurca Benth. ex Moldenke, Prelim. Alph. List Invalid Names 32, in syn. 1940. Zapania curassavica Pavon ex Moldenke, op. cit. 54, in syn. 1940 [not Z. curassavica (L.) Lam., 1791]. Zapania spinosa Pavon ex Moldenke, op. cit. 55, in syn. 1940. Escholtzia glabra Schmitz ex Moldenke in Fedde, Repert. 49: 104, in syn. 1940. Verbena diandra Sessé & Moc. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941.

Literature: Benth., Pl. Hartweg. 21. 1839; Walp., Repert. 4: 11. 1845; A. Gray, Syn. Fl. N. Amer., ed. 2, 2 (1): 334. 1886; Grenz., Ann. Mo. Bot. Gard. 13: 80--81. 1926; Moldenke, Geogr. Distrib. 4, 8, 11, 13, 15, 16, & 18. 1939; Moldenke, Prelim. Alph. List Invalid Names 32, 40, 41, 54, & 55. 1940; Moldenke in Fedde, Repert. 49: 104--107. 1940; Moldenke, Suppl. List Invalid Names 8. 1941; Calderón & Standl., Fl. Salvador., ed. 2, 235.

1941; Moldenke, Known Geogr. Distrib., [ed. 1], 12, 14, 15, 19, 21, 27, 29--32, & 86. 1942; Moldenke, Alph. List Invalid Names 33, 42, & 57. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 67--68. 1942; Moldenke, Known Geogr. Distrib., [ed. 2], 21, 26, 28, 34, 38, 50, 55, 57, 59, & 176. 1949.

7 -- calyx and corolla, x 2.1

8 -- corolla spread open, x 5.6

9 -- pistil, x 2.1

10 -- coccus, x 5.6

11 -- calyx, x 5.6

This variety is by far the commonest and most widely distributed variety of the species in Mexico and Central America. It may be distinguished by the much shorter beaks on the cocci (only about 0.5 mm. long). Its leaf-blades are also usually noticeably smaller, more elliptic, more decidedly obtuse and rounded at the apex, and often falcate, and the plant is generally lower and more dwarfed in habit. It inhabits, according to collectors, hills, plains, llanos, roadsides in hilly places, scrub land, wet places on hilltops, black volcanic soil, and is found among boulders and

shrubbery in sunny barrancas. It has been found at altitudes of from 1000 to 2470 m., blooming in February, July, August, September, and October, and in fruit from July to October. The vernacular name "shep-uón" has been recorded for it.

The flowers are described as reddish, pink, purple, or lavender, but the Lundells say that the corolla is lavender with a paler eye. Balls describes the plant as having single stems to 12 inches tall, branched at the top, with very small pale-mauve flowers borne in stiff narrow spikes to 3 inches long, growing on open stony hillsides. Webster, Rowell, and Barkley found it in gravel of crumbling granite on hillsides and in granitic soil on cliffs of sandstone and soft granite. Gentry reports that it grows in grama grassland on rolling plains of volcanic agglomerate and reddish-brown clay loams with pebble intrusions.

Specimens have been misidentified in herbaria as "Bouchea prismatica Kuntze", "B. prismatica (Jacq.) Kuntze", and "Stachytarpheta cajanensis Rich." Calderón & Standl., Fl. Salvador., ed. 2, 235 (1941), call it "Bouchea ehrenbergii Cham." In my Alph. List Invalid Names Suppl. 1: 16 (1947) I reduced Lomake brachiata to the synonymy of this variety, but since Rafinesque states that the type specimen, not seen by me, is from Cuba, where this variety is unknown, I feel now that it should be reduced to the synonymy of the typical form of the species.

Additional citations: ARIZONA: Cochise Co.: Harrison, Kearney, & Hastings 6123 (To). Santa Cruz Co.: Harrison & Fulton 8175 (To); Peebles & Harrison 4698 (To); Shreve 7694 (Fs, Mi). MEXICO: Chihuahua: H. S. Gentry 8250 (N); LeSueur 91 (Au, F--837304), 136 (Au, F--837302, Gg--319697); Pringle 325 (F--104206, Ll, Pa, Up--17056, Up--17057, Vt), 994 (Me, Me, Vt); Shreve 9093 (Fs, Mi); E. Wilkinson s.n. [18 Aug. 1885] (Ob--50621). Durango: H. S. Gentry 8321 (N); Hernández Xolocotzi, Rubert, & Guevara X. 2616 (N); Edw. Palmer 416 (F--51497, Me, Me); Patoni 268 (Me); Shreve 9162 (Mi). Federal District: Balls 5212 (W--1793794); G. L. Fisher s.n. [Tlalpam, Aug. 3, 1924] (Cm, Hp); E. Lyonnet 2336 (W--1790972); Matuda 19070 (N), 21703 (N), 21869 (N); Née 101 (Q); Pringle 7941 (F--120306, Vt); Schmitz s.n. [circa urbem Mexici; Herb. Reichenbach f. 131217] (V); Zamora, Paxson, & Barkley 16M902 (Au, N). Guanajuato: Yates & Wilcox 90 (Ak--31230). Hidalgo: Herb. Inst. Biol. Univ. Nac. Mex. 7148, in part (Me); Lundell & Lundell 12185 (Ld); H. E. Moore 1508 (N). Jalisco: Barkley, Webster, & Rowell 7579 (N), 7642 (N); Edw. Palmer 261 (Pa, Sg--68282). México: Berlandier 838 (Du--166399); Hinton 6368 (Ca --586452, F--878391). Michoacán: Arsène 4 (F--387214), 2857 (Ur), 8489 (F--484976, Ur); Hinton 12998 (Au, N, Oa--6699), 13036 (F--959188), 13968 (Au, N, N); Kenoyer s.n. [Morelia, 8-18-38] (Fs). Oaxaca: Galeotti 765 (Br); Herb. Inst. Biol. Univ. Nac. Mex. 7148, in part (Me); Rowell, Webster, & Barkley 17M488 (N); Silvio & Conzatti 3577 (Me); L. C. Smith 747 (Me); Webster, Rowell, &

Barkley 17M502 (Au). Puebla: Purpus 3405 (F--276345). Querétaro: Arsène 9997 (F--485079); Barkley, Rowell, & Paxson 737 (N); Barkley, Webster, & Paxson 697 (N); Rose, Painter, & Rose 9570 (F--634832). San Luis Potosí: Parry & Palmer 716 (Io, Pa), 722 1/2 (Io, Pa). Sonora: Wiggins 7055 (Mi). Tamaulipas: Stanford, Lauber, & Taylor 2302 (N). State undetermined: Sessé, Mociño, Castillo, & Maldonado 32 (F--844970), 33 (F--344969), 123 ["82"] (F-846418). GUATEMALA: Huehuetenango: Seler & Seler 3072 (Du--283751, Gg--242729); Steyermark 51588 (F--1199192). ST. THOMAS: L. H. Bailey 13 (Ba). BARBADOS: Bot. Stat. Herb. Barbados 79 (F-200788). COLOMBIA: Boyacá: Cuatrecasas 9678 (N). Santander: Araque Molina & Barkley 261 (N).

BOUCHEA PRISMATICA var. LACINIATA Grenz.

Synonymy: Verbena laciniata Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 47, in syn. 1940 [not V. laciniata (L.) Briq., 1904, nor Kuntze, 1942]. Bouchea ehrenbergii var. fol. laciniatis A. Gray ex Moldenke in Fedde, Repert. 49: 110, in syn. 1940. Verbena laevigata Sessé & Moc. ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941.

Literature: Grenz., Ann. Mo. Bot. Gard. 13: 80. 1926; Moldenke, Geogr. Distrib. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 47. 1940; Moldenke in Fedde, Repert. 49: 109--110. 1940; Moldenke, Suppl. List Invalid Names 9. 1941; Moldenke, Alph. List Invalid Names 48. 1942; Moldenke, Known Geogr. Distrib., [ed. 1], 16 & 86 (1942) & [ed. 2], 28 & 176. 1949.

The plant is said by Hinton to grow to 1 m. tall. Ferris & Mexia describe it as a roadside weed with pink flowers.

Additional citations: MEXICO: Guerrero: Hinton 10605 (F--937973). Sinaloa: Ferris & Mexia 5194 (Du--150657). State undetermined: Sessé, Mociño, Castillo, & Maldonado 125 ["91"] (F--844943).

BOUCHEA PRISMATICA var. LONGIROSTRA Grenz.

Literature: Millsp., Field Columb. Mus. Publ. Bot. 2: 178. 1906; Grenz., Ann. Mo. Bot. Gard. 13: 81--82. 1926; Moldenke, Geogr. Distrib. 3, 4, 6, 7, 13, 15, 19, & 20. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 177. 1940; Moldenke in Fedde, Repert. 49: 107--109. 1940; Moldenke, Known Geogr. Distrib., [ed. 1], 5, 16, 20, 24--27, 30--32, & 86. 1942; Moldenke, Phytologia 2: 93. 1944; Moldenke, Known Geogr. Distrib., [ed. 2], 10, 28, 36, 42, 46, 47, 49, 58, 59, 62, & 176. 1949.

The variety has been collected along roadsides, in waste and ballast land, in old fields, and as a weed in orange groves, at altitudes of from 10 to 1265 m., in flower in January and from June through October, and in fruit in January, March, and from June through September. The flowers are described by collectors as blue, pink, purple, and light-purple. Edwards says that the corollas drop very quickly. Harris and Eyerdam describe the plant

as a roadside weed. Leavenworth says it is a pink-flowered herb growing in moist soil along riverbanks. Pittier states that it forms colonies in fertile places and waste land along roadsides. Specimens have been misidentified in herbaria as B. prismatica and as "Bouchea ehrenbergii Cham.", "Bruechea prismatica (L.) Kuntze", "Buechea prismatica (L.) Kuntze", Stachytarpheta jamaicensis (L.) Vahl, "Stachytarphaeta jamaicensis (L.) Vahl", "Stachytarpheta jamaicensis L.", "Stachytarpheta prismatica L.", and "Stachytarpheta prismatica Vahl".

The Hinton 12050 cited below has quite the general aspect of B. nelsonii, but the beaks on the cocci are not quite elongated enough for that species. The C. Wright 3660 cited by me in Fedde, Repert. 49: 108 (1940) as from "Province undetermined" is actually from Las Villas, Cuba. The Curtiss s.n. [Havana, May 11], also cited below, is incorrectly referred to by Grenzebach in her monograph as "Curtiss & West".

Because of their historic importance, the two specimens from Linnaeus' herbarium cited below are described in full as to their annotations: The Jamaican specimen has no annotation on the front, but on the back of the sheet one finds "Linné herb." in pencil, "Jamaica" in ink (in one handwriting), "Bouchea Ehrenbergii Cham." (in a second handwriting) also in ink, and, likewide in ink, "Stachytarpheta prismatica Vahl R. & S." in a third handwriting. Finally, also in ink, in a handwriting that seems to be that of Linnaeus himself, the number "12". The second specimen has on the front side of the sheet, on top, in ink the word "Verbena", and, near the bottom, in pencil "Verb. 4. prismia. Sp. pl. 19 = Bouchea Ehrenbergii Cham. in Linnaea" and in ink (in what appears to be Linnaeus' own handwriting) "prismatica 4", followed in ink (in another handwriting) "autogr. divi Linnaei". On the reverse side of the sheet one finds in pencil "Linné herb." and in ink (in Linnaeus' own handwriting) "Plum. phyt. 70. f. 1" and also in ink(in another handwriting) "autogr. divi Linnaei". This is followed in ink (in still another handwriting) "Verbena diandra, spicis laxis, calycibus alternis prismaticis truncatis aristatis, foliis ovatis obtusis. Linn. Spec. plant. 19.4", and, also in ink (in an unknown handwriting, apparently of later date) "Bouchea Ehrenbergii Cham." This is followed in ink, in still another unknown hand, "Stachytarpheta prismatica R. & S. (Verbena prismatica Linn.-Willd.)".

Additional citations: ALABAMA: Mobile Co.: Mohr s.n. [Mobile, Sept. 1883] (Mi), s.n. [Ballast grounds, Estuary, Mobile river, Oct. 1883] (Vt), s.n. [Oct. 8, 1883] (Du--90904). MEXICO: Guerrero: Hernández Xolocotzi & Alexander 111 (N). Hidalgo: M. T. Edwards 758 (Au, F--918303); Kenoyer 513 (F--914820); H. E. Moore 1826 (N). Michoacán: Hinton 12050 (N); W. C. Leavenworth 479 (N, Ur). Sinaloa: Mexia 107 (Gg--141891). BAHAMAS: Britton & Brace 782 (F--172065); Britton & Millspaugh 5796 (F--198598). CUBA: Camagüey: Acuña 13781 (Es). Havana: Baker & Wilson 524 (F--

185397); Boldo 86 (Q); Curtiss s.n. [Havana, May 11] (F--184863); Shafer 190 (Cm). Las Villas: Alain A.1535 (N); Combs 154 (Io--33758, Ka--61156); Pringle 14 (Vt); C. Wright 3660 (Pa). Oriente: Clément 2765 (Ha, N); Shafer 1364 (F--284855). Province undetermined: C. Wright s.n. [1865; Herb. Sauvalle 1745] (Hv). JAMAICA: W. Harris 11792 (F--438808--isotype, Gg--31962--isotype), s.n. [Aug. 12, 1897] (F--145416); Herb. Linnaeus s.n. (F--photo, N--photo, S, Sg--photo, Z--photo); Masson s.n. [1782] (S). HISPANIOLA: Haiti: Eyerdam 29 (Se--20822). PUERTO RICO: Britton, Cowell & Brown 5378 (F--451536). COLOMBIA: Atlántico: Durand & Garcia Barriga 2352 (Jc), 2372 (W--1778988), 2540 (W--1778994). Bolívar: Araque Molina & Barkley 19Bo004 (N). VENEZUELA: Bolívar: Holt & Gehriger 174 [Herb. Nac. Venez. 12640] (Ve). Federal District: H. Pittier 7887 (Du--297833, Gg--311); Vogl 559 (N). Mérida: E. Reed 587 (N). LOCALITY OF COLLECTION UNDESIGNATED: Herb. Linnaeus s.n. (F--photo, N--photo, S, Sg--photo, Z--photo); Herb. Swartz s.n. (S).

BOUCHEA PSEUDOCHASCANUM (Walp.) Grenz.

Synonymy: Stachytarpheta pseudochascanum Walp., Repert. 4: 11. 1845. Bouchea laetevirens Schau. in A. DC., Prodr. 11: 557--558. 1847. Bouchéa incrassata Lange, Ind. Sem. Hort. Haun. 31. 1870. Stachytarpheta azureo-nigra Hort. ex Lange, Bot. Tidssk. 8: [ser. 2, 4:] 3, in syn. 1874. Stachytarpha pseudo-chascanum Walp. ex Schau. in A. DC., Prodr. 11: 572, in syn. 1847. Stachytarpha pseudochascanum Walp. ex Schau. in Mart., Fl. Bras. 9: 196, in syn. 1851. Bouchea incrassata Lange ex Jacks., Ind. Kew. 1: 327. 1893.

Literature: Walp., Repert. 4: 11. 1845; Schau. in A. DC., Prodr. 11: 557--558. 1847; Schau. in Mart., Fl. Bras. 9: 196 & 307. 1851; Lange, Ind. Sem. Hort. Haun. 31. 1870; Lange, Bot. Tidssk., 8: [ser. 2, 4:] 3--5, pl. 2. 1874; Jacks., Ind. Kew. 1: 327. 1893; Grenz., Ann. Mo. Bot. Gard. 13: 85--86. 1926; Junell, Symb. Bot. Upsal. 4: 21--30 & 172--176, figs. 29, 44, 46, 49, & 53. 1934; Dahlgren, Svensk Bot. Tidsk. 32: 231. 1938; Moldenke, Geogr. Distrib. 25 & 35. 1939; Moldenke, Prelim. Alph. List Invalid Names 7, 41, & 42. 1940; Moldenke in Fedde, Repert. 49: 114--117. 1940; Moldenke, Alph. List Invalid Names 6 & 42. 1942; Moldenke, Known Geogr. Distrib., [ed. 1], 36, 71, & 86 (1942) & [ed. 2], 75, 156, & 176. 1949; Moldenke, Phytologia 2: 93. 1944.

The gynoecium morphology of this species is discussed by Junell in the reference cited above. The species has been collected in flower and fruit in October.

Additional citations: BRAZIL: Federal District: Alston & Lutz 147 (N); Moldenke & Moldenke 19597 (N, Ot, Sm). CULTIVATED: Java: Herb. Hort. Bot. Bogor. XVK.A.XLV.14 (Bz, Bz--26441, N).

BOUCHEA RUSBYI Moldenke

Synonymy: Bouchea incisa Rusby, Bull. N. Y. Bot. Gard. 4: 432.

1907 [not B. incisa H. H. W. Pearson, 1905].

Literature: H. H. Rusby, Bull. N. Y. Bot. Gard. 4: 432. 1907; Prain, Ind. Kew. Suppl. 4: 28. 1913; Grenz., Ann. Mo. Bot. Gard. 13: 86--87. 1926; Moldenke, Torreya 34: 8. 1934; Moldenke, Geogr. Distrib. 28. 1939; Moldenke, Prelim. Alph. List Invalid Names 7. 1940; Moldenke in Fedde, Repert. 49: 113--114. 1940; Moldenke, Lilloa 6: 314. 1941; Moldenke, Known Geogr. Distrib., [Ed. 1], 40 & 86. 1942; Moldenke, Alph. List Invalid Names 6. 1942; Moldenke, Phytologia 2: 93. 1944; Erdtman, Svensk Bot. Tidsk, 39: 281. 1945; Moldenke, Known Geogr. Distrib., [ed. 2], 96 & 176. 1949.

This plant is described by Buchtien as a shrub 1.5 m. tall, with blue-violet flowers, and by Steinbach as a shrub 80 cm. tall, with lilac flowers. Its pollen morphology is discussed by Erdtman in the reference cited above. It has been collected at altitudes of 400 to 1700 m., blooming in January and April. The common names "verbena de flor garnde" and "verbena de flos grande" have been recorded for it, and herbarium specimens have been misidentified as "Acanthaceae". The Chicago specimen of Killip & Smith 25001 exactly matches the isotype of B. rusbyi in that herbarium. The remaining specimens of this collection ought, therefore, to be re-examined as they may actually represent this species instead of B. fluminensis.

Additional citations: BOLIVIA: El Beni: Buchtien 8183 (La, N). Santa Cruz: Steinbach 5587 [Herb. Osten 16813] (Ug). Department undetermined: M. Bang 2226 (Bz--17242--isotype, Cm--isotype, F--78035--isotype, Pa--isotype).

BOUCHEA SPATHULATA Torr.

Synonymy: Bouchea spatulata Torr. ex Moldenke, Prelim. Alph. List Invalid Names 8, in syn. 1940.

Literature: Torr. in Emory, Rep. U. S. & Mex. Bound. Surv. 2: 126. 1859; A. Gray, Syn. Fl. N. Amer., ed. 2, 2 (1): 335. 1886; Coult., Contrib. U. S. Nat. Herb. 2: 326. 1892; Jacks., Ind. Kew. 1: 327. 1893; Grenz., Ann. Mo. Bot. Gard. 13: 87--88. 1926; Moldenke, Geogr. Distrib. 13. 1939; Moldenke, Prelim. Alph. List Invalid Names 8. 1940; Moldenke in Fedde, Repert. 49: 126--127. 1940; Moldenke, Known Geogr. Distrib., [ed. 1], 12, 16, & 86. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 68--69. 1942; Moldenke, Alph. List Invalid Names 7. 1942; Ertdman, Svensk Bot. Tidsk. 39: 281. 1945; Moldenke, Phytologia 2: 154. 1948; Moldenke, Known Geogr. Distrib., [ed. 2], 21, 28, & 176. 1949; McDougall & Sperry, Pl. Big Bend Nat. Park 146. 1951.

The pollen morphology of this species is discussed by Erdtman in the reference cited above. The species has been collected in anthesis in June and October. Hanson reports it infrequent in canyons. Hinton says it grows to about 80 cm. tall in small colonies on arid limestone hillslopes and has odorous purple flowers. McDougall & Sperry describe it as a low branching shrub occurring in dry canyons and on open rocky dry ridges and mountainsides.

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