A Monograph on
THE TERMITOPHILOUS STAPHYLINIDAE
(Coleoptera)

CHARLES H. SEEVERS

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Contents

I. Termites and Termitophiles: General Considerations

INTRODUCTION

This monograph represents a departure from a majority of systematic revisional works in that ecological relationships rather than systematic position determined the species to be included. The systematic section is concerned with revisions of groups of staphylinid beetles having in common the fact that they are obligatory inhabitants of termite societies. The central theme is the evolutionary history of one mode of life within a very large family of organisms, the Staphylinidae.

My studies on termitophilous insects began about twenty years ago, when Dr. Alfred E. Emerson very generously provided me with a substantial collection accumulated during his termite investigations in South America. This collection was augmented from a number of sources until a systematic revision of the world's termitophilous Staphylinidae became feasible. Even though the termite nests of extensive tropical areas have not been thoroughly explored and many genera and species are still to be discovered, a synthesis of the substantial body of knowledge relating to this group of insects and a discussion of evolutionary implications seemed justifiable.

The objectives of these studies may be summarized as follows: taxonomic revisions of the various categories of termitophilous Staphylinidae; presentation of a list of host termites; formulation of hypothetical phylogenies for the larger groups of termitophilous Staphylinidae; and, lastly, a synthesis of the taxonomic, phylogenetic, biogeographical, and host data for each group in an attempt to elucidate its evolutionary history. These goals have frequently been somewhat elusive owing to the difficulty of obtaining critical specimens and the unsatisfactory status of staphylinid classification. As the studies progressed it became apparent that the termitophilous Staphylinidae are exceptionally satisfactory for certain evolutionary studies, particularly when interpreted as part of relatively stable interspecies relationships, i.e., the relationships of termites and their associated organisms. Opportunities are rarely provided to study the history of two diverse genetic systems that evolved under very similar ecological circumstances for long periods of geologic history. The evolution of staphylinid termitophiles, as evidenced by data to be presented later, was quite remarkable for the high degree of host specificity that characterized it. There are probably few cases to be found among host-parasite or host-commensal relationships in which the integrity of host relationships was maintained so faithfully over such long periods of evolutionary history.

If the evolutionary histories of termitophiles have been very closely linked with those of their hosts, hypotheses relating to the phylogenetic and biogeographical histories of hosts and guests should be mutually supportive. One of the major conclusions of this work is that such hypotheses, worked out independently for termites and Staphylinidae, have a very high degree of concordance. Progress in preparing hypothetical phylogenies of the termitophilous groups has been slow, due in large part to the artificial nature of the classification of the subfamily Aleocharinae. Before aleocharine categories containing termitophiles could be reorganized so as to be defensible on phylogenetic grounds, it was necessary to devote considerable study to the entire subfamily. Fortunately, on the other hand, the phyletic history of termites has been extensively studied by Dr. Emerson and several of his students, Dr. Laura Hare, and Dr. Muzaffer Ahmad. Emerson has clarified many aspects of termite evolution and has proposed important principles relative to the biogeography of termites.

At the outset it is proper to take cognizance of earlier works relating to the evolution of termitophily. The large majority of papers on termitophilous Staphylinidae have been taxonomic in character and have devoted little attention to evolution. The pioneering studies on myrmecophilous and termitophilous insects made by the Rev. E. Wasmann may have been important in some respects, but they contributed little of significance to our knowledge of the phylogeny, biogeography, and evolution of these insects. For more than thirty years Wasmann wrote voluminously and repetitiously about certain aspects of the evolution of myrmecophily and termitophily, but emphasis on mystical concepts such as "amical selection" and "symphilic instincts" did much to discredit his theoretical views. Wasmann's opinions have little bearing on this monograph and need not be reviewed.

In 1920, Warren published a diagram purporting to show the independent evolution of physogastric Aleocharinae in the three major continental tropic areas of the world. This fanciful tree was quite obviously based on a superficial examination of the literature; Warren was not a specialist on the Staphylinidae. His "phylogenetic tree" is probably one of the most absurd on record; genera of different tribes and subtribes are arranged in three lines with complete disregard of the facts of morphology. Wheeler (1928, pl. 41) published Warren's tree and, tacitly at least, approved it.

Warren derived the termitophilous Staphylinidae of each major tropical area from generalized *Myrmedonia*-like stock and showed in each case a series of genera presumably leading to a highly developed physogastric genus at the apex of the tree. At the apices of his independent evolutionary lines he had *Spirachtha* (South America), *Termitomimus* (Africa), and *Termitoptochus* (Indomalaya). It will be shown later that these genera were derived from termitophile stock that spread throughout the tropics of the world with its hosts. It will also be shown that the genera of Warren's "evolutionary lines" belong to a series of tribes and subtribes and could not conceivably bear the relationships indicated.

Warren concluded that the termitophilous Staphylinidae gradually evolved from free-living species of the different faunal regions after the major termite areas became geographically isolated and the various termite genera had evolved and spread. He stated that the termitophilous faunas of the major termite regions have a striking external similarity but that systematically they do not appear to be more closely allied than the ordinary free-living faunas. Warren reasoned that a greater common element would exist throughout the termitophilous faunas of the world if the termitophiles had evolved before the general distribution of termites. I can only conclude from my studies that Warren's generalizations are completely erroneous when applied to the major groups of termitophilous Staphylinidae. Warren accepted the highly artificial aleocharine classification without critical analysis and thus failed to recognize the "common elements" in the termitophilous faunas of the major tropical areas. One of the major thesis of the present work is that a number of termitophilous groups originated early in the evolutionary history of their host group and dispersed with their hosts to far distant areas.

In recent years new methods of approach to problems of insect evolution have been utilized with considerable success. For many years attempts to analyze the evolutionary history of insects have relied almost exclusively on fossil evidence. Paleozoic fossils have given some insight into the nature of very ancient insects, and significant information about more recent forms has resulted from studies of Tertiary fossils, but, except in a few groups, there have been no Mesozoic fossils to illuminate that important period, when many modern subfamilies, tribes, and genera were differentiating. But even without fossil evidence it now seems possible to deduce past histories of some insect groups after a careful synthesis of various areas of evidence: their phyletic lines as judged by comparative morphology; their present-day geographical distributions and ecological limitations; and knowledge and hypotheses about ancient land masses, land bridges, and climate. Some very important contributions to our knowledge of insect evolution have resulted from this type of analysis (Emerson, 1949, 1952a, 1955, on termites; Darlington, 1950, on paussid beetles; Ross, 1951, on caddiceflies). Evidence is accumulating to demonstrate that many insect genera, both primitive and derived, have existed without important changes since Cretaceous times or earlier. The evidence for this hypothesis is largely circumstantial but as the evidence grows to significant proportions the probability that the hypothesis is valid increases.

ACKNOWLEDGMENTS

I am very greatly indebted to Dr. Alfred E. Emerson of the University of Chicago, whose numerous contributions to this project made it possible. Through his own collecting efforts and through contacts with other termite specialists, Dr. Emerson has been the most important source of material. Even more significant as a contribution to our knowledge of termitophile–termite evolutionary interrelationships, Dr. Emerson has made it possible to present a host list of unprecedented accuracy. The termites that became available were identified by him, with the exception of certain Brazilian specimens determined by Mr. Renato L. Araujo. Dr. Emerson also checked the host records cited by earlier investigators and in many cases suggested changes of zoological or nomenclatural significance (the actual specimens on which these earlier records were based were not examined, however). Finally, discussions of various termitophile problems that Dr. Emerson and I have had over a period of years contributed significantly to the improvement of the monograph.

It is a pleasure to express appreciation to the following persons through whose courtesy and generosity I was able to study important materials: Dr. A. Reichensperger, Bad Gödesberg, Germany; Mr. R. L. Araujo, Instituto Biológico, São Paulo, Brazil; Drs. E. A.

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After completing what I considered to be a final draft of this monograph, I had an opportunity to visit several European museums in connection with other studies on the systematics of Staphylinidae. This trip, made possible by a grant-in-aid from the National Science Foundation, enabled me to examine types and other specimens of termitophilous Staphylinidae not previously available. Some of the results of these studies have been incorporated in this manuscript. In addition to gratefully acknowledging the aid from the National Science Foundation, I wish to thank the following men for their kind co-operation in helping to make the study trip successful: Dr. E. M. Kruytzer, Curator of the Natuurhistorisch Museum, Maastricht, The Netherlands, and Dr. H. Schmitz, Curator of the Wasmann collection in the Natuurhistorisch Museum; Dr. A. Reichensperger, Bad Gödesberg, Germany; Messrs. N. D. Riley, E. B. Britton, and J. Balfour-Browne of the British Museum (Natural History); Mr. Gaston Fagel of the Institut Royal des Sciences Naturelles de Belgique.

ORGANIZATION OF TERMITE SOCIETIES AND TERMITE EVOLUTION

It is appropriate at this point to review some of the general features of termite evolution as background for subsequent discussions of host–guest interrelationships. This section deals with the organization of termite families and their phylogenetic relationships. Later in the paper, those termite families and subfamilies that contain important groups of termitophiles are considered in greater detail.

The material for this summary was drawn for the most part from the publications of Emerson; these include discussions of the evolution of termite nesting behavior (Emerson, 1938), termite ecological and evolutionary interrelationships (Emerson, 1949), and the biogeography of termites (Emerson, 1952, 1955). Discussions of termite phylogeny in this and later sections are based on the above works, on several of Emerson's taxonomic papers, and on contributions by Hare (1937) and Ahmad (1950).

The 1800 named species of living termites are grouped into about 150 genera and 5 families. Primarily tropical insects, relatively few termites occur even in warm temperate regions, and only about nineteen species of four genera are adapted to a temperate climate. The general relationships of the five termite families are shown in a diagram (fig. 1) designed to illustrate independently derived stocks of staphylinid termitophiles and their primary host associations. A short résumé of the social systems of these families is presented below, although we are chiefly concerned with the Termitidae and their guests.

Kalotermitidae: The termites of this family are primitive, as evidenced by their morphology, social organization, and nesting behavior. The kalotermitids, frequently called dry-wood termites, excavate irregular channels in decayed portions of tree trunks—galleries which require no soil connections. The kalotermitids do not construct definite termitaria and most of their galleries result from feeding. The colonies of these termites consist of reproductive males and females, soldiers, and nymphs which perform the work of the colony; no adult worker caste is differentiated. The queen is not physogastric and no royal cell is constructed. The Kalotermitidae apparently do not have staphylinid guests and will not be discussed further.

Mastotermitidae: This family is represented by a single living species in Australia. Fossil evidence shows that species of this family were widely distributed in past periods. These termites show many primitive morphological features and their social system contains no worker caste. The nesting behavior is more specialized than that of the Kalotermitidae and a colony may contain more than a million individuals.

Hodotermitidae: A small family of primitive termites regarded as relicts of an earlier, more widely distributed group.

Rhinotermitidae: Although not as a rule having more elaborate nesting behaviors than the Kalotermitidae, the termites of this family exhibit a more highly developed social system, as evidenced by differentiation of a worker caste, development of a physogastric queen with greater reproductive capacity, and increase in colony size. Nests of most species are found in excavated galleries in wood, but the galleries often extend into the ground and external gallery-tunnels are present. *Coptotermes*, a large tropical genus, may construct large mounds of triturated wood or clay mixed with excreta. *Rhinotermes* and close relatives are noteworthy for their

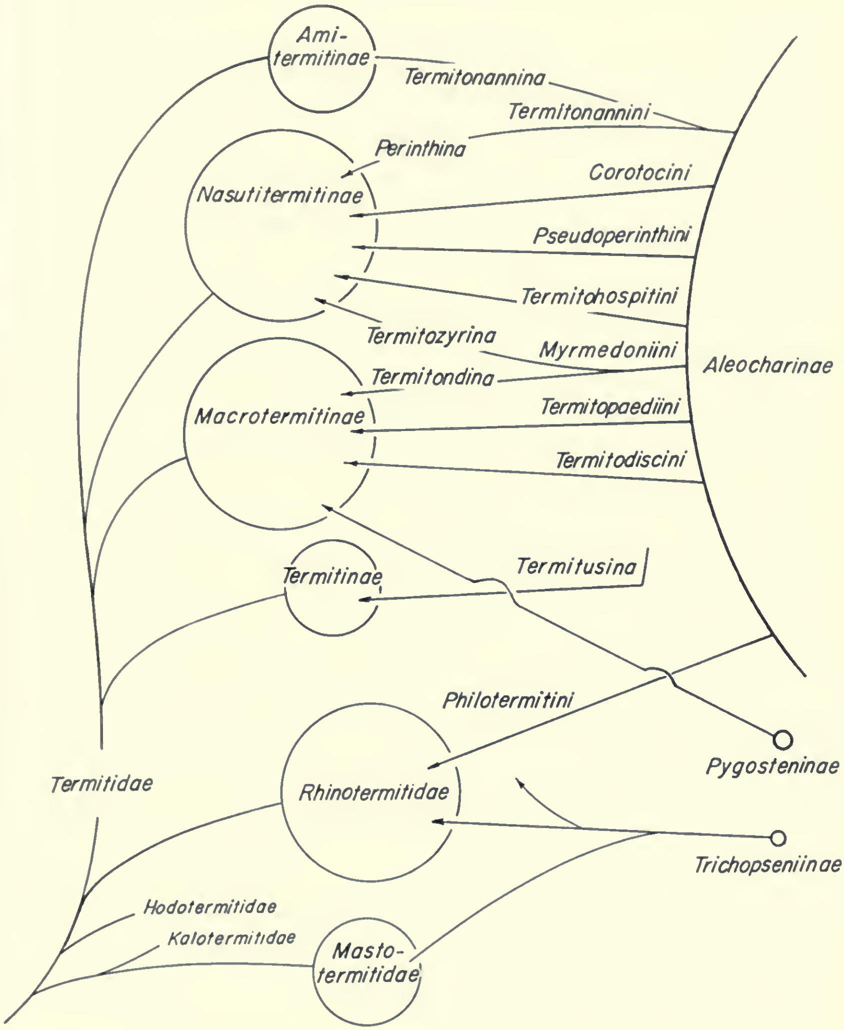

FIG. 1. Primary host relationships of major categories of termitophilous Staphylinidae.

dimorphic soldiers, the minor soldiers having a prolonged labrum for ejecting a repellent fluid. *Reticulitermes* is of special interest in that most of its species are adjusted to temperate conditions.

Termitidae: About three-fourths of the termite species belong to the Termitidae, a family widely distributed in the tropics. Their social life is the most advanced in the Isoptera, and its members are noted for morphological specializations. The many nest types and nesting behaviors make generalization difficult; some species reside in nests no more elaborate than those of the simplest Rhinotermitidae, while others construct termitaria of remarkable complexity. Reference to the diagram of termite relationships (fig. 1) will show that the Termitidae includes four important subfamilies, two of which (Nasutitermitinae and Macrotermitinae) contain a large majority of the staphylinid termitophiles. Discussions of the evolution and biogeography of these subfamilies are deferred for later sections.

The evidence suggests that successful establishments of various termitophile groups occurred after the subfamilies had differentiated. However, it is possible that early generalized members of the Termitidae may have had guest species that were passed on to several subfamilies. The Termitinae and Amitermitinae have relatively few staphylinid termitophiles and some of these may be the result of secondary adaptations on the part of nasutitermitine guests. Nests of the Amitermitinae should be thoroughly investigated in the hope of finding evidence bearing on the origin of some termitophile groups.

General Remarks on the Biogeography of Termites

The following summary is abstracted from Emerson's paper on the biogeography of termites (1952a). Many of the generalizations are relevant to the discussions of this monograph and will be discussed later in context.

All five termite families were in existence and had dispersed to the major tropical areas of the earth by late Mesozoic times. The subfamilies of Termitidae differentiated in the Mesozoic and in the Tertiary. No major changes in the present continental land masses need be postulated to account for the distribution of termites, but several hypotheses pertaining to land bridge connections are necessary. It is necessary to postulate that tropical conditions existed in Mesozoic times and that a Bering or Aleutian land bridge was available to tropical insects, thus enabling termites originating in South America to introduce elements into the Australian, Indomalayan, and Ethiopian faunas, and termites originating in the Old World to introduce elements into the Neotropical fauna. It seems very unlikely that this bridge was available to tropical termites during the Tertiary. South America and North America were connected presumably at the Isthmus of Panama before Eocene and after late Pliocene times. Opportunity for the spread of termites from the Indomalayan region to Australia existed in the Cretaceous Period but not later. Access from tropical Asia to tropical Africa probably existed under moist conditions in the Pliocene or earlier, and Madagascar was probably contiguous to the African continent in the late Cretaceous or Eocene but not later.

In discussing the dispersal of termites Emerson emphasized the importance of such factors as food, defense against predators, and ability to compete against ecological equivalents, and he notes that many genera failed to move far from their place of origin because of these biotic factors. Accidental or chance dispersals were kept at a minimum by the fact that termites were dispersed only by land or over narrow water gaps in a large majority of cases. Termites are relatively weak fliers and after the nuptial flight the males must find the females to mate, a situation that precludes long, successful flights over water.

TERMITOPHILY IN GENERAL

During the long evolutionary history of termites and ants, their societies have been invaded continually by predatory animals of great diversity. The probability that a particular species of staphylinid beetle could adapt to the exacting set of conditions imposed by social life was extremely small, yet a few were able to do so. The nature of the integrative mechanisms of insect societies was such that some alien species were able to adapt to them and to become termitophiles or myrmecophiles. The integration of termite populations is achieved through behavior mechanisms initiated by various sensory stimuli, particularly those of a chemical nature (see Emerson, 1949, pp. 419–435, for a discussion of the organization of insect societies). Colony odors are evidently quite specific in character; some may be characteristic of the species, others of the individual colony, and termites are probably accepted or rejected on the basis of their odors. The difficulties involved in adapting to the narrow limits of the society are emphasized by the fact that the present-day fauna of termitophilous Staphylinidae represents perhaps a dozen establishments of individual species, for each natural group of termitophiles (tribe, subfamily, etc.) stemmed, of course, from one established species.

Inasmuch as the term "termitophile" has been broadly and loosely applied to almost any animal found in or near termite nests, it is essential to define the term as used in this monograph. Uncritical use of the term has resulted in a superficially impressive list of termitophiles ranging from annelid worms to reptiles (see Warren's 1920 list of the kinds and number of species of animals recorded from termite nests). Inclusion of all manner of organisms in the category of termitophiles has tended to obscure generalizations that might be reached.

I propose to restrict the use of "termitophile" to those species of staphylinid beetles that are obligatory members of termite societies at some stage in their life history. This implies that termitophilous species are unable to survive without their host societies, and that, as a rule, they leave the colony only for dispersal purposes. Whether or not this definition is applicable to termitophiles in general is debatable, and no attempt will be made to justify it as a general definition. It is admittedly difficult in certain cases to determine whether a species has an obligatory relationship to termite societies or not. Experience has shown that certain groups of Staphylinidae are always found in termite nests and we may assume that newly discovered members of these groups are termitophilous. Physogastric species, even when collected for the first time, may be presumed to have an obligatory association with termites. On the other hand, one may be justifiably skeptical of species of large free-living genera, such as *Atheta*, which are found in termitaria. Various species of staphylinids are attracted to termitaria when they are broken open for investigation, and if the collector is not careful some of these species may soon be on the list of termitophiles. In doubtful cases, repeated captures are necessary to establish the status of a species.

Wasmann's Classification of Termitophiles

Wasmann, recognizing the fact that all organisms associated with social insects do not have the same relationships to the colony, proposed that termitophiles be placed in three categories: synechthrans, synoeketes, and symphiles. Synechthrans were defined as poorly adjusted, often persecuted predators living in close association with termite nests; presumably these species survive in sparsely inhabited areas of the nest or in the vicinity of nests. The synoeketes were considered by Wasmann to be tolerated guests with no obvious adaptation for exudate production; they were believed to be scavengers in the nest. Most synoeketes were said to have defense-type body forms, usually limuloid. Symphiles were defined as "true guests," inasmuch as they have some morphological adaptation (physogastry or trichomes) presumed to be for the elaboration of exudates.

Wasmann's categories have been generally accepted (Wheeler, 1928, Emerson, 1949, and others). Nevertheless, it seems that the classification should be examined critically, and the desirability of retaining it discussed. Emerson (1949, p. 719) stated that "Wasmann's classification seems to have stood the test of time," but I suspect that the categories have been used without being considered very carefully.

I have no objection to the use of the term "synechthrans" for termitophagous predators, but I believe that they should not be regarded as termitophiles. They exhibit no integration into the social systems that they prey on, and it is doubtful, at least in many cases, that this is an obligatory relationship. The staphylinid synechthrans are morphologically generalized, and there is no evidence whatsoever that this category provides material for the evolution of true termitophiles.

Inasmuch as a division of termitophiles into symphiles and synoeketes in accordance with Wasmann's definitions requires some knowledge of the behavior and physiology of each species, such a division is virtually impossible. In practice, definitions have been ignored and all physogastric species have been called symphiles and all non-physogastric species referred to as synoeketes. It has been assumed that all physogastric species (symphiles) have established with the termites a mutualistic relationship not attained by the synoeketes; this carries the implication that they are better adapted and more successful than the synoeketes. In all probability this implied difference in success exaggerates the actual gap between these two categories. If success is measured in terms of ability to survive in the social systems, there is probably little to choose between in the two categories; the non-physogastric termitophiles have, on the whole, probably survived for as long a period of evolution, and at present inhabit as many colonies and in as great numbers as the symphiles. It seems to me that all termitophilous Staphylinidae, as defined in this paper, have achieved physiological adaptation to the biotic conditions of termite societies, with all that this implies. By one device or another they have achieved a method of escaping detection in societies highly sensitive to foreign organisms and well prepared to cope with them. Both so-called synoeketes and symphiles are remarkably well adjusted physiologically to termite societies, and even though the latter exhibit adaptive features presumably not possessed by the former they cannot justifiably be differentiated as "true guests." In order to avoid unjustified connotations the terms "physogastric" and "non-physogastric" termitophiles will be used in this paper.

Before we terminate a discussion of Wasmann's categories, there is one matter that calls for comment. Wheeler (1928, p. 265) stated that "in both cases (myrmecophiles and termitophiles) there is the same origin from synechthrans and synoeketes, which, as they become more intimate with their hosts, gradually take on the peculiar characters of symphiles." This statement seems to be completely without foundation and probably gives the incorrect impression of the evolution of staphylinid guests. The non-physogastric synoeketes are specialized for termitophily in their own fashion, and many genera have apparently existed with little change since Cretaceous times. The evidence, to be discussed in more detail later in the paper, suggests that the specialized physogastric termitophiles evolved rather rapidly from generalized aleocharine stocks and became physogastric early in their evolution, probably during Cretaceous times or earlier. There are a few cases in which physogastric genera have evolved within a group of non-physogastric species some time after the group had become established, e.g., *Termitonilla* of the Termitonannini, but in the large majority of cases a major category of termitophiles is comprised of physogastric or non-physogastric species but not a combination of the two types. The present-day termitophilous groups probably originated early in the evolutionary history of their host groups, attained their adaptive features in a relatively short time, and have since changed only in relatively minor ways.

Major Adaptations Associated with Termitophily

The advantages that termitophilous insects may have in living in well-established termitaria seem to be these: galleries and chambers provide secluded places even for some poorly adapted insects; physical conditions of temperature and humidity are controlled and uniform; available food is plentiful and varied; the colony offers protection against predators.

The physical factors of termite nests could scarcely have offered difficult problems of adjustment to potential termitophiles but the biotic factors with which they had to cope were indeed formidable. Only by adjustment to factors that serve to integrate the colony could resistance be overcome. The most conspicuous adaptive features of termitophiles are those that relate to trophallaxis. The physiological mechanisms of social integration are not well known, but it is presumed that morphological specializations such as physogastry and exudatory appendages are concerned with them in some way.

Physogastry and exudatory appendages.—The physogastric abdomens of termites and termitophiles (figs. 14, 24, *c*) are swollen to some degree and the sclerites are separated by areas of non-sclerotized, membranous integument. Physogastry reaches its maximum development in certain termite queens, the abdomen of some *Macrotermes* queens attaining lengths of more than five inches and volumes some 125 times greater than that of stenogastric individuals.

Wasmann and Holmgren were early proponents of the idea that one function of the physogastric abdomen is to secrete exudates that serve an important role in colony integration. Holmgren (1909), in seeking a physiological mechanism of exudation, decided that the abdominal adipose tissue of termites is a source of a fatty secretion carried by the blood to the integument, through which it exudes. Wheeler proposed the theory of trophallaxis to account for social integration and attributed considerable significance to abdominal exudates. Escherich and others had noted that the physogastric abdomen of queens was continually licked, and even nibbled at, by workers tending the queen and progeny.

Although there seems to be agreement that physogastric abdomens of termites secrete substances avidly sought by workers, there is as yet no satisfactory explanation for the physiological mechanism involved. Hypertrophy of the queen's abdomen is primarily due to increase in size of the ovaries and is basically an adaptation for increased egg production. Blood tissue increases and long columns of royal adipose tissue are well developed. Grassé and Lesperon (1938) and Grassé (1949) pointed out that these fat bodies have no secretory function and do not participate in exudation. Grassé also stated that there are no glandular hairs or integumental glands on the distended termite abdomen, yet in some cases droplets of clear fluid appear on its surface.

Wheeler (1928) observed termites transporting staphylinids of the genus *Spirachtha* and licking their remarkable abdominal appendages and other membranous parts of the body. Wheeler explained the physogastry of termitophiles as the result of adaptation to the peculiar trophallactic habits of termites and to similar physical and trophic conditions. He believed that confinement to narrow, crowded galleries, limited oxygen supply, absence of light, and an abundance of carbohydrate food are conducive to adiposity and that physogastry may result from these conditions if the organisms are predisposed to it.

No adequate explanation of the physiological mechanism of exudate secretion in termitophiles is available. McIndoo (1923) made a histological examination of the *Spirachtha* abdomen and appendages but came to no important conclusions; he suggested only that materials could pass from the blood into hypodermal cells and through the cuticle. Trägårdh (1907) reported that the physogastry of *Termitomimus* was due primarily to hypertrophy of fat bodies and to a lesser extent to the gonads, and that the cuticle is penetrated by many extremely fine pores.

Grassé and Lesperon (1938) studied the secretory mechanism in exudatory appendages of a termitophilous beetle larva, *Troctontus silvestrii* Grassé and Lesperon. They reported that termites licked the appendages and bodies of the larvae and that in return the larvae received stomodeal aliment. The secretion was elaborated by special open hairs (adenotrichs) having a saccule at their base, which opens into the hair cavity. This is evidently a special case and is perhaps not typical of mechanisms in other termitophilous larvae (Lepidoptera, Diptera, Coleoptera).

Studies on physogastry and its physiological role in termitophily are greatly needed if this important feature is to be fully appreciated.

Limuloid body form.—Inasmuch as numerous termitophilous and myrmecophilous groups are characterized by the limuloid body-form of their members, Wasmann presumed that it has much adaptive significance. He believed that limuloid species are not particularly well adjusted to social conditions and rely on their form for protection. There is little evidence bearing on this hypothesis but it will be discussed at appropriate places later in the paper.

II. Termitophilous Staphylinidae: Phylogenetic and Biogeographical Considerations

It is now evident from host-termitophile data that the evolution of each termitophile category (subfamily, tribe, subtribe) occurred almost entirely in conjunction with the phylogenetic history of a natural group of termites. Speciation and generic differentiation of termites within the termite groups doubtless provided opportunities for the isolation of various termitophile populations and for subsequent speciation phenomena. A high degree of host specificity was necessary for evolution of termitophiles to be restricted to phyletic lines of termites. Many species of present-day termitophiles are monoxenous, and the others generally occur with one or more allied species of the same host genus. Most of the records of termitophilous species occurring with several genera of termites are unsubstantiated; many of these records are probably due to careless and uncritical collecting techniques.

Even though host specificity is strong in most termitophile relationships, it is to be expected that some cases of termite speciation would have resulted in the occurrence of a staphylinid species with two host species for some period of time. Of course we may have difficulty in determining the true state of affairs, as our judgments are based on morphological criteria. Individuals occurring with two termite host species may be judged to belong to the same species, yet may have undergone physiological speciation. Such cases could hardly be detected without experimental analysis. It is probable that some species of termitophile have been able to adjust to the social conditions of a second termite host rather rapidly, even in rare cases to the societies of distantly related termites. We may conclude that staphylinid guests, in general, have been very conservative in their host relationships and that transfer of host affinities has been very difficult. The host-guest patterns that are now discernible could hardly have been attained under other circumstances.

TERMITOPHILOUS STAPHYLINIDAE ASSOCIATED WITH THE NASUTITERMITINAE

Phylogeny and Evolution of the Nasutitermitinae

The discussion below reflects the phylogenetic concepts of Emerson (1945, 1949, 1952a, 1952b) and Ahmad (1950).

The Nasutitermitinae, the largest subfamily of termites, are very widely distributed in tropical regions. Their most noteworthy evolutionary advance was the differentiation of nasute soldiers, an achievement presumably contributing greatly to their success. The primitive nasutitermitine genera, restricted to South America, have conventional soldiers with biting mandibles, whereas the much more numerous derived genera have soldiers with prolonged snouts and functionless mandibles. Forceful ejection of a sticky repellent from their snouts constitutes their mode of defense.

Emerson's studies have led him to conclude that nasute soldiers evolved independently in two phylogenetic sequences of Nasutitermitinae (fig. 3), each line containing, among others, a large tropicopolitan genus, *Nasutitermes* and *Subulitermes*, respectively.

Inasmuch as all the present-day primitive mandibulate genera (*Syntermes, Procornitermes, Cornitermes,* etc.) are restricted to the Neotropical Region, it is reasonable to believe that the Nasutitermitinae differentiated in this area.

The Nasutitermes branch.—This phylogenetic sequence, comprised of some nineteen genera, is widely distributed in the tropics of both hemispheres. Its largest genus, *Nasutitermes,* contains about 195 named species; they occur in the Neotropical Region, the Oriental Region, the Ethiopian Region, Madagascar, Australia and the Papuan Region, Micronesia, and Polynesia as far as the Fiji Islands. Emerson postulates that this line of nasute genera stemmed from *Syntermes*-like stock during Cretaceous times in South America and subsequently spread to the Oriental Region by way of an Alaskan land bridge. This dispersal was early enough to allow the group to reach Australia and the Pacific Islands.

After the Alaskan portal became ecologically unsuitable for these genera—tropical conditions were essential—several endemic genera arose in each hemisphere during the Tertiary. Such endemic genera as *Velocitermes, Tenuirostritermes, Diversitermes,* and *Constrictotermes* appeared in the American tropics. The Palaeotropical Region evolved a series of genera including *Grallatotermes, Lacessititermes,* and *Trinervitermes.* The last-named genus is a large and important one occurring in grasslands of Africa and Indomalaya. Emerson believes that it originated in Africa during Miocene times, soon after the tropical savannas were established.

The Subulitermes branch.—This sequence of genera was probably derived from *Syntermes–Procornitermes* stock in South America. Several neotropical genera—*Paracornitermes, Labiotermes, Armitermes,* and *Curvitermes*—have well-developed mandibles as well as long frontal protuberances. The most advanced genera of this evolutionary line have nasute soldiers with reduced, functionless mandibles. *Subulitermes* is found rather widely in both Neotropical and Palaeotropical Regions and other genera are endemic to Africa (*Mimeutermes, Eutermellus*) or other areas.

Inasmuch as the genera of this branch of Nasutitermitinae have relatively few termitophiles, they do not enter into subsequent discussions as frequently as do those of the *Nasutitermes* branch.

The Termitophilous Tribe Corotocini

As constituted in this monograph the Corotocini is the largest and most highly specialized tribe of termitophilous Aleocharinae. Originally proposed by Fenyes (1918) to include a series of termitophilous and dorylophilous genera having 4, 4, 4-segmented tarsi, the tribe was reduced to the status of a subtribe of Hygronomini by Bernhauer and Scheerpeltz (1926). I cannot concur with the previous treatments of the group for these reasons: all aleocharines with 4, 4, 4-segmented tarsi should not be grouped in one tribe; African dorylophiles do not belong in the same group with termitophilous genera; the Corotocini should be expanded to include genera formerly in other tribes. More than 120 species, or almost one-half of the known termitophilous Aleocharinae, belong here.

Even though our knowledge of this tribe is far from complete, the body of information now available provides a satisfactory basis for speculation concerning its evolutionary history. General intratribal relations are illustrated by figure 2, and hypothetical phyletic lines within subtribes are shown in a series of diagrams (figs. 4, 5, 7). The evidence, discussed in more detail later, suggests that the Corotocini originated in the Neotropical Region from generalized aleocharine stock. It is hardly to be expected that any present-day genus would fulfill all the criteria as an ancestor for the Corotocini. The large free-living genus *Oxypoda* is doubtless a generalized aleocharine and *Oxypoda*-like stock could well have been ancestral to this tribe. While it has been conventional to place *Oxypoda* near the end of aleocharine lists, this only reflects the artificiality of the classification. In subsequent discussions *Oxypoda* is used to represent the generalized Aleocharinae for comparative purposes but this does not imply that it was the ancestral genus.

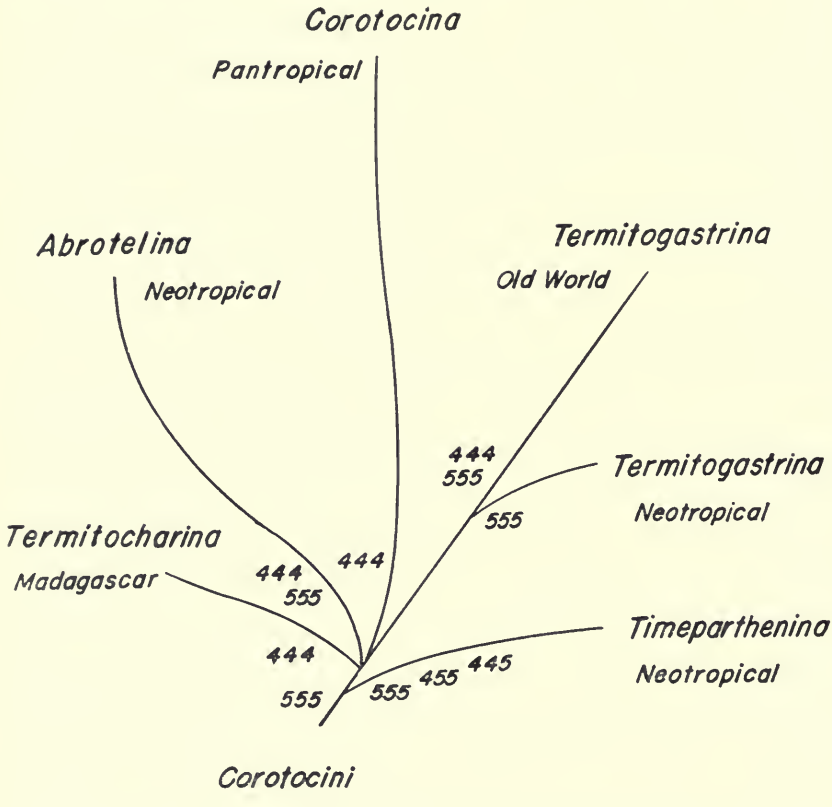

FIG. 2. Subtribes of Corotocini. Tarsal formulae are indicated.

A. *Tribal characteristics.*—In support of the viewpoint that the Corotocini are a monophyletic group is the fact that its genera are characterized by four traits of an unusual nature. Each of these characters appears rarely in other Aleocharinae but no group possesses all of them. The tribe Termitopaediini, associated with Macrotermitinae, is comprised of physogastric genera that have acquired several of the same adaptive traits, e.g., the free mesocoxae and triangular hind coxae. Before proceeding to a discussion of the phylogenetic relationships of the Corotocini an analysis of the most important tribal characteristics is desirable.

1. Physogastry: This adaptation evolved independently among termitophilous insects on a number of occasions (see general discussion of physogastry, p. 21). All corotocines have this feature to some degree, although there is a surprising diversity of expression within the tribe. Physogastry is an important character in differentiating the Corotocini from all non-termitophilous Aleocharinae, but not from all termitophilous groups. Several subtribes of Corotocini have distinctive patterns of physogastry.

2. Mentum fused to submentum: Although the Aleocharinae in general have the mentum free and movable, the corotocines have the mentum fused to the submentum to form a shield-like sclerite (fig. 18, *q*). It is reasonable to believe that the stationary condition of the mentum has some significance in feeding behavior; if these beetles receive liquid aliment from the hosts, this condition may facilitate the process. A few genera of termitophilous Aleocharinae have independently acquired a similar condition (*Lauella* of the Termitonannini, *Termitobaena* of the Termitopaediini), but this is exceptional among non-corotocine termitophiles. Furthermore, all myrmecophilous Aleocharinae have the conventional labial condition.

3. Mesocoxal acetabula unmargined; mesocoxae free. Hind coxae triangular; metepimera abbreviated: The evolution of physogastry evidently necessitated adaptive changes in the legs and thorax to provide better balance for the hypertrophied abdomen. A series of adaptations seem designed to lengthen the legs and to spread them so as to balance the voluminous abdomen (fig. 21, *a*, *b*). Femora, tibiae, and tarsi of many corotocines are rather long, but this alone does not seem to serve the purpose.

The mesocoxae are free; they are not set in deep, well-defined acetabula in typical aleocharine fashion. The unusual length of the coxae, their freedom, and their widely separated points of articulation seem to suggest that the middle legs are capable of being widely spread. The hind legs are somewhat lengthened and more widely spread by several modifications. The typical aleocharine condition places the proximal ends of the hind femora rather close together, but the corotocine femora articulate with elongated, triangular coxae. The subtribe Corotocina carries this adaptation farther, and the legs are even more widely separated due to prolongations of the metasternal articulating processes (fig. 21, *b*). It is significant that the Corotocina have the most voluminous abdomens in the tribe.

Abbreviation of the metepimera is apparently correlated with change in form of the hind coxae, but the significance of this is not apparent.

4. Terminal antennal segments with two or more coeloconic sensilla: The species of this tribe, as well as those of the termitophilous tribe Termitonannini, bear distinctive coeloconic sensilla on the terminal antennomeres. These specialized receptors, usually visible only in cleared specimens, consist of an oval pit into which sensory pegs extend. Inasmuch as sensilla of this exact type and position are not commonly found in the Aleocharinae, they are a useful supplementary character in diagnosing Corotocini and Termitonannini. Similar sensilla occur in other Staphylinidae; *Sympolemon* Wasmann, an African genus of dorylophilous Pygosteninae, has them. Coeloconic sensilla have been noted on antennae of insects of various groups; the antennae of the house fly have pits with 10–20 sensory pegs (Snodgrass, 1935, p. 521).

There can be no doubt that these sensilla are chemoreceptors, but there are of course no clues to the nature of the chemicals to which they are sensitive. They are among the three types of sensilla (placoid, basiconic, and coeloconic; Snodgrass, 1935, pp. 514–523) usually associated with olfaction.

B. *Phylogenetic and biogeographical considerations.*—Phylogenetic, biogeographical, and host data may reasonably be interpreted to show that the history of the tribe Corotocini began with the establishment of an aleocharine species in societies of a generalized species of Nasutitermitinae and that this event occurred in South America during the Cretaceous Period or earlier. The following discussion in support of this statement is accompanied by a series of diagrams and maps. The diagrams are designed to illustrate phyletic relationships within the Corotocini (figs. 2, 4, 5, 7) and to show how closely associated the phyletic history of the tribe was with that of the Nasutitermitinae (fig. 3). The maps (figs. 6, 8) present hypothetical dispersal patterns to account for the present distribution of corotocine termitophiles.

1. The origin of the Corotocini: Inasmuch as all corotocine genera have the specialized characteristics of the tribe, links with generalized Aleocharinae such as *Oxypoda* are very difficult to detect, if, indeed, they exist. *Termitophya* (subtribe Termitogastrina) and *Termituncula* (subtribe Timeparthenina) have features

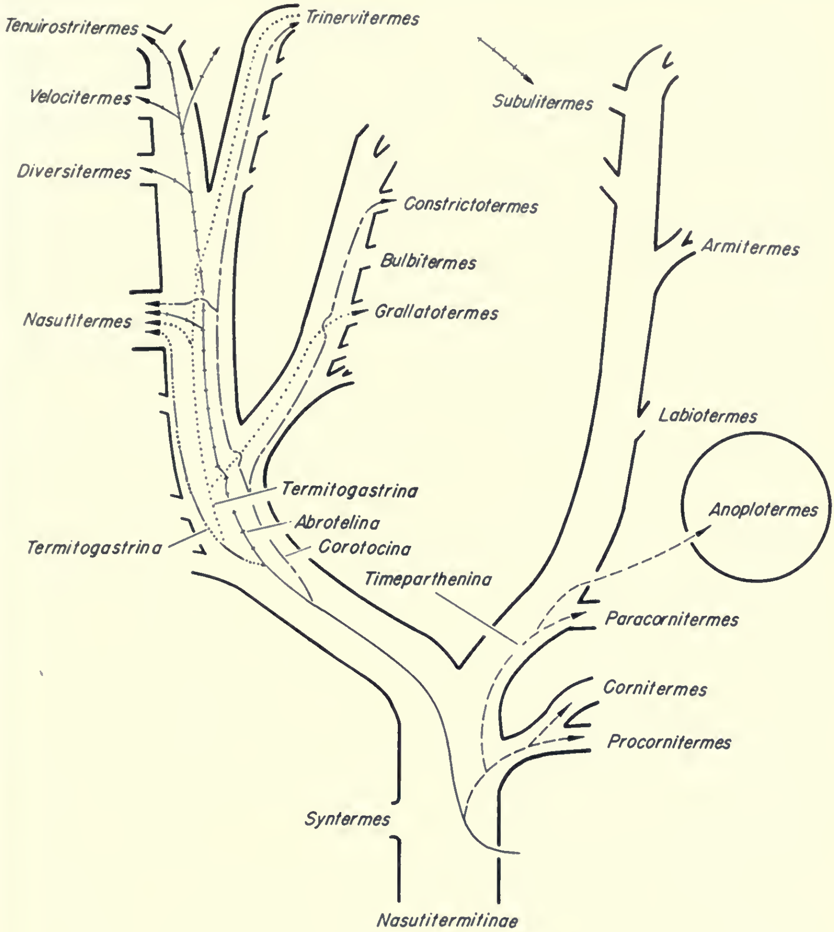

FIG. 3. Host relationships of tribe Corotocini.

indicating that they are the most generalized members of the tribe. At least each is near the base of a phyletic sequence within the Corotocini. On morphological evidence alone it would be exceedingly difficult to determine which of the present-day groups first differentiated from basic corotocine stock. However, the host relationships of these subtribes seem to provide the answer. All genera of Termitogastrina occur with derived genera (*Nasutitermes*, *Trinervitermes*, etc.), whereas most species of Timeparthenina are associated with primitive mandibulate Nasutitermitinae (*Cornitermes*, *Procornitermes*, *Paracornitermes*). We know, then, that the Corotocini had become established early in the history of the Nasutitermitinae. The present-day Timeparthenina (figs. 4, 14) evidently represent a fragment of early corotocine stock that became isolated with the *Cornitermes* complex of genera and had no opportunity to become associated with the *Nasutitermes* branch of Nasutitermitinae. Both the Timeparthenina and the primitive mandibulate genera of Nasutitermitinae are restricted to South America, a fact that suggests a neotropical origin for the Corotocini.

The subtribe Timeparthenina is distinctive in its pattern of physogastry; the basal abdominal segments undergo the greatest increase in size, and the abdomen cannot be recurved above the thorax. *Termituncula, Autuoria,* and *Timeparthenus* illustrate a tendency for the second, third, and fourth abdominal segments to become progressively larger—so large in extreme cases that the basal part of the abdomen overlies the thorax. As evidenced by its relatively small physogastric abdomen, 5, 5, 5-segmented tarsi, and 11-segmented antennae, *Termituncula* is the most generalized member of the subtribe. Among the derived genera of Timeparthenina certain trends are noteworthy: increased hypertrophy of the abdomen, decrease in tarsal segmentation from 5, 5, 5 to 4, 5, 5 and then to 4, 4, 5, and reduction in number of antennal segments to ten.

Although it appears that the primary association of the Timeparthenina was with the generalized mandibulate genera of Nasutitermitinae, the fact that the two most highly specialized genera, *Timeparthenus* and *Ptocholellus,* occur with *Anoplotermes* (Amitermitinae) merits attention. The occurrence of a natural group of termitophiles with two subfamilies of termites seems to require one of these alternative explanations: (1) a species of an established termitophilous group may have been able to adapt rather rapidly to a termite species of a different subfamily; (2) the termitophilous group may have been established with termite stock ancestral to both termite subfamilies. Available evidence in the case of the Timeparthenina seems to suggest the first alternative. The primary evolution of the group probably took place in association with several primitive genera of Nasutitermitinae, followed by a secondary establishment of one of its species in societies of a species of *Anoplotermes.* This secondary establishment led to subsequent differentiation of several specialized genera, *Timeparthenus* and *Ptocholellus.* One can only surmise the difficulty of the major host change required by this hypothesis. At the present time earthen mounds frequently harbor species of *Anoplotermes* in close proximity to various species of Nasutitermitinae. Presumably, it would be no more difficult for a termitophilous species to adapt to a new host genus than for a free-living species to adapt to termite societies. It is perhaps of interest to note that the societies of *Anoplotermes* lack a soldier

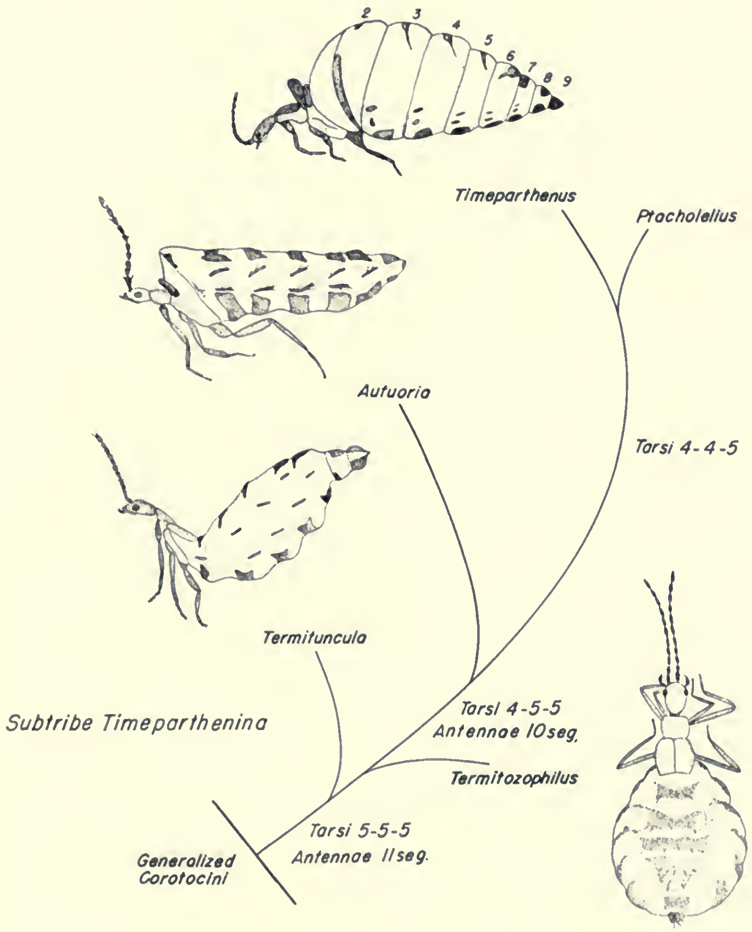

FIG. 4. Subtribe Timeparthenina.

caste, but it would probably be a mistake to infer that their societies are susceptible to the establishment of alien organisms because of this.

As an alternative hypothesis, it is conceivable that the differentiation of Corotocini occurred earlier in the history of Termitidae than postulated—early enough, in fact, to permit descendants of early corotocines to evolve with Amitermitinae as well as Nasutitermitinae. There are several objections to this theory: In the first place, only *Anoplotermes* among Amitermitinae is known to harbor Corotocini; secondly, only the most specialized members of the subtribe Timeparthenina are known to occur with *Anoplotermes*.

2. The differentiation and dispersion of subtribes: After the differentiation of the Timeparthenina, generalized corotocine stock evidently became associated with the newly evolved *Nasutitermes* branch of Nasutitermitinae and gave rise to the other subtribes. The Termitogastrina evidently originated in the New World tropics and spread to the Indomalayan and Ethiopian Regions with the Nasutitermitinae. The Corotocina, occurring as they do in almost all tropical areas of the world, probably had the same general dispersal pattern as the Termitogastrina. The Abrotelina are probably restricted to the Neotropical Region, although *Termitochara* of Madagascar may have been derived from this group.

The very poor representation of Corotocini in termite colonies of the *Subulitermes* branch raises interesting questions. The few species of Abrotelina known to occur with *Subulitermes* may be the result of a secondary establishment rather than the product of an evolutionary sequence within the *Subulitermes* branch.

(a) Subtribe Termitogastrina: The main features of the origin and differentiation of this subtribe in the Neotropical Region seem relatively simple, but they become more complex in the Old World tropics. In the American tropics all genera and species occur with *Nasutitermes*, so there can be little doubt that this genus or its immediate precursor was the original subtribal host. *Termitophya*, the least specialized member of the Termitogastrina, retains many generalized features: The head and thorax, although having the special tribal features, are relatively generalized; the abdomen is at most feebly physogastric; and the fourth and fifth tarsal segments are free and movable.

Other genera of South American Termitogastrina are more strongly physogastric than *Termitophya* but in no case does the abdomen have extensive areas of non-sclerotized integument as in certain Old World genera. Apart from being considerably larger than in free-living species, the abdominal sclerites are not unusually modified in the South American genera of the subtribe, nor do extreme post-imaginal changes occur as in the Corotocina.

The Old World genera of Termitogastrina do not comprise as homogeneous a group as do their American allies. There is little

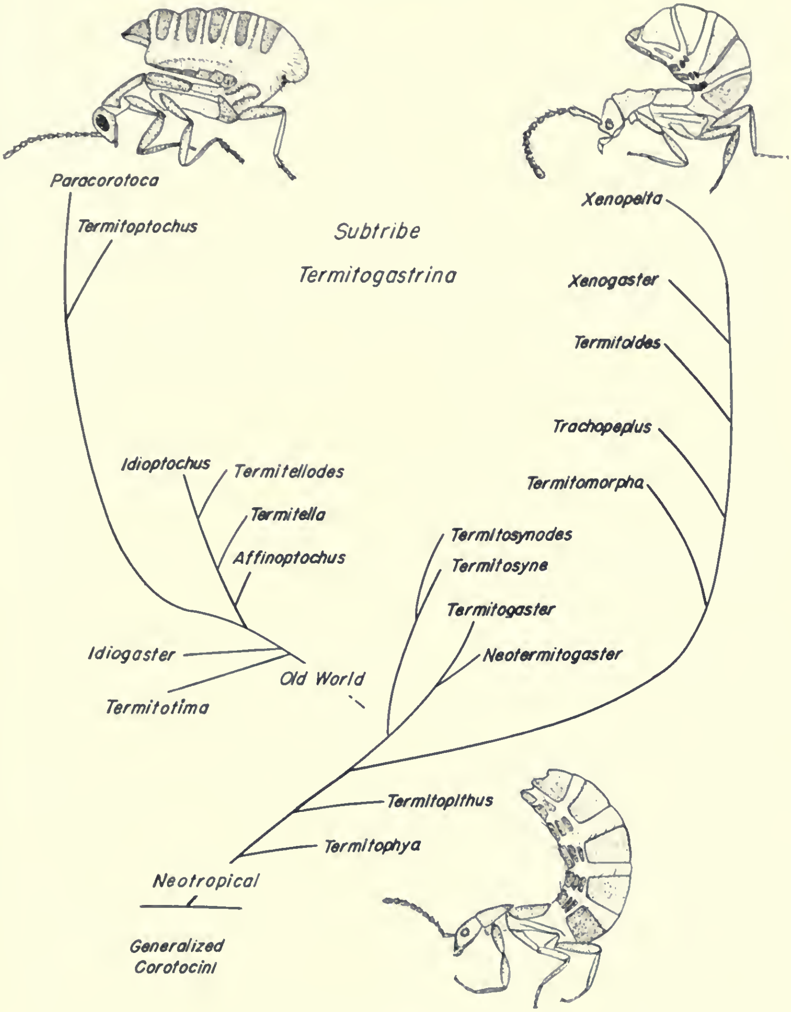

FIG. 5. Subtribe Termitogastrina.

doubt that they were derived from subtribal stock that entered the Palaeotropical regions with *Nasutitermes*-like hosts. Several of these genera—*Termitotima* (India) and *Idiogaster* (Ethiopia)—are rather like certain American genera, but others have undergone appreciable specialization. One generic group including *Affinoptochus* (Java), *Termitella* (Belgian Congo), and *Idioptochus* (Tanganyika) has much in common with the above-mentioned genera

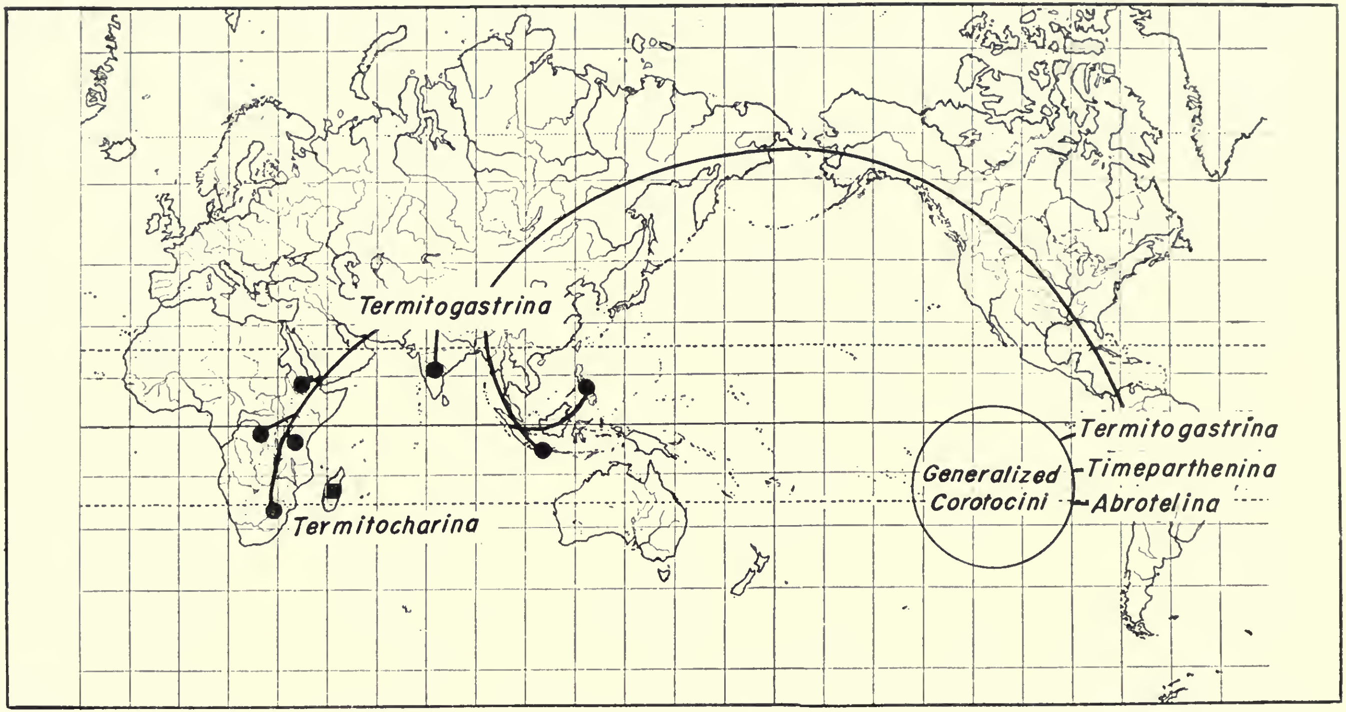

FIG. 6. Distribution of Corotocini (except Corotocina).

except that the sixth and seventh tergites (fig. 19, *d*, *e*) are distinctively modified. Another group—*Termitoptochus* (Indomalaya), *Millotoca* (Africa, Madagascar), and *Paracorotoca* (South Africa)—includes the most highly specialized species of the subtribe. They are noteworthy for having large ovate abdomens with large areas of non-sclerotized integument (fig. 19, *e*) as well as the distinctive sixth and seventh tergites referred to above. The tarsal situation in the Old World genera merely reflects the trend, initiated in South America, toward fusing of the fourth and fifth tarsal segments; in many derived genera the segmentation is 4, 4, 4. The strongly physogastric genera, e.g., *Termitoptochus*, frequently have reduced prementums and labial palpi, the latter consisting of one or two very tiny segments.

Our knowledge of the host relationships of palaeotropical Termitogastrina is fragmentary yet in some aspects instructive. The record is consistent in that all species occur with genera of the *Nasutitermes* branch of Nasutitermitinae. Approximately one-half of the species occur with *Nasutitermes* and the others with endemic Old World genera—*Trinervitermes, Bulbitermes, Grallatotermes.*

On the basis of available evidence, it may be postulated that ancestral stock from which the palaeotropical representatives of the subtribe were derived entered Asia at the time of the dispersal of certain Nasutitermitinae from the American tropics. Inasmuch as the American tropics are believed to have been continuous with those of the Old World by way of an Alaskan bridge during the Cretaceous Period, this may well have been the dispersal route. The hosts were probably very similar to the present-day *Nasutitermes.* Thereafter, the Termitogastrina were evidently successful in keeping pace with the geographic expansion of the Nasutitermitinae as well as in following their phyletic ramifications, if we may judge by present-day associations with several endemic Old World genera.

(b) Subtribe Corotocina (figs. 7, 8, 21–26): The most highly specialized of all staphylinid termitophiles belong to the Corotocina. They are especially noteworthy for the remarkable post-imaginal development that results in such bizarre abdominal and thoracic modifications. Generalizations with respect to physogastry in this group are not easily made due to the diversity of abdominal types, but a correlated character involving the hind coxal articulation is important for diagnostic purposes. As pointed out in the section on tribal characteristics (p. 27), one means of improving balance in those species with hypertrophied abdomens was to spread the hind

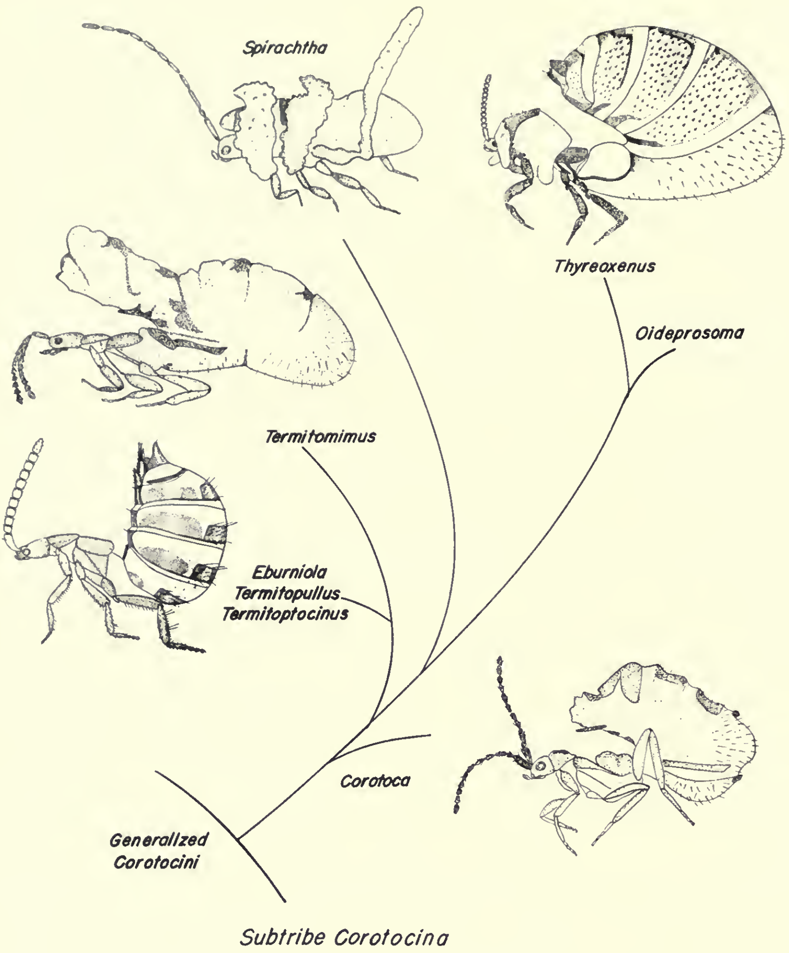

FIG. 7. Subtribe Corotocina.

legs by various devices. Apparently the distinctive hind coxal articulation (fig. 21, *b*) in the Corotocina is such an adaptation.

The complexity of post-imaginal development in such genera as *Thyreoxenus*, *Spirachtha*, and *Termitomimus* is indeed astonishing. This process has yet to be analyzed in detail, and some of its aspects are extremely puzzling. The problem of the attainment of physogastry has received almost no consideration and those who have believed physogastry to be a post-imaginal development have doubtless thought only in terms of hypertrophy of the abdomen.

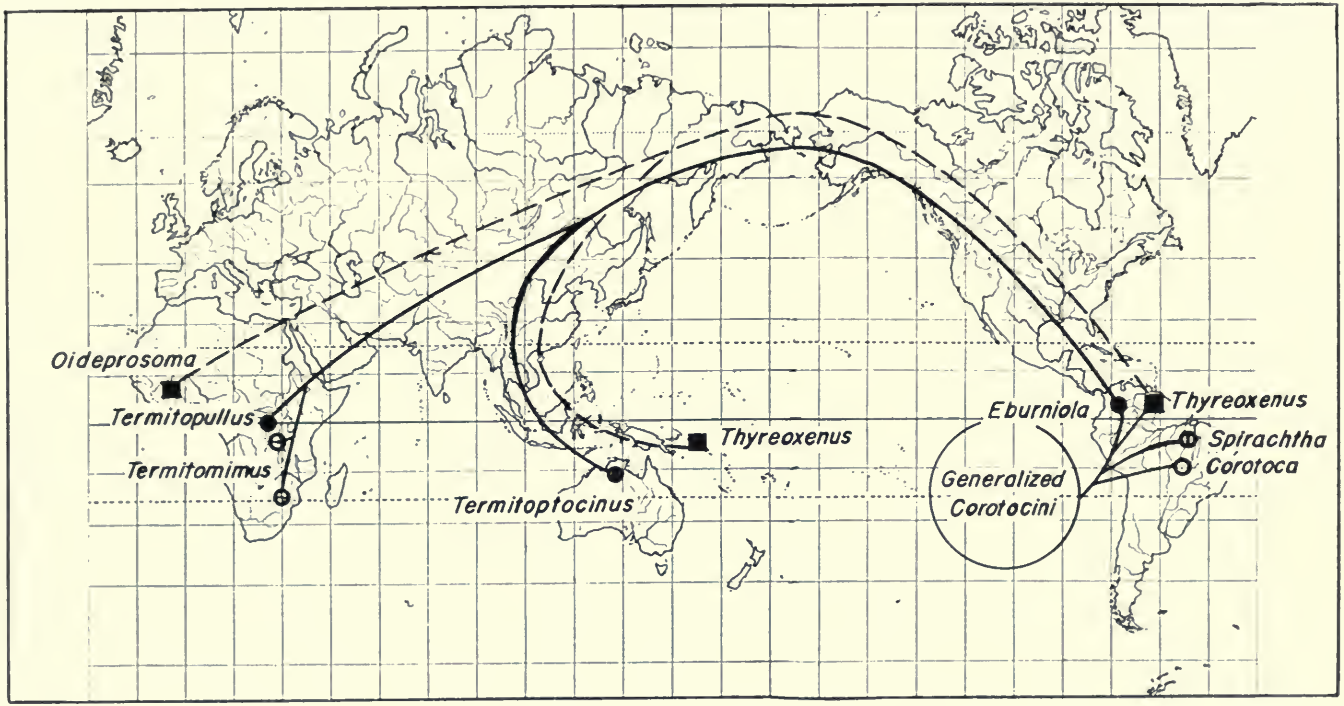

FIG. 8. Distribution of genera of subtribe Corotocina.

Two series of specimens that I have examined show clearly that the problem is far more complex. Reference to photographs of four individuals of *Thyreoxenus major* Mann (fig. 26) and three of *Termitomimus emersoni* Seevers (fig. 24) will show that other characteristics, even proportions of the legs, are modified. Stenogastric individuals are frail, slender, winged forms with abdomens of typical aleocharine appearance. Their hind coxae and metasterna do not have the distinctive characteristics of the physogastric imagos. The stenogastric individuals would not, in fact, be identifiable as members of the subtribe Corotocina although perhaps as Corotocini. In the case of *Thyreoxenus major* several intermediate stages are available, suggesting that the changes from stenogastric to physogastric condition are gradual. If intermediate stages exhibiting various degrees of change were not available, genetic dimorphism rather than post-imaginal development would seem to be a more attractive theory to account for these phenomena. The chief difficulty with the post-imaginal development theory is to account for the many body changes in the absence of a moult.

Larvae of the Corotocina present several features of exceptional interest. As early as 1854, Schiødte reported the presence of well-developed larvae in abdomens of female *Corotoca,* and Reichensperger (1936) published a photograph of a female with a larva protruding from her abdomen. A number of *Corotoca* females that I have examined contained larvae of various sizes. Larvae of this genus are released in an advanced stage and probably pupate almost immediately. By contrast, larvae of several species of *Thyreoxenus* have been collected from termite colonies and have never been noted in female abdomens. *Thyreoxenus* larvae, by way of further contrast with those of *Corotoca,* are characterized by the presence of long lateral abdominal appendages.

Evidence relating to larval development in the Corotocina, inconclusive as it is, suggests the following hypothesis. If abdominal appendages of larval *Thyreoxenus* and other genera are exudatory structures of adaptive significance, it may be that species of these genera are capable of living freely among the termites because of them. On the other hand, viviparity in *Corotoca,* and perhaps in *Spirachtha,* may be an adaptation to offset the lack of exudatory appendages.

Corotocina are known to occur in South America, Australia, the Solomon Islands, and Africa, and it is predictable that a moderate number will be discovered in the Indomalayan Region. A majority of the species occur with *Nasutitermes,* but others are associated with

Trinervitermes and *Constrictotermes.* It is difficult at present to relate the Corotocina to other subtribes very precisely. Stenogastric individuals may logically be expected to provide more clues to relationship than physogastric individuals, but so far I can only conclude that the Corotocina are more similar to some Timeparthenina and Abrotelina than to the Termitogastrina. The Corotocina evidently differentiated from generalized tribal stock early in the history of the *Nasutitermes* branch. Judging by abdominal structure, three very closely allied genera—*Eburniola* (South America), *Termitopullus* (Belgian Congo), and *Termitoptocinus* (Australia)—are closest to the base of this phyletic sequence. Inasmuch as these genera occur with *Nasutitermes* it is probable that their precursor originated with that host genus in South America and accompanied it to various tropical areas of the Old World. A pre-Tertiary origin of the *Eburniola*-complex is suggested by the presence of *Termitoptocinus* in Australia as it is very doubtful if an opportunity existed in post-Cretaceous times for *Nasutitermes* and its guests to reach that continent.

The African genus *Termitomimus* (fig. 24) surely originated in the Ethiopian Region from *Termitopullus*-like stock. The head and thorax of *Termitomimus* are very similar to those of the *Eburniola* group but the abdomen is remarkably distinctive. Two Belgian Congo species of *Termitomimus* occur with *Nasutitermes* and a South African species with *Trinervitermes.* The latter genus is restricted to the Old World tropics and differentiated according to Emerson (1952a) in Miocene times when the African savannas were developed.

The evolutionary histories of the South American *Constrictotermes* guests *Corotoca* and *Spirachtha* are somewhat difficult to reconstruct. Apart from its astonishing abdomen with unique exudatory appendages (fig. 22), *Spirachtha* bears considerable resemblance to *Eburniola* and may have evolved from *Eburniola*-like stock. *Corotoca,* on the other hand, has departed to a greater degree from the cephalic and thoracic pattern that characterizes the majority of the subtribe. It can hardly be stated with confidence that *Corotoca* and *Spirachtha* descended from one species of the subtribe that became ecologically isolated with *Constrictotermes;* perhaps they originated from different segments of the Corotocina. The present-day distribution and host relationship of these genera provide few clues to their history. *Constrictotermes* is a small genus of three described species occurring in Brazil, the Guianas, and eastern Bolivia, Peru, and Ecuador. The small size of the genus has served to limit the number of guest species, but it is surprising that as many as three species of *Corotoca* are known to occur in a single colony of *Constrictotermes cyphergaster*. This suggests that geographic isolation of populations of *C. cyphergaster* has provided an opportunity for speciation of *Corotoca* and that subsequent reunion of the termite populations allowed the ranges of the *Corotoca* species to overlap. Unfortunately, the geographic ranges of the different species of *Corotoca* are not well enough known to provide evidence for this theory.

Clues to the origin of *Corotoca* and *Spirachtha* may ultimately be provided through study of guests of the closest relatives of *Constrictotermes*. Emerson (1949) and Ahmad (1950) conclude that *Constrictotermes* is the American representative of a group of Oriental Nasutitermitinae including *Grallatotermes, Bulbitermes, Hospitalitermes,* and *Lacessititermes*. The nests of these genera have not yet been examined for guests, except possibly in the most cursory fashion.

A most interesting line of divergence within the Corotocina is represented by *Thyreoxenus* and *Oideprosoma*—genera noteworthy for their physothoracic as well as physogastric condition (figs. 25, 26). Post-imaginal development of the imagos of these genera results in a large membranous prothorax upon which the pronotum rests, saddle-like. Ten neotropical and one Solomon Islands species of *Thyreoxenus* are now known. *Oideprosoma* is as yet represented by a single French Guinea species. The American species of *Thyreoxenus* reveal little concerning the origin and history of this generic complex; the species are too uniform in structure and all occur with the host genus *Nasutitermes*. On the other hand, the Old World species, by virtue of their interesting localities and host associations, do provide a few clues to this evolutionary history. The Solomon Islands and French Guinea records can only indicate that the *Thyreoxenus–Oideprosoma* generic group has at one time or another occurred in many areas of the palaeotropical region. Indeed, it may be predicted with considerable assurance that species of this group will be found in a number of Indo-Australian and African localities, although perhaps somewhat less frequently on the latter continent.

The fragmentary evidence now available points to a close association of the phyletic histories of the *Thyreoxenus* generic group and the *Nasutitermes* branch of Nasutitermitinae. All species of *Thyreoxenus* have been collected with *Nasutitermes*, and *Oideprosoma* was found with *Trinervitermes*. As a working hypothesis, it may be reasoned that *Thyreoxenus* differentiated in societies of *Nasutitermes* in the American tropics prior to the dispersal of these termites to the Oriental Region in pre-Tertiary times. The very close relationship of *T. major* of Panama and *T. solomonensis* of Melanesia attests to the high degree of specialization attained at this early date and the minor changes that have occurred since.

(c) Subtribe Abrotelina (fig. 20): At present this group contains about twenty-five neotropical species, associated, except in a few cases, with genera of the *Nasutitermes* branch: *Abroteles* with *Nasutitermes;* the *Termitoiceus* complex with *Diversitermes* and *Velocitermes; Eburniogaster* and *Termitonidia* with *Tenuirostritermes.*

The Abrotelina are not characterized by a single outstanding trait, but their frail build and pattern of physogastry indicate that they comprise a distinct phyletic line within the Corotocini. The time of origin of the subtribe is somewhat doubtful, as there is still a question of whether or not the group reached the Old World. The Madagascar genus *Termitochara,* which I have provisionally placed in a separate subtribe, may belong to the Abrotelina. If so, this would indicate an origin early in the history of the *Nasutitermes* branch. Morphologically, there is much to indicate that *Termitochara* is of the same phyletic line as this group; on the other hand, its occurrence (not verified) with two genera of termites of other subfamilies (*Capritermes* of the Termitinae and *Microcerotermes* of the Amitermitinae) is quite incompatible with the host relationships of the Abrotelina.

The *Termitoiceus* generic group seems to have differentiated in stock of the *Nasutitermes* branch ancestral to two endemic South American genera, *Diversitermes* and *Velocitermes.* Several species have, however, been reported in association with societies of *Subulitermes* (*Subulitermes* branch of Nasutitermitinae). As in similar cases (see discussion, p. 30) it may be necessary to postulate a host change at some time in the evolutionary history of the subtribe.

An interesting group of species comprising the genera *Eburniogaster* and *Termitonidia* occur with colonies of the subterranean genus *Tenuirostritermes* of the southwestern United States, Mexico, and Central America. Inasmuch as these specialized termites excavate galleries that reach the surface of the ground beneath stones or other objects, large concentrations of termites and some guests may be exposed by turning stones. Emerson (1952a) postulated a Tertiary origin for *Tenuirostritermes* in Central America at a time when South America was isolated. *Tenuirostritermes* was able to enter South America to a very limited extent following the Pliocene re-establishment of a connection between South and Central America. The Central and South American *Tenuirostritermes* colonies have not yet been searched for termitophiles.

The Termitophilous Tribe Termitonannini

In marked contrast to the Corotocini, the members of this tribe are limuloid in form and with the exception of the Brazilian genus *Termitonilla* are non-physogastric. It is probable that the Termitonannini evolved from free-living aleocharine stock independently of any other termitophilous group. The presence, on the terminal antennal segments, of coeloconic sensilla almost identical with those of the Corotocini may suggest a closer relationship between the two tribes than seems likely on other grounds. These sensilla, rare as they are in the Aleocharinae, may be the result of convergent development.

As organized in this monograph, the tribe is comprised of the subtribes Perinthina and Termitonannina—groups formerly placed in different sections of the Aleocharinae by virtue of their different tarsal and antennal segmentations. If we discount these easily-accounted-for differences, there is little to justify recognition of two tribes.

A limuloid body-form does not by itself suffice to distinguish this tribe, for there are a number of other termitophilous and myrmecophilous groups with similar body form. But termitophilous limuloid species with 4, 4, 4- or 4, 4, 5-segmented tarsi and with one or more pairs of coeloconic sensilla on their terminal antennomeres, probably belong here.

In numerous papers Wasmann characterized limuloid myrmecophiles and termitophiles as "defensive type" guests and placed great emphasis on the protection that this form allegedly afforded them. The fact that at least five independently evolved groups of termitophilous Staphylinidae have limuloid forms would seem to be significant, but there is no reason to believe that the most obvious explanation—that this form affords protection from attack by termites or ants—is necessarily the correct one. It seems unlikely that present-day guests rely chiefly, or at all, on body-form for protection from termites, although it is conceivable that during an early phase of their history large pronota and elytra may have provided important protection to head, antennae, mouth parts, and legs. It is doubtful that the limuloid termitophiles could have

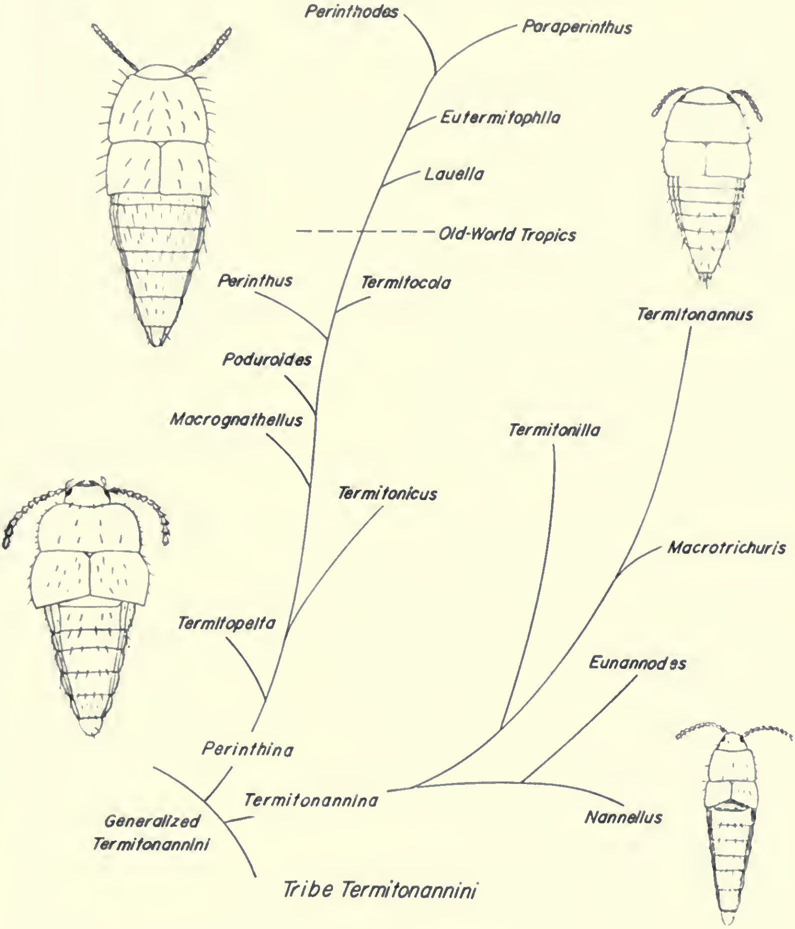

FIG. 9. Tribe Termitonannini.

survived over a long period of time and speciated so successfully without a more subtle and effective protective device. It is unlikely that the Termitonannini are synoeketes in Wasmann's sense; it seems more reasonable to believe that they have evolved a rather high degree of physiological integration with the colony.

A hypothetical history of the Termitonannini may be partially constructed from available phylogenetic, biogeographical, and host data. The subtribe Perinthina is pantropical in distribution and restricted in host associations to the Nasutitermitinae. The subtribe Termitonannina is apparently limited to the American tropics and

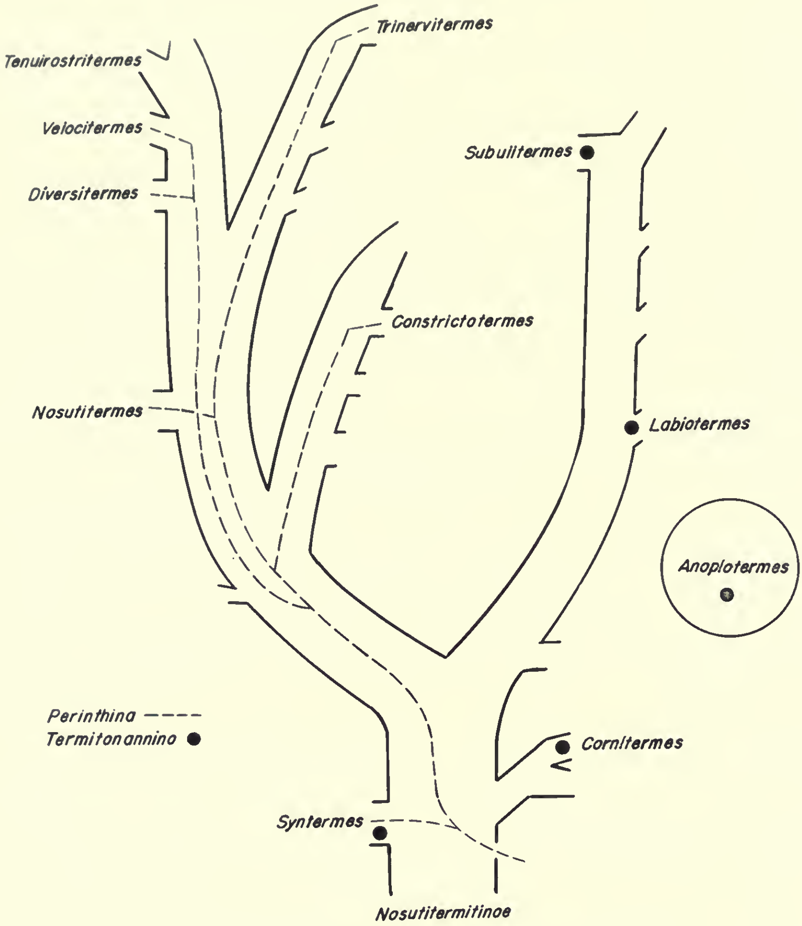

Fig. 10. Host relationships of Termitonannini.

has a host pattern that includes *Anoplotermes* (Amitermitinae) and several genera of Nasutitermitinae. The following discussion presents data that may be interpreted as evidence for an early tribal origin, probably in the American tropics during the Cretaceous Period. The events prior to the differentiation of the present-day subtribes are conjectural, but it is clear that only the first phases in the evolution of the limuloid form had taken place. The more specialized aspects of this modification apparently took place independently in each subtribe.

A. Subtribe Perinthina (figs. 9, 10, 11, 27).—The evolutionary history of the Perinthina is so closely linked with that of the Nasutitermitinae, and the *Nasutitermes* branch in particular, that much of the previous discussion in connection with the Corotocini is applicable here. It is of particular interest to note how closely the evolutionary pattern parallels that of the Corotocini.

The association of the Brazilian genus *Termitopelta* with the primitive nasutitermitine genus *Syntermes* is interpreted as evidence that the Perinthina differentiated soon after the origin of the Nasutitermitinae if not sooner. There are certain morphological features of *Termitopelta* that indicate it as possibly the most generalized of present-day Perinthina. *Termitopelta* seems to represent the level of evolution within the subtribe prior to acquisition of the specialized limuloid facies that characterizes almost all of its members. In contrast to the derived genera with large convex pronota that almost cover their hypognathous heads, *Termitopelta* has a large, relatively flat pronotum and an exposed, prognathous head. Inasmuch as the latter condition more closely resembles the typical aleocharine structure, it is presumed to be more generalized.

With the exception of *Termitonicus*, the neotropical genera—*Termitocola*, *Perinthus*, *Macrognathellus*, and *Poduroides*—have a limuloid, *Perinthus*-like appearance and are evidently offshoots from the main phyletic sequence. *Termitonicus*, a specialized genus of unusual facies, retains the generalized prognathous condition of the head. Of the derived limuloid genera, *Termitocola* exhibits fewer specializations of antennae and mouth parts and has departed to a lesser degree from the main course. The neotropical limuloid genera occur with termites of the *Nasutitermes* branch and were doubtless closely associated with that phyletic line of termites from the time of its differentiation.

Palaeotropical Perinthina are now known to occur in India, Java, Palua Islands, Fiji Islands, and the Belgian Congo. The four genera involved could have evolved from *Termitocola*-like stock from the Neotropical Region; all are certainly derived genera of the main phyletic sequence within the subtribe. The Indomalayan-Papuan genera *Lauella* and *Eutermitophila* differ from *Termitocola* of Panama in minor respects; the African genera *Perinthodes* and *Paraperinthus* are more highly specialized in some respects. The palaeotropical species have been found in societies of *Nasutitermes* and *Trinervitermes*. Available evidence thus suggests that *Termitocola*-like stock entered the Oriental Region during the dispersal of the Nasutitermitinae, probably during Cretaceous times. There is doubtless a moderately large undiscovered perinthine fauna in the Indomalayan Region, judging by the occurrence of *Lauella* in such outlying areas as the Fiji and Palau Islands.

The two Belgian Congo genera, the first of the Perinthina to be recorded from the Ethiopian Region, are notable for modifications of the hind coxae from the typical transverse type of the Aleocharinae to a "triangular" form characteristic of certain other termitophilous tribes (Corotocini and Termitopaediini).

B. Subtribe Termitonannina (figs. 9, 10, 30).—Twenty neotropical species of this subtribe have now been recorded and there is as yet no evidence that the group occurs in the Old World tropics. The host relationships of its species are perhaps the most interesting, and certainly the most puzzling, feature of the Termitonannina. The host pattern includes *Anoplotermes* and closely allied *Speculitermes* of the Amitermitinae as well as a series of genera of Nasutitermitinae, the latter including *Syntermes, Procornitermes, Cornitermes, Labiotermes,* and *Subulitermes.* It is especially noteworthy that the nasutitermitine hosts belong either to primitive mandibulate genera or to genera of the *Subulitermes* branch. No species has been found with a host of the *Nasutitermes* branch. The more generalized genera of the subtribe—*Nannellus, Eunannodes,* and *Macrotrichurus* —and the remarkable physogastric genus *Termitonilla* occur with *Anoplotermes.* The large genus *Termitonannus,* the most highly specialized limuloid genus of the group, occurs with a variety of hosts; a majority of its species are associated with *Anoplotermes* while the others are recorded as guests of the nasutitermitine genera named above.

The phyletic relationships of the subtribe may be summarized rather briefly. As in the case of the Perinthina, a prognathous head is presumed to be more generalized than the hypognathous one. *Nannellus* and *Eunannodes* are believed to be the most generalized of the subtribe. The physogastric genus *Termitonilla* has generalized head and thoracic structures and evidently differentiated from relatively generalized stock. In appearance *Termitonilla* is strikingly like *Eburniola* of the Corotocini, so that this is a most interesting case of the convergent development of physogastry. The limuloid genus *Termitonannus* has very specialized head structures; its head is greatly shortened and hypognathous and almost covered by the large pronotum.

In view of the difficulties in correlating phyletic and host patterns, the evolutionary history of the Termitonannina is not easily

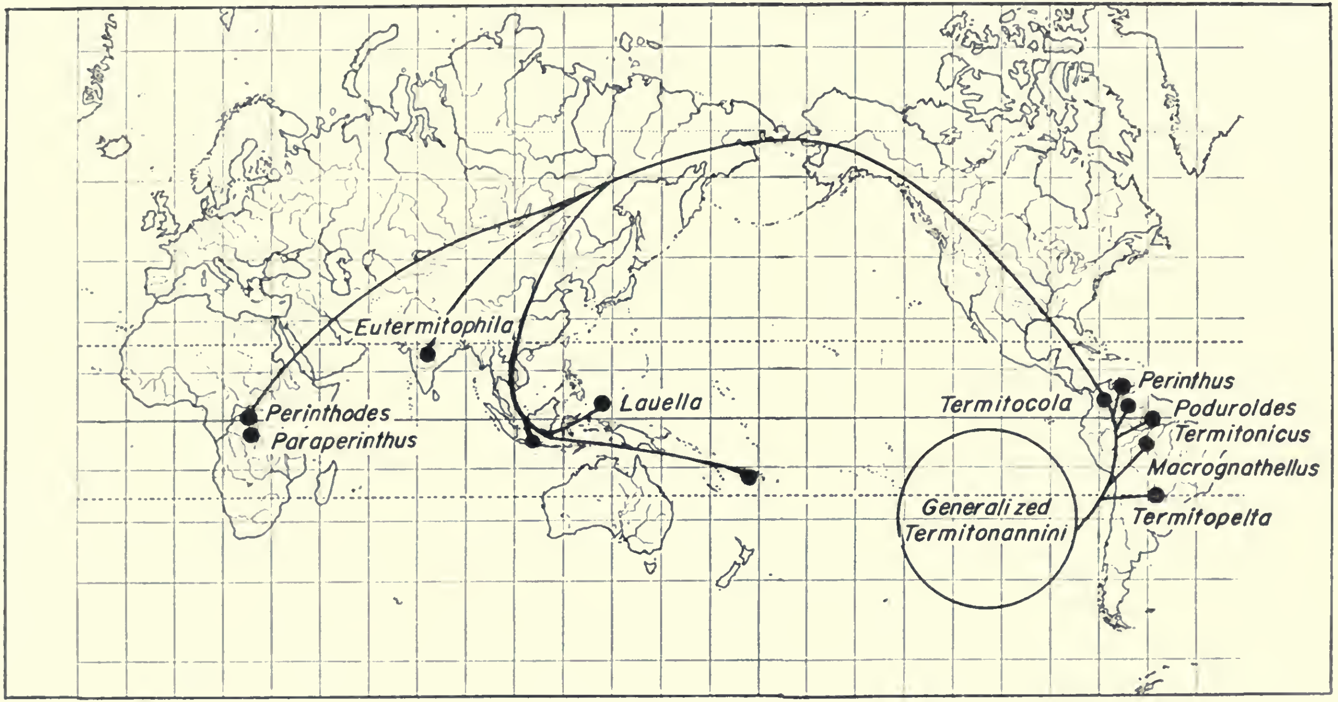

FIG. 11. Distribution of genera of subtribe Perinthina.

reconstructed. This is especially true if we bear in mind the different host pattern of the subtribe Perinthina. Inasmuch as a large majority of its species, including the more generalized ones, occur with *Anoplotermes*, one can hardly escape the conclusion that this genus was probably the primary host genus for the subtribe. In the preceding section a common termitophile ancestor for the subtribes Perinthina and Termitonannina was postulated; yet the host patterns of the two tribes are hardly compatible with such a hypothesis and it is most difficult to decide what the host of such an ancestor might have been. Several possibilities are available. To account for the two host patterns without postulating one or more major changes in host associations from Nasutitermitinae to Amitermitinae or vice versa, it would be necessary to place the common ancestor in societies of Termitidae ancestral to both subfamilies. If this had been the case, one would expect the Termitonannina to be more widely distributed in the Amitermitinae than present evidence suggests.

Future considerations of the Perinthina and Termitonannina should be carried on with two possibilities in mind. The first is that these groups may have evolved independently from different free-living aleocharine stocks. Secondly, the records of species of Termitonannina with hosts other than *Anoplotermes* may simply reflect faulty collecting procedures. *Anoplotermes* colonies, in a high percentage of cases, occur in mounds occupied by other termites, such as *Syntermes* and *Subulitermes*. Inasmuch as *Anoplotermes* lacks the soldier caste it would have been easy in at least some cases to have collected soldiers of the wrong host.

The Termitophilous Tribe Termitohospitini

Although originally proposed (Seevers, 1941) for a small group of neotropical species, the tribe Termitohospitini (figs. 12, 31) is expanded in this monograph to include a number of Old World genera formerly placed in the heterogeneous tribe Bolitocharini. It is not unlikely that stock similar to that from which this tribe of termitophiles originated may be found among the present-day free-living bolitocharines.

With the exception of the subtribe Termitospectrina, whose members are perhaps slightly physogastric, this tribe is comprised of limuloid species that may be grouped in three subtribes. Tribal members may be recognized by their 4, 4, 5-segmented tarsi and their distinctive heads and mouth parts.

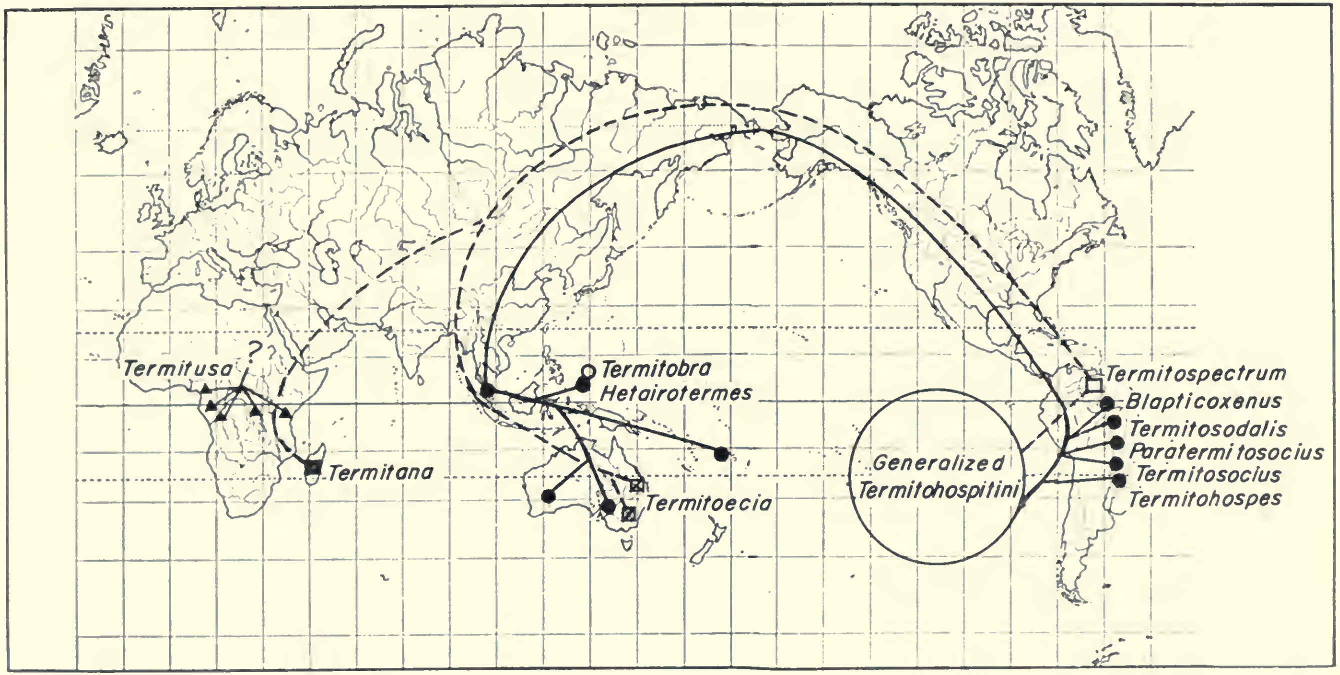

FIG. 12. Distribution of genera of tribe Termitohospitini.

The South American subtribe Termitohospitina is comprised of five genera that occur with primitive mandibulate genera of Nasutitermitinae as well as with derived genera of the *Nasutitermes* branch. It is difficult to arrange the Termitohospitina in a phyletic series at present. *Termitohospes* occurs with *Cornitermes* and *Nasutitermes; Termitosocius* and *Paratermitosocius* are guests of *Nasutitermes; Blapticoxenus* and *Termitosodalis* are associated with two derived endemic neotropical genera *Velocitermes* and *Diversitermes*. This pattern is quite similar to the patterns of certain Corotocini and Termitonannini discussed in previous sections. The subtribe Termitohospitina almost certainly differentiated in association with primitive Nasutitermitinae; in fact, the entire tribe may have originated with the establishment of a free-living ancestor in such a colony.

After the hypothetical origin of the tribe in South America, it seems probable that tribal stock dispersed to the Oriental Region with the Nasutitermitinae, as described for other groups. A small group of Indomalayan and Australian species belonging to *Hetairotermes* and *Termitobra* comprise the subtribe Hetairotermitina. This group presumably evolved from American stock; the morphological characteristics of the species are quite consistent with this presumption. In only a few instances is the host of these species known, but the occurrence of two Palau Islands species with *Nasutitermes* is convincing evidence that the group at least reached the Indomalayan Region with Nasutitermitinae. *Hetairotermes* apparently speciated rather extensively in Australia, judged by the material now available.

Three genera from widely separated parts of the world are herein grouped to form the subtribe Termitospectrina. The species of this group differ from those of other subtribes in having a typical aleocharine body-form (non-limuloid). Their heads are prognathous, the pronota do not cover the head, and their abdomens are recurved over the foreparts. Despite these important differences, I tentatively place *Termitospectrum* and related genera in this tribe because of marked similarities in the structure of their mouth parts. The divergence of the Termitospectrina from the other subtribes, if indeed they had a common ancestry, must have been very early in tribal history—certainly before the limuloid body-form was evolved in the tribe.

The Termitospectrina is comprised of *Termitospectrum* of South America, *Termitoecia* of Australia, and *Termitana* of Madagascar.

In the current classification of Aleocharinae these genera are placed in different tribes; in the case of *Termitana* an incorrect tribal position resulted in part from Fairmaire's miscounting of the tarsal segments. There is little about the structure, distribution, or host relationships of these genera to suggest a place of origin for the group or to account for the present distribution. *Termitospectrum* is known to occur with *Nasutitermes* in South America, but the hosts of the other genera have not been recorded.

The subtribe Termitusina is provisionally established for a single African genus that occurs with *Cubitermes* and *Noditermes* of the Termitinae. Eight species of *Termitusa* have been proposed, but in view of the fact that about seventy species of *Cubitermes* have been named this may be far short of the number in existence. The species of *Termitusa* are limuloid in form and have mouth parts like those of Termitohospitina in many respects. Yet I am not completely convinced that the genus belongs here, inasmuch as the host relationships do not conform to the tribal pattern. I have been unable to discover an adequate basis for its separation, but I have not subjected the genus to as careful a morphological study as is desirable to establish its true relationship to the Termitohospitini.

TERMITOPHILOUS STAPHYLINIDAE ASSOCIATED WITH MACROTERMITINAE

The Macrotermitinae

The Macrotermitinae are fungus-growing termites of the Old World tropics and according to Emerson (1955) originated in the Ethiopian Region during Tertiary times. All ten genera of the subfamily occur in Africa and the more primitive genera such as *Acanthotermes* and *Pseudacanthotermes* are endemic to that continent. Only the largest and most advanced genera—*Macrotermes*, *Odontotermes*, and *Microtermes*—reached the Indomalayan Region, presumably during the Miocene. The fungus-growing termites occur as far east as Java, Sumatra, Celebes, Borneo, and the Philippines, but apparently had no opportunity to reach the Australian and Papuan regions.

Some of the most spectacular termitaria in the world are constructed by certain African *Macrotermes*. The mounds of *M. bellicosus* in the Cameroons and Belgian Congo attain heights greater than eighteen feet and diameters of more than seventy-five feet. Within the termitaria workers construct a complex system of chambers and cells in which eggs, fungus masses, and wood dust are stored. Fungus gardens are constructed by workers who masticate wood to a paste and roll it into pellets that are pressed together to form convoluted structures upon which fungus growth occurs. Fungus mycelia may bear small white spherules that are fed to reproductives and nymphs. Workers and soldiers feed primarily on grass, leaves, and wood.

The termitophile fauna associated with societies of Macrotermitinae evidently originated independently of those groups that live with Nasutitermitinae. The staphylinid fauna, consisting of members of several independently derived tribes, is in no way shared by the termites of these major subfamilies. It is noteworthy, though, that the staphylinid guests of both termite subfamilies have acquired almost all the termitophile characteristics presumed to be adaptive.

The termitophilous Aleocharinae occurring with Macrotermitinae are assigned in this monograph to the following tribes: Termitopaediini, Termitodiscini, and Myrmedoniini. In addition, some species of Indomalayan Pygosteninae, a predominantly myrmecophilous subfamily, are guests of fungus-growing termites. The following discussion of macrotermitine guests is limited to the Termitopaediini and Termitodiscini.

The Termitophilous Tribe Termitopaediini

The tribe Termitopaediini is proposed as a new assemblage in this paper and its composition is very likely to require revision when new material becomes available. The tribe is based on a generic complex including the African genera *Termitopaedia*, *Termitopulex*, and *Termitolinus*, as well as the Indomalayan *Dioxeuta* (=*Jacobsonella*), and *Neodioxeuta*. A second generic group is comprised of three Ethiopian genera, *Protermitobia*, *Termitotecna*, and *Termitobia*. How closely allied these two groups are is still to be determined. Two other genera, *Termitotropha* (South Africa) and *Termitobaena* (Borneo), are tentatively placed in the Termitopaediini. These genera may be closely allied to three Indomalayan genera, *Felda*, *Zunia*, and *Termitobiella*, which I have left in the "catch-all" tribe Myrmedoniini because I have not had an opportunity to study them.

The *Termitopaedia* group of genera occurs with *Pseudacanthotermes*, *Macrotermes*, and *Microtermes*, thus conforming to a consistent pattern. *Pseudacanthotermes* is a relatively primitive, endemic African genus of fungus-growing termites; it provides some of the evidence linking the origin of this termite subfamily to the Ethiopian Region. The occurrence of *Termitopaedia* with *Pseudacanthotermes* suggests that the Termitopaediini were established early in the evolutionary history of the Macrotermitinae. *Termitopulex, Termitolinus, Dioxeuta,* and *Neodioxeuta* are associated with the derived genus *Macrotermes; Termitopulex* also occurs with *Microtermes,* the most specialized genus of fungus-growing termites.

The *Termitobia* group of genera presents a less consistent host situation. It is true that *Macrotermes,* the host of *Termitobia,* and *Odontotermes,* with which *Termitotecna* occurs, are fungus-growing termites, but *Cubitermes,* the host genus for the two known species of *Protermitobia,* belongs to the subfamily Termitinae. Unless one falls back on the explanation of a major shift in host affinities at some point in the history of the group, this situation is difficult to explain. Additional discoveries may help to clarify these host relationships.

Our present knowledge of the hosts of *Termitotropha* and *Termitobaena* is even less satisfactory. *Termitotropha* was stated to be a guest of *Amitermes* (Amitermitinae), but the single, nineteenth century record requires confirmation. The host of *Termitobaena* is not known. The three Indomalayan genera—*Felda, Zunia,* and *Termitobiella*—that may be allied to these genera occur with *Capritermes* (Termitinae). This fact, by itself, would not lead one to suspect close relationship.

It is clear that our knowledge of the Termitopaediini is too fragmentary to allow for more than brief glimpses into the tribe's evolutionary history. There is no evidence to contradict Emerson's (1952a, 1955) view that the Macrotermitinae originated in Africa and that *Macrotermes* and *Odontotermes* moved eastward into Indomalaya during the Tertiary, too late to reach the Australian and Papuan regions. The Indomalayan genus *Dioxeuta* (India, Malaya, Java, Sumatra, Borneo, the Philippines) is certainly the counterpart of the Ethiopian genus *Termitopulex.* These genera are relatively generalized, but *Dioxeuta* gave rise to a group of physogastric species (*Neodioxeuta*) with very remarkable abdomens (fig. 33, *b*). The *Neodioxeuta* abdomen exhibits the same type of enlargement, involving chiefly the basal segments, as that of the bizarre genus *Termitobia* of Africa, but this is doubtless a convergence within the tribe.

The Termitophilous Tribe Termitodiscini

As I have indicated in the systematic section of the monograph, there is little justification for separating this group from the Aleocharinae as Wasmann did when he proposed the subfamily Termitodiscinae. The Termitodiscini are minute, limuloid species that occur with the fungus-growing species. *Termitodiscus* has been found with *Odontotermes* in both Ethiopian and Indomalayan regions, *Discoxenus* with *Odontotermes* in India and Ceylon, and *Termitogerrus* with *Macrotermes* in the Ethiopian Region. There is as yet hardly an adequate basis for profitable speculations about the evolutionary history of the group.

TERMITOPHILOUS STAPHYLINIDAE ASSOCIATED WITH RHINOTERMITIDAE

The Termitophilous Tribe Philotermitini

The aleocharine tribe Philotermitini is a small group of species occurring with two genera of New World Rhinotermitidae—six species of *Philotermes* with *Reticulitermes* in the eastern United States, and one species of *Neophilotermes* with Central American *Coptotermes*. The Philotermitini resemble free-living Staphylinidae in appearance, and exhibit no adaptive features usually associated with termitophily. There can be little doubt, however, that the species are well integrated with termite societies and none at all about the obligatory nature of the relationship.

Speculation concerning the origin and evolution of this small group is probably fruitless at this time. The tribe appears to be an endemic American group but this may merely reflect the small attention given to colonies of Old World Rhinotermitidae. Inasmuch as *Reticulitermes* is a Holarctic genus with about as many species in Eurasia as in the United States and Mexico, and *Coptotermes* is a tropicopolitan genus of nearly fifty recorded species, it is difficult to believe that the present distribution of the tribe represents its true range.

The Termitophilous Subfamily Trichopseniinae

All members of this unusually interesting subfamily are guests of termites. Although only nine genera have as yet been discovered, the subfamily is known to occur in every major zoogeographic area (fig. 13): Neotropical, Nearctic, Palaearctic, Indomalayan, Papuan,

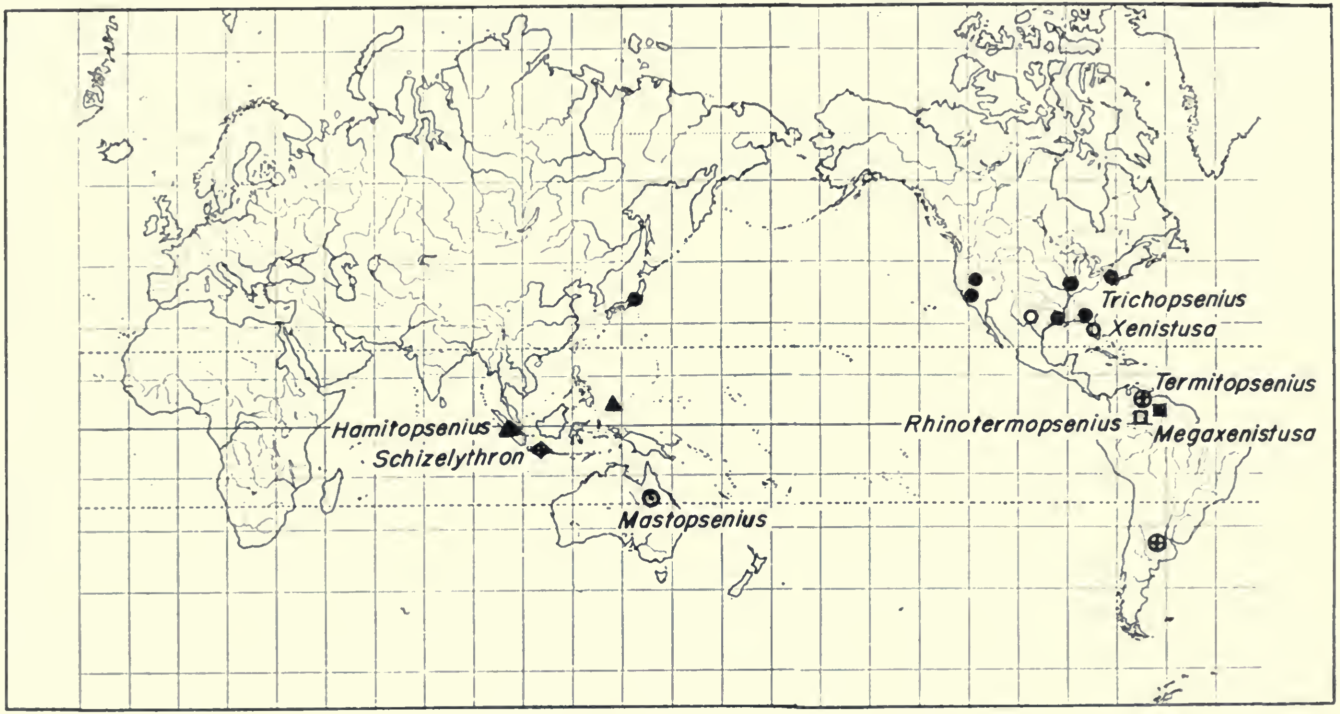

FIG. 13. Distribution of genera of subfamily Trichopseniinae.

Australian, and Ethiopian Regions. Its species have been recorded with termites of several families but it seems likely that the primary association was with the Rhinotermitidae.

It would be very difficult if not impossible to describe a subfamily facies, inasmuch as the genera present a diversity of body-forms. The less specialized genera are non-physogastric while others exhibit moderately strong physogastry. One form of specialization was the development of a pronounced limuloid form. A series of photographs shows this diversity to good advantage: *Trichopsenius* (fig. 40, *a*, *b*), *Hamitopsenius* (fig. 41, *c*), *Rhinotermopsenius* (fig. 40, *d*), *Xenistusa* (fig. 40, *c*), and *Mastopsenius* (fig. 41, *a*). *Trichopsenius* of North America and Japan may possibly be the most generalized of the known genera; its species are semi-limuloid in form, with one species showing incipient physogastry. Its North American relative *Xenistusa* is relatively generalized as to head structure and has a feebly physogastric abdomen. *Mastopsenius* of Australia has a remarkable fusiform body, including a physogastric abdomen. *Schizelythron* of Java is noteworthy for its bizarre elytra, which are split for almost their entire length. The extreme limuloid body-form is displayed by the Indomalayan, Papuan, and Australian *Hamitopsenius* as well as by its American ally, *Termitopsenius*. These two genera are so close that it is questionable whether they should be separated. An extremely interesting new Ethiopian genus, received too late to describe in this paper, is the first representative in that region.

The Trichopseniinae, although diverse in appearance, are very easy to recognize by the very distinctive relationship of the hind legs to the metasternum (fig. 42). The large hind trochanters appear to articulate with the metasternum, but this can only mean that the coxae are indistinguishably fused to the metasternum. The reader who is interested in more details of this unique characteristic is referred to an earlier paper (Seevers, 1941). The head of the Trichopseniinae also has some unusual features.

The adaptive significance of the hind leg modification is not evident from its morphology, but a clue may be provided by a behavior trait observed in British Guiana by Dr. Emerson some years ago. He noticed that two species of *Rhinotermes* guests (*Termitopsenius acanthoscelis* Seevers and *Rhinotermopsenius saltatorius* Seevers) were able to leap for surprising distances, considering their very small size. Leaps up to three inches were observed. It is difficult to appraise the value of this behavior as an escape mechanism, but it might have played an important role in the evolution of the subfamily. It is not known how widespread this behavior is within the family, but it might well have been associated, at least early in the evolution of the group, with the singular mode of leg articulation.

It is difficult, with the information now available, to reconstruct the phyletic history of the subfamily, or to relate this group to free-living Staphylinidae. Inasmuch as fourteen of the seventeen known species of the subfamily occur with species of Rhinotermitidae, it is reasonable to consider this group their primary hosts. Two of the three records involving termites of other families (*Mastotermes*, *Amitermes*) are based on single records and require confirmation; the other record (*Neocapritermes*) is probably correct but is rather easily accounted for. There seems to be no evidence at present favoring any one region as a center of origin for the Trichopseniinae, although the alternatives almost certainly include only the Americas and the Indomalayan Region.

Although most conclusions made at this time concerning the evolution of this subfamily are likely to be premature, it is instructive to examine the host relationships of the Trichopseniinae to determine whether or not a pattern is discernible. Emerson (1955) places the center of origin of the Rhinotermitidae in the Indomalayan Region during pre-Cretaceous times. The family is comprised of two major phyletic lines (Ahmad, 1950); one branch contains *Prorhinotermes*, *Schedorhinotermes*, *Rhinotermes*, and allied genera; the other line gave rise to *Heterotermes*, *Coptotermes*, *Reticulitermes*, and relatives. Trichopseniine guests are found with members of both phyletic lines, a fact suggesting an ancient origin for the subfamily. The first of the above-mentioned phyletic lines has more recorded termitophile genera at present: *Schedorhinotermes* is the host of *Schizelythron* in Java as well as an undescribed genus of the Belgian Congo; *Prorhinotermes* harbors a species of *Hamitopsenius* in Micronesia; and the neotropical *Rhinotermes* has three associated genera in British Guiana—*Megaxenistusa*, *Termitopsenius*, and *Rhinotermopsenius*. Of the other phyletic line, *Reticulitermes* is the only genus known to harbor trichopseniine termitophiles; *Xenistusa* occurs in the southern United States and *Trichopsenius* in North America and Japan. There is no satisfactory explanation as to why such large tropical genera as *Heterotermes* and *Coptotermes* do not have guests of this subfamily. Inadequate collecting could easily be responsible for failure to record them.

The three records of Trichopseniinae with termites other than Rhinotermitidae do not seriously distort the host pattern that is beginning to become apparent. Two of these records involve the *Hamitopsenius–Termitopsenius* branch of Trichopseniinae. Species of these extremely specialized limuloid genera are known for certain to occur with *Prorhinotermes* in the Palau Islands (Micronesia) and with *Rhinotermes* in British Guiana. A Sumatran species of *Hamitopsenius* was recorded with *Amitermes* by Wasmann, but this could easily reflect uncritical collecting of host material and requires substantiation. On the other hand, the occurrence of the Argentine species *Termitopsenius limulus* with *Neocapritermes* (Termitidae) has been confirmed, and inasmuch as the British Guiana species of *Termitopsenius* is a *Rhinotermes* guest, it seems likely that in this case a host change was involved. The most puzzling case of all is that of the Australian species *Mastopsenius australis,* which occurs with *Mastotermes darwiniensis,* the only living species of the primitive family Mastotermitidae. This situation seems to defy explanation at this time.

III. The Termitophilous Staphylinidae: Systematic Revision

MATERIAL AND METHODS

This revision deals with approximately three hundred species of termitophilous Staphylinidae, exclusive of synecthrans such as *Zyras*. At least nine-tenths of the genera and four-fifths of the species were examined during the course of the studies. Perhaps one-half of the unavailable species were relatively well described and figured by Silvestri and present few problems of placement.

Type material of almost all species described by Wasmann, Mann, Borgmeier, Bernhauer, Cameron, Casey, Fenyes, Reichensperger, Sharp, Fauvel, and Lea was examined at one time or another. My own collection, consisting of a high percentage of the termitophilous species treated in the revision, is now incorporated in the collection of Chicago Natural History Museum.

Dr. Alfred Emerson provided a substantial part of the material for these studies; some he collected and some he acquired from other termite specialists and collectors. The following is a summary of the principal sources of the termitophilous specimens and the regions from which the material came: A. E. Emerson (British Guiana, Panama, Belgian Congo, United States); A. Reichensperger (Brazil, Tanganyika); R. L. Araujo (Brazil); A. M. Adamson (Trinidad); W. M. Mann collection, United States National Museum (Bolivia, Central America, Liberia); H. S. Dybas collection, Pacific Science Board Expedition (Micronesia); M. Bernhauer collection, Chicago Natural History Museum (Indomalaya, Africa, Brazil); M. Cameron collection, British Museum (Natural History); E. Wasmann collection, Natuurhistorisch Museum, Maastricht, The Netherlands (world-wide); A. Fauvel collection, Institut Royal des Sciences Naturelles de Belgique.

All available host termites (except as noted in the systematic section) were determined by Dr. Emerson. Host records are summarized in lists at the end of the paper. Many generic names and some specific names of termite hosts are not the same as those cited by Wasmann and other early writers due to subdivision of the broad generic categories then in use. The termite nomenclature agrees closely with that of Snyder's (1949) catalogue of the termites.

The specimens studied have been on points, in alcohol, and on slides after treatment with potassium hydroxide. Measurements of parts of the body are generally given in terms of an arbitrary unit (0.009 mm.), the measurements having been made with an ocular grid calibrated with a stage micrometer. The measurements are useful primarily for comparative purposes and enable one to judge the relative lengths of such structures as antennal segments. The actual lengths of such small structures are generally of little concern, but they may easily be obtained by converting the units to fractions of a millimeter. Although the measurements are useful for comparative purposes it should be borne in mind that slight differences in antennal and tarsal lengths, for example, are difficult to measure.

There are not as many figures of structural details as I should have liked to provide. Inasmuch as a high percentage of previously described genera and species were illustrated in some detail, it is not deemed necessary to repeat the figures here. Reference should be made to papers by Silvestri, Wasmann, Kemner, Warren, and Seevers. The termitophilous Staphylinidae are far better illustrated than are most free-living species of the family. Some readers may wonder why the aedeagi of males were not utilized to a greater extent for diagnostic purposes. These structures have not proved to be especially useful either for taxonomic purposes or for studies of phylogeny. There are some differences in the aedeagi that may prove to be of greater significance in future studies.

THE STAPHYLINIDAE: GENERAL CONSIDERATIONS

The Staphylinidae comprise one of the largest groups of insects, numbering more than 25,000 species distributed throughout the world. A large majority of these species are predators and feed chiefly on other insects that occur in carrion, dung, and decaying organic materials. The ecological role of the Staphylinidae must be of considerable importance in many microhabitats, inasmuch as their habits of predation must influence the populations of those habitats to a significant degree. Some genera are fungivorous and others apparently saprophytic.

The family Staphylinidae is divided into about twenty subfamilies; some are well-defined categories, others of dubious merit.

Species of at least nine subfamilies have been listed as termitophiles, but only the Aleocharinae, Trichopseniinae, and Pygosteninae have termitophilous groups of significance. The recorded species of other subfamilies, with the exception of a few species of Hypocyphtinae and Tachyporinae, do not conform to the definition of a termitophile given earlier in the paper. A list of the doubtful species is given at the end of the paper; some of these are probably synecthrans but most are accidental associations. Single records of species belonging to large genera of free-living forms are particularly suspect.

KEY TO SUBFAMILIES WITH TERMITOPHILOUS SPECIES

1. The large hind trochanters appearing to articulate directly with metasternum (fig. 42); metasternal plates extending laterally from mid-line over bases of femora; paratergites absent .... Trichopseniinae
   Relationship of hind leg to metasternum generalized; no metasternal plates present; paratergites present 2
2. Antennae inserted medial to the eyes 3
   Antennae inserted at front or side margin of head 4
3. Antennae thick, spindle-shaped, apex tapering to point. Pygosteninae (and some Termitodiscini)
   Antennae otherwise .... Aleocharinae
4. Antennae 10-segmented .... Hypocyphtinae
   Antennae 11-segmented .... Tachyporinae

Subfamily ALEOCHARINAE

The subfamily Aleocharinae, to which a large majority of the termitophilous Staphylinidae belong, is an extremely large assemblage of relatively small species, averaging perhaps 5 mm. in length. So great is the number of aleocharine species and individuals that they frequently dominate microhabitats. The aleocharines are doubtless of major importance as predators in a variety of decaying animal and vegetable materials where they feed on dipterous larvae and other insects. They are abundant on cadavers, in dung, in decaying fruit and fungi, in the leaf mold of the forest floor, in decaying logs and under bark, on stream and pond shores, in the intertidal zone of ocean shores, in nests of some birds and mammals, on fresh mushrooms, and in a variety of other habitats. The Aleocharinae, in the course of their evolution, have moved into ecological niches and have speciated to a degree rivaled by few insect groups at the subfamily level.

In 1831 Mannerheim proposed the Aleocharides as a sixth tribe of Brachelytra. Soon after, Erichson (1837, 1840) established the classification of the Staphylinidae in essentially its present form, and recognized the Aleocharini as a major subdivision. Aleocharine specialists since Erichson's time have contributed little of fundamental importance to the organization of generic groups within the subfamily and have retained the artificial features on which the tribal classification was based. The tribal organization currently in use was proposed by Ganglbauer (1895) and the twentieth century specialists have expanded but scarcely modified the tribal arrangement (Fenyes, 1918–21; Bernhauer and Scheerpeltz, 1926; Cameron, 1939).

The first termitophilous Staphylinidae to be discovered were the highly specialized South American genera, *Corotoca* and *Spirachtha*. Schiødte (1853) was even able to report that *Corotoca* females produce living larvae. Kraatz added the American genus *Philotermes* in 1857 but it was nearly forty years later that Wasmann published the first of an extensive series of reports dealing with termite and ant guests. At the beginning of the present century Silvestri also began a series of noteworthy publications on termite guests. It is somewhat surprising that many of the men who described genera and species of staphylinid termitophiles—Schiødte, Wasmann, Silvestri, Trägårdh, Warren, Kemner, Reichensperger, Mann, and Borgmeier—were not primarily students of the Staphylinidae, whereas the aleocharine specialists—Casey, Fenyes, Bernhauer, and Cameron—did not make large contributions to our knowledge of the termite guests.

The present-day organization of aleocharine genera into tribes and subtribes is so artificial that it almost completely obscures interesting evolutionary relationships. A complete revision of generic groups with phylogenetic considerations uppermost in mind is badly needed. The termitophilous genera have been assigned in bewildering fashion to tribes that included free-living as well as myrmecophilous species. I have found it necessary to shift the positions of so many genera that there is little resemblance between my proposed classification and that currently in use.

KEY TO TERMITOPHILOUS TRIBES OF ALEOCHARINAE OCCURRING IN THE NEW WORLD

1. Mentum fused to submentum; hind coxae triangular; metepimera abbreviated; mesocoxal acetabula not margined; physogastric......Corotocini
   Species without the above combination of characters....................2
2. Tarsi 4, 4, 4-segmented; stenogastric species....................Perinthina (Termitonannini)
   Tarsi 4, 4, 5 or 4, 5, 5-segmented....................................3
3. Tarsi 4, 5, 5-segmented................................Termitozyrina (Myrmedoniini)
   Tarsi 4, 4, 5-segmented..4

4. Antennae with 10 segments or less .... Termitonannina (Termitonannini)
   Antennae 11-segmented 5
5. Labial palpi very much elongated, filiform .... Termitohospitini
   Labial palpi neither elongated nor filiform .... Philotermitini

KEY TO TERMITOPHILOUS TRIBES OF ALEOCHARINAE OCCURRING IN THE OLD WORLD

1. Mentum fused to submentum; hind coxae triangular; metepimera abbreviated; mesocoxal acetabula not margined; physogastric .... Corotocini
   Species without the above combination of characters 2
2. Tarsi 4, 4, 4-segmented; limuloid species .... Perinthina (Termitonannini)
   Tarsi 4, 4, 5 or 4, 5, 5-segmented 3
3. Tarsi 4, 4, 5-segmented .... Termitohospitini
   Tarsi 4, 5, 5-segmented 4
4. Head covered by large, shield-shaped pronotum .... Termitodiscini
   Head visible from above 5
5. Body-form limuloid 6
   Body-form otherwise 7
6. Front of head with transverse cariniform line .... Pseudoperinthini
   Front of head without such a line .... Termitendina (Myrmedoniini)
7. Physogastric species .... Termitopaediini or Feldina (Myrmedoniini)
   Non-physogastric species 8
8. Galea and lacinia elongated; maxillary sinuses very large .... Myrmedoniina (Myrmedoniini)
   Galea and lacinia not elongated; maxillary sinuses not appreciably enlarged. Athetini

Tribe COROTOCINI

Tribe Corotocini: Fenyes, 1918–21, Gen. Insect., 173: 17, 61.

The distinctive characteristics of this tribe were discussed at some length in an earlier section of the paper (p. 26). The species are grouped in five subtribes.

KEY TO SUBTRIBES OF COROTOCINI

1. Abdomen (fig. 14, *a–d*) not recurved over foreparts; abdomen strongly inflated and very membranous .... Timeparthenina
   Abdomen recurved over foreparts 2
2. Hind coxae (fig. 21, *b*) loosely articulated to metasterna; median metasternal articulating processes prolonged so that hind coxae are not contiguous with metasternum .... Corotocina
   Hind coxal-metasternal relationship generalized 3

3. Sixth and seventh tergites as in fig. 19, *d;* seventh unusually large, shield-shaped; some genera with large, ovate, membranous abdomens; Old World tropics . . . . Termitogastrina (part)
   Sixth and seventh tergites otherwise; never with large, ovate, membranous abdomens 4
4. Tarsi 4, 4, 4-segmented 5
   Tarsi 5, 5, 5-segmented (the two terminal tarsal segments frequently fused or partly so, but recognizable as segments) 6
5. Antennae cylindrical, 10-segmented; neotropics . . . . . Genus *Abroteles* Casey
   Antennae 11-segmented; Madagascar . . . . Termitocharina
6. Frail species; integuments weakly sclerotized; tarsi 5, 5, 5-segmented, the fourth and fifth segments free . . . . Abrotelina (part)
   Relatively robust species with heavily sclerotized integuments; the terminal segment of the 5, 5, 5-segmented tarsi partly fused to fourth segment and not movable . . . . Termitogastrina (part)

Subtribe TIMEPARTHENINA

The genera that comprise the Timeparthenina are distinguished primarily by their pattern of physogastry. The abdomens of these genera are strongly inflated and present appreciable areas of membranous integument, but they are especially noteworthy because they are not recurved over the foreparts as are the abdomens of the other subtribes of Corotocini. The known genera illustrate various degrees of physogastric development, showing a definite trend toward enlargement of the basal abdominal segments (figs. 4, 14). The least specialized condition is that of *Termituncula,* while the most specialized condition is illustrated by *Timeparthenus.* The basal abdominal segments of the latter genus are extremely large.

The variations in tarsal and antennal segmentation within the subtribe are rather striking; the tarsal segments number 5, 5, 5 or 4, 5, 5 or 4, 4, 5; the antennae consist of eleven or ten segments.

A minor deviation from the pattern of characters that distinguish the Corotocini is shown by *Termituncula* and *Termitozophilus,* which have free mentums in contrast to the usual mentum-submentum condition.

Fenyes (1921, p. 34) first proposed the tribe Timeparthenini to receive *Timeparthenus,* but this served only to isolate the genus and to obscure its relationship to other termitophilous genera.

TERMITUNCULA Borgmeier

Termituncula Borgmeier, 1950, Rev. Ent., **21**: 662. Type species: *Termituncula gracilipes* Borgmeier.

Head, pronotum, and elytra generalized in form; body rather frail. Antennae 11-segmented; elongated; segments 1–7 distinctly longer than broad; 8–10 subequal in width and length. Mentum-submentum distinctive. Maxillary palpi slender; segment 3 moderately thick, segment 4 slender, elongated, as long as 3.

Abdomen distinctive; elongato-ovoidal, two to three times as broad as foreparts; width less than the dorso-ventral thickness; with moderately deep intersegmental constrictions. Segments 3–7 physogastric; membranous integument extensive; all sclerites widely separated. Second abdominal segment not inflated, second sternite not present; segments 3–5 increasing in size, 6–7 decreasing in size. Tergites small, the seventh a little longer than the others; paratergites narrow, strap-like. Sternites generalized, larger than tergites. Legs long and slender; femora and tibiae nearly equal in length. Tarsi 5, 5, 5-segmented.

Termituncula gracilipes Borgmeier. Figure 14, *a*.

Termituncula gracilipes Borgmeier, 1950, Rev. Ent., **21**: 664, text figs. 39–51 (Campinas, Goiás, Brazil; *Cornitermes similis* Hagen; Borgmeier coll.).

Material examined.—One paratype from same termite colony as holotype. The host is *Procornitermes araujoi* Emerson, determined by Emerson after Borgmeier's paper was published.

Head, thorax, elytra, and tergites bright yellow-brown, sternites yellow, legs and antennae yellowish. Head shining, not punctured; pronotum and elytra very finely and sparsely punctured, without pubescence. Head with 2 vertexal setae; pronotum with 6 setae on apical margin, 2 along lateral border, and 2 tiny hairs in the middle of the basal margin. Elytra with one bristle near anterior angle and one on side border near hind angle. Tergites 2–6 with 6 bristles on apical margin; tergite 7 with one at each hind angle; tergite 8 with one sub-basal seta and an apical row of 8 bristles. Each paratergite with 2 or 3 bristles. First antennal segment thickened, longer than the following segments; segment 3 shorter than second and a little longer than fourth; segments 2–7 longer than broad, 8–10 subquadrate. Pronotum subequal in length and width.

Length, 2.6–3 mm.

TERMITOZOPHILUS Silvestri

Termitozophilus Silvestri, 1901, Boll. Mus. Zool. Torino, **16**: 7; 1903, Redia, **1**: 192; Fenyes, 1920, Gen. Insect., **173B**: 348. Type species: *Termitozophilus laetus* Silvestri.

Corymbogaster Mann, 1923, Zoologica, **3**: 346; Borgmeier, 1950, Rev. Ent., **21**: 640. Type species: *Corymbogaster miranda* Mann.

Head and thorax slender; abdomen extremely broad, about four times as broad as foreparts. Head slightly longer than broad; dorsum unmodified. Gula broad, its sides scarcely converging in front; submentum and mentum distinct. Labial palpi slender. Maxillary palpi slender, segments 2 and 3 almost spindle-shaped. Antennal segments verticillate. Pronotal length subequal to maximum width; base and apex arcuate, sides sinuate, broadest at anterior angles. Legs long and slender; tarsi 5, 5, 5-segmented. Abdomen very distinctive (fig. 14, *d*); twice as broad as thick dorso-ventrally; segment 2 not inflated; second sternite present. Tergites, paratergites, and sternites augmented by secondary sclerotizations of the adjacent integument; the sclerites proper are clearly defined by the fact that they bear setae.

Termitozophilus laetus Silvestri. Figure 14, *c*, *d*.

Termitozophilus laetus Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p. 8 (Tacurúpucú, Paraguay, and Coxipó, Mato Grosso, Brazil; *Cornitermes similis* Hagen); 1903, Redia, **1**: 193, pl. 5, fig. 252, pl. 6, figs. 255-256; Bruch, 1931, Rev. Ent., **1**: 388, fig. 2.

Material examined.—A large series of specimens from 25 colonies of *Cornitermes cumulans* Kollar, one colony of *Cornitermes snyderi* Emerson, and one colony of *Cornitermes bequaerti* Emerson, collected by R. L. Araujo at various localities near São Paulo, Brazil; a series from four colonies of *Cornitermes cumulans* Kollar, from Passa Quatro, Minas Gerais, Brazil. This species was recorded from Posadas, Misiones, Argentina, by Bruch (1931). The *Cornitermes similis* Hagen as determined by Silvestri was *Cornitermes cumulans* Kollar.

Color reddish-brown, sternites sometimes paler; membranous integument white. Head with one seta medial to each eye and a pair of occipital setae. Pronotum with 8 setae on apical margin, 2 on each lateral margin, and 2 on disk. Each elytron with about 8 long setae. Tergites 3–6 with apical rows of 6 setae; tergite 7 without setae; tergite 8 with two rows of short setae, about 6 in each row. Inner paratergites of segments 3–7 with 5, 10, 9, 11, and 8 setae, respectively; outer paratergites with 5, 9, 9, 9, and 6 setae, respectively. Sternites with three rows of macrosetae; an apical row of about 10, a middle row of 6–8, and a basal row of about 8. First antennal segment a little more than twice as long as broad, thicker than the other segments; segments 2–4 long and slender, subequal, each a little shorter than the first; segments 5–10 increasing very slightly in width, each about twice as long as broad; segment 11 more than twice as long as segment 10, almost four times as long as broad.

Length, 3 mm. (abdomen extended).

Termitozophilus mirandus Mann

Corymbogaster miranda Mann, 1923, Zoologica, **3**: 347, text fig. 35 (Kartabo, British Guiana; *Cornitermes pugnax* Emerson; United States National Museum).

Material examined.—Type series.

Head, pronotum, and elytra light reddish-brown, sternites rufo-testaceous, their anterior margins brown; tergites pale reddish-brown. Head with two setae behind and slightly medial to each eye; pilosity of pronotum, elytra, and tergites as in *laetus*. Inner paratergites 2–7 with 2, 3, 2, 4, 3, 4 setae, respectively; outer paratergites 3–7 with 3, 4, 4, 4, 5 setae, respectively. Antennae (12: 6: 6: 4: 4: 5: 5: 4: 4: 4: 16) strongly incrassate, segments 1–4 very slender, 5–10 increasing

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FIG. 14. (a) *Termituncula gracilipes* Borgmeier. (b) *Autuoria elegantulum* Silvestri. (c) *Termitozophilus laetus* Silvestri; stenogastric, winged individual. (d) *Termitozophilus laetus* Silvestri; physogastric individual.


a
b
c
d

in width, segment 3 only two-fifths as broad as segment 10; segment 1 slender, its maximum width less than one-half its length, its posterior surface flattened; segments 2 and 3 slightly longer than broad; segment 4 small, subquadrate; 5 and 6 larger than 4, subquadrate; 7–10 slightly broader than long.

Length, 2.1 mm.

AUTUORIA Silvestri

Autuoria Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 309. Type species: *Autuoria elegantulum* Silvestri (not *A. orthocephali* Silvestri, MS., designated by Silvestri).

Differing from *Termituncula* and *Termitozophilus* in having 10-segmented antennae, 4, 5, 5-segmented tarsi, and distinctive abdominal structure. The abdomen is intermediate in degree of physogastry between *Termituncula* and *Timeparthenus;* the second segment is much inflated and pushes the elytra into a vertical position, the second tergite is small, but the second sternite is apparently absent. The abdomen is more compressed dorso-ventrally than in *Timeparthenus,* and the sternites and tergites are more generalized and not spaced so far apart.

Autuoria elegantulum Silvestri. Figure 14, *b*.

Autuoria elegantulum Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 310, text figs. V, 1–17 (Jabaquara, São Paulo, Brazil; *Cornitermes "autuorii* Silvestri"; Silvestri coll.).

Material examined.—Ten specimens, São Paulo (Ipiranga), Brazil, collected by R. L. Araujo, with *Paracornitermes emersoni* Araujo (determined by R. L. Araujo). It is possible that *"Cornitermes autuorii"* Silvestri (a manuscript name) is the same as *Paracornitermes emersoni* Araujo, as this termitophilous species occurs in colonies of both.

Head, thorax, elytra, and tergites bright yellow-brown, sternites yellow, legs and antennae yellow. Head shining, not punctured; pronotum and elytra very finely and sparsely punctured, without pubescence. Head with 2 vertexal setae; pronotum with 6 setae on apical margin, 2 on lateral border, and 2 tiny hairs in the middle of the basal margin. Elytra with one bristle near anterior angle and one on side border near hind angle. Tergites 2–6 with 6 bristles on apical margin; tergite 7 with one at each hind angle; tergite 8 with one sub-basal seta and an apical row of 8 bristles. Each paratergite with 2 or 3 bristles. Antennae not incrassate, the scape about equal to segments 2–4 combined, segments 2 and 3 subequal, perhaps slightly longer than broad, segment 4 a trifle shorter than 3; segments 4 and 5 subequal; segments 2–7 longer than broad, 8–10 subquadrate. Pronotum as broad as long.

Length, 2.6–3 mm.

TIMEPARTHENUS Silvestri

Timeparthenus Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p. 10; 1903, Redia, **1**: 196; 1946, Comm. Pont. Acad. Sci., **10**: 299; Fenyes, 1918, Gen. Insect., **173A**: 75. Type species: *Timeparthenus regius* Silvestri.

This genus has not been available for study. Silvestri's figures are so complete that identification of the genus should not be difficult. The distinctive abdomen and 4, 4, 5-segmented tarsi distinguish this genus from the preceding genera of the subtribe. The antennae are 10-segmented, and the terminal segment has two pairs of polytrichous sensilla. The abdomen is strongly hypertrophied, ovate, and incapable of being reflected over foreparts. Segments 2–5 are greatly expanded, segments 6 and 7 are less so, and segments 8 and 9 are small. The second segment is so large and extends so far forward that it obscures a view of the thorax from above. Tergites and sternites 3–6 are small, the paratergites are very small, and all sclerites are widely separated.

Timeparthenus regius Silvestri

Timeparthenus regius Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p. 11 (Coxipó, Cuyabá, Mato Grosso, Brazil; Silvestri coll.; *Anoplotermes tenebrosus* Hagen); 1903, Redia, **1**: 197, pl. 6, figs. 261–264; Hegh, 1922, Les Termites, fig. 412; Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 301, text figs. I, 1–3, II, 1–14.

Silvestri presented detailed figures of this and the following species but did not contrast them very well. There should be little difficulty in identifying specimens by comparing them with the figures. *Anoplotermes hageni* Snyder and Emerson (=*tenebrosus* Silvestri) is the new name for the host.

Timeparthenus oglobini Silvestri

Timeparthemus (sic) *oglobini* Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 303, text fig. III, 1–11 (Loreto, Misiones, Argentina; *Anoplotermes pacificus* Fr. Müller; Silvestri coll.).

Anoplotermes bequaerti Snyder and Emerson (=*pacificus* Fr. Müller) is the new name of the host.

PTOCHOLELLUS Silvestri

Ptocholellus Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 305. Type species: *Ptocholellus mimus* Silvestri.

Ptocholellus has not been available for study. Silvestri's diagnosis of this genus is not convincing but the long description and detailed figures suggest a number of small differences that may separate it from *Timeparthenus*. I shall make no attempt to evaluate these differences or to present a diagnosis. Silvestri states that the antennae are closer together than in *Timeparthenus* and the tergal glands of the seventh abdominal segment are widely separated.

Ptocholellus mimus Silvestri

Ptocholellus mimus Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 308, text fig. IV, 1–28 (Lagôa Santa, Minas Gerais, Brazil; *Anoplotermes ? turricola* Silvestri; Silvestri coll.).

Subtribe TERMITOGASTRINA

The neotropical genera of this subtribe were formerly placed in the Caloderae group of Oxypodini (Fenyes, 1918–21), or in the subtribe Termitogastri of the Aleocharini (Bernhauer and Scheerpeltz, 1926). The palaeotropical genera were scattered through several tribes, including the Hygronomini and Termitoptochini. Although the group doubtless forms an evolutionary unit it is not easy to characterize; this is due to the fact that the Termitogastrina include such different genera as the generalized *Termitophya* and the highly specialized *Paracorotoca*. A discussion of the phylogenetic relationships within the subtribe is presented elsewhere in the paper.

GENERIC GROUPS

A. Genera having the sixth and seventh tergites in a relatively generalized condition: The *Termitophya* group, including all the neotropical genera and two Old World genera, *Termitotima* Wasmann and *Idiogaster* Wasmann.

B. Genera having distinctively specialized sixth and seventh tergites (fig. 19, *d*) but not having the abdomen greatly inflated or predominantly membranous: The *Termitella* group, including four Old World genera, *Termitella* Wasmann, *Termitellodes* Seevers, *Affinoptochus* Kemner, and *Idioptochus* Seevers.

C. Genera having the sixth and seventh tergites as above and having large, ovate, predominantly membranous abdomens (fig. 19, *e*): The *Termitoptochus* group, including the Indomalayan *Termitoptochus* Silvestri and the African *Paracorotoca* Warren and *Millotoca* Paulian.

KEY TO NEOTROPICAL GENERA OF TERMITOGASTRINA

1. Inner margins of elytra contiguous; apex of elytra moderately to strongly emarginate (sutural length in *Termitopithus* only about one-half as long as outer margin) 2
   Inner margins of elytra divergent a short distance behind scutellum 7
2. Pronotum generalized, i.e., transverse, evenly convex, not impressed, subglabrous; seventh and eighth sternites with finely fluted sculpture. *Termitophya* Wasmann
   Pronotum and sternites otherwise 3
3. Pronotum so impressed as to be saddle-shaped; pronotum reddish-brown, subglabrous, elongated . . . . . *Termitopithus*, new gen.
   Pronotum otherwise 4
4. Abdomen strongly inflated; outer paratergites separated from inner paratergites and from sternites by membranous integument 5
   Abdomen broad and flat, with little membranous integument exposed; paratergites, tergites, and sternites contiguous; each inner paratergite about two-fifths as broad as tergite 6
5. Mentum-submentum as in fig. 18, *k;* pronotum with a narrow transverse impression terminating in pits . . . . . *Neotermitogaster* Seevers
   Mentum-submentum as in fig. 18, *a–j;* pronotum impressed differently. *Termitogaster* Casey
6. Seventh tergite one-third as long as broad . . . . . *Termitosyne*, new gen.
   Seventh tergite two-thirds as long as broad . . . . . *Termitosynodes*, new gen.
7. Pronotal disk not impressed; gula very narrow at some point. *Termitomorpha* Wasmann
   Pronotal disk impressed; gula moderately broad 8
8. Elytra with a longitudinal carina laterally . . . . . *Xenopelta* Mann
   Elytra without carina 9
9. Clypeus with a prominent medial horn . . . . . *Termitoides* Seevers
   Clypeus without medial horn 10
10. Entire pronotal disk impressed . . . . . *Xenogaster* Wasmann
   Pronotal disk not broadly impressed although with several minor impressions. *Trachopeplus* Mann

TERMITOPHYA Wasmann

Termitophya Wasmann, 1902, Ent. Tijd., **45**: 95; Fenyes, 1920, Gen. Insect., **173B**: 346; Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 19. Type species: *Termitophya heyeri* Wasmann.

Head capsule relatively generalized; clypeus strongly declivous or deflexed from a point behind the antennal fossae. Antennae geniculate; scape comparatively short, about equal to segments 3 and 4 together; segments 2–10 variable. Mentum-submentum (fig. 17, *a–i*) uniform in shape except for that of *T. amica.* Maxillary palpi relatively slender; segment 2 cornucopia-shaped, somewhat compressed; segment 3 ovoidal, usually more than twice as long as broad.

Pronotum about one-fifth broader than long; uniformly convex, never impressed; sides moderately arcuate, basal angles obsolete; two submarginal and one marginal seta present; surface smooth, shining, very minutely punctulate, glabrous except for extremely fine, sparse stubble. Elytra contiguous; apex shallowly emarginate. Abdomen feebly to moderately physogastric; non-sclerotized integument exposed to a limited extent in some species. Inner paratergites elevated moderately; ventral surface (sternites and outer paratergites) uniformly convex. Surface of sternites 7 and 8 distinctively fluted, i.e., with numerous longitudinal ridges and furrows.

Remarks.—Termitophya is comprised of the most generalized species of the subtribe Termitogastrina as evidenced by the following features: Head capsule without modifications; feebly geniculate antennae; gula and mentum-submentum not separated by a suture; maxillary palpi relatively generalized; pronotum and elytra generalized; abdomen not strongly physogastric.

The species of *Termitophya* present a uniform appearance but may be distinguished by variations in the following: proportions of antennal segments, sculpture and pilosity of head, pilosity of elytra, pilosity and sculpture of sternites, and shape and pilosity of mentum-submentum.

KEY TO SPECIES OF *TERMITOPHYA*

1. Each elytron with two pairs of erect setae; two supraorbital setae present. *punctata* Mann

   Each elytron with one pair of erect setae (three setae in *heyeri*); one supraorbital seta or none present 2

2. Head coarsely reticulated; sternites 3–6 reticulated 3

   Head not reticulated (finely and obsoletely so in *flaviventris*); sternites 3–6 not reticulated 4

3. Fine punctures of head obscured by reticulation; sternites 3–5 glabrous, or nearly so, at middle . . . . *amica* Mann

   Coarse punctures of head clearly visible; sternites 3–5 with a vestiture of pale erect hairs throughout . . . . *piliventris* Seevers

4. Median area of sternites 3–5 not different in vestiture from more lateral areas: the hairs moderately dense, uniformly distributed, recumbent, and rather pale; surface of sternites 3–5 distinctly punctulate. *holmgreni* Wasmann

   A wide median area (about two-thirds) of sternites 3–5 differing in vestiture from more lateral areas: either glabrous or with sparse, semi-erect hairs 5

5. Head coarsely punctate, the punctures rather deep and clear-cut; surface between punctures shining and without sculpture; median areas of sternites 3–5 with a vestiture of sparse, erect hairs (obvious only when abdomen is viewed in profile) 6

   Punctures of head not coarse, deep, and clear-cut (in some species they may be moderately coarse, but are shallow and indistinct); median area of sternites 3–5 almost glabrous (third sternite with a few short semi-erect hairs) . . 7

6. Chaetotaxy of mentum-submentum as in fig. 17, *a* . . . . *heyeri* Wasmann

   Chaetotaxy of mentum-submentum as in fig. 17, *i* . . . . *araujoi* Borgmeier

7. Second antennal segment longer than third (4 : 3); clypeus and anterior part of vertex finely reticulated . . . . *flaviventris* Mann

   Second antennal segment shorter than third; head not finely reticulated . . . 8

8. Elytra with two setae in a submarginal row; second antennal segment one-half as long as scape . . . . *inornata* Seevers
   Elytra with one seta on disk; second antennal segment less than one-half as long as scape 9
9. Median two-thirds of fifth sternite glabrous except for a very sparse stubble; mentum-submentum with pilosity as in fig. 17, *c;* fourth antennal segment one-half longer than third and broader . . . . *emersoni* Seevers
   Median area of fifth sternite with a vestiture of medium-sized pale, erect hairs; mentum-submentum with setae as in fig. 17, *f;* fourth antennal segment possibly a little longer and broader than third but not distinctly so. *ecuadoriensis* Seevers

Termitophya heyeri Wasmann. Figure 17, *a*.

Termitophya heyeri Wasmann, 1902, Tijd. Ent., **45:** 97, pl. IX, fig. 1 (São Leopoldo, Rio Grande do Sul, Brazil; *Eutermes fulviceps* Silvestri; Wasmann coll.).

Material examined.—Brazil: São Leopoldo (type); Blumenau, Santa Catarina (ex Reichensperger coll.).

Host records.—The identity of *Eutermes fulviceps* Silvestri is not known to termite specialists. The Blumenau specimens were accompanied by specimens of *Nasutitermes jaraguae* Holmgren and *N. itapocuensis* Holmgren.

One supraorbital seta and three elytral setae present. Head coarsely punctate, the rather deep and clear-cut punctures moderately dense although irregularly distributed. Head shining, with scarcely perceptible sculpture except along occipital border. Antennae (16, 9, 11, 11, 9, 8, 8, 8, 8, 8, 16) with segments 3 and 4 longer than any of segments 2–10; segment 2 a little more than one-half as long as scape. Sternites 3–5 with a uniformly distributed sparse vestiture of fine, erect hairs, the tips of which are bent (obvious in profile); sternites 3–6 smooth, shining.

Termitophya araujoi Borgmeier. Figure 17, *i*.

Termitophya araujoi Borgmeier, 1950, Rev. Ent., **21:** 670, figs. 62–67 (Parada Deodoro, Santo Amaro, São Paulo, Brazil; host not cited; Instituto Biológico, São Paulo).

Host record.—*Nasutitermes proximus* Silvestri (host of the holotype; determined by Emerson after publication of Borgmeier's paper).

This species has not been available for study, but judging from Borgmeier's description it is very close to *T. heyeri*. A slight difference in the chaetotaxy of the mentum-submentum is indicated in figures 17, *a* and 17, *i*. Borgmeier reported that *T. araujoi* may be distinguished from *T. heyeri* by its shorter basal segment of labial palpi and by the longer antennae (longer than head and pronotum), but it is very doubtful if Wasmann's description was accurate enough to allow a comparison.

Termitophya emersoni Seevers. Figures 15, *a*, 17, *c*.

Termitophya emersoni Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 14, pl. III, fig. 12 (Barro Colorado Island, Panama Canal Zone; *Nasutitermes ephratae* Holmgren; Chicago Natural History Museum).

Material examined.—Panama: Barro Colorado Island (type series). British Guiana: Kartabo.

Host records.—*Nasutitermes ephratae* Holmgren (Panama, British Guiana).

No supraorbital setae present; one elytral seta near outer apical angle. Head punctures medium-coarse and not very densely arranged; surface shining, intervals smooth except for a few almost imperceptibly fine punctules. Head with sparse, pale, short hairs. Antennae (16, 6, 6, 9, 8, 7, 6, 6, 6, 6, 14) with segment 2 less than one-half as long as scape; segments 2 and 3 subequal; segment 4 the longest of segments 2–10. Sternite 3 with sparse, short, semi-erect hairs; sternites 4–6 glabrous. Mentum-submentum as in figure 17, *c*.

Termitophya ecuadoriensis Seevers. Figure 17, *f*.

Termitophya ecuadoriensis Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 16, pl. III, fig. 14 (Gualaquiza, Ecuador; *Nasutitermes peruanus* Holmgren; American Museum of Natural History).

No supraorbital setae present; one elytral seta on disk. Head moderately densely punctate, the punctures of medium coarseness, shallow, and not clear-cut (possibly elongated); intervals semi-opaque, due to very fine, irregularly-spaced punctules; hairs short, pale, fine. Antennae (16, 6, 8, 8.5, 7, 7, 7, 7, 7, 7, 14) with segment 2 less than one-half as long as scape and a little shorter than any of segments 3–10; segments 3 and 4 subequal and longer than any of segments 5–10. Sternite 3 with sparse, fine, semi-erect hairs; sternite 4 with a wide median area almost glabrous; sternite 5 with sparse, semi-erect hairs, its surface almost without sculpture. Mentum-submentum as in figure 17, *f*.

Termitophya inornata Seevers. Figure 17, *g*.

Termitophya inornata Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 18 (Gualaquiza, Ecuador; *Nasutitermes dendrophilus* Holmgren; American Museum of Natural History).

No supraorbital setae present; two elytral setae in submarginal row. Head with punctures of medium coarseness, shallow, their outlines obscure; intervals semi-opaque, surface irregularly sculptured with confluent punctules or obsolescent reticulation (visible only with high magnification). Antennae (16, 8, 9, 9, 9, 8, 8, 7, 7, 7, 16) with segment 2 about one-half as long as scape; segments 3, 4, and 5 subequal and a little longer than segment 2 or any of segments 6–10. Sternites 3–6 smooth, very shining; sternite 3 with very sparse, short hairs; sternites 4 and 5 glabrous. Mentum-submentum as in figure 17, *g*.

FIG. 15. (a) *Termitophya emersoni* Seevers. (b) *Termitopithus crassiusculus* Seevers. (c) *Termitosyne platygastra* Seevers. (d) *Termitosyne platygastra* Seevers; dorsal view of abdomen. (e) *Termitomorpha fissipennis* Casey. (f) *Termitomorpha meinerti* Wasmann.

Termitophya flaviventris Mann. Figure 17, *e*.

Termitophya flaviventris Mann, 1923, Zoologica, **3**: 352 (Kartabo, British Guiana; *Nasutitermes costalis* Holmgren; United States National Museum).

Material examined.—British Guiana: Kartabo (type series). Trinidad, British West Indies: Arena Forest and Northern Range (ex Adamson coll.).

Host records.—*Nasutitermes costalis* Holmgren (British Guiana, Trinidad).

No supraorbital setae present; two elytral setae in submarginal row. Head with punctures of medium coarseness, not densely arranged. Clypeus and anterior part of vertex finely reticulated, but more posterior surface almost smooth. Head with sparse vestiture of fine short, pale hairs. Antennae (15, 8, 6, 7, 7, 6, 6, 6, 6, 6, 14) with segment 2 a little more than one-half as long as scape and longer than any of segments 3–10; segment 3 a little shorter than either 4 or 5. Sternites 3–6 smooth, very shining; sternite 3 with very sparse, pale hairs; sternites 4 and 5 glabrous. Mentum-submentum as in figure 17, *e*.

Termitophya holmgreni Wasmann. Figure 17, *d*.

Termitophya holmgreni Wasmann, *in* Wasmann and Holmgren, 1911, Zool. Anz., **38**: 429 (Mojos, Bolivia; *Eutermes mojosensis* Holmgren; Wasmann coll.).

Termitophya wasmanni Holmgren, *in* Wasmann and Holmgren, 1911, Zool. Anz., **38**: 429 (Chaquimayo, Peru; *Eutermes chaquimayensis* Holmgren and *Eutermes minimus* Holmgren). New synonymy.

Material examined.—Three syntypes in Wasmann collection labelled "types" of *Termitophya holmgreni* Wasmann; two "bei *Eutermes minimus* Holmgren, Chaquimayo, Peru, Holmgren, 1909" and one "bei *Eutermes chaquimayensis* Holmgren, Chaquimayo, Peru." I have designated the latter specimen as lectotype.

One specimen in Wasmann collection is labelled "*Termitophya wasmanni* Holmgren, type; bei *Eutermes ripperti;* Mojos, Bolivia," with an additional label "N. B., bei *Eutermes mojosensis* Holmgren (nicht *ripperti;* vgl. Holmgren)." Inasmuch as there are probably additional specimens in the Holmgren collection, the above specimen may be regarded as a syntype.

It may be noted that the locality and host records cited by Wasmann and Holmgren do not agree with the data accompanying the specimens. Evidently the data for the two species were interchanged in the manuscript before publication. It seems to me that the data in the collection must be assumed to be correct.

In addition to the specimens in the Wasmann collection, I have studied specimens from Rurrenabaque, Beni, Bolivia, collected with

FIG. 16. (a) *Termitogaster insolens* Casey. (b) *Termitogaster nigricollis* Silvestri. (c) *Xenopelta cornuta* Mann. (d) *Neotermitogaster colonus* Seevers. (e) *Xenogaster inquilina* Borgmeier.

Nasutitermes chaquimayensis Holmgren (ex W. M. Mann coll., USNM).

Remarks.—Careful examination of specimens of *T. holmgreni* and *T. wasmanni* in the Wasmann collection did not reveal the diagnostic features given by the two authors. The species were distinguished from one another by different antennal lengths, proportions of antennal segments, and pronotal and elytral proportions. Wasmann was very inaccurate in judging measurements and proportions and in this instance he erred in all of his estimates. The differences do not exist. Inasmuch as this is true, the confusion of locality and host data does not assume much importance.

No supraorbital setae present; elytra with two setae. Head with medium-coarse punctures densely arranged; the punctures not clearly distinct from each other, apparently because of an obsolescent reticulation of broken lines; surface dull. Antennae (15: 6: 8: 8: 8: 7: 7: 7: 7: 6: 14) with segment 2 less than one-half as long as scape, and not as broad as the following segments; segments 3, 4, and 5 subequal, only a little longer than any of segments 6–9. Sternites 3–5 with a rather conspicuous vestiture of moderately dense, pale, recumbent hairs; the median and lateral areas similarly clothed. Mentum-submentum as in figure 17, *d*. Pronotum about one-sixth broader than long. Elytra shorter than pronotum.

Termitophya piliventris Seevers. Figure 17, *b*.

Termitophya piliventris Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 17, pl. III, fig. 13 (Barro Colorado Island, Panama Canal Zone; *Nasutitermes columbicus* Holmgren; Chicago Natural History Museum).

One supraorbital seta present; two elytral setae in marginal row. Head punctures coarse and moderately dense, concentrated chiefly in a large circular area of vertex and becoming finer and less dense laterally and posteriorly. Head with a close-meshed coarse reticulation which does not obscure the punctation. Antennae (18, 7, 9, 10, 9, 9, 9, 8, 8, 8, 15) with segment 2 less than one-half as long as scape and shorter than any of the following segments; segment 4 the longest of segments 2–10; segments 3, 5, 6, and 7 subequal. Sternites 3–5 with a sparse vestiture of erect, pale hairs (conspicuous in profile), the median and lateral areas similarly clothed; sternites 3–6 finely reticulated. Mentum-submentum as in figure 17, *b*.

Termitophya amica Mann. Figure 17, *h*.

Termitophya amica Mann, 1923, Zoologica, **3**: 351 (Kartabo, British Guiana; *Nasutitermes guayanae* Holmgren; United States National Museum); Emerson, 1935, Ann. Ent. Soc. Amer., **28**: 369, fig. 4; Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 19.

Material examined.—British Guiana: Kartabo (type series). Trinidad, British West Indies: Valencia Forest (ex Adamson coll.).

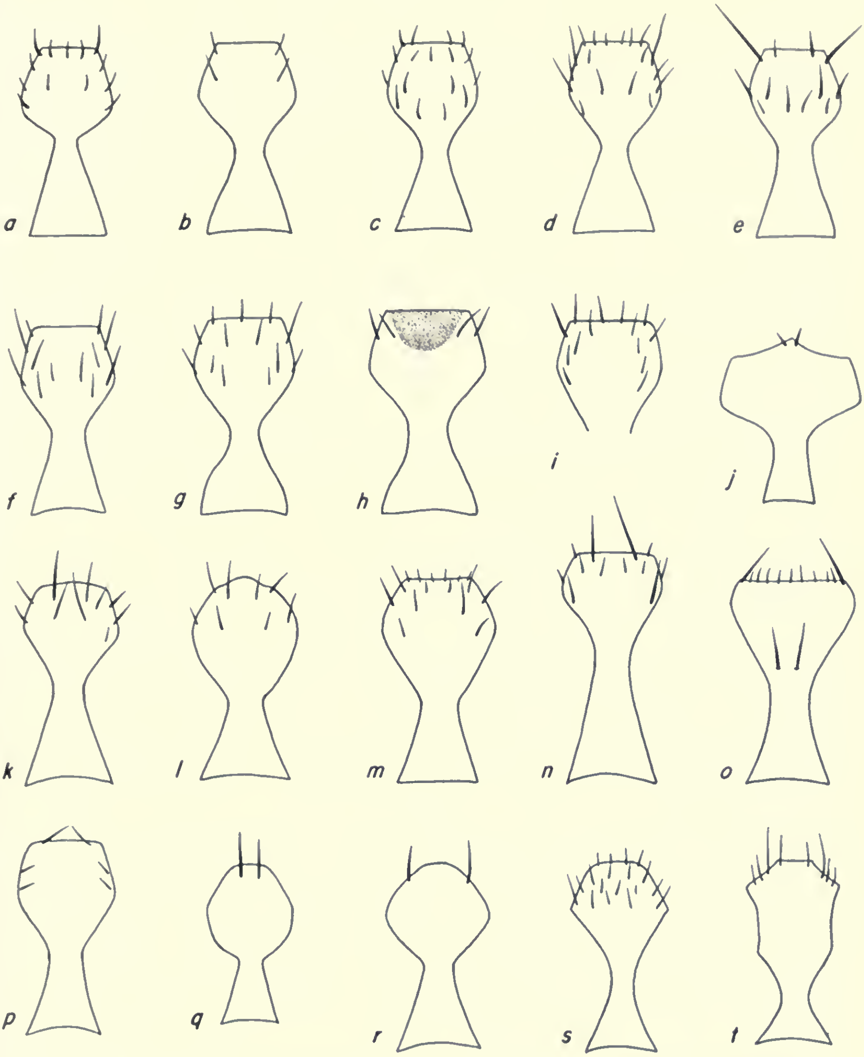


FIG. 17. Submentum-mentum and gula. (a) *Termitophya heyeri* Wasmann. (b) *Termitophya piliventris* Seevers. (c) *Termitophya emersoni* Seevers. (d) *Termitophya holmgreni* Wasmann. (e) *Termitophya flaviventris* Mann. (f) *Termitophya ecuadoriensis* Seevers. (g) *Termitophya inornata* Seevers. (h) *Termitophya amica* Mann. (i) *Termitophya araujoi* Borgmeier (after Borgmeier, 1950). (j) *Termitosynodes williamsi* Seevers. (k) *Xenogaster inflata* Wasmann. (l) *Xenogaster pilosula* Seevers. (m) *Xenogaster reichenspergeri* Seevers. (n) *Termitopithus crassiusculus* Seevers. (o) *Termitosyne platygastra* Seevers. (p) *Xenogaster glabriventris* Seevers. (q) *Xenogaster nana* Seevers. (r) *Xenogaster subnuda* Seevers. (s) *Xenogaster inquilina* Borgmeier. (t) *Termitoides marginatus* Seevers.

One supraorbital seta present; two elytral setae in submarginal row. Head punctures fine, sparsely and irregularly arranged; punctation almost obscured by a close-meshed coarse reticulation. Head dull; its fine, pale hairs short and sparse. Antennae (19, 7, 11, 11, 10, 9, 8, 8, 8, 8, 17) with segment 2 less than one-half as long as scape, and shorter than any of the following segments; segments 3 and 4 subequal in length, longer than any of segments 2–10. Sternite 3 with very sparse, semi-erect, short hairs; 4 and 5 glabrous; 3–6 with reticulated surface. Mentum-submentum distinctive in form and pilosity (fig. 17, *h*).

Termitophya punctata Mann

Termitophya punctata Mann, 1923, Zoologica, **3**: 349, text fig. 36 (Kartabo, British Guiana; *Nasutitermes guayanae* Holmgren; United States National Museum); Emerson, 1935, Ann. Ent. Soc. Amer., **28**: 369, text fig. 3.

Material examined.—British Guiana: Kartabo (one paratype).

Host record.—*Nasutitermes similis* Emerson (Emerson, 1935).

Two supraorbital setae and two pairs of elytral setae present.

TERMITOPITHUS, new genus

Type species: *Termitopithus crassiusculus*, new species.

Termitopithus seems to be closely allied to *Termitophya*, from which it differs in pronotal structure, elytra, and distinctive abdominal form. The head is in most respects like that of *Termitophya*, but the antennae are more geniculate. The elongated, saddle-shaped pronotum and the ovate, very membranous abdomen are very distinctive.

Head similar to that of *Termitophya;* vertex flat or feebly concave; clypeus moderately declivous from approximately the level of the posterior margins of antennal fossae. Antennae strongly geniculate, scape about equal to the three following segments combined; scape somewhat thickened in its basal two-thirds when viewed from side, anterior face of scape produced basally to an acute ridge and deeply concave in its apical one-third. Antennal segment 2 subequal to segments 3 and 4 combined, its anterior face concave; segments 3–10 short, cylindrical.

Mentum-submentum (fig. 17, *n*) not especially distinctive, not separated from gula by a suture. Maxillary palpi unusually small for the subtribe; segment 2 cornucopia-like, its basal one-third attenuated; segment 3 oval, about three-fourths as wide as long; segment 4 awl-shaped.

Pronotum distinctively saddle-shaped, one-tenth longer than maximum width; entire disk shallowly concave, without pits or elevations; apical margin strongly arcuate, anterior angles almost obsolete. Pronotum widest midway between apex and base; sides arcuately convergent in front and posteriorly sinuate to the base; basal angles almost rectangular, base about five-sixths the maximum width. Inner margins of elytra contiguous; sutural length only about one-half as long as outer margins; apical margin of each elytron strongly oblique. Elytra and pronotum about equal in length.

Abdomen strongly physogastric, ovate in form and permanently recurved over foreparts. Tergites 3–6 moderately large, separated by membranous integument, tergites 6 and 7 contiguous, tergite 7 much larger, about four-sevenths as long as broad. Sternites widely separated by membranous cuticle; sternite 3 very large, shield-like, separated from metasternum by considerable non-sclerotized cuticle; sternites 4–6 very broad, strap-like.

Termitopithus crassiusculus, new species. Figures 15, *b*, 17, *n*.

Holotype from Blumenau, Santa Catarina, Brazil (ex Reichensperger collection). In collection of Chicago Natural History Museum.

Paratypes.—Six specimens, same data as holotype. One specimen, Ilha Grande, Rio de Janeiro, Brazil, collected October 9, 1944, by Helmut Sick. Paratypes in Chicago Natural History Museum, Reichensperger collection, United States National Museum, and Wasmann collection.

Host.—*Nasutitermes aquilinus* Holmgren (both localities).

Head, pronotum, and elytra light reddish-brown, tergites light-brown, sternites pale testaceous. Head smooth, not reticulated, but with an almost imperceptibly fine punctulation. Pronotal disk smooth, shining, impunctate, and with only traces of reticulation medially; sides coarsely reticulated, sparsely punctate, the punctures obscured by reticulation. Elytral disk smooth, shining, not reticulated, but with a sparse fine punctation in basal half; sides coarsely reticulated and sparsely punctate on basal two-thirds. Tergites with a reticulation of moderately coarse raised lines, most conspicuous on tergites 7 and 8. Sternites with a broad medial smooth area without reticulation, and bearing only scattered setigerous punctures; the sternites are dull in appearance on the sides of the abdomen as the setigerous punctures become coarse and densely arranged and as the surface becomes coarsely reticulated (the general appearance is that of coarse granulation).

Head with scattered, very inconspicuous, fine short hairs. Pronotal disk with extremely few, very fine hairs; sides with a moderate number of fine pale hairs, especially along lateral margins near humeri. Elytra with sparse, fine hairs near base and on sides. Tergites 3–5 with few hairs except in the apical row; 6–8 with moderately dense vestiture of fine pale hairs; sternites with vestiture of erect pale hairs, among which are a number of longer, darker setae. Sternites 4–7 sparsely clothed with erect pale hairs medially, and with a few longer darker hairs in basal and apical rows. Sternites with a much denser pubescence laterally, sternite 8 rather hairy. Postgenae (lateral to gula), prosternum, and metasternum with a number of moderately long pale hairs.

Antennae (42, 18, 9, 9, 9, 8, 8, 8, 8, 8, 18) with the scape and segment 2 modified as for the genus; segment 2 twice as long as any of segments 3–10; segments 3–5 subequal in length.

Length of head and thorax, 2 mm.; abdomen, 2.6 mm.

TERMITOSYNE, new genus

Type species: *Termitosyne platygastra*, new species.

Head subequal in length and width or slightly longer than broad; clypeus feebly declivous, its border slightly emarginate; head feebly elevated between antennal fossae; vertex with a shallow, V-shaped impression. Antennae geniculate; scape relatively long, about equal to segments 2–5 combined. Mentum-submentum distinctive in form (fig. 17, *o*).

Pronotum transverse; disk broadly impressed but more superficially than in *Xenogaster*. Elytra contiguous. Abdomen distinctive; very broad, dorsum almost flat; sclerites of each segment contiguous; relatively little non-sclerotized cuticle exposed. Inner paratergites very large, two-fifths or more as broad as tergites, in the same plane as tergites; outer paratergites small. Convex ventral surface of abdomen occupied by the large sternites.

Termitosyne platygastra, new species. Figures 15, *c*, *d*, 17, *o*.

Holotype from Blumenau, Santa Catarina, Brazil (ex Reichensperger collection). In collection of Chicago Natural History Museum.

Paratypes.—Nineteen specimens, same data as holotype. One specimen, Ilha Grande, Rio de Janeiro, Brazil, collected October 9, 1944, by Helmut Sick. Four specimens, Passa Quatro, Minas Gerais, Brazil (ex Reichensperger collection). Paratypes in collections of Chicago Natural History Museum, Reichensperger, Borgmeier, and United States National Museum.

Head coarsely reticulated and with a moderately dense covering of short pale hairs. Pronotum reticulated, moderately densely clothed with short pale hairs; the impressed area with feeble asperities. Elytra with a fairly dense vestiture of pale semi-recumbent hairs. Tergites glabrous except for a very few pale hairs and with almost no traces of reticulation; inner paratergites reticulated; sternites smooth and shining, with a sparse vestiture of pale hairs, more dense on terminal segments.

Antennae (46, 6, 10, 10, 10, 10, 10, 9, 8, 8, 20) with segment 2 unusually small, only one-seventh as long as scape; segments 3–8 not appreciably different. Segment 2 of maxillary palpi cornucopia-like, its inner surface concave; distinctive segment 3 slightly wider than long, its surface spongy except for a conspicuous flattened area dorsally. Mentum-submentum distinctive (fig. 17, *o*).

Pronotum a little less than one-fifth broader than long; disk broadly and shallowly impressed, deepest near middle. Elytra contiguous for a distance and diverging feebly behind middle.

Proportions of tergites and inner paratergites of abdomen as follows: Fourth paratergite (42 × 38) almost one-half as broad as tergite (90 × 36); fifth paratergite (42 × 40) almost one-half as broad as tergite (90 × 36); sixth paratergite (42 × 36) about one-half as broad as tergite (90 × 40); seventh paratergite (36 × 30) about four-fifths as broad as tergite (86 × 30). Seventh tergite trapezoidal, almost three times as wide as long, its surface slightly convex medially and slightly reflexed laterally; seventh paratergite triangular, its inner margin oblique, its outer margin arcuate.

Length, 4 mm. (with abdomen extended).

TERMITOSYNODES, new genus

Type species: *Termitosynodes williamsi*, new species.

Similar to *Termitosyne*, especially in the form of the abdomen, but differing in a number of respects: clypeus strongly deflexed; maxillary palpi distinctive; mentum-submentum distinctive; antennal proportions different; pronotum broader and distinctively impressed; seventh tergite distinctively elongated (two-thirds as long as broad; only one-third as long as broad in *Termitosyne*); seventh inner paratergite distinctive.

Head slightly broader than long; clypeus almost vertically deflexed to the apical margin, and elevated to form a transverse ridge between antennal fossae; vertex broadly concave. Maxillary palpi not modified as in *Termitosyne*. Mentum-submentum distinctive (fig. 17, *j*).

Pronotum transverse; disk broadly impressed except for a central eminence. Elytra contiguous, except diverging slightly behind middle.

Abdomen similar in form to that of *Termitosyne;* very broad, with little non-sclerotized cuticle and with very large inner paratergites. Seventh tergite extremely long, about two-thirds as broad as long; seventh paratergite distinctive in form.

Termitosynodes williamsi, new species. Figure 17, *j*.

Holotype from Guayaquil, Ecuador, collected by F. X. Williams. In the collection of United States National Museum.

Paratype.—One specimen, same data as type; in collection of Chicago Natural History Museum.

Host.—Nasutitermes nigriceps Haldeman.

Head strongly shining, weakly reticulated, obsoletely so near base; sparsely setose, with a few clypeal setae and one occipital pair. Pronotum shining, feebly and irregularly reticulated; setae on anterior and lateral margins and a few on disk. Tergites and paratergites smooth, shining, with a few traces of reticulation and only feebly punctulate; with a row of long, pale, semi-erect hairs. Sternites sparsely and irregularly punctulate and reticulate; with a sparse vestiture of pale, erect hairs, conspicuous only when viewed in profile.

Antennae (42, 10, 11.5, 11.5, 10, 9, 9, 8, 8, 8, 18) with segment 2 about one-fourth as long as scape; segments 3 and 4 equal in length; segments 5–10 not appreciably different. Mentum-submentum distinctive (fig. 17, *j*).

Pronotum about three-tenths broader than long; entire disk impressed except for a central eminence. Relative widths of tergites and inner paratergites of abdomen as follows: fourth paratergite (30) almost one-half as wide as tergite (65); fifth paratergite (32) less than one-half as wide as tergite (70); sixth paratergite (32) more than two-fifths as wide as tergite (73); seventh paratergite (26) two-fifths as wide as tergite (68). Seventh tergite and inner paratergites very long, the latter with a distinctive form, its outer margin broadly arcuate in front, becoming deeply emarginate and sinuate behind the middle. Outer paratergites extremely thin, often located with difficulty. Sternites convex; seventh broadly and deeply emarginate medially.

Length, 2.5 mm.

TERMITOMORPHA Wasmann

Termitomorpha Wasmann, 1894, Krit. Verz., p. 210; Fenyes, 1920, Gen. Insect., **173B**: 346. Type species: *Termitomorpha meinerti* Wasmann.

Thaxteria Fenyes, 1921, Bull. Mus. Comp. Zool., **65**: 17. Type species: *Thaxteria insularis* Fenyes. New synonymy.

Termitosomus Seevers, 1939, Amer. Mus. Nov., no. 1018, p. 3; 1946, Rev. Ent., **17**: 253; Borgmeier, 1950, Rev. Ent., **21**: 638. Type species: *Termitosomus fissipennis* Casey.

Clypeus moderately declivous or abruptly and strongly deflexed some distance in front of antennal fossae. Antennae strongly geniculate, rather slender. Gula (fig. 18, *m*) very slender, widest at base. Mentum-submentum variable (fig. 18, *l*, *m*); in general longer than broad and in most cases with parallel sides; surface often broadly impressed near base. Surface of maxillae broadly impressed basally, maxillary palpi large, segment 2 approximately triangular, its upper margin arcuate; segment 3 oval in outline, segment 4 subulate.

Pronotum transverse, evenly convex, not impressed, its sides nearly parallel. Elytra not contiguous, their inner margins diverging strongly behind the scutellum; inner one-half to one-third of elytra coriaceous to hyaline; elytral apices narrow. Wings vestigial. Prosternum very short, usually with a median elevation.

Abdomen only moderately physogastric, and with limited areas of membranous integument; rather termite-like in appearance in some species. Tergites strongly convex, paratergites contiguous with each other and with sternites and tergites; abdomen usually medio-laterally compressed.

Remarks.—*Termitosomus* Seevers was, at my suggestion, placed in synonymy by Borgmeier (1950). *Thaxteria* Fenyes is also a synonym of this genus. Fenyes incorrectly determined the tarsal formula of that genus to be 4, 4, 4 and placed *Thaxteria* near *Corotoca*. Examination of the type of *Thaxteria insularis* Fenyes confirmed my suspicion that it is a synonym of *Termitomorpha meinerti* Wasmann.

KEY TO SPECIES OF *TERMITOMORPHA*

1. Outer margin of hind femora obtusely dentate due to an arcuate emargination of the proximal two-thirds; clypeus with two cariniform tubercles medially. *fissipennis* Casey

   Hind femora not dentate; clypeus without tubercles....................2

2. Mesothoracic trochanter with a dentiform tubercle....................3

   Mesothoracic trochanter without a dentiform tubercle....................4

3. Second antennal segment compressed and as long as segments 3 and 4 combined.......................*huachii* Seevers

   Second antennal segment not compressed and about three-fourths as long as segments 3 and 4 combined....................*meinerti* Wasmann

4. Clypeus flat for a short distance in front of antennal fossae to an arcuate "margin" and then sharply deflexed to its anterior border; lateral and apical margins of mentum-submentum almost straight.........*costaricensis* Seevers

Clypeus declivous to its anterior border, but not abruptly deflexed; apical margin of mentum-submentum strongly arcuate, the apical angles obsolete. *manni* Seevers

Termitomorpha meinerti Wasmann. Figures 15, *f*, 18, *l*.

Termitomorpha meinerti Wasmann, 1894, Krit. Verz., p. 211 (Las Trincheras, Venezuela; *Eutermes meinerti* Wasmann; University of Copenhagen Museum).

Thaxteria insularis Fenyes, 1921, Bull. Mus. Comp. Zool., **65**: 18 (Grand Etang, Grenada; Museum of Comparative Zoology). New synonymy.

Termitogaster simulans Mann, 1923, Zoologica, **3**: 338, text fig. 32 (Kartabo, British Guiana; *Nasutitermes costalis* Holmgren). New synonymy.

Termitosomus simulans Mann, Seevers, 1939, Amer. Mus. Nov., no. 1018, p. 3, text figs. 7, 21, 24; 1946, Rev. Ent., **17**: 253.

Material examined.—British Guiana: Kartabo (type series of *T. simulans* Mann). Grenada: Grand Etang (type of *T. insularis* Fenyes). Trinidad, British West Indies: Northern Range (ex Adamson coll.).

Host records.—Nasutitermes meinerti Wasmann (Venezuela); *Nasutitermes costalis* Holmgren (British Guiana, Trinidad, Grenada).

Color reddish-brown. Clypeus elevated to form a transverse ridge and then rather steeply declivous to its feebly emarginate border. Antennal scape longer than segments 2, 3, 4 combined; segment 2 about three-fourths longer than 3; segment 3 longer than 4; segments 4–10 gradually decreasing in length. Mentum-submentum distinctive (fig. 18, *l*). Pronotum with sides converging slightly toward base; its apex broadly arcuate; base arcuate but with a medial shallow emargination and lateral sinuations. Prosternum broadly elevated at middle but not tuberculate or carinate. Hind femora not modified. Mesothoracic trochanter with a dentiform tubercle.

Remarks.—Although I have not examined the type of *T. meinerti* there is little doubt that *T. simulans* is a synonym of it. This, however, should be checked as soon as possible. Fenyes' *insularis* is a synonym of Mann's *simulans* and presumably of *meinerti* also.

Termitomorpha huachii Seevers

Termitomorpha huachii Seevers, 1946, Rev. Ent., **17**: 254 (Huachi, Beni, Bolivia; *Nasutitermes* sp. indet., worker caste only; United States National Museum).

Closely related to *T. meinerti* from which it differs in antennal structure: Antennae with a very long scape, equal to segments 2–5 combined; segment 2 compressed and elongated, equal to segments 3 and 4 combined.

Termitomorpha fissipennis Casey. Figures 15, *e*, 18, *m*.

Termitogaster fissipennis Casey, 1890, Ann. N. Y. Acad. Sci., **5**: 187 (Panama; no host cited; United States National Museum).

Termitogaster simopelta Mann, 1923, Zoologica, **3**: 341, text fig. 33 (Kartabo, British Guiana; *Nasutitermes costalis* Holmgren; United States National Museum).

Termitosomus fissipennis Casey, Seevers, 1939, Amer. Mus. Nov., no. 1018, p. 3, text figs. 8, 20, 23; Seevers, 1946, Rev. Ent., **17**: 253.

Material examined.—Panama: (Casey's type). In addition, Barro Colorado Island, Canal Zone. British Guiana: Kartabo (types of *T. simopelta* Mann). Trinidad, British West Indies: Northern Range (ex Adamson coll.). Costa Rica: Hamburg Farm (ex Nevermann coll., USNM).

Host records.—*Nasutitermes corniger* Motschulsky (Panama, Costa Rica). *N. costalis* Holmgren (British Guiana, Trinidad).

Color flavo-testaceous; each elytron with a broad, reddish, longitudinal stripe. Clypeus almost flat for a short distance and then strongly deflexed to its anterior border, which has a moderately deep median notch flanked by fine, acute processes. Clypeus at point of deflexion with two broad cariniform tubercles. Antennal scape equal to segments 2, 3, and 4 combined; segments 2 and 3 subequal in length; segment 4 a little more than one-half as long as 3; 4–10 very similar, decreasing very slightly in length. Mentum-submentum distinctive (fig. 18, *m*). Pronotal apex arcuate, base nearly straight, and sides almost parallel. Prosternum with an acute tubercle at middle. Outer margin of hind femora obtusely dentate due to an arcuate emargination of the proximal two-thirds. Mesothoracic trochanter with small dentiform tubercle.

Termitomorpha costaricensis Seevers

Termitosomus costaricensis Seevers, 1946, Rev. Ent., **17**: 255 (Hamburg Farm, Santa Clara Prov., Costa Rica; *Nasutitermes* sp.; United States National Museum).

Material examined.—Costa Rica: Hamburg Farm (type) and Ibera, Santa Cruz, with *Nasutitermes corniger* Motschulsky.

Color light reddish-brown. Clypeus almost flat for a distance in front of antennal fossae and then strongly deflexed to its anterior border, the deflexion producing an arcuate "margin" which is evenly rounded at middle but obliquely carinate laterally; with a convex longitudinal elevation between antennal fossae. Mentum-submentum distinctive, more strongly setose than in *meinerti;* its basal one-half transversely concave, and the apical half strongly reflexed dorsad. Pronotal base feebly arcuate but with a relatively deep medial notch due to an impression of adjacent surface and moderately strong lateral sinuations. Hind femora and middle trochanters not modified.

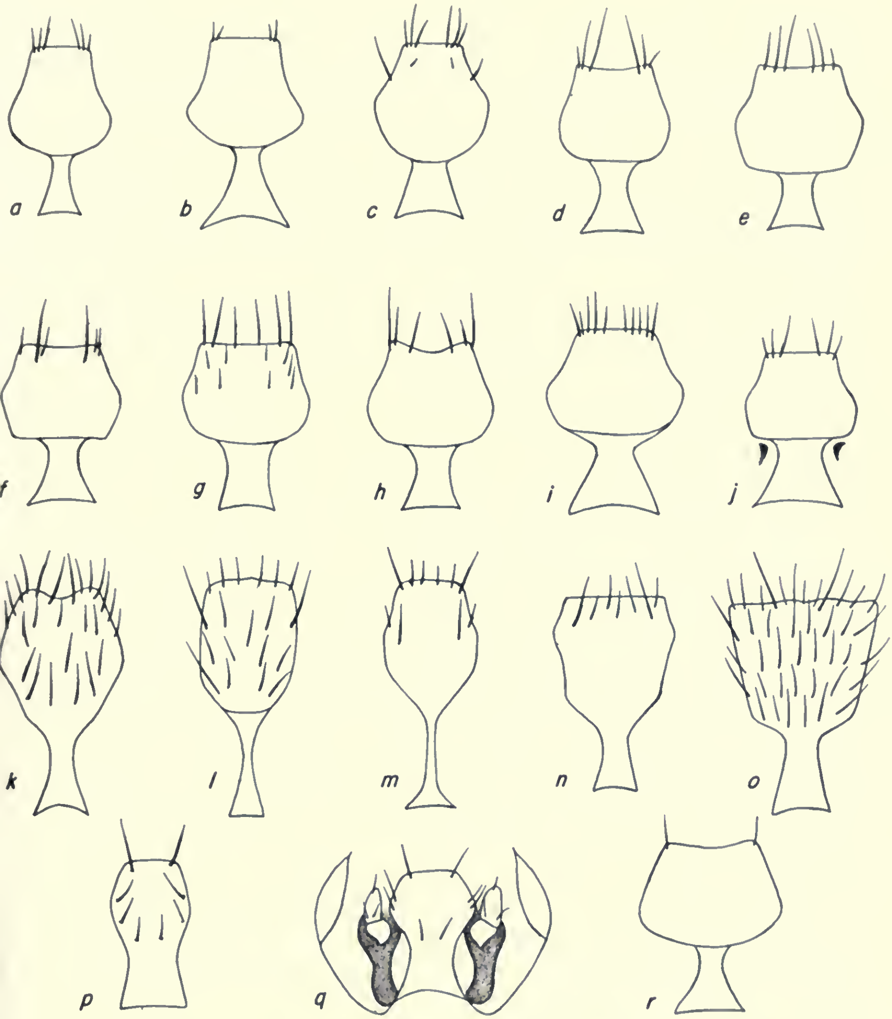


FIG. 18. Submentum-mentum and gula. (a) *Termitogaster insolens* Casey. (b) *Termitogaster puncticeps* Seevers. (c) *Termitogaster impressicollis* Seevers. (d) *Termitogaster beniensis* Seevers. (e) *Termitogaster nigricollis* Silvestri. (f) *Termitogaster wenzeli* Seevers. (g) *Termitogaster emersoni* Mann. (h) *Termitogaster chavantinae* Seevers. (i) *Termitogaster bicolor* Seevers. (j) *Termitogaster diversicollis* Seevers. (k) *Neotermitogaster colonus* Seevers. (l) *Termitomorpha meinerti* Wasmann. (m) *Termitomorpha fissipennis* Casey. (n) *Trachopeplus disjunctipennis* Seevers. (o) *Xenopelta cornuta* Mann. (p) *Termitella foveolata* Reichensperger. (q) *Termitella lujae* Wasmann, under side of head illustrating the deep postgenal sulci. (r) *Idioptochus lehmensicki* Seevers.

Termitomorpha manni Seevers

Termitosomus manni Seevers, 1946, Rev. Ent., **17**: 253 (Rurrenabaque, Beni, Bolivia; *Nasutitermes peruanus* Holmgren and *N. pilosus* Snyder; United States National Museum).

Color light reddish-brown. Clypeus with a low, transversely arcuate, smooth elevation, and then strongly declivous to the feebly arcuate anterior border. Antennae with a very long scape, about as long as segments 2–5 combined; scape somewhat compressed, especially near base; segment 2 about one-fourth longer than 3; segment 3 about one-third longer than 4; segment 4 a little longer than 5; 6–10 subequal. Pronotum with strongly arcuate apical margin, straight sides, and broadly arcuate base, which is slightly notched at middle and sinuate laterally. Prosternum broadly and convexly elevated at middle. Hind femora not modified; middle trochanters without dentiform tubercle.

TRACHOPEPLUS Mann

Trachopeplus Mann, 1923, Zoologica, **3**: 353; Seevers, 1939, Amer. Mus. Nov., no. 1018, p. 6. Type species: *Trachopeplus setosus* Mann.

Head wider than long; feebly elevated between antennal fossae; clypeus feebly declivous, its apical margin strongly arcuate; vertex with shallow, narrowly confluent depressions behind antennal fossae. Gula moderately broad, not separated from mentum-submentum by a suture. Mentum-submentum distinctive (fig. 18, *n*). Maxillary palpi with an unusually long cornucopia-shaped segment 2, very narrow at base and broad at apex; segment 3 large, broad at base, its sides convergent to the slender apex; segment 4 subulate. Antennae geniculate, scape somewhat longer than the three following segments combined.

Pronotum transverse; its basal and apical margins bisinuate, lateral margins almost straight, and disk with a deep transverse impression in front of the middle and usually with other smaller depressions and elevations. Elytra large; strongly divergent except for a short distance at base; the medial margins deflexed. Wings vestigial.

Abdomen similar to that of *Termitogaster;* dorsum slightly convex, venter strongly so; sclerites of a given segment almost contiguous, but with some non-sclerotized cuticle exposed between segments; inner paratergites moderate in size, not elevated; outer paratergites smaller.

Trachopeplus setosus Mann

Trachopeplus setosus Mann, 1923, Zoologica, **3**: 354, text fig. 37 (Kartabo, British Guiana; *Nasutitermes acajutlae* Holmgren; United States National Museum).

Host record.—Nasutitermes nigriceps Haldeman (=*acajutlae* Holmgren).

This species has not been available for study and the original description did not characterize the species very thoroughly.

Trachopeplus disjunctipennis Seevers. Figure 18, *n*.

Trachopeplus disjunctipennis Seevers, 1939, Amer. Mus. Nov., no. 1018, p. 6, text figs. 13, 17, 25, 28, 32, 34 (El Coco, near Bolivar, Ecuador; *Nasutitermes pilifrons* Holmgren; American Museum of Natural History).

Host record.—Nasutitermes nigriceps Haldeman (=*pilifrons* Holmgren).

This species is closely allied to *T. setosus* Mann but seems to differ in details of chaetotaxy and in the form and contours of the pronotum.

Color dark brown; abdomen reddish-brown, darker apically. Head, pronotum and elytra densely, evenly, very minutely punctulate and microscopically pubescent. Clypeus with about 13 setae, vertex with two pairs of medial setae; occiput and postgenae with a row of about 9 setae extending forward below the eye. Pronotum with 4 setae on apical margin, 8 on each lateral margin, about 8 in a semi-circular subapical row, about 4 in a submarginal row on each side, and about 12 in the area behind the U-shaped impression. Elytra with 3 marginal setae and 6 discal setae. Third tergite with an apical row of 8 black setae and a few pale ones; tergites 4–7 with an apical row of 9 and a subapical row of 8 stout setae; eighth tergite with 6 apical setae and 8 in a row about the middle; ninth tergite with an apical row of 6 and a middle row of 4; paratergites with 3 or 4 stout setae. Sternites with three or four rows of stout black setae.

Pronotum about three-fourths as long as wide; anterior and basal borders bisinuate; the latter more strongly arcuate medially; anterior angles truncate; sides nearly parallel, slightly produced at the insertion of each bristle so as to appear feebly scalloped. Pronotal disk in front of middle with a broad, deep, transverse impression which bends and extends to basal border; this impression encloses a broad, low eminence; surface adjacent to apical margin shallowly impressed on each side.

Length, 3–3.5 mm.

TERMITOGASTER Casey

Termitogaster Casey, 1889, Ann. N. Y. Acad. Sci., **4**: 63; Fenyes, 1920, Gen. Insect., **173B**: 345; Mann, 1923, Zoologica, **3**: 338; Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 11; 1939, Amer. Mus. Nov., no. 1018, p. 1; 1946, Rev. Ent., **17**: 248. Type species: *Termitogaster insolens* Casey.

Dorsum of head having only minor elevations and depressions; clypeus slightly declivous to shallowly concave but never abruptly deflexed, its margin straight to rather deeply emarginate. Antennal scape about as long as segments 2, 3, and 4 combined; antennal segments variable, especially 2–4. Maxilla with cardo prolonged laterally or not; palpi variable. Mentum-submentum of distinctive form as a rule (fig. 18, *a–j*); separated from gula by a suture.

Pronotum, as a rule, robust, strongly convex, black in color, and with only minor impressions and elevations; but in a few cases lighter in color, not as convex, and with the disk broadly impressed. Pronotum averaging about one-tenth broader than long, but subequal in length and width in at least one case. Elytra with inner margins contiguous throughout.

Abdomen strongly physogastric, probably held in a vertical position. Sides of abdomen with moderately extensive areas of white non-sclerotized integument. Tergites subequal in length, strongly transverse; inner paratergites triangular in shape, the fifth strongly attenuated. Outer paratergites very slender, oblique.

Remarks.—The following structures seem to exhibit little variation within the genus: abdominal structure and chaetotaxy, pronotal chaetotaxy, elytra, sternum, legs.

The antennae are variable in the proportions of their segments, and the following table may be useful for comparative purposes. These are relative lengths and are subject to minor intraspecific variation.

	Scape	2	3	4	5	6	7	8	9	10	11
insolens	34	10	12	8	8	7	7	7	7	7	18
testaceus	34	12	11	8	8	7	7	7	7	7	18
puncticeps	42	12	13	10	9	9	8	8	8	8	18
brevis	32	9	9	7	6	7	7	6	6	6	17
emarginatus	40	12	12	9	9	8	7	7	6	6	18
impressicollis	40	14	14	12	9	8	8	8	8	8	18
bicolor	34	11	12	8	8	7	7	6	6	6	17
emersoni	38	10	11	9	8	7	7	7	7	7	18
chavantinae	36	10	12	9	8	8	8	8	7	7	20
wenzeli	36	13	9	9	8	7	7	6	6	6	16
nigricollis	40	14	11	10	8	8	7	7	7	6	16
beniensis	36	12	12	10	9	8	8	8	7	7	18
diversicollis	34	10	12	9	8	8	8	8	8	7	18
magdalenae	32	10	9	8	8	8	7	7	6	6	18

The dimensions of the pronotum are variable: the pronotum is one-tenth to one-fifth wider than long in most cases—*impressicollis, emarginatus, emersoni, chavantinae, nigricollis, beniensis, bicolor, insolens, testaceus, magdalenae;* less than one-tenth wider than long in a few species—*puncticeps, wenzeli,* and *brevis;* the width and length nearly equal—*diversicollis.*

KEY TO SPECIES OF *TERMITOGASTER*

1. Cardo of maxilla acuminately produced laterally 2
   Cardo of maxilla not produced 4
2. Dorsum of head densely and coarsely punctate . . . . *puncticeps* Seevers
   Dorsum of head finely punctulate 3
3. Pronotum piceous, strongly convex, its disk with only feeble impressions; antennal segment 3 longer than 2 . . . . *insolens* Casey
   Pronotum testaceous, its disk strongly impressed; antennal segment 2 slightly longer than 3 . . . . *testaceus* Seevers
4. Legs relatively short; neither metathoracic femora nor tibiae longer than pronotum; surface of head between antennae elevated; clypeus concave, its border moderately emarginate . . . . *brevis* Mann

Legs longer; both metathoracic femora and tibiae at least one-third longer than pronotum; surface of head otherwise 5

5. Clypeus very deeply emarginate . . . . *emarginatus* Seevers
Clypeus at most shallowly emarginate 6

6. Vertex coarsely and uniformly punctate 7
Vertex finely and uniformly punctulate, or if the surface behind the eyes is moderately coarsely punctate, the vertex is almost impunctate medially . . . 8

7. Pronotal disk more or less flattened, and with irregular impressions; disk brown, outer one-fourth of pronotum black; mentum-submentum distinctive (fig. 18, *i*); head with one occipital seta on each side . . . . *bicolor* Seevers
Disk of pronotum not flattened appreciably but with several moderately deep impressions; pronotum not conspicuously bicolored, although areas of disk may be rufo-piceus; mentum-submentum distinctive (fig. 18, *c*); head with two or three occipital setae on each half . . . . *impressicollis* Seevers

8. Pronotum distinctly transverse, usually about one-tenth broader than long; pronotum convex and with only minor impressions 9
Pronotum nearly equal in length and width; pronotum brown, its entire disk strongly impressed, and with a sub-basal eminence within the impression. *diversicollis*, new sp.

9. Antennal segment 2 longer than 3 10
Antennal segment 2 subequal to segment 3 or shorter 11

10. Chaetotaxy of mentum-submentum as in fig. 18, *e;* dorsum of head moderately coarsely and densely punctate except for medial areas of vertex and occiput . . . . *nigricollis* Silvestri
Chaetotaxy of mentum-submentum as in fig. 18, *f;* dorsum of head very finely punctulate . . . . *wenzeli*, new sp.

11. Vertex with a pair of setae between antennal fossae in a line with their posterior margins . . . . *emersoni* Mann
Vertex without the above-mentioned vertexal setae 12

12. Antennal segment 3 longer than 2; mentum-submentum distinctive (fig. 18, *h*) . . . . *chavantinae*, new sp.
Antennal segment 3 equal to 2; mentum-submentum not as above 13

13. Mentum-submentum distinctive; one occipital seta on each side. *magdalenae* Seevers
Mentum-submentum distinctive (fig. 18, *d*); two or three occipital setae on each side . . . . *beniensis* Seevers
(*Termitogaster wasmanni* Holmgren is not included in the above key)

Termitogaster insolens Casey. Figures 16, *a*, 18, *a*.

Termitogaster insolens Casey, 1889, Ann. N. Y. Acad. Sci., 4: 65 (Panama; with termites; United States National Museum); Seevers, 1937, Ann. Soc. Amer., **30**: 14, pl. 2, fig. 5; 1939, Amer. Mus. Nov., no. 1018, text figs. 1, 10, 14, 22, 26, 27, 33; 1946, Rev. Ent., **17**: 248.

Material examined.—Barro Colorado Island, Panama Canal Zone (CNHM); Estrella, Costa Rica (USNM); Hamburg Farm, Costa Rica (USNM); Zent, Costa Rica (USNM); Progresso and Malon, Honduras (USNM); all with *Nasutitermes corniger* Motschulsky.

Color reddish-brown, pronotum black. Vertex not elevated between antennae; clypeus slightly declivous, its margin feebly emarginate. Distance between antennal fossae only two-fifths the width of head at eye level. Three to five occipital setae on each side; vertexal setae absent. Head finely punctulate. Antennae with segment 3 longer than 2 and 4–10; segments 4 and 5 subequal. Cardo of maxilla acuminately produced laterally, visible from above. Segment 2 of maxillary palpi with surface of its broader basal half flattened; segment 3 oval, about two-thirds as broad as long. Mentum-submentum distinctive (fig. 18, *a*). Pronotum about one-seventh broader than long; robust, convex; its surface contours variable, with several shallow impressions and deeper pits.

Length, 3 mm.

Termitogaster testaceus Seevers

Termitogaster testaceus Seevers, 1946, Rev. Ent., **17**: 250 (Zent, Costa Rica; *Nasutitermes corniger* Motschulsky; United States National Museum).

Material examined.—The holotype.

Closely allied to *insolens* but differing in these respects: Coloration testaceous, sides of pronotum reddish-brown; antennae with segment 2 slightly longer than 3; pronotal disk strongly and rather uniformly impressed, basal one-half with a low, triangular elevation.

Termitogaster puncticeps Seevers. Figure 18, *b*.

Termitogaster puncticeps Seevers, 1946, Rev. Ent., **17**: 249 (Rurrenabaque, Beni, Bolivia; *Nasutitermes peruanus* Holmgren; United States National Museum).

Material examined.—The type series.

Color light-brown, pronotal sides piceous, disk mottled-brown and reddish-brown. Vertex elevated somewhat between antennae; clypeus moderately declivous, its margin feebly emarginate. Three to five occipital setae on each side; vertexal setae absent. Head coarsely punctate except for a median V-shaped impunctate area. Antennae with segment 2 slightly shorter than 3; segment 3 the longest of segments 2–10; segment 4 slightly longer than 5. Cardo acuminately produced. Segment 2 of maxillary palpi bent at middle to form a right angle, proximal half with its broad flat surface in a horizontal plane, distal half vertical. Mentum-submentum distinctive (fig. 18, *b*). Pronotum only about one-twentieth broader than long; its disk delimited from the smooth sloping sides by rather deep, although irregular, impressions that converge midway between basal and apical borders, and again near base; disk with a prominent median eminence before base; disk may also have a shallow median impression near apical border that terminates in a pit in front of above-mentioned eminence.

Termitogaster wasmanni Holmgren, new comb.

Xenogaster wasmanni Holmgren, 1911, *in* Wasmann and Holmgren, Zool. Anz., **38**: 429 (Mojos, Bolivia; *Eutermes mojosensis* Holmgren; Holmgren coll.).

Wasmann and Holmgren placed this species in *Xenogaster*, distinguishing it from *X. nigricollis* Silvestri by the fact that the second antennal segment is longer than the third. This one line "diagnosis" was the only information provided by the authors.

It has been evident to me for some time that *nigricollis*, and presumably *wasmanni*, belong to *Termitogaster*. Recently when I had the opportunity to examine the Wasmann types I thought it would be possible to place this species more accurately. Unfortunately, the specimens in the Wasmann collection labeled "types" of this species are from nests of *Nasutitermes chaquimayensis* Holmgren, Chaquimayo, Peru (not the recorded host or the type locality), and they do not conform to the one diagnostic character given by Wasmann and Holmgren. The type, if such exists, is probably in the Holmgren collection.

Termitogaster impressicollis Seevers. Figure 18, *c*.

Termitogaster impressicollis Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 11, pl. 2, figs. 3, 6 (Hacienda de Tenguel, Ecuador; *Nasutitermes peruanus* Holmgren; American Museum of Natural History); 1939, Amer. Mus. Nov., no. 1018, text figs. 2, 15; 1946, Rev. Ent., **17**: 248.

Material examined.—Ecuador specimens: Hacienda de Tenguel; Gualaquiza; Faijoo; Hacienda de Santo Domingo; San Miguel; Bucay Chico (USNM); all with *Nasutitermes peruanus* Holmgren. Rurrenabaque, Beni, Bolivia (USNM). Río Frio and Santa Anna, Colombia (USNM), with *Nasutitermes meinerti* Wasmann.

Head and elytra brown, pronotum black, abdomen reddish-brown. Head transversely elevated between antennae; surface behind this elevation moderately deeply concave, and clypeus moderately declivous. Distance between antennal fossae less than two-fifths the width of head at eye level. Two or three occipital setae on each side; vertexal setae absent. Dorsum coarsely and densely punctate behind eyes, the punctures finer and less dense at middle; surface between antennae impunctate, occipital border very sparsely punctate. Antennae with segments 2 and 3 equal, longer than segment 4, which is longer than 5. Cardo not produced laterally. Segment 2 of maxillary palpi with its ventral surface flattened. Mentum-submentum as in figure 18, *c*. Pronotum about one-fifth broader than long; disk not deeply or uniformly impressed, but with irregular contours as follows; two rather deep pits at either side of center and a transverse groove, interrupted medially, in front of basal border; an impression before apical border, giving rise to a rather sharp ridge (visible in profile).

Termitogaster bicolor Seevers. Figure 18, *i*.

Termitogaster bicolor Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 12, pl. 2, figs. 4, 7 (Gualaquiza, Ecuador; *Nasutitermes dendrophilus* Holmgren; American Museum of Natural History); 1946, Rev. Ent., **17**: 248.

Material examined.—The type series.

Color reddish-brown; pronotum black, disk light-brown. Vertex slightly elevated between antennae; clypeus feebly declivous. Distance between antennal fossae only one-third the width of head at eye level. One occipital seta on each side; no vertexal setae. Head punctate as in *T. impressicollis*. Antennae with segment 3 slightly longer than 2; segments 4 and 5 subequal, each only about two-thirds as long as segment 3. Cardo not produced laterally. Segment 2 of maxillary palpi triangular in outline, its ventral surface flattened. Mentum-submentum as in figure 18, *i*. Pronotum one-fifth broader than long; disk broadly impressed and much lighter in color than the sides; discal surface irregular due to a number of grooves, pits, and low elevations.

Termitogaster emersoni Mann. Figure 18, *g*.

Termitogaster emersoni Mann, 1923, Zoologica, **3**: 342, text fig. 34 (Kartabo, British Guiana; *Nasutitermes ephratae* Holmgren; United States National Museum; Seevers, 1937, Ann. Ent. Soc. Amer., **30**, pl. 2, fig. 8; 1939, Amer. Mus. Nov., no. 1018, text fig. 3; 1946, Rev. Ent., **17**: 248.

Material examined.—A series of specimens, including types, from Kartabo, British Guiana; also Río Claro, Glyan Road, and Northern Range, Trinidad, British West Indies (CNHM, ex Adamson coll.); all with *Nasutitermes ephratae* Holmgren.

Color brown, pronotum black. Vertex not elevated between antennae; clypeus feebly declivous, its border slightly emarginate. Distance between antennal fossae about one-half the width of head at eye level. Two or three occipital setae on each side; vertex with a pair of setae medial to antennal fossae at level of their caudal margins. Head very finely punctulate, the punctules often indistinctly defined; occiput and vertex very sparsely and indistinctly punctulate at middle. Pronotum dull, surface with a fine reticulation, often obsolescent, and extremely fine and dense punctulation, but without distinct, easily observed punctures. Antennae with segment 3 a little longer and stouter than 2; segments 4, 5, and 6 decreasing slightly in length. Cardo not produced laterally. Segment of maxillary palpi triangular; segment 3 oval, little more than one-half as broad as long. Mentum-submentum distinctive (fig. 18, *g*). Pronotum about one-tenth wider than long; strongly convex; contours irregular, with variable impressions and pits, but without distinctive pattern.

Termitogaster chavantinae, new species. Figure 18, *h*.

Closely allied to *emersoni*, but lacking vertexal setae, and having moderately coarse, distinct head punctures (very fine and indistinct in *emersoni*), a distinctive mentum-submentum, and distinct punctures on the pronotum in addition to the very minute reticulation.

Color brown, pronotum black. Vertex of head not elevated between antennae; clypeus slightly declivous, its margin feebly emarginate. Distance between antennal fossae about one-half the width of head at eye level. Three occipital setae; vertexal setae absent. Head with fine to moderately coarse, distinct punctures; these are moderately dense except between antennae. Antennae with segment 3 longer than segment 2 or any of segments 4–10. Cardo not produced laterally. Pronotum moderately densely punctate; punctures distinct and easily discernible; in addition, with a much finer sculpture of fine lines and extremely minute punctules. Mentum-submentum as in figure 18, *h*; its apical margin more deeply emarginate than in *emersoni* and *wenzeli*. Pronotum almost one-tenth wider than long; structure as in *emersoni*.

Length, 2.5 mm. (with abdomen extended).

Holotype from Chavantina, Mato Grosso, Brazil, collected January 7, 1947, with *Nasutitermes bivalens* Holmgren, by Helmut Sick. In collection of Chicago Natural History Museum. No paratypes.

Termitogaster magdalenae Seevers

Termitogaster magdalenae Seevers, 1946, Rev. Ent., **17**: 252 (Puerto Berrio, Antioquia, Colombia; *Nasutitermes ephratae* Holmgren; Chicago Natural History Museum).

Color brown, pronotum black, abdomen reddish-brown. Vertex not elevated between antennae; clypeus slightly declivous. Distance between antennal fossae about one-half the width of head at eye level. One occipital seta on each side; vertexal setae absent. Head finely punctate. Antennae with segment 2 a little longer than any of segments 3–10; segments 2, 3, and 4 decreasing in length. Cardo not produced. Mentum-submentum with only two apical setae. Pronotum more than one-tenth broader than long; a shallow median impression in the apical half, a low, rather broad elevation behind it, and a U-shaped impression caudad and laterad of the medial elevation.

Termitogaster nigricollis Silvestri, new comb. Figures 16, *b*, 18, *e*.

Xenogaster nigricollis Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p. 3 (Santa Ana, Misiones, Argentina, and Coxipó, near Cuyabá, Mato Grosso, Brazil; *Eutermes arenarius proximus* Silv. and *E. a. pluriarticulatus* Silv.; Silvestri coll.); 1903, Redia, **1**: 189, pl. 5, figs. 246–248; Wasmann and Holmgren, 1911, Zool. Anz., **38**: 429.

Material examined.—Biriguí, São Paulo, Brazil (R. L. Araujo); Jabaquara, São Paulo, Brazil (R. L. Araujo); with *Nasutitermes bivalens* Holmgren.

Distribution.—Misiones, Argentina, with *Nasutitermes sanctae-anae* Holmgren; São Paulo, Brazil, with *Nasutitermes bivalens* Holmgren; and Mato Grosso, Brazil, with *Nasutitermes pluri-articulatus* Holmgren. Wasmann and Holmgren recorded this species from Mojos, Bolivia, but their identification is questionable.

Color reddish-brown, pronotum black. Surface of head scarcely elevated between antennal fossae; clypeus feebly declivous. Distance between antennal fossae about one-half the width of head at eye level. Head with moderately dense and coarse punctation behind eyes, otherwise sparsely and finely punctulate. Two occipital setae on each half, vertexal setae absent. Antennae with segment 2 longer than 3; segments 3, 4, and 5 decreasing in length, 5 and 6 equal. Cardo not produced. Segment 3 of maxillary palpi about two-thirds as broad as long. Mentum-submentum distinctive (fig. 18, *e*). Pronotum more than one-tenth broader than long; with a transverse sub-basal impression, the ends of which extend forward as weak longitudinal impressions to terminate as moderately deep pits; and with a small eminence in front of transverse impression.

Length, 3 mm.

Termitogaster wenzeli, new species. Figure 18, *f*.

Closely related to *nigricollis* Silvestri but distinguished by the structure and chaetotaxy of the mentum-submentum and by the punctation of the head.

Head reddish-brown, pronotum black, elytra light-brown, abdomen reddish-brown. Head very sparsely and finely punctulate, the pale V-shaped area between antennae impunctate; vertex and occiput almost impunctate medially. Head between antennal fossae very feebly elevated; clypeus very slightly declivous, its border feebly emarginate. Distance between antennal fossae about one-half the width of head at eye level. Two occipital setae on each side; vertex without a pair of setae at level of posterior margins of antennal fossae. Antennae with segment 2 longer than 3; segments 3 and 4 equal; 5–10 decreasing very slightly. Mentum-submentum distinctive (fig. 18, *f*). Cardo not produced. Segment 3 of maxillary palpi three-fifths as broad as long. Pronotum strongly convex, only one-twentieth broader than long; with a pair of moderately deep discal pits, and other minor irregularities.

Length, 3.5 mm.

Holotype from Recife, Pernambuco, Brazil; collected July 3, 1944, with *Nasutitermes bivalens* Holmgren, by Rupert L. Wenzel. In collection of Chicago Natural History Museum. No paratypes.

Termitogaster beniensis Seevers. Figure 18, *d*.

Termitogaster beniensis Seevers, 1946, Rev. Ent., 17: 250 (Huachi, Beni, Bolivia; *Nasutitermes chaquimayensis* Holmgren; United States National Museum).

Material examined.—Bolivia: Huachi; Rurrenabaque; Río Colorado; and Cachuela Esperanza; all with *N. chaquimayensis* Holmgren.

Closely related to *nigricollis;* distinguished by having its second and third antennal segments equal in length, by having more occipital setae, and by the more slender third segment of the maxillary palpi.

Color light reddish-brown; pronotum piceus, abdomen dark reddish-brown. Head not elevated between antennae, clypeus not declivous, its border feebly emarginate. Distance between antennal fossae about one-half the width of the head at eye level. Two or three occipital setae; vertexal setae absent. Antennae with segments 2 and 3 subequal in length; 4, 5, and 6 decreasing slightly in length. Cardo not produced. Segment 3 of maxillary palpi twice as long as broad. Mentum-submentum distinctive (fig. 18, *d*). Pronotum more than one-tenth broader than long; convex, with relatively minor surface contours; a shallow arcuate impression near basal border with ends extending forward as lateral impressions to terminate as rather deep pits.

Length, 3 mm.

Termitogaster emarginatus Seevers

Termitogaster emarginatus Seevers, 1946, Rev. Ent., **17**: 251 (Mogi-mirim, São Paulo, Brazil; *Nasutitermes globiceps* Holmgren; Chicago Natural History Museum).

Material examined.—The type and additional specimens from Iepê and Santa Ernestina, São Paulo, Brazil, collected by R. L. Araujo with *Nasutitermes globiceps* Holmgren (determined by R. L. Araujo).

Head reddish-brown, pronotum black, elytra brown, abdomen light reddish-brown. Vertex not elevated between antennae, clypeus very feebly declivous, its margin with a deep, arcuate emargination. Five occipital setae on each side; not vertexal setae; only 6–8 clypeal setae on each half. Antennae with segments 2 and 3 about equal in length, but segment 2 distinctly broader; segments 4 and 5 subequal, 6–10 decreasing in length. Cardo not produced. Pronotum almost one-fifth broader than long; very strongly convex; surface with a feebly longitudinal impression on each side, a shallow, broader median impression, and a few other minor irregularities. Elytra with only one humeral seta.

Length, 3 mm.

Termitogaster brevis Mann

Termitogaster brevis Mann, 1923, Zoologica, **3**: 344 (Kartabo, British Guiana; *Nasutitermes costalis* Holmgren; United States National Museum); Seevers, 1937, Ann. Ent. Soc. Amer., **30**, pl. 2, fig. 9; 1939, Amer. Mus. Nov., no. 1018, text fig. 4; 1946, Rev. Ent., **17**: 248.

Material examined.—Kartabo, British Guiana (type series). Manzanilla (CNHM), Arena Forest (CNHM, ex Adamson coll.), and Northern Range (CNHM, ex Adamson coll.), Trinidad, British West Indies; all with *N. costalis* Holmgren.

Color brown, pronotum black. Surface of head between antennae convexly elevated; clypeus concave, its border moderately emarginate. Head finely and inconspicuously punctulate. Antennae with segments 2 and 3 equal, segments 4–10 subequal; segments 2 and 3 relatively short, segment 10 two-thirds as long as segment 2. Cardo with a suggestion of lateral production. Pronotum only a trifle broader than long. Legs relatively short; metathoracic legs, for example, with neither femora nor tibiae longer than pronotum.

Termitogaster diversicollis, new species. Figure 18, *j*.

Distinguished from all other members of the genus by its distinctive pronotum, and by its uniform light-brown coloration. The general appearance is that of a *Xenogaster,* but except for the unusual pronotum this species agrees with the pattern of characters of *Termitogaster.*

Color light-brown throughout. Head not elevated between antennal fossae; clypeus flat, its border moderately emarginate. Head with low, oblique ridges extending caudad and mesad from antennal fossae to occipital border where they join, enclosing a triangular impression. Head subopaque, very fine and moderately densely punctulate. One occipital seta on each side. Antennae with segment 3 longer than 2 or 4. Mentum-submentum as in figure 18, *j;* postgenae lateral to gula with a suggestion of sulci. Pronotum as broad as long; basal and anterior margins arcuate; broadest near anterior margin; sides arcuate in front and converging basally, slightly sinuate. Pronotal disk broadly and strongly impressed, the impression broadest near base and narrower anteriorly; basal half of the impression with a very conspicuous, triangular eminence. Abdomen of holotype stenogastric (atypical in appearance, but with the structure and chaetotaxy of the genus).

Length, 2 mm. (stenogastric individual).

Holotype from Villavicencio, Meta, Colombia; collected July 11, 1938, with *Nasutitermes ephratae* Holmgren, by Charles H. Seevers. In collection of Chicago Natural History Museum.

NEOTERMITOGASTER Seevers

Neotermitogaster Seevers, 1939, Amer. Mus. Nov., no. 1018, p. 8. Type species: *Neotermitogaster colonus* Seevers.

Most closely related to *Termitogaster,* from which it differs in the form and pilosity of the mentum-submentum, in not having the gula and submentum separated by a suture, and in the dentition of the mandibles, the distinctive chaetotaxy of head and pronotum, distinctive punctation, and pronotal contours.

Head feebly impressed between antennae; clypeus slightly convex, its margin feebly emarginate. Mandibles broader than in *Termitogaster,* each with a single broad, blunt median tooth. Antennae geniculate, rather stout; scape almost as long as segments 2–5 combined; thickened distally; segments 2–10 cylindrical. Mentum-submentum distinctive (fig. 18, *k*); not separated from gula. Maxilla with large, subtriangular cardo that is not produced laterally. Segment 2 of maxillary palpi large, transverse, moderately arcuate; segment 3 oval. Pronotum slightly transverse; moderately convex; sides rather strongly deflexed; disk with a transverse impression, the ends of which deepen to form crater-like pits; the impression with a shallow, elongated pit at middle. Elytra contiguous; as broad as pronotum but somewhat shorter, the sutural length a little more than one-half the pronotal length; apical margin of elytra deeply emarginate. Abdomen similar to that of *Termitogaster;* the last paratergites fused at middle.

Neotermitogaster colonus Seevers. Figures 16, *d*, 18, *k*.

Neotermitogaster colonus Seevers, 1939, Amer. Mus. Nov., no. 1018, p. 9, text figs. 9, 11, 19, 29, 36 (Hacienda de Santo Domingo, Ecuador; *Nasutitermes peruanus* Holmgren; American Museum of Natural History).

Head and thorax fuscous, abdomen brown; strongly shining. Head, pronotum, elytra, and abdomen finely punctate, the punctures arranged in dense clusters, especially around setiferous punctures. Head with 7 clypeal setae in two rows; vertex with one median seta; dorsum and genae with numerous short, fine hairs. Antennae with segment 2 about three-fourths as long as 3; segment 2 subequal to each of segments 4–7; segments 8–10 a trifle shorter than the preceding. Pronotum with 8 rather stout setae on apical margin (the median 6 longer); disk with 6 setae in two longitudinal rows, and with numerous fine, suberect pale hairs. Elytra with one seta on lateral border and one on disk close to anterior border; otherwise glabrous except for very sparse hairs near pronotum. Tergites 3–7 with a subapical row of 4 erect setae; tergites 4–6 with an additional basal row of 4; eighth tergite with an apical row of 4 and a basal row of 2; tergites 3–6 with 12–16 semi-recumbent bristles on apical margin.

TERMITOIDES Seevers

Termitoides Seevers, 1939, Amer. Mus. Nov., no. 1018, p. 7. Type species: *Termitoides marginatus* Seevers.

This genus is distinguished by its clypeal horn and the form of its mentum-submentum. The pronotum and elytra resemble those of *Xenogaster*, except that they do not have the granulose sculpture.

Clypeus with a large median "horn," a broad acute process extending above and beyond the apical border; clypeus lateral to the horn, somewhat depressed. Antennae geniculate; scape longer than the three following segments combined; segments 2–11 slender, cylindrical. The slender mandibles with a moderately strong subapical tooth, and a larger medial tooth having a slightly hooked tip. Mentum-submentum (fig. 17, *t*) distinctive, its narrow apex almost straight, its anterior angles strongly truncated and its sides sinuate for a distance and then converging to the gula. Segment 2 of maxillary palpi about as broad as long, segment 3 oval, elongated. Pronotum approximately one-fifth broader than long, its apical border moderately bisinuate, sides evenly rounded from base to apex, and posterior border feebly arcuate. Pronotal disk strongly impressed medially, with two very deep pits. Elytra not contiguous, their inner margins diverging posteriorly.

Termitoides marginatus Seevers. Figure 17, *t*.

Termitoides marginatus Seevers, 1939, Amer. Mus. Nov., no. 1018, p. 8, text figs. 6, 12, 18, 31, 35 (Hacienda de Santo Domingo, Ecuador; *Nasutitermes peruanus* Holmgren; American Museum of Natural History).

Head and pronotum smoky-brown, pronotal disk lighter; abdomen reddish-brown. Head, pronotum, and elytra finely, sparsely punctulate. Pronotum with an oblique row of 4 setae bordering disk; elytra with one seta on lateral margin. Antennal segment 2 nearly twice as long as broad; segments 2–6 decreasing in length and increasing in width; segment 6 broader than long; 6–7 subequal, 8–10 slightly shorter, subequal. Chaetotaxy of abdomen as follows: Tergites 3–6 with about 12 semi-erect setae on posterior margin and 4 in a subapical row; tergite 7 with 2 apical and 2 subapical setae; tergites rather densely clothed with fine, suberect hairs. Sternite 3 with three rows of 4, 4, 12 setae; sternites 4–6 with 8 in a basal row and 14 in an apical row; sternite 7 with 8 in a basal row and 10 in an apical row; sternite 8 with 8 in an apical row.

Length, 3–4 mm.

XENOGASTER Wasmann

Xenogaster Wasmann, 1891, Verh. Zool. Bot. Ges. Wien, **41**: 651; Fenyes, 1920, Gen. Insect., **173B**: 349. Type species: *Xenogaster inflata* Wasmann.

Distinguished from *Termitogaster*, with which it is often confused, in these respects: Inner margins of elytra separated for almost their entire length; pronotal disk broadly impressed; submentum and gula not separated by a suture; coloration brown; head, pronotum, and elytra asperately punctate and reticulated so as to appear granulose.

Surface of head not elevated between antennal fossae. Clypeus strongly deflexed immediately in front of antennal fossae to produce a transverse "carina" connecting the anterior margins of the fossae (*inflata, nana, subnuda, pilosula*); or clypeus not deflexed and at most feebly declivous (*fossulata, reichenspergeri, glabriventris, inquilina*). Antennae strongly geniculate; scape often longer than the next four segments combined; the segments variable:

	Scape	2	3	4	5	6	7	8	9	10	11
inflata	50	10	11.5	11.5	9	9	8.5	8	8	8	20
pilosula	50	14	14	14	12	10	10	9	8	8	22
subnuda	40	9	12	9	8	8	8	7	7	7	18
nana	36	8	6	6	6	6	6	6	6	6	16
reichenspergeri	58	17	12	10	10	8	8	7	7	6	18
glabriventris	54	18	12	12	10	9	8	8	8	8	19
fossulata	35	10	8	7	7	7	7	7	7	7	20
inquilina	50	14	12	10	8	8	8	7	7	7	18

Mentum-submentum variable in form and pilosity (fig. 17, *k–m, p–s*); not separated from gula by a suture. Maxillary palpi with segment 2 shaped like a compressed cornucopia; segment 3 variable in size: as broad as long (*nana*); four-fifths as broad as long (*subnuda*); two-thirds as broad as long (*inflata, pilosula, inquilina, reichenspergeri, fossulata*); one-half as broad as long (*glabriventris*).

Pronotal disk broadly and deeply impressed; usually brown in color and with a granulose texture. Pronotal proportions variable: one-fifth broader than long (*subnuda*); one-eighth broader than long (*pilosula* and *nana*); one-tenth broader than long (*inflata*); subequal in length and width (*glabriventris, inquilina*, and *fossulata*); one-tenth longer than broad (*reichenspergeri*). Elytra separated for almost their entire length, their inner margins usually pale and somewhat hyaline. Abdomen very similar to that of *Termitogaster*, the sclerites usually separated by areas of non-sclerotized cuticle.

Remarks.—It may be justifiable to separate the four species with a feebly declivous clypeus (*reichenspergeri, glabriventris, inquilina,* and *fossulata*) from those with a strongly deflexed clypeus, but I believe that we know too little about this group to do so at present. I am not sure that the four species are actually as closely allied as this one character may suggest. The condition of the clypeus is quite variable in the subtribe Termitogastrina and there is about as much variation among the species of *Termitomorpha* as among those of *Xenogaster.*

Xenogaster seems to occur primarily in the southern Neotropical Region, seven of its species having been found in southern Brazil and one in British Guiana. *Termitogaster,* by contrast, has nine of its fourteen species in northern South America and Central America, three in Bolivia, and only two in southern Brazil.

KEY TO SPECIES OF *XENOGASTER*

1. Clypeus strongly deflexed anterior to antennal fossae; pronotum broader than long 2
   Clypeus not deflexed anterior to antennal fossae, at most moderately declivous; pronotum subequal in length and width or longer than broad 5
2. Carina between anterior margins of antennal fossae almost straight 3
   Carina of front of head distinctly arcuate . . . . . *pilosula,* new sp.
3. Third antennal segment distinctly longer than any of segments 2–10. *subnuda,* new sp.
   Third antennal segment not longer than some of segments 2–10 4
4. Antennal segments 3 and 4 subequal, each longer than segment 2 or any of segments 5–10 . . . . . *inflata* Wasmann
   Antennal segments 3 and 4 subequal, each shorter than segment 2 and not longer than any of segments 5–10 . . . . . *nana,* new sp.
5. Antennal scape extremely long, more than one-half as long as segments 2–11 combined; distal half of its anterior surface broadly concave, the proximal half of scape conspicuously broader . . . . . *reichenspergeri,* new sp.
   Antennal scape less than one-half the combined length of segments 2–11; scape nearly uniform in width 6
6. Second antennal segment one-half longer than segment 3. *glabriventris,* new sp.
   Second antennal segment at most one-fifth longer than segment 3 7
7. Sides of pronotum dark reddish-brown, tinged with black, the disk lighter brown; coloration of body reddish-brown . . . . . *inquilina* Borgmeier
   Pronotum uniform in color; coloration of body pale testaceous. *fossulata* Mann

Xenogaster inflata Wasmann. Figure 17, *k*.

Xenogaster inflata Wasmann, 1891, Verh. Zool. Bot. Ges. Wien, **41**: 652, pl. 6, figs. 16–24 (Santa Catarina, Brazil; *Eutermes arenarius fulviceps* Silvestri; Wasmann coll.); Silvestri, 1903, Redia, **1**: 190, pl. 5, figs. 250–251, pl. 6, fig. 260.

Material examined.—The specimens in the Wasmann collection, mounted and in alcohol, which were determined as this species by Wasmann, belong to two species; one of these species is described elsewhere in this paper as *X. subnuda.* From the four mounted specimens bearing "type" labels, I have selected as lectotype the one with the label "Santa Catharina (Hetscko)" as it is evidently the specimen upon which Wasmann based *X. inflata.* A series of 34 mounted and unmounted specimens from Joinville, Santa Catarina, collected by Schmalz (1891, 1903, 1904), consists of 22 *X. inflata* and 12 *X. subnuda.* Specimens from Joinville were distributed to other collections by Wasmann as "cotypes" of *X. inflata;* some of these are probably *X. subnuda.*

Other specimens studied: Two specimens from Joinville, Santa Catarina, labelled cotypes, accompanied by *Nasutitermes aquilinus* Holmgren (USNM). A series from Blumenau, Santa Catarina (ex Reichensperger coll.), with *Nasutitermes itapocuensis* Holmgren; and specimens from Ilha Grande, Rio de Janeiro, Brazil (ex Helmut Sick), with *Nasutitermes itapocuensis* Holmgren.

Coloration of head, pronotum, and elytra dark reddish-brown, abdomen reddish-brown. Clypeus deflexed in front of antennal fossae, the deflexed part in a vertical plane; clypeus thus with a transverse "carina" between the antennal fossae. Vertex between antennal fossae broadly and shallowly concave; vertex and occiput transversely convex. Antennae with scape five times as long as segment 2; segments 3 and 4 subequal, each longer than segment 2 or any of segments 5–10. Mentum-submentum distinctive in form and pilosity (fig. 17, *k*). Segment of maxillary palpi two-thirds as broad as long. Pronotum about one-tenth broader than long, its disk broadly and rather deeply impressed. Head, pronotum, and elytra coarsely reticulated and asperately punctate. Head without erect setae; pronotum with 3 setae along the lateral rim of the discal impression; elytra with a few feeble setae. Tergites 3–6 with a marginal row of semi-erect dark bristles and tergites 4–6 with an additional submarginal row of 6 long, erect bristles; tergite 7 with 4 long submarginal bristles. Tergites with numerous fine, erect pale hairs. Sternites with marginal and sub-basal rows of long, erect black bristles. Sternites moderately densely clothed with pale hairs with curved tips.

Length, 3–3.5 mm.

Xenogaster pilosula, new species. Figure 17, *l.*

Coloration of head, pronotum, and elytra dark reddish-brown, abdomen light-brown. Clypeus strongly deflexed, the resulting transverse "carina" arcuate. Antennae with scape as long as in *inflata* but only a little more than three times as long as segment 2; segments 2, 3, and 4 subequal in length; each longer than any of segments 5–10. Mentum-submentum distinctive (fig. 17, *l*). Maxillary palpi as in *inflata.* Pronotum about one-eighth broader than long, impressed as in *inflata.* Head, pronotum, elytra, and tergites coarsely reticulate and asperately punctate. Tergites 3–6 with apical row of about 15 long, coarse, recumbent setae and usually with a few black, semi-erect subapical bristles; tergites 7 and 8 with 4 long erect subapical bristles. Tergites with a moderately dense vestiture of pale, semi-erect hairs. Vestiture of sternites as in *inflata*.

Length, 3 mm.

Holotype from Blumenau, Santa Catarina, Brazil (ex Reichensperger collection), with *Nasutitermes* sp. In collection of Chicago Natural History Museum.

Paratypes.—Ten specimens, same data as holotype; four specimens, Passa Quatro, Minas Gerais, Brazil (ex Reichensperger collection), with *Nasutitermes ehrhardti* Holmgren. Paratypes in collections of Chicago Natural History Museum, United States National Museum, and A. Reichensperger.

Xenogaster subnuda, new species. Figure 17, *r*.

Head and pronotum brown, elytra dark brown with paler inner margins; abdomen reddish-brown. Clypeus deflexed in front of antennal fossae, resulting in an almost straight "carina" as in *inflata*. Antennae with scape relatively short, less than five times as long as segment 2; segment 3 distinctly longer than any of segments 2–10. Mentum-submentum distinctive (fig. 17, *r*). Segment 3 of maxillary palpi about four-fifths as broad as long. Pronotum about one-fifth broader than long, impressed as in *inflata*. Head, pronotum, and elytra coarsely reticulate, and asperately punctate. Tergites with marginal rows of long recumbent bristles, but otherwise almost devoid of setae, except that tergites 3–5 have one subapical seta near each lateral margin, and tergites 6–8 have a few additional subapical bristles; tergites shining, with only traces of reticulation. Tergites with a sparse vestiture of short hairs; sternites with a basal and a subapical row of erect bristles; sternites almost glabrous, having only a sparse, short stubble.

Length, 3–3.5 mm.

Holotype from Blumenau, Santa Catarina, Brazil (ex Reichensperger collection), with *Nasutitermes itapocuensis* Holmgren. In collection of Chicago Natural History Museum.

Paratypes.—Forty-four specimens, same data as holotype; nine specimens, Passa Quatro, Minas Gerais, Brazil, with *Nasutitermes* sp.; one specimen, Ilha Grande, Rio de Janeiro, Brazil, with *Nasutitermes* sp. In collections of Chicago Natural History Museum, United States National Museum, Reichensperger, and Borgmeier.

Xenogaster nana, new species. Figure 17, *q*.

Color reddish-brown, elytra a little darker. Clypeus sharply deflexed in front of antennal fossae, resulting in a carina with a medial incision. Antennae with scape four and one-half times as long as segment 2, segment 2 longer than any of segments 3–10, which are subequal in length. Mentum-submentum distinctive (fig. 17, *q*). Segment 3 of maxillary palpi subequal in length and width. Pronotum about one-eighth broader than long, its discal impression broad and deep; shallow subapically, deep at middle, broad and shallow subbasally. Head, pronotum, and elytra coarsely reticulated and asperately punctate; elytral granulations quite coarse. Tergites shining, with an inconspicuous reticulation or very fine asperate punctures. Tergites 3–8 with the usual marginal row of setae, and tergites 5–8 with an additional submarginal row; sternites 3–8 with erect bristles; glabrous except for an extremely sparse short stubble.

Length, 2.5 mm.

Holotype from the state of Minas Gerais, Brazil (ex Reichensperger collection); with *Nasutitermes jaraguae* Holmgren. In collection of Chicago Natural History Museum.

Paratypes.—Six specimens, same data as holotype. In collections of Chicago Natural History Museum, United States National Museum, and Reichensperger.

Xenogaster reichenspergeri, new species. Figure 17, *m*.

Distinguished from the four preceding species by the non-deflexed clypeus; distinguished from the following species by its distinctive antennal scape, the proportions of its antennal segments, the proportions of its pronotum, the distinctive mentum-submentum, the glabrous sternites, and the more reduced elytra.

Color reddish-brown; lateral and anterior margins of pronotum black. Clypeus slightly declivous, its margin straight; vertex shallowly concave, with a low, smooth ridge between antennal fossae. Antennae with an unusually long scape which is more than one half as long as segments 2–11 combined; segment 2 almost one-half longer than segment 3; segments 3–10 decreasing in length and increasing in width. Antennal scape distinctive; with one margin of its anterior face elevated as a conspicuous "tooth" near middle, and the anterior surface of its distal half broadly and shallowly emarginate. Mentum-submentum distinctive (fig. 17, *m*). Maxillary palpi very similar to those of *inflata*. Pronotum about one-tenth longer than broad; discal impression narrower than in the other species, most deeply impressed in the middle one-third; basal one-third weakly impressed, with a smooth medial elevation. Inner margins of elytra strongly divergent behind scutellum (elytra exhibit more degenerative changes than in the other species), each elytron so decreasing in width that the apex is approximately one-half as broad as base.

Head reticulated and asperately punctate; pronotum reticulated only at sides, with the impressed area asperately punctate; elytra reticulated and asperately punctate. Sternites glabrous except for an almost imperceptible stubble of fine hairs. Clypeus with 6 or more long black setae and many finer hairs; surface between antennae with a pair of black bristles. Pronotum with sparse, pale, erect setae along anterior and lateral margins of the impression. Tergites with an inconspicuous pilosity; sternites with basal and marginal rows of bristles.

Length, 3.25 mm.

Holotype from Blumenau, Santa Catarina, Brazil (ex Reichensperger collection); with *Nasutitermes jaraguae* Holmgren. In collection of Chicago Natural History Museum.

Paratypes.—Fourteen specimens, same data as holotype; two specimens, Passa Quatro, Minas Gerais, Brazil (ex Reichensperger collection), with *Nasutitermes*, new sp.; two specimens, Rio Negro, Paraná, Brazil (ex Reichensperger collection), with *Nasutitermes jaraguae* Holmgren.

Xenogaster glabriventris, new species. Figure 17, *p*.

Color reddish-brown; lateral margins of pronotum rufo-piceous. Clypeus very feebly declivous, its anterior margin arcuate; surface between antennal fossae not at all elevated. Antennae with scape very long, approximately one-half as long as segments 2–11 combined; segment 2 one-half longer than 3; segments 3 and 4 subequal, segments 5–10 decreasing in length. Mentum-submentum distinctive (fig. 17, *p*). Maxillary palpi as in *inflata* except that segment 3 is only one-half as broad as long. Pronotum subequal in width and length; disk broadly impressed. Head reticulated, only feebly and sparsely asperate; surface more shining than usual; pronotum with a dense asperate stubble (appearing granulose); elytra with a very coarse reticulation of raised lines; tergites reticulated and in places with short, fine, recumbent hairs. Tergites with marginal rows of pale recumbent bristles; tergites 3–5 without erect bristles, 6–8 with one conspicuous black bristle near each lateral margin, 7 and 8 with an additional medial pair. Sternites smooth, shining, with no sculpture except a very faint reticulation; 6 long marginal bristles and a pair of sub-basal ones but no finer hairs of any kind.

Length, 3–3.5 mm.

Holotype from Blumenau, Santa Catarina, Brazil (ex Reichensperger collection), with *Nasutitermes jaraguae* Holmgren. In collection of Chicago Natural History Museum.

Xenogaster fossulata Mann

Xenogaster fossulata Mann, 1923, Zoologica, 3: 359 (Kartabo, British Guiana; *Nasutitermes intermedius* Banks; United States National Museum).

Material examined.—The holotype.

Color pale testaceous. Clypeus horizontal, not deflexed; surface between antennae not elevated. Antennae with scape about two-fifths as long as segments 2–11 combined; segment 2 longer than 3; segment 3 a little longer than 4; segments 4–10 subequal. Mentum-submentum finely setulose (not studied in detail). Maxillary palpi with segment 3 about two-thirds as broad as long. Pronotum subequal in length and width; disk deeply impressed but the impression more restricted than in *inflata*, its deepest part beginning about one-third of the way back and terminating short of the base; impression with a deeper pit on each side near its anterior limit. Head sparsely and finely setulose, vertex almost glabrous; pronotum sparsely and finely setose, with no apparent pattern; elytral surface closely granulose, and moderately densely setose. Tergites smooth, shining, feebly reticulated, each with one or two rows of long, pale, semi-recumbent hairs. Sternites with an apical row of sparse, long, pale to brown setae, and with two or three irregular rows of short bristles.

Xenogaster inquilina Borgmeier. Figures 16, *e*, 17, *s*.

Xenogaster inquilina Borgmeier, 1950, Rev. Ent., **21**: 667, text figs. 52–61 (Parada Deodoro, Sto. Amaro, São Paulo, Brazil; *Nasutitermes* sp.; Instituto Biológico, São Paulo).

Material examined.—Four paratypes from same colony as holotype, with *Nasutitermes proximus* Silvestri (determined after publication of Borgmeier's paper); 134 specimens, Santo Amaro, São Paulo, Brazil, April 10, 1951 (R. L. Araujo), with *Nasutitermes itapocuensis* Holmgren (determined by R. L. Araujo).

Related to *glabriventris* and *fossulata*, from which it differs in characteristics of antennae and submentum-mentum.

Color brown. Clypeus moderately strongly declivous from the anterior margin of antennal fossae, resulting in an obtuse "ridge" between the antennae. Antennae with scape about two-fifths as long as segments 2–11 combined; segments 2–5 decreasing in length, 5–10 not appreciably different. Mentum-submentum distinctive (fig. 17, *s*). Maxillary palpi with segment 3 about two-thirds as broad as long. Pronotum approximately equal in length and width; its sides darker brown than the disk. Pronotum deeply impressed at middle, with two large, circular pits at deepest point; impression about one-half as broad as pronotum. Head with a coarse reticulation of raised lines, and with fine asperate punctures laterally; pronotum coarsely reticulated and with very fine, asperate punctulation; elytra coarsely reticulated and asperately punctate. Sternites glabrous, strongly shining, with obsolescent reticulation. Sternites 3–6 with two or three rows of long erect setae, as follows: third: 2 sub-basal, 2 at middle, 8 subapical; fourth: 4 sub-basal, 10 subapical; fifth: 4 sub-basal, 10 subapical; sixth: 4 sub-basal, 8 subapical.

XENOPELTA Mann

Xenopelta Mann, 1923, Zoologica, **3**: 356. Type species: *Xenopelta cornuta* Mann.

Ceratoxenus Mann, 1923, Zoologica, **3**: 360; Emerson, 1935, Ann. Ent. Soc. Amer., **28**: 369. Type species: *Ceratoxenus tricornis* Mann.

Head triangular in profile (margin of pronotum forming base of triangle, the sloping dorsum of head one of the sides, and ventral margin of postgena the other). Clypeus with a carina medial to each antennal fossa and a smaller medial protuberance; abruptly deflexed in front of these processes.

Pronotal disk strongly impressed; one larger, deeper basal impression, and a smaller shallow, apical impression. Elytra strongly divergent a short distance behind scutellum; elytra broadly impressed, the impression bounded laterally by longitudinal carinae.

Gula moderately broad, short, not separated from submentum by a suture. Mentum-submentum distinctive (fig. 18, *o*); large, robust, trapezoidal in form, and densely setose. Maxillary palpi with segment 2 cornucopia-like, and segment 3 broad at base and narrow at apex.

Abdomen with moderate areas of non-sclerotized integument. Inner paratergites 3-6 about one-fifth as broad as tergites, separated only slightly from them. Seventh paratergite long, slender, arcuate. Outer paratergites about three-fourths as broad as inner ones, separated from them to a slight degree but contiguous with sternites.

Remarks.—Emerson (1935) synonymized *Ceratoxenus*, pointing out that *cornuta* and *tricornis* are closely allied species.

Xenopelta cornuta Mann. Figures 16, *c*, 18, *o*.

Xenopelta cornuta Mann, 1923, Zoologica, **3**: 357, text fig. 38 (Kartabo, British Guiana; *Nasutitermes guayanae* Holmgren; United States National Museum); Emerson, 1935, Ann. Ent. Soc. Amer., **28**: 369, text fig. 5.

Material examined.—Type material from British Guiana. In addition, specimens from Barro Colorado Island, Panama Canal Zone; with *Nasutitermes columbicus* Holmgren.

Head, pronotum, and the elytral sides closely reticulated, the surface somewhat dull. Clypeus setose, dorsum of head without setae; pronotal sides with scattered short setae; elytra with a pair of long setae in front of impressed disk; sides of elytra with short, stubby bristles. Tergites 3-5 with marginal rows of long, pale, recumbent setae and numerous short, erect hairs; tergites 6-8 without the above vestiture; tergite 7 with a pair of long, dark setae and tergite 8 with two pairs. Sternite 3 with numerous moderately long, erect setae, sternites 4-7 with two or three irregular rows of moderately long, pale setae.

Vertex of head with a large shallow V-shaped impression, bounded by smooth, low elevations; head with an oblique, cariniform elevation medial to each antennal fossa, each carina sloping toward the median line to a small, rounded clypeal eminence. Clypeus strongly deflexed, clothed with a vestiture of dense white pubescence.

Antennae (44: 10: 9: 12: 8: 8: 8: 8: 7: 7: 20) with segment 4 longer than any of segments 2-10. Maxillary palpi with segment 2 roughly triangular, its upper margin slightly arcuate; segment 3 twice as long as broad, attenuated, its apex one-half as broad as base, segment 4 short, only one-fifth as long as third. Mentum-submentum as in figure 18, *o*.

Length, 2.5 mm.

Xenopelta tricornis Mann

Ceratoxenus tricornis Mann, 1923, Zoologica, **3**: 360, text fig. 39 (Kartabo, British Guiana; *Nasutitermes guayanae* Holmgren; United States National Museum).

Xenopelta tricornis Mann, Emerson, 1935, Ann. Ent. Soc. Amer., **28**: 369, text fig. 6; with *Nasutitermes similis* Emerson.

Material examined.—Paratypes.

Dorsum of head as in *cornuta* except that it is tricornuate: the carinae medial to antennal fossae strongly produced as long acute processes, and the clypeus produced medially as a stout obtuse process. Antennae (36: 10: 8: 9: 8: 8: 7: 6: 6: 6: 16) differing from *cornuta* in the proportions of some segments, chiefly in the shorter first and fourth segments. Maxillary palpi with segment 3 less than twice as long as basal width; its round apex narrower than the base.

TERMITOTIMA Wasmann

Termitotima Wasmann, 1916, Zool. Jahrb. Syst., **39**: 188; Cameron, 1939, Fauna Brit. India, Coleopt., **4**: 40. Type species: *Termitotima assmuthi* Wasmann.

Termitotima seems to have been derived from *Xenogaster*-like stock and shares numerous characters with the present-day species of *Xenogaster*. With respect to tergite characters, it occupies an intermediate position between the neotropical genera of Termitogastrina and most of the paleotropical species.

Head capsule unmodified; clypeus moderately declivous. Antennae strongly geniculate, scape longer than three following segments combined. Gula moderately broad. Postgenae without sulci. Second and third segments of maxillary palpi subequal in length.

Pronotum a little more than one-third broader than long. Pronotal apex almost straight; sides sinuate, the basal one-half somewhat narrower than apical half (11: 12); base arcuate but straight in medial area. Pronotal disk broadly but shallowly depressed, the depressed area with a low median elevation.

Inner elytral margins divergent from a short distance behind scutellum. Elytra hyaline. Wings vestigial. Tarsi 4, 4, 4-segmented; the point of fusion of original fourth and fifth segments visible.

Abdomen broad; in appearance much like that of *Xenogaster*. Third sternite very large; its length at median line approximately one-half the width; its posterior margin straight. Sixth tergite bent near each lateral margin; perhaps representative of the first stage in the extreme condition of the sixth tergite found in most palaearctic genera of Termitogastrina. Seventh tergite obtrapezoidal.

Termitotima assmuthi Wasmann

Termitotima assmuthi Wasmann, 1916, Zool. Jahrb. Syst., **39**: 188, pl. 4, fig. 15 (Khandala, India; *Eutermes biformis* Wasmann; Wasmann coll.).

Material examined.—India: Khandala (type).

Host record.—The host of the type is *Trinervitermes biformis* Wasmann.

Head, pronotum, and elytra pale testaceous; abdomen light rufo-testaceous. Head and pronotum finely granulose. Elytra with a covering of extremely fine microsetae. Body for the most part devoid of macrosetae. Seventh and eighth tergites with moderately dense vestiture of black hairs; sternites 3–6 with an apical row of very short, erect hairs and extremely few elsewhere. Inner paratergites of segment 7 with an apical cluster of about 10 moderately long, brown hairs. Seventh sternite produced near each lateral margin to form rounded lobes over eighth sternite and these processes bear clusters of perhaps 15–20 brown setae.

Relative lengths of antennal segments as follows: 44: 10: 12: 13: 10: 9: 9: 8: 8: 8: 17. Scape one-half broader than the other segments, which are subequal in width.

Relative lengths and widths of tergites: third (8, 90), fourth (16, 100), fifth (16, 105), sixth (14, 100), seventh (70, maximum width 90, minimum width 45), eighth (50, 65). Width of inner paratergites 20. Outer paratergites slender; third distinct, 4–5 almost completely fused to sternites, sixth partially fused, seventh distinct.

IDIOGASTER Wasmann

Idiogaster Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 89; Fenyes, 1918, Gen. Insect., **173A**: 62. Type species: *Idiogaster escherichi* Wasmann.

This genus appears to be more closely related to *Termitotima* than to any of the known African genera. The abdomen of the type specimen has the terminal segments telescoped to a degree that makes it difficult to examine the sixth and seventh tergites accurately. The sixth tergite is probably relatively short (it is partially covered by the fifth) and does not seem to be bent at all. The seventh tergite is obtrapezoidal, and it is probable that the anterior end is almost transverse.

I am unable to state in what respects *Idiogaster* is different from *Termitotima,* except that the pronotum is relatively broader (three-fifths broader than long and not twice as broad as long, as Wasmann indicated).

Idiogaster escherichi Wasmann

Idiogaster escherichi Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 90, pl. 5, figs. 3, 3, *a* (Urwald Dongola, Eritrea; *Eutermes rapulum* Sjöstedt; Wasmann coll.).

Material examined.—Eritrea: Urwald Dongola (type).

Host record.—The host is *Trinervitermes rapulum* Sjöstedt.

Head finely granulated; pronotum smooth, almost impunctate. Seventh tergite with several irregular rows of moderately long setae; terminal tergites setose; sternites 3–6 with very inconspicuous stubble. Relative lengths of antennal segments as follows: 38: 12: 12: 13: 12: 11: 11: 10: 9: 9: 15. Pronotum three-fifths broader than long. Abdomen more than twice as broad as elytra at scutellum; relative widths of fifth tergite and fifth paratergite 90: 26.

TERMITELLA Wasmann

Termitella Wasmann, 1911, Rev. Zool. Afr., **1**: 170; 1912, Zeitschr. wiss. Zool., **101**: 90; Fenyes, 1918, Gen. Insect., **173A**: 65. Type species: *Termitella lujae* Wasmann.

Termitissa Reichensperger, 1912, Ent. Mitteil., **11**: 78. Type species: *Termitissa foveolata* Reichensperger. New synonymy.

Termitoctesis Bernhauer, 1938, Ann. Mus. Stor. nat. Genova, **60**: 123. Type species: *Termitoctesis gridelli* Bernhauer. New synonymy.

The *Termitella* generic group, comprised of this and the three following genera, have the abdomen as in the preceding genera except that the sixth and seventh tergites are distinctively modified (fig. 19, *d*).

Termitella is easily distinguished from all other genera of the subtribe by its remarkable postgenal sulci (fig. 18, *q*); indeed, this modification is probably without parallel in the Aleocharinae.

Head moderately transverse; dorsum unmodified; clypeus very short. Maxillary sinuses extended to base of head as deep postgenal sulci (fig. 18, *q*). Pronotum broader than long; disk impressed. Elytra as long as or longer than pronotum; inner margins contiguous, although much shorter than lateral margins.

Abdomen inflated in varying degrees; width at level of fifth segment varying from one-third wider to almost twice as wide as elytra at scutellum level. Sixth and seventh tergites as in figure 19, *d;* variable in the degree to which the sixth tergite is arched.

Remarks.—*Termitissa* Reichensperger and *Termitoctesis* Bernhauer were originally proposed for species allegedly differing in tarsal segmentation from *Termitella*. *T. lujae* was described by Wasmann as having 4, 4, 4-segmented tarsi; the others were stated to have 4, 4, 5 or 5, 5, 5-segmented tarsi. *T. lujae* has 5-segmented tarsi, although the last two segments are incompletely separated as in most of the foregoing genera. The difference in degree of fusion of the fourth and fifth tarsal segments scarcely seems important enough to justify a series of monotypic genera when the species are otherwise so similar.

Termitella lujae Wasmann. Figure 18, *q*.

Termitella lujae Wasmann, 1911, Rev. Zool. Afr., **1**: 170, text fig. 22, *a, b* (Sankuru, Kasai, Belgian Congo; *Eutermes lujae* Wasmann; Wasmann coll.).

Material examined.—Belgian Congo: Sankuru (2 specimens on pin bearing type label in Wasmann coll.); 3 specimens, Stanleyfalls (Kohl leg.); 2 specimens, Stanleyville (in Wasmann coll.); Stanleyfalls (Wasmann det.; in USNM coll.); 21 specimens, Yangambi (May 29, 1948, A. E. Emerson leg.; in CNHM coll.).

Host records.—*Nasutitermes maculiventris* Sjöstedt (=*Eutermes lujae* Wasmann), host of Sankuru and Stanleyfalls specimens. *Nasutitermes torquatus* Sjöstedt, host of Yangambi specimens.

Rufo-testaceous. Head feebly reticulated, very minutely punctulate, and very finely pubescent; with a pair of short occipital setae. Pronotum feebly reticulated, almost imperceptibly punctulate and pubescent; a submarginal row of short setae along each side. Elytra reticulated, finely punctulate and pubescent, duller than pronotum. Tergites 3–6 with apical rows of 4, 6, 6, 8 setae, respectively; tergite 7 with a median transverse row of 4 and an apical row of 4; tergite 8 with about 10 black bristles. Sternites shining, with an almost imperceptible reticulation and extremely minute pubescence (glabrous in appearance); sternites with an apical row of fine setae and a few on adjacent surface.

Submentum-mentum as in figure 18, *q*. Labial palpi robust; beset with numerous strong bristles; two basal segments incompletely separated; first segment subquadrate, its apex oblique; second segment almost as long as basal segment but more slender. Third segment of maxillary palpi elliptical, twice as long as broad. Antennal segments with relative lengths as follows: 20: 7: 6: 6: 6: 6: 6: 6: 6: 6: 14. Segments 2–10 short, slightly transverse, subequal in length.

Pronotum only slightly broader than long; disk impressed except for a low, broad eminence in front of basal margin; the impression somewhat U-shaped, its deepest areas sub-foveolate. Pronotum and elytra subequal in length.

Tarsi 5, 5, 5-segmented (segments 4 and 5 distinct only in slide preparations). Relative lengths of hind leg parts as follows: femur (43), tibia (40), tarsus (28), tarsomeres (10, 5, 4, 9; segments 4 and 5 combined). Basal segment of hind tarsi relatively broad; twice as long as broad.

Abdomen moderately inflated; approximately one-third broader at level of fifth segment than elytra at scutellum level. Tergite 6 bent to form a V-shaped sclerite, the ends of its arms extending about half way along tergite 7. Seventh tergite a little longer than broad.

Termitella foveolata Reichensperger, new comb. Figure 18, *p*.

Termitissa foveolata Reichensperger, 1922, Ent. Mitteil., **11**: 80, text figs. 5, *a*, 6, *a*; pl. 1, figs. 6, 6, *a* (Stanleyville, Belgian Congo; *Eutermes* sp.; Reichensperger coll.).

Material examined.—Belgian Congo: Stanleyville (2 cotypes, Wasmann coll.; 1 cotype, USNM coll.); Camp Putnam, Epulu (one specimen, May 20, 1948, A. E. Emerson leg.).

Host record.—*Nasutitermes torquatus* Sjöstedt (Camp Putnam, Belgian Congo).

Closely related to *T. lujae*, differing in proportions of antennal segments, pronotal proportions and contours, more slender mandibles, size of maxillary palpi, basal segment of hind tarsi, and abdominal width.

Antennal segments with following relative lengths: 28: 8: 8: 8: 8: 6: 6: 5: 5: 5: 14. Segments 2–5 subequal, longer than any of segments 6–10. Pronotum one-fourth broader than long; disk transversely impressed and with two deep foveae. Maxillary palpi with third segment three times as long as broad. Basal segment of hind tarsi slender, cylindrical, three times as long as broad. Abdomen at level of fifth segment two-thirds broader than elytra at scutellum.

Termitella gridellii Bernhauer, new comb.

Termitoctesis gridellii Bernhauer, 1938, Ann. Mus. Stor. nat. Genova, **60**: 126, text figs. 4–6 (Alto Uelle, Belgian Congo; *Trinervitermes* sp.; Chicago Natural History Museum).

Material examined.—Belgian Congo: Alto Uelle (type and one cotype).

Host record.—Probably a species of *Nasutitermes*. *Trinervitermes*, a genus of savanna termites, apparently does not occur at the type locality of this species.

Differs from *T. lujae* in having coarsely reticulated head, broader pronotum, different antennal proportions, longer basal tarsal segment; differs from *T. foveolata* in lacking pronotal foveae, having a more slender abdomen, and in antennal proportions.

Head coarsely reticulated; pronotum reticulated except on impressed area. Pronotum one-fourth broader than long; apical two-thirds of disk broadly and deeply impressed but not foveolate. Third segment of maxillary palpi fusiform, about three times as long as broad. Relative lengths of antennal segments as follows: 22: 7: 8: 7: 7: 7: 7: 6: 6: 6: 15. Scape slightly bowed, more slender at base than at apex; segment 2 more slender than the following segments; segments 2–7 subequal in length, with segment 3 perhaps a trifle longer than the others. Basal segment of hind tarsi slender, almost four times as long as broad. Abdomen at level of fifth segment one-third broader than elytra at scutellum. Seventh tergite a little broader than length at medial line.

Length, 2 mm.

Termitella rubricollis, new species. Figure 19, *c*, *d*.

Distinguished from the other species of the genus by its broader abdomen, nine-tenths broader than elytra at scutellum level. The sixth tergite is not bent as extremely as in the other species.

Head dark testaceous; pronotum ferrugineous, with testaceous areas; elytra dark testaceous; abdomen flavo-testaceous; tibia frequently ferrugineous. Head, pronotum, and elytra almost imperceptibly punctulate and pubescent. Head reticulated, moderately shining; pronotum closely reticulated, appearing finely granulated, feebly shining; elytra reticulated, obsoletely so near apex; abdominal sclerites almost impunctate, strongly shining. Head, pronotum, and elytra without macrosetae. Tergites 3–6 with 4 apical setae, tergite 7 with 4 sub-basal and 4 very weak apical setae; tergite 8 with 6 apical and 2 subapical setae (one near each lateral margin). Sternites 3–6 with only an apical row of setae; sternite 7 with one pair of subapical bristles.

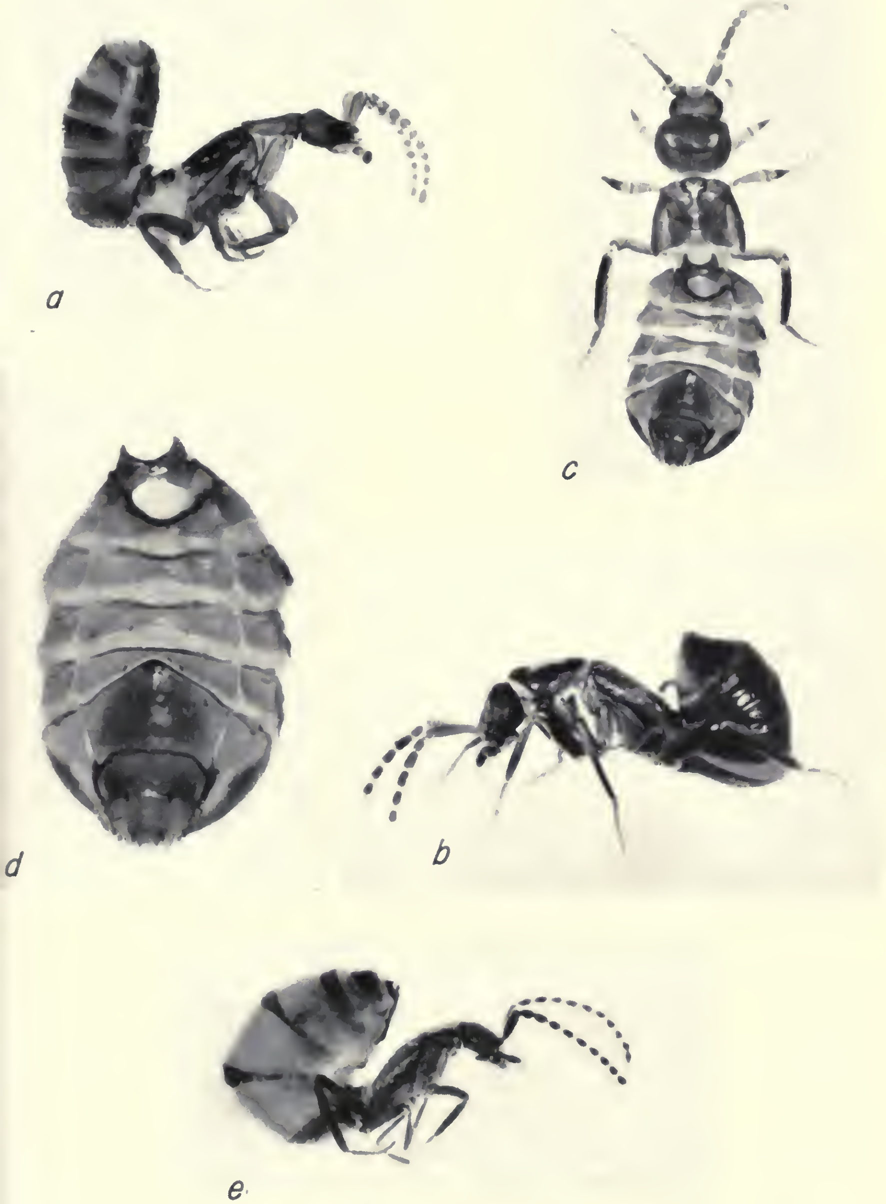


FIG. 19. (a) *Termitellodes lativentris* Seevers. (b) *Idioptochus lehmensicki* Seevers. (c) *Termitella rubricollis* Seevers. (d) *Termitella rubricollis* Seevers; dorsal view of abdomen. (e) *Millotoca tanganyikae* Seevers.

Head one-fourth broader than long, broadly elevated at base, vertex shallowly concave. Submentum-mentum with three pairs of setae (anterior, middle, and posterior). Second segment of maxillary palpi large, about as long as third but broader and very thin; third segment oval, twice as long as broad. Relative lengths of antennal segments as follows: 34: 10: 10: 10: 8: 8: 8: 6: 6: 6: 16. Segments 2–4 subequal, segments 5–7 shorter, and 8–10 still shorter.

Pronotum one-fourth broader than long; disk with a broad, deep, transverse impression terminating in broad foveae as in *T. foveolata*. Elytra longer than pronotum. Tarsi 5, 5, 5-segmented; segments 4 and 5 incompletely separated. Hind legs with relative lengths of parts as follows: femur (76), tibia (70), tarsus (45), tarsomeres, segments 4 and 5 combined (20, 9, 6, 10).

Abdomen relatively broad; nine-tenths broader at level of fifth segment than elytra at scutellum. Fifth tergite almost ten times as broad as long; inner paratergite of fifth segment almost one-fourth as broad as tergite. Sixth tergite (fig. 19, *d*) arcuate, but not bent as extremely as in the other species, extending back to about one-fourth the length of the seventh tergite. Seventh tergite three-fifths as long as broad.

Holotype from Camp Putnam, Epulu, Belgian Congo; collected May 20, 1948, by A. E. Emerson, with *Nasutitermes torquatus* Sjöstedt. In Chicago Natural History Museum.

Paratypes.—Nineteen specimens, same data as type.

TERMITELLODES, new genus

Type species: *Termitellodes lativentris*, new species.

In appearance similar to *Termitella* but not having the maxillary sinuses prolonged as deep postgenal sulci. The abdomen is appreciably broader than in *Termitella* and the sixth and seventh tergites are modified to a lesser degree than in *Termitella*.

Head somewhat longer than broad; occiput elevated, vertex shallowly concave; clypeus transversely convex. Labial palpi smaller and much more sparsely setose than in *Termitella*. Pronotum only a little broader than long; entire disk shallowly impressed; pronotal sides converging basally. Elytra longer than pronotum. Tarsi 5, 5, 5-segmented; fourth and fifth segments partially fused. Abdomen one and one-third broader than elytra at scutellum level (156: 68). Dorsum of abdomen almost flat; inner paratergites very broad, those of fifth segment one-third as broad as tergite. Sixth tergite only slightly V-shaped; seventh tergite two-thirds as long as broad (somewhat shorter than in *Termitella*).

Termitellodes lativentris, new species. Figure 19, *a*.

Rufo-testaceous. Head, pronotum, and elytra with fine granular sculpture and a close-meshed reticulation; without macrosetae; sparsely, inconspicuously pubescent. Tergites 3–7 without macrosetae; almost glabrous; tergites 8 and 9 with a few dark setae. Third sternite with a moderate number of fine, pale hairs; sternites 4–8 with very short, inconspicuous pubescence medially and a more dense pubescence laterally (the hairs are fine and short). Sternites with small, fine setae in the apical row and with very sparse and fine setae elsewhere. Mentum-submentum with one seta at each apical angle.

Relative lengths of antennal segments as follows: 37: 12: 8: 8: 7: 7: 7: 7: 7: 6: 16. Scape longer than the three following segments combined; segment 2 somewhat longer than any of segments 3–10. Relative lengths of hind leg parts as follows: femur (75), tibia (70), tarsus (46), tarsomeres, the fourth and fifth combined (20, 10, 6, 10).

Length, 3 mm.

Holotype from Rwindi Camp, Belgian Congo; collected May 5, 1948, by A. E. Emerson; with *Nasutitermes usambarensis* Sjöstedt. In Chicago Natural History Museum.

Paratypes.—Thirty-four specimens, same data as type.

AFFINOPTOCHUS Kemner

Affinoptochus Kemner, 1925, Ark. Zool., **18A**, no. 10, p. 7; 1925, Ent. Tidskr., **46**: 109. Type species: *Affinoptochus exclusus* Kemner.

Inasmuch as this genus has not been available for study, it is probably unwise for me to base a characterization on Kemner's descriptions and figures, satisfactory as these may be for purposes of identification. It is clear from Kemner's figure of the abdomen that *Affinoptochus* has the extremely modified sixth and seventh tergites characteristic of the *Termitella* group of genera. No other members of this group are known from the Indomalayan region, so *Termitella* is probably its closest known relative. It is evidently not as closely allied to *Termitoptochus* as Kemner believed.

Kemner figured the larva and pupa as well as the imago of *Affinoptochus exclusus,* having reared imagos from larvae found in termite nests. The imago figured by Kemner was stenogastric, but it is probable that physogastry would have been attained by post-imaginal development if an opportunity had been provided.

Affinoptochus exclusus Kemner

Affinoptochus exclusus Kemner, 1925, Ark. Zool., **18A**, no. 10, p. 12, text figs. 1–3, pls. 1–3 (Buitenzorg, Java; *Eutermes constrictoides* Holmgren and *Eutermes matangensis* Haviland; Kemner coll.).

The two hosts recorded by Kemner belong to two termite genera: *Bulbitermes constrictoides* Holmgren and *Nasutitermes matangensis* Haviland.

IDIOPTOCHUS, new genus

Type species: *Idioptochus lehmensicki,* new species.

Idioptochus is distinguished from the other genera of the *Termitella* group by its pronotal form and contours, distinctive elytra, form of mentum-submentum (fig. 18, *r*), extremely large third sternite, and very large seventh tergite.

Head broader than long; vertex elevated between antennae, and with shallow depressions behind antennae; clypeus declivous. Eyes large, one-fifth as broad as head, more than one-half as long as head. Antennae geniculate; segments 2–11 cylindrical, subequal in width. Maxillary sinuses not prolonged to form postgenal sulci. Gula narrow at apex; mentum-submentum as in figure 18, *r*.

Pronotum one-fifth longer than broad; broadest in front of middle, sides sinuate, the width of basal one-half only three-fourths that of maximum width; base almost straight, apex strongly arcuate; sides strongly deflexed. Elytra subequal to pronotum in length; inner margins subcontiguous, sutural length only one-third that of outer margins; the elytra strongly divergent as each elytron is very much narrowed apically. Wings vestigial. Tarsi 4, 4, 4-segmented.

Abdomen (fig. 19, *b*) compact, the sclerites large and only small areas of membranous integument visible (chiefly between sternites). Tergites 3–6 very short, especially at middle; tergites 5 and 6 arcuate. Tergite 7 extremely large, shield-like, covering about two-thirds the upper surface of the abdomen. Inner paratergites large, forming an elevated margin. Third sternite very large, a little longer than broad, its posterior margin forming a semi-circle extending over more than 180 degrees. Sternites 4–7 large, but less than one-third as long as the third sternite.

Idioptochus lehmensicki, new species. Figures 18, *r*, 19, *b*.

Reddish-brown; pronotum, legs, and sternites with indefinite piceous areas; elytra pale brown. Head, pronotum, elytra, and tergites without macrosetae; sternites with fine, pale hairs moderately numerous on third sternite but very sparse on others. Head finely reticulated, moderately densely punctate, and with a very short pubescence; pronotum reticulated (obsoletely in places), very finely punctulate and pubescent. Relative lengths of antennal segments as follows: 50: 11: 16: 14: 13: 12: 11: 10: 10: 8: 16. All segments except the tenth longer than broad, although 2, 7, 8, and 9 are only slightly so.

Pronotal disk with a large rounded apical elevation; surface behind elevation with an H-shaped impression, the central part of which is more deeply impressed.

Holotype from Mafia Island, Tanganyika Territory, collected in 1938 by R. Lehmensick (ex Reichensperger coll.), with *Grallatotermes africanus* Harris. In collection of Chicago Natural History Museum.

Paratypes.—Several specimens, same data as type, in collection of A. Reichensperger.

TERMITOPTOCHUS Silvestri

Termitoptochus Silvestri, 1910, Boll. Lab. Zool. Portici, **5**: 37; 1921, Boll. Lab. Zool. Portici, **15**: 3; Fenyes, 1918, Gen. Insect., **173A**: 59; Kemner, 1925, Ark. Zool., **18A**, no. 10, p. 17; Cameron, 1939, Fauna Brit. India, Coleopt., Staphyl., **4**: 39. Type species: *Termitoptochus indicus* Silvestri.

Termitoptochus, Millotoca, and *Paracorotoca* comprise a section of the subtribe Termitogastrina characterized by large ovate membranous abdomens. As evidenced by the modified sixth and seventh tergites, as well as by the very large third sternite, this generic group seems to have had its origin in common with the *Termitella* group of genera.

Termitoptochus has not been available for study but it was so well figured by Silvestri that its relationships are relatively clear. *Millotoca* of the Ethiopian Region and Madagascar is apparently its closest known relative. The following characteristics may be important in distinguishing *Termitoptochus.*

Head as broad as long, oval in form, somewhat compressed dorso-ventrally. Antennae feebly incrassate, not geniculate, segments 3–10 broader at apex than base. Mandibles very small, scarcely dentate. Maxillary palpi 4-segmented (not 2-segmented as stated by Silvestri). Labium obtrapezoidal, sides rounded, anterior margin slightly sinuate, with numerous setae. Labial palpi very small; one or two segmented. Pronotum somewhat broader than long, slightly convex, surface not impressed; sides a little rounded, anterior border produced on each side of middle into a broad, short process. Elytra longer than pronotum, obliquely truncate behind. Wings vestigial. Tarsi 4, 4, 4-segmented. Abdomen ovoidal, strongly physogastric, permanently recurved over foreparts. Abdominal sclerites widely separated by areas of white membranous integument; sternite 3 much larger than the others; tergites 3–7 broader than long. Seventh tergite very large.

Remarks.—Silvestri based two species of *Termitoptochus* on imagos and four others, presumed to belong to this genus, on larvae. It is perhaps unfortunate that Silvestri created nomenclatural problems by giving names to larvae that may be difficult to associate with the proper imagos. Silvestri figured the larvae in detail but even so it may be a long time before proper associations are made. It is interesting to note that Silvestri apparently did not have larvae of either *T. indicus* or *T. philippinus* (he did not figure the larvae of either species), yet he based other species on larvae.

Termitoptochus indicus Silvestri

Termitoptochus indicus Silvestri, 1910, Boll. Lab. Zool. Portici, **5**: 39, text figs. I–III (Singapore, Malaya; *Eutermes singaporiensis* Haviland; Silvestri coll.).

This species, the type of the genus, was based on imagos. Specimens have not been available for study, and Silvestri's figures are the only guide to the identification of *indicus.*

Termitoptochus philippinus Silvestri

Termitoptochus philippinus Silvestri, 1921, Boll. Lab. Zool. Portici, **15**: 3, text fig. I (Manila, Philippine Islands; *Eutermes las-pinasensis* Oshima; Silvestri coll.).

Silvestri stated that this species, based on imagos, differs from *indicus* in having apex of lacinia more elongated, labial palpi one-segmented (two-segmented in *indicus*), and basal segment of hind tarsi longer. Silvestri's figures show differences in chaetotaxy and other structures.

The host of this species is *Nasutitermes luzonicus* Oshima (= *N. las-pinasensis* Oshima).

Termitoptochus luzonicus Silvestri

Termitoptochus luzonicus Silvestri, 1921, Boll. Lab. Zool. Portici, **15**: 5, text figs. II, III (Manila, Philippine Islands; *Eutermes luzonicus* Oshima; Silvestri coll.).

This species, based on larva only, may be a synonym of *T. philippinus;* the type localities and hosts are the same. There is no indication as to why Silvestri did not consider this species to be the larval stage of the foregoing; perhaps he was influenced by the different host names.

Termitoptochus peninsularis Silvestri

Termitoptochus peninsularis Silvestri, 1921, Boll. Lab. Zool. Portici, **15**: 8, text figs. IV, V (Coimbatore, Madras, India; *Eutermes heimi* Wasmann; Silvestri coll.).

Silvestri erroneously referred to this species as *T. insularis* in his key on page 14 of the above paper.

The host is *Trinervitermes heimi* Wasmann.

Termitoptochus ceylonicus Silvestri

Termitoptochus ceylonicus Silvestri, 1921, Boll. Lab. Zool. Portici, **15**: 8 (named under the remarks accompanying the description of *T. luzonicus*), 14 (key diagnosis); 1911, Zool. Jahrb. Syst., **30**: 403, text figs. (described as "larva eutermina") (Peradeniya, Ceylon; *Eutermes ceylonicus* Holmgren; Silvestri coll.).

The host is *Nasutitermes ceylonicus* Holmgren.

Termitoptochus (?) **sumatranus** Silvestri

Termitoptochus (?) *sumatranus* Silvestri, 1921, Boll. Lab. Zool. Portici, **15**: 10, text figs. VI–VIII (Bandar Barol, Sumatra; *Eutermes butteli* Holmgren; Silvestri coll.).

The host is *Hospitalitermes butelli* Holmgren.

PARACOROTOCA Warren

Paracorotoca Warren, 1920, Ann. Natal Mus., 4: 247; Kemner, 1926, Ark. Zool., **18A**, no. 10, p. 17. Type species: *Paracorotoca akermani* Warren.

There has been no opportunity for me to make a careful comparison of this genus and its closest relatives, *Millotoca* and *Termitoptochus*. Warren published a long paper on the morphology of *Paracorotoca*, but it is difficult to draw up a generic diagnosis from this account. There should be no conceivable difficulty in identifying *P. akermani* with Warren's figures at hand.

Paracorotoca akermani Warren

Corotoca akermani Warren, 1914, Ann. Natal Mus., **3**: 103 (Pietermaritzburg and Durban, Natal; *Eutermes trinerviformis* Holmgren; Natal Museum).

Paracorotoca akermani Warren, 1920, Ann. Natal Mus., **4**: 297, pls.; Hegh, 1922, Les Termites, p. 611, text fig.

Warren searched about 400 nests of *Trinervitermes trinerviformis* Holmgren for this species, even taking some nests into the laboratory for examination. Only fourteen imagos were found, although larvae were at least twenty times as frequent. Warren was unable to rear the very delicate larvae in observation colonies.

Warren did not observe exchange of exudates between beetles and their hosts; the termites in fact seemed to ignore them. Warren described a very remarkable behavior on the part of the beetles; when disturbed they vibrated their bodies in typical termite fashion.

The larvae of this species were figured by Warren. They are noteworthy for having well-developed membranous appendages on the abdomen. Whether or not these appendages are exudatory organs is conjectural.

MILLOTOCA Paulian

Millotoca Paulian, 1948, Mem. Inst. Sci. Madagascar, **1A**: 15. Type species: *Millotoca mirotermitidis* Paulian.

Millotoca was proposed by Paulian for a Madagascan species that has not been available for study. It is not advisable at this time to undertake to differentiate *Millotoca, Termitoptochus,* and *Paracorotoca,* as my concept of *Millotoca* is based on study of a new species from Tanganyika which I believe belongs here.

Millotoca is doubtless less specialized than *Paracorotoca* and appears to be closer to the Indomalayan *Termitoptochus*. The abdomens of *Millotoca* and *Termitoptochus* are less specialized than that of *Paracorotoca.*

Information regarding host associations for the genus is incomplete. The recorded host of *M. mirotermitidis* is probably incorrect, as Paulian indicates. It seems likely that the beetles were taken from a mound containing several species of termites, and that the specimens of *Termes* (= *Mirotermes*) *baculiformis* Holmgren accompanying the beetles do not represent the true host. It is more logical to expect the host to be a species of Nasutitermitinae. The Tanganyikan species described below occurs with *Grallatotermes,* a genus of Nasutitermitinae very recently recorded in Africa for the first time.

Millotoca mirotermitidis Paulian

Millotoca mirotermitidis Paulian, 1948, Mem. Inst. Sci. Madagascar, **1A**: 17, text figs. (Maroantsetra, Madagascar; *Mirotermes baculiformis* Holmgren; Paris Museum).

Paulian figured the entire beetle, ventral aspect of thorax, antenna, maxilla, prementum and labial palpi, and hind leg.

Millotoca tanganyikae, new species. Figure 19, *e.*

Distinguished from *M. mirotermitidis* by differences in antennal structure and by having the pronotal disk impressed. The antennal scape is longer than segments 2 and 3 combined, segments 4–10 are elongated or subquadrate; in *mirotermitidis,* the scape is shorter than segments 2 and 3 combined, segments 4–10 are apparently transverse. Paulian did not state that the pronotum of *M. mirotermitidis* is impressed, and presumably it is not. Other differences cannot easily be determined without direct comparison of specimens of the two species.

Head and thorax light-brown, tergites paler brown, sternites testaceous to rufo-testaceous. Dorsum of head not modified, clypeus feebly declivous. Mentum-submentum not setose. Basal segment of labial palpi rather stout, segment 2 shorter and narrower, segment 3 slender, about as long as second. Segment 2 of maxillary palpi robust, moderately broad at base, broader at apex; segment 3 elliptical in outline, slightly flattened medio-laterally, about as broad at apex as segment 2 and subequal in length. Antennal segments with the following relative lengths: 30 : 12 : 12 : 9 : 10 : 10 : 10 : 8 : 8 : 8 : 18; scape longer than segments 2 and 3 combined; segments 2–11 subequal in width.

Head glabrous, with scarcely a suggestion of punctation. Head, pronotum, elytra, and tergites without erect setae or pubescence of any type; sternite 3 with a few scattered erect setae; other sternites with basal and apical rows of short setae.

Pronotum about one-seventh broader than long, broadest in front of middle, apical margin arcuate, anterior angles rounded, sides arcuate in front of middle, almost straight behind middle; base straight, about as broad as pronotal length; pronotal disk extensively but irregularly impressed. Elytra contiguous, one-fourth longer than pronotum; the inner margin three-fifths as long as lateral margins; apex of elytra very deeply concave, the posterior margin of each elytron strongly oblique; outer apical angles acute. Wings vestigial. Tarsi 4, 4, 4-segmented. Hind legs rather long; relative lengths of their parts as follows: femur, 78; tibia, 78; tarsus, 46; tarsomeres, 20, 8, 8, 10.

Third sternite very large, shield-shaped; sternites 4–7 narrow, strap-like; paratergites separated by membranous integument, the outer ones small.

Length, 2.1 mm. (with abdomen recurved); length of head and thorax, 1.5 mm.; of abdomen, 1.5 mm. Width of head and thorax, 0.5 mm.; of abdomen, 1.1 mm.

Holotype from Mafia Island, Tanganyika Territory, collected in 1938 by R. Lehmensick (ex Reichensperger coll.). In collection of Chicago Natural History Museum. Host: *Grallatotermes africanus* Harris.

Paratype.—One specimen, same data as type, in collection of A. Reichensperger.

Subtribe ABROTELINA

Frail species, frequently with very thin sclerites; head and thorax slender, abdomen ovoidal, weakly to strongly physogastric. Entire clypeus very weakly sclerotized or not sclerotized; there is very little sclerotization anterior to the tentorial pit level. Pronotum small, its surface not impressed. Tergites relatively narrow, about three-fifths as broad as the abdomen; inner paratergites large, about one-third as broad as the tergites. Elytra generalized, contiguous. Wings normal. Antennae 11-segmented. Tarsi 4, 4, 4-segmented or 5, 5, 5-segmented. Abdominal segments 7–9 distinctive (fig. 20, *f*).

KEY TO THE GENERA OF ABROTELINA

1. Tarsi 4, 4, 4-segmented; antennal segments partially telescoped, the pedicels invisible . . . . *Abroteles* Casey

   Tarsi 5, 5, 5-segmented; antennae more loosely organized, the pedicels visible 2

2. Pronotum narrower than head or about equal to it in width; pronotum subequal in length or slightly elongated . . . . *Termitoiceus* complex of genera

   Pronotum broader than head; pronotum broader than long 3

3. Pronotum broadest in front of middle (about two-thirds the distance from base to apex), apical and basal widths subequal, base arcuate or straight; basal segment of labial palpi only moderately long . . . . . *Eburniogaster* Seevers

   Pronotum broadest behind the middle or at the middle, apex about three-fourths as broad as base, base strongly bisinuate; basal segment of labial palpi very long . . . . *Termitonidia* Seevers

ABROTELES Casey

Abroteles Casey, 1890, Ann. N. Y. Acad. Sci., **5**: 190; Fenyes, 1918, Gen. Insect., **173A**: 61. Type species: *Abroteles beaumonti* Casey.

Termitothymus Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p.1; 1903, Redia, **1**: 187; Fenyes, 1918, Gen. Insect., **173A**: 65; Borgmeier, 1950, Rev. Ent., **21**: 638. Type species: *Termitothymus philetaerus* Silvestri.

Head moderately transverse; dorsum unmodified; clypeus very short, scarcely extending beyond anterior border of antennal fossae. Antennae with first segment short, thick, its inner surface concave; segments 2 and 3 transverse; segments partially telescoped, their pedicels invisible; sensory foveae on segments 4 and 11. Mentum-submentum delimited from gula by a depression. Labial palpi 3-segmented. Ligula incised. Galea with a strong, sinuous, terminal spine; its oblique inner margin with a row of stiff spines. Maxillary palpi unusually slender; segment 2 very slender at base, swollen toward apex; segment 3 slender, ovoidal; segment 4 slender, aciculate. Mandibles moderately strong, their apices acute, pointed.

Pronotum transverse, about two-thirds as long as wide; frail in build, evenly convex. Elytra a little wider than pronotum, generalized. Metepimeron larger than usual. Legs short, femora broad, thin. Tarsi 4, 4, 4-segmented.

Abdomen feebly enlarged, somewhat recurved; weakly physogastric, sclerites separated at most by small areas of membrane; dorsum flat, venter convex. Tergites relatively narrow, only three-fifths the total width of segment; seventh longer than sixth; eighth rather long. Inner paratergites large, one-third as broad as tergites; those of seventh segment elongated, acute at apex. Seventh tergite with a dense marginal fringe of pale hairs. Seventh sternite usually emarginate or modified.

Remarks.—At my suggestion, Borgmeier (1950) synonymized *Termitothymus* with *Abroteles* in his catalogue of neotropical staphylinid termitophiles.

The following is a summary of the important diagnostic characters:

Pubescence and pilosity of the sternites:
- Uniformly pubescent; no erect setae . . . . *lobata, badia.*
- A median area with much shorter and much sparser pubescence.
  - No erect setae . . . . *compacticornis.*
  - One pair of setae . . . . *bisetosus, pubicollis.*
  - Two rows of setae . . . . *beaumonti, rurrenabaquensis.*

Pronotal chaetotaxy:
- No erect setae . . . . *badia.*
- One seta near each apical angle.
  - One on each lateral margin . . . . *compacticornis.*
  - Four on anterior margin . . . . *pubicollis.*
  - Six on anterior margin . . . . *beaumonti, bisetosus, rurrenabaquensis.*
  - Two on lateral margin, 6 on anterior margin, and disk with about 10 . . *lobata.*

Pronotal pubescence:
- Pubescence a very short, uniform stubble .... *lobata, badia, bisetosus.*
- Pubescence moderately long; uniform throughout .... *pubicollis.*
- Lateral areas of pronotal surface with longer pubescence than that of disk. *beaumonti, rurrenabaquensis.*

Pronotal proportions; ratio of width to length:
- 1.5 to 1.6 times as broad as long. *compacticornis, bisetosus, pubicollis, rurrenabaquensis.*
- 1.65 to 1.75 times as broad as long................. *lobata, beaumonti, badia.*

Pronotal form:
- Pronotum broadest near base; sides converging in front. *beaumonti, bisetosus, pubicollis, rurrenabaquensis, lobata.*
- Pronotum broadest midway between base and apex.
  - Its sides converging in front .... *compacticornis.*
  - Its sides not converging in front .... *badia.*

Coloration:
- Light brown to flavo-testaceous. *beaumonti, rurrenabaquensis, bisetosus, pubicollis, compacticornis.*
- Darker reddish-brown .... *lobata.*
- Light chocolate-brown .... *badia.*

Seventh sternite:
- Apical border produced medially as a large rounded lobe .... *lobata.*
- Apical border emarginate due to prolongation of outer apical angles. *beaumonti, bisetosus, badia, rurrenabaquensis.*
- Apical border not emarginate .... *compacticornis, pubicollis.*

Abroteles beaumonti Casey. Figure 20, *e, f.*

Abroteles beaumonti Casey, 1890, Ann. N. Y. Acad. Sci., **5**: 191 (Panama; with termites; United States National Museum); Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 6.

Material examined.—Holotype. In addition, a series from Barro Colorado Island, Panama Canal Zone, with *Nasutitermes corniger* Motschulsky and *N. ephratae* Holmgren; from Hamburg Farm, Costa Rica (USNM), with *N. corniger* Motschulsky; from La Ceiba, Honduras (USNM), with *N. corniger* Motschulsky; from Río Frio, Colombia (USNM), with *N. meinerti* Wasmann.

Flavo-testaceous to testaceous. Pronotum with one seta at each anterior apical angle, 6 along anterior border, one on each lateral margin. Medial two-thirds of pronotum with very short pale pubescence; outer one-sixth with 10–15 longer, semi-recumbent, pale hairs. Elytral disc with about 18 semi-erect pale hairs; elytral margins with moderately dense, semi-recumbent, pale hairs.

Pronotum approximately seven-tenths broader than long; broadest sub-basally, its sides converging appreciably in front; anterior margin about two-thirds the maximum width; anterior margin straight, base feebly bisinuate.

Sternites with a broad median subglabrous area (with sparse, very short stubble); laterally densely pubescent. Sternites with two irregular rows of setae in addition to apical row; sternite 3 with a basal pair, a subapical pair, and often one lateral seta; sternite 4 with a sub-basal row of about 4 setae and a subapical row of about 6; sternite 5 with two medial pairs and 5 or 6 lateral setae. Seventh sternite broadly emarginate, due primarily to the production of the apical angles.

Length, 2–2.5 mm.

Abroteles rurrenabaquensis Seevers

Abroteles rurrenabaquensis Seevers, 1946, Rev. Ent., **17**: 261 (Rurrenabaque, Beni, Bolivia; *Nasutitermes chaquimayensis* Holmgren; United States National Museum).

Material examined.—Type series, and specimens from Huachi, Beni, Bolivia; from *N. chaquimayensis* Holmgren, *N. peruanus* Holmgren, and *N. pilosus* Snyder.

Yellowish-brown, elytra slightly darker; lateral and apical margins of pronotum and apical margins of elytra hyaline. Pronotum with one seta at each apical angle, one on each lateral margin, and six on anterior margin. Pronotum with a circular median area densely and rather finely punctate and pubescent; laterally very sparsely punctate and with 20–25 longer, pale, semi-recumbent hairs. Elytra with five or six irregular, longitudinal rows of moderately long, pale hairs. Pronotum approximately three-fifths broader than long; broadest sub-basally, the sides converging appreciably in front; apex straight, base bisinuate. Sternites with a broad subglabrous median area, having only a sparse, very short stubble; sternites densely pubescent laterally, with two irregular rows of eight to ten setae in addition to the apical row. Seventh sternite broadly emarginate.

Length, 2 mm.

Abroteles bisetosus Seevers

Abroteles bisetosus Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 5 (Gualaquiza, Azuay, Ecuador; *Nasutitermes dendrophilus* Holmgren; American Museum of Natural History).

Light brown to flavo-testaceous. Pronotal setae as in *beaumonti*. Pronotum with a uniform, sparse, very short stubble; without longer setae. Elytra with sparse, semi-recumbent hairs, considerably longer than those of pronotum. Pronotum slightly more than one-half broader than long; broadest at base, sides converging evenly from base to apex; anterior margin straight, base arcuate. Sternites with a broad median subglabrous area; densely pubescent laterally; with one pair of erect setae in addition to apical row. Seventh sternite broadly emarginate.

Length, 2 mm.

Abroteles compacticornis Borgmeier

Abroteles compacticornis Borgmeier, 1950, Rev. Ent., **21**: 654, text figs. 9–17 (Parada Deodoro, Sto. Amaro, São Paulo, Brazil; *Nasutitermes* sp.; Borgmeier coll.).

Material examined.—Specimens from Blumenau, Santa Catarina, Brazil (ex Reichensperger coll.); with *Nasutitermes jarague* Holmgren.

FIG. 20. (a) *Perlinctus foveicollis* Seevers. (b) *Termitoiceus simulans* Silvestri. (c) *Termitonidia jaliscensis* Seevers. (d) *Eburniogaster anahuaci* Seevers. (e) *Abroteles beaumonti* Casey. (f) *Abroteles beaumonti* Casey; dorsal view of abdomen.

The host of the type is *Nasutitermes proximus* Silvestri (determined by A. Emerson after Borgmeier's paper was published).

Coloration yellowish-brown. Pronotum with one short seta at each apical angle, one on each lateral margin; with a uniformly distributed, very short stubble. Elytral pubescence similar to that of pronotum except that the hairs are a little longer. Pronotum one-half broader than long; broadest about midway between base and apex, sides converging more in front than behind; apex slightly emarginate, base arcuate. Sternites with a broad median subglabrous area having sparse, extremely short hairs; pubescent only along a narrow area near lateral margin. Sternites without erect setae except for the apical row. Seventh sternite with apical angles produced slightly, but the apical border scarcely emarginate.

Length, 1.9 mm.

Abroteles pubicollis, new species

Yellow-brown to flavo-testaceous. Pronotum with one erect seta at each apical angle, one on each lateral margin and four on anterior margin; evenly and moderately densely clothed with numerous semi-recumbent pale hairs. Elytral pubescence similar to that of pronotum. Pronotum approximately three-fifths broader than long; broadest sub-basally; sides converging appreciably in front (a little more than two-thirds as broad as maximum width). Sternites with a median subglabrous area and pubescent lateral areas (median area narrower than in the other species); with one pair of erect setae in addition to the apical row. Seventh sternite unmodified.

Length, 1.75 mm.

Holotype from the state of Minas Gerais, Brazil (ex Reichensperger coll.); with *Nasutitermes jaraguae* Holmgren. In collection of Chicago Natural History Museum.

Paratypes.—Two specimens, same data as holotype; in collections of Chicago Natural History Museum and Reichensperger.

Abroteles lobata, new species

Dark reddish-brown. Pronotum with one erect seta at each apical angle, one on each lateral margin, six on anterior margin, and five on each half of disk arranged in a medial row of three and two laterally. Pronotum moderately densely and finely pubescent, the hairs rather uniformly distributed except for a conspicuous medial area which is very densely punctulate and finely pubescent. Elytra with one erect seta on each lateral margin; surface uniformly and rather densely pubescent. Pronotum approximately two-thirds broader than long; broadest near base, sides strongly converging in front, three-fourths as broad at apex as maximum width. Sternites uniformly and densely clothed with moderately long, pale, recumbent hairs. Sternites with no erect setae in addition to those of apical row. Seventh sternite with a medial area produced as a large lobe.

Length, 2.8 mm.

Holotype from Iepê, São Paulo, Brazil, collected September 4, 1946, by R. L. Araujo; with *Nasutitermes globiceps* Holmgren. In collection of Chicago Natural History Museum.

Paratypes.—Four specimens from Santa Ernestina, São Paulo, Brazil, collected October 23, 1947, by R. L. Araujo; with *Nasutitermes globiceps* Holmgren (determined by R. Araujo). In collections of Chicago Natural History Museum and Instituto Biológico, São Paulo, Brazil.

Abroteles badia, new species

Coloration light chocolate-brown. Pronotum with no erect setae. Pronotum with a moderately dense, very fine pubescence, the minute hairs more densely arranged in the center of the disk. Elytral pubescence fine. Pronotum approximately three-fourths broader than long; its sides feebly and evenly arcuate, the maximum width midway between base and apex, which are equal in width. Sternites with a short, uniformly distributed, densely arranged stubble. Sternites without erect setae in addition to those of apical row.

Length, 2.3 mm.

Holotype from Atibáia, São Paulo, Brazil, collected March 19, 1946, by R. L. Araujo; with *Nasutitermes coxipoensis* Holmgren (determined by R. Araujo). In collection of Chicago Natural History Museum.

Paratypes.—Sixty-two specimens from five nests of *Nasutitermes coxipoensis* Holmgren (determined by R. Araujo) in the vicinity of São Paulo, Brazil, collected by R. L. Araujo, J. F. Prado, and W. A. Maluf (São Paulo, January 27, 1948; Congonhas, August 3 and September 19, 1951; and Vila Primavera, July 31, 1951). In collections of Chicago Natural History Museum and Instituto Biológico, São Paulo, Brazil.

Abroteles philetaerus Silvestri

Termitothymus philetaerus Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p. 1 (Cernadas, Cordoba, Argentina; *Eutermes arenarius fulviceps* Silvestri; Silvestri coll.); 1903, Redia, **1**: 188, pl. 5, figs. 243–245.

Abroteles philetaerus Silvestri, Borgmeier, 1950, Rev. Ent., **21**: 644.

Silvestri's description of this species leaves no doubt that it belongs to *Abroteles*. The characters useful for diagnostic purposes were not described by Silvestri, so I am unable to place the species properly.

TERMITOICEUS Silvestri and related genera

Silvestri described seven closely related species and one subspecies and proposed six genera to receive them. He described and figured the species with his customary thoroughness but did not present very convincing generic diagnoses. For a time it seemed to me that Silvestri had erected too many genera but there is reason to believe that most of them are justifiable. Two new species have already been received and indicate that several of Silvestri's genera will probably stand.

Silvestri chose rather weak diagnostic characters to differentiate his genera, and relied strongly on the form of the ligula and the type of setae on the sides of the abdominal sternites. I have not seen enough material of this group to redefine the genera and shall not attempt to analyze Silvestri's descriptions in detail.

An interesting feature of *Termitoiceus* and most, if not all, of its close allies is the fusion of inner and outer paratergites of each segment to form a large transverse sclerite on each side of the dorsum. I know this is true of *Termitoiceus* and *Perlinctus* from personal observation and of *Mormellus,* judging from Silvestri's illustration. The condition in *Oecidiophilus* is not clear from Silvestri's figure, but his figures of *Parvidolum* show the paratergites to be distinct.

KEY TO SPECIES OF *TERMITOICEUS* AND RELATED GENERA

The following key is constructed chiefly from information taken from Silvestri's descriptions and figures; only three species were available, and two of these are described as new.

1. Third antennal segment at least one-half longer than broad 2
   Third antennal segment subquadrate to transverse 4

2. Sternites 3–7 with numerous fine spatuliform setae on sides; head distinctly transverse 8
   Sternites 3–7 with fine, simple hairs 3

3. Ligula incised; hind tarsus with first segment equal in length to segments 2–4 combined .... *Oecidiophilus mimellus* Silv.
   Ligula triangular; hind tarsus with first segment equal in length to segments 2–5 combined .... *Termitoiceus anastrephoproctus* Silv.

4. Vertex with a curving row of 4 setae behind each eye; pronotum with 4 or more macrosetae 5
   Vertex with one seta behind each eye or none; pronotum lacking macrosetae or with 2 small setae on anterior margin 6

5. Pronotum with 12 macrosetae .... *Fonsechellus bicolor* Silv.
   Pronotum with 4 macrosetae .... *Fonsechellus fragilis,* new sp.

6. Sternites 4–7 with geniculate setae on sides ..... *Fonsechellus diversicolor* Silv.
   Sternites 4–7 with lanceolate or simple setae 7

7. Antennal segments 3–10 transverse; scape about equal to segments 2–4 combined; sternites 4–7 with numerous lanceolate hairs on sides. *Parvidolum microsomatis* Silv.
   Antennal segments 3–10 subquadrate; scape about equal to segments 2 and 3 combined; sternites 4–7 with simple setae .... *Mormellus bicolor* Silv.

8. Pronotum with two strong foveae .... *Perlinctus foveicollis,* new sp.
   Pronotum without foveae .... *Perlinctus quaesitus* Silv.

TERMITOICEUS Silvestri

Termitoiceus Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p. 5; 1903, Redia, **1**: 191; Fenyes, 1920, Gen. Insect., **173B**: 345; Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 326. Type species: *Termitoiceus anastrephoproctus* Silvestri.

Small, rather frail species, with slender head and thorax, and large, recurved abdomen. Head small, slightly broader than long; dorsum unmodified; clypeus not sclerotized. Antennae with segments 2–7 longer than broad. Ligula arcuate. Maxillary palpi with segments 2 and 3 subequal in size; segment 3 oval, somewhat compressed. Pronotum small, slightly longer than broad; sides scarcely converging posteriorly, disk not impressed, hypomera very small. Elytra slender, longer than broad; contiguous. Tarsi 5, 5, 5-segmented; all segments free and movable. Tergites 3–6 only about twice as broad as long; seventh elongated, about as long as broad, its tergal glands contiguous. Sternites very broad and short, with considerable membranous integument between them; seventh sternite usually broadly emarginate. Sternites with fine curved setae on their sides.

Termitoiceus anastrephoproctus Silvestri

Termitoiceus anastrephoproctus Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p. 6 (Coxipó, near Cuyabá, Mato Grosso, Brazil; *Eutermes heteropterus* Silvestri; Silvestri coll.); Wasmann, 1902, Tijd. Ent., **45**: 96; Silvestri, 1903, Redia, **1**: 192, pl. 5, fig. 253, pl. 6, figs. 254, 257; 1946, Comm. Pont. Acad. Sci., **10**: 330, fig. 11 (as *anastrephoroctus*).

Host record.—The host of the type was *Velocitermes heteropterus* Silvestri, but Silvestri records one specimen with *Anoplotermes tenebrosus* Kollar.

The following characteristics were selected from Silvestri's description: Color flavate; membranous integument straw-colored. Head and pronotum coarsely punctate. Head slightly broader than long. Head with 4 setae on apical margin; pronotum and elytra without setae. Antennal scape subequal to segments 2 and 3 together; segment 3 one-third longer than 2 or 4; segments 2–7 longer than broad, 3–7 decreasing in length; 8–10 subquadrate. Pronotum about as broad as head, a little longer than apical width; anterior margin slightly convex, sides scarcely converging behind. Hind tarsi almost as long as tibiae; basal segment subequal to the others combined. Tergites 3–6 with a marginal row of setae; seventh with 4 irregular transverse series and one pair of longer setae; eighth with 8 setae; ninth with 4 setae. Sternites 3–5 with numerous small curved setae.

Length, 5 mm.

Termitoiceus simulans Silvestri. Figure 20, *b*.

Termitoiceus anastrephoproctus simulans Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 331, text fig. 12 (Rio dos Coros, São Paulo, Brazil, and Baurú, São Paulo, Brazil; *Nasutitermes heteropterus* Silvestri; Silvestri coll.).

Material examined.—One specimen from Vila Primavera, São Paulo, Brazil, collected by W. A. Maluf, with *Diversitermes*, n. sp. (determined by R. L. Araujo).

Silvestri described *simulans* as a subspecies of *anastrephoproctus*, but it seems more nearly to fulfill the criteria for a distinct species. *T. simulans* was said to differ from *anastrephoproctus* in being rufotestaceous; in having the antennal scape longer than segments 2 and 3 combined, segment 3 only one-fourth longer than 2, segment 10 a little longer than broad, segment 11 a little more than twice as long as broad, the setae of tergites 3–7 one-fourth shorter, and the eighth tergite with 6 instead of 8 macrosetae.

The host is *Velocitermes heteropterus* Silvestri, but Silvestri records one specimen with *Spinitermes* sp.

OECIDIOPHILUS Silvestri

Oecidiophilus Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 331. Type species: *Oecidiophilus mimellus* Silvestri; not *O. oglobinii* as designated by Silvestri (this was a manuscript name not used by Silvestri).

Oecidiophilus is very closely related to *Termitoiceus* and is doubtfully distinct. Silvestri gave the following diagnostic features: ligula incised, distinct form of second tergite, the absence of macrosetae on ninth tergite, and relatively shorter basal segment of hind tarsi.

Oecidiophilus mimellus Silvestri

Oecidiophilus mimellus Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 334, text fig. 13 (Loreto, Misiones, Argentina; *Nasutitermes* (s. lat.) sp.; Silvestri coll.).

Straw-colored. Head a little longer than broad. Head, except for two clypeal setae, pronotum, and elytra without macrosetae. Antennal scape subequal to segments 2 and 3 together; segment 2 a little shorter than 3; 3–6 subequal, longer than broad; 7–10 decreasing a little in length and width. Ligula incised at middle. Hind tarsi with basal segment equal to segments 2–4 combined. Tergites 3–6 with 6 short, marginal setae; eighth with 4 macrosetae and several small ones; ninth with 4 short, subapical setae. Inner paratergites weakly sclerotized. Outer paratergites scarcely separated from sternites. Sternites 4–6 with transverse series of short setae.

Length, 3.2 mm.

FONSECHELLUS Silvestri

Fonsechellus Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 312. Type species: *Fonsechellus diversicolor* Silvestri.

Trianellus Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 315 (subgenus). Type species: *Fonsechellus (Trianellus) bicolor* Silvestri.

Fonsechellus is closely allied to *Termitoiceus*, from which it was stated by Silvestri to differ in having a bilobed ligula, the ninth tergite with 10 macrosetae, and sternites 4–6 (or 7) with distinctive geniculate setae.

There seems to be little justification for placing *bicolor* in the subgenus *Trianellus*, which differs, according to Silvestri, in having the head longer than broad, vertex with 8 macrosetae, and only sternites 4–6 with geniculate setae (4–7 in *Fonsechellus* s. str.).

Fonsechellus diversicolor Silvestri

Fonsechellus diversicolor Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 315, text fig. 6 (Alto da Serra, São Paulo, Brazil; *Nasutitermes "distinctellus"* Silvestri; Silvestri coll.).

Head subequal in length and width. Head, thorax, tergites, and legs rufoflavate, femora darker, abdomen pale straw-colored. Antennal scape longer than segments 2 and 3 combined; segment 2 a little shorter and narrower than 3; segments 3 and 4 subquadrate; segments 5–10 a little shorter than the preceding, subequal, slightly transverse. Head with 2 widely separated vertexal setae; pronotum with 2 small setae on anterior margin. Pronotum about as long as broad, sides a little sinuous. Tergites 3–6 with several marginal setae, and seventh with two pairs of setae. Sternites 4–7 with numerous very small, geniculate setae on their sides; sternites with several series of erect setae.

Length, 4 mm.

Remarks.—The host is evidently a species of *Velocitermes* or *Diversitermes* which Silvestri included with *Nasutitermes*.

Fonsechellus bicolor Silvestri

Fonsechellus (*Trianellus*) *bicolor* Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 316, text fig. 7 (Alto da Serra, São Paulo, Brazil; *Nasutitermes "distinctellus"* Silvestri; Silvestri coll.).

Coloration flavo-ferrugineous. Head a little longer than broad; with an irregular row of 4 setae extending posteriorly and medially from each eye. Pronotum with 2 setae on anterior margin near apical angle and 2 on each lateral margin; pronotal disk with one subapical pair of setae and one pair near base. Elytra with about 4 setae near base. Antennal scape shorter than in *diversicolor*, subequal to segments 2 and 3 together; segment 2 a little shorter than 3; segments 3 and 4 subequal, a trifle broader than segments 5–10; segments 3–10 slightly transverse or subquadrate. Pronotum a trifle longer than maximum width; sides converging posteriorly, the base about two-thirds as broad as long. Tergites 3–6 with 6 short marginal and several subapical setae. Sternites 3–5 with 4 or 5 transverse series of numerous, arcuate setae; sternite 6 with 3 transverse series; sternites 3–6 with fine, geniculate setae on their sides, seventh without these setae.

Length, 2.8 mm.

Fonsechellus fragilis, new species

Closely related to *bicolor*, from which it may be distinguished by the following characters: The pronotum has only 4 setae, 2 on anterior margin and 2 on disk a short distance behind apex and closer together than the marginal pair; the sides of the sixth sternite with dense clusters of fine hairs which have bent tips but are not geniculate as in *bicolor* (these hairs are very sparse on sternites 3, 4, 5, and 7).

Holotype from Blumenau, Santa Catarina, Brazil (ex Reichensperger collection); with *Subulitermes*, n. sp. In collection of Chicago Natural History Museum.

PERLINCTUS Silvestri

Perlinctus Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 320. Type species: *Perlinctus quaesitus* Silvestri.

According to Silvestri, this genus differs from *Termitoiceus* in having geniculate antennae, bilobed ligula, sternites 3–7 with spatuliform setae, and the ninth tergite with 6 macrosetae; from *Fonsechellus* in having spatuliform setae on the sternites; and from *Parvidolum* in having the ligula bilobed, spatuliform setae on sternites 3–7, and the ninth tergite with 6 macrosetae.

Perlinctus quaesitus Silvestri

Perlinctus quaesitus Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 323, text fig. 9 ((Jabaquara, São Paulo, Brazil; *Nasutitermes diversimiles;* Silvestri coll.).

Record.—Vitória, Espirito Santo, Brazil.

Coloration castaneous, membranous parts straw-colored. Head a little broader than long. Head, pronotum, and elytra without macrosetae. Antennal scape two-thirds as long as segments 2 and 3 together; segment 2 three-fifths as long as scape; segment 3 about one-half longer than 2; segments 4 and 5 seem a little longer than broad; 4–10 decreasing slightly in length. Pronotum slightly narrower than head, its sides converging posteriorly. Hind tarsi elongated; basal segment about as long as segments 2, 3, 4 together. Inner and outer paratergites scarcely separated. Eighth tergite with 10 macrosetae; ninth with 6 setae. Sternites 3–7 with numerous fine spatuliform hairs on their sides.

Length, 3.1 mm.

Remarks.—The host is probably *Diversitermes diversimilis* Silvestri.

Perlinctus foveicollis, new species. Figure 20, *a*.

Distinguished from *quaesitus* by the presence of conspicuous foveae on the pronotum and smaller ones on the vertex of the head.

Head and thorax castaneous; abdominal sclerites light-brown. Head, pronotum, and elytra without macrosetae; tergites 3–6 with an inconspicuous row of short setae along apical margin and a few minor ones; tergites 7–9 with a moderate number of longer bristles and fine pale setae; ninth with about 6 terminal setae. Third sternite with about 60 long, curved macrosetae in fine, rather irregular rows, and a number of fine, pale hairs; sternites 4–8 very sparsely setose. Sternites densely punctulate, especially along the sides, each puncture with a very minute "spatuliform" seta. Head sparsely punctulate; surface reticulated medial to each antennal fossa. Pronotum and elytra very finely and sparsely punctulate; surface shining.

Head transverse; four-fifths as long as broad; vertex with a pair of small, closely placed foveae between eyes. Pronotum about one-tenth broader than long; apex bisinuate; sides strongly converging basally so that base is about two-thirds as broad as apex. Pronotum with two moderately broad foveae that are separated by about one-third pronotal width.

Antennae very similar to those of *quaesitus*. Relative lengths of antennal segments as follows: 13 : 6 : 9 : 7 : 6 : 6 : 5 : 5 : 4 : 4 : 12. Segment 3 longer than any of segments 2–10; segments 3–10 decreasing in length.

Length, 2.1 mm. (with abdomen recurved); total length, about 3.5 mm.

Holotype from Morumbí, São Paulo, Brazil; collected October 31, 1950, by R. L. Araujo, with *Diversitermes*, n. sp. In collection of Chicago Natural History Museum.

PARVIDOLUM Silvestri

Parvidolum Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 318. Type species: *Parvidolum microsomatis* Silvestri.

Silvestri stated that this genus differs from *Fonsechellus* in having a distinctive abdomen.

Parvidolum microsomatis Silvestri

Parvidolum microsamatis Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 320, text fig. 8 (Campinas, São Paulo, Brazil; *Nasutitermes microsoma* Silvestri; Silvestri coll.). Silvestri obviously intended to use *microsomatis*, although he spelled the name "*microsamatis*."

Coloration testaceous, terminal parts of abdomen flavescent. Head as broad as long; with one postocular seta and three small setae on vertex. Antennae strongly geniculate; scape about as long as segments 2–4 together; segment 2 obconical, longer than any of segments 3–10, which are transverse. Ligula triangular in shape, acute medially. Pronotum slightly narrower than head; sides converging posteriorly. Hind tarsi with basal segment about equal to segments 2 and 3 together; tarsi relatively robust and short. Tergites small, 3–6 transversely rectangular, seventh a little longer than broad. Paratergites difficult to distinguish in Silvestri's figures; they seem to be broad, and on the dorsal surface. Eighth tergite with 4 macrosetae; ninth with one pair of macrosetae; sternites 4–7 with numerous short, spatuliform setae on their sides.

Length, 2.6 mm.

Remarks.—The host of this species is *Subulitermes microsoma* Silvestri.

MORMELLUS Silvestri

Mormellus Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 325. Type species: *Mormellus bicolor* Silvestri.

This genus is very close to several of the others of this group of genera, but Silvestri did not present an adequate diagnosis. He emphasizes the presence of two pairs of sensory foveae on the terminal antennal segment instead of the usual pair.

Mormellus bicolor Silvestri

Mormellus bicolor Silvestri, 1946, Comm. Pont. Acad. Sci., **10**: 325, text fig. 10 (Jabaquara, São Paulo, Brazil; *Nasutitermes microsoma* Silvestri; Silvestri coll.).

Head and thorax castaneous, abdomen pale flavate. Head slightly broader than long. Head, pronotum, and elytra without macrosetae; head with numerous very short hairs. Antennal scape about equal to segments 2 and 3 together, about twice as long as broad; segments 2 and 3 subequal, perhaps a little longer than either 4 or 5; segments 5–10 increasing in width; 3–10 slightly transverse; terminal segment with a median polytrichous fovea in addition to the usual pair. Ligula incised at middle. Pronotum obtrapezoidal, scarcely broader at apex than length. Hind tarsi moderate in length; basal segment about as long as segments 2 and 3. Inner paratergites appear in Silvestri's figure almost as broad as the tergites (part of this may be the outer paratergite). Tergites 3–7 with 4–6 short marginal setae; eighth with a few short setae; ninth with 6 macrosetae. Sternites with numerous arcuate hairs (not unusual) on their sides.

Remarks.—The host of this species is *Subulitermes microsoma* Silvestri.

TERMITOSIUS Silvestri

Termitosius Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p. 8; 1903, Redia, **1**: 195; Fenyes, 1920, Gen. Insect., **173B**: 374. Type species: *Termitosius pauciseta* Silvestri.

This genus has not been available for study, and Silvestri's description and figures do not enable me to place the genus accurately. Silvestri related *Termitosius* to *Termitozophilus* but it probably belongs in this subtribe. A re-examination of the type or study of topotypic material will be necessary before the position of the genus can be ascertained.

Termitosius pauciseta Silvestri

Termitosius pauciseta Silvestri, 1901, Boll. Mus. Zool. Torino, **16**, no. 398, p. 9 (Tacurúpucú, Paraguay; *Eutermes heteropterus* Silvestri; Silvestri coll.); 1903, Redia, **1**: 195, pl. 5, fig. 249, pl. 6, figs. 258, 259.

EBURNIOGASTER Seevers

Eburniogaster Seevers, 1938, Ann. Ent. Soc. Amer., **31**: 424. Type species: *Eburniogaster termitocola* Seevers.

Body frail in build; very sparsely setose and pubescent. Head and thorax slender, abdomen moderately physogastric. Head dorso-ventrally compressed, circular in outline. Antennae 11-segmented; first segment moderately long, equal to segments 2 and 3 combined; segment 2 short, segments 3–10 as a rule elongated. Clypeus very short. Gula broad; mentum-submentum weakly sclerotized. Ligula bifid. Maxillae small; galea slightly longer than lacinia, setose on its inner border for more than half the length; lacinia with its inner border concave and densely setose.

Pronotum a little broader than head, and broader than long; broadest in front of the middle, about two-thirds the distance from base to apex; apical and basal widths subequal; base arcuate or straight. Elytra about as long as pronotum. Metathorax with considerable exposed membranous integument laterally.

Abdomen moderately inflated; dorsum flat, venter convex; tergites, paratergites, and sternites contiguous within each segment; abdomen with considerable membranous integument exposed between sclerites of adjacent segments. Tergites generalized, seventh longer than the others. Inner and outer paratergites well developed, the outer ones usually broader than the inner.

Eburniogaster termitocola Seevers

Eburniogaster termitocola Seevers, 1938, Ann. Ent. Soc. Amer., **31**: 426, pl. 1, figs. 1–4 (Oracle, Arizona; *Tenuirostritermes tenuirostris* Desneux; Chicago Natural History Museum).

Color testaceous. Head slightly broader than long, shining, moderately punctate, more coarsely so than in *anahuaci*. Basal segment of antennae with anterior surface flattened; segment 3 two-fifths longer than 4; segment 5 one-fifth longer than 4; segments 5–7 subequal, 8–10 decreasing in length, segment 11 longer than 10. Segments 4 and 5 of maxillary palpi conjointly two-fifths as long as third; segment 3 large, oval, three-fifths as broad as long. Pronotum four-fifths as long as broad; humeri rather strongly deflexed, sides sinuate, narrowing abruptly behind middle, basal angles nearly right, base feebly arcuate. Pronotum without setae; disk glabrous, nearly impunctate, humeri very finely pubescent and punctulate. Elytra sparsely punctulate and pubescent, not setose.

Length, 3.5 mm.

Eburniogaster texana Brues

Termitogaster texana Brues, 1902, Ent. News, **13**: 186, pl. 9, figs. 3–5 (Austin, Texas; *Tenuirostritermes cinereus* Buckley; type depository unknown).

Eburniogaster texana Brues, Seevers, 1938, Ann. Ent. Soc. Amer., **31**: 427.

Specimens of *texana* have not been available for study. The species was based on a physogastric specimen alleged to be a female and two stenogastric individuals believed to be males. It seems evident from Brues' description and figures that these specimens belonged to two species and probably two genera. The physogastric individual was without doubt an *Eburniogaster*, and inasmuch as it was described first it may be assumed to be the type.

The "males" were described as having the abdomen only slightly swollen, and as differing in detailed structure of antennae, mandibles, labium, maxillae, and pronotal and elytral chaetotaxy. It is very doubtful that the sexes of a species of *Eburniogaster* would differ in so many respects. It is probable that these specimens belong to *Termitonidia*, species of which occur with regularity in the same nests as *Eburniogaster*. Two of Brues' figures (pl. 9, figs. 3, 5) depict *Eburniogaster texana*, and the other (pl. 9, fig. 4) shows the galea, lacinia, labial palpi, and ligula of the specimens which are probably a species of *Termitonidia*. The galea and lacinia, in particular, are much like those of *Termitonidia lunata* Seevers from Arizona.

Eburniogaster texana apparently differs from *termitocola* in pronotal and antennal characters. The pronotum of *texana* has parallel sides, while that of *termitocola* has distinctly sinuate lateral margins. A comparison of the two species is desirable.

Eburniogaster anahuaci, new species. Figure 20, *d*.

This species differs from *termitocola* in antennal structure, in the presence of setae on pronotum and elytra, in pronotal shape, and in minor respects mentioned in the description.

Color flavo-testaceous; elytra brownish, sides and apices irregularly pale. Head slightly broader than long, shining, sparsely punctulate. First antennal segment not compressed, segments 3–10 subequal, about three-fourths as broad as long. Segments 4 and 5 of maxillary palpi conjointly three-fourths as long as third; segment 3 oval, nearly twice as long as broad. Pronotum four-fifths as long as broad; sides arcuate, converging evenly from widest point behind humeri to strongly arcuate base; basal angles obsolescent, the basal margin almost semicircular in outline. Pronotum with three fine setae along apical half of lateral margin and one on each half of anterior margin. Elytra with one long seta on side, lateral to humerus, and two on upper surface near lateral margin.

Length, 2 mm.

Holotype from Tuxpan, Michoacan, Mexico; collected July 23, 1941, by Charles H. Seevers; with *Tenuirostritermes*, n. sp. In collection of Chicago Natural History Museum. No paratypes.

TERMITONIDIA Seevers

Termitonidia Seevers, 1938, Ann. Ent. Soc. Amer., **31**: 428. Type species: *Termitonidia lunata* Seevers.

Body slender; abdomen feebly physogastric; body with numerous setae. Head compressed dorso-ventrally; oval in outline above. Postclypeus moderately long, its anterior border emarginate. Antennae elongated, slender; longer than head and thorax; first segment moderately long, club-shaped, slightly shorter than segments 2 and 3 combined; segments 2–11 slender; segment 2 short, segments 3–11 elongated, twice as long as wide as a rule. Galea and lacinia elongated, slender; lacinia shorter than galea; both strongly acute at tip, and each with closely setose medial borders. Maxillary palpi long and slender; second segment feebly arcuate, about three-fourths as long as spindle-shaped third; fourth very slender.

Pronotum broadest at middle or behind the middle; apex about three-fourths as broad as base; base strongly bisinuate; pronotum broader than head and broader than long. Elytra generalized, the posterior angles sometimes truncated. Wings present.

Abdomen generalized in appearance; feebly inflated, with small areas of membranous integument exposed between sclerites of adjacent segments; abdomen tapering posteriorly. Tergites, paratergites, and sternites generalized.

KEY TO SPECIES OF *TERMITONIDIA*

1. Seventh sternite deeply emarginate, its apical angles acute. . *lunata* Seevers
   Seventh sternite unmodified 2
2. Tergites 3–6 with 4 macrosetae; head with a transverse row of 6 setae on vertex and 2 on clypeus . . . . *jaliscensis*, new sp.
   Tergites 3–6 with 5 macrosetae; head with 4 longitudinal rows of setae. *tarascani*, new sp.
   Tergites 3–6 with 6 very long macrosetae; head with a transverse row of 4 setae at base . . . . *michoacani*, new sp.

Termitonidia lunata Seevers

Termitonidia lunata Seevers, 1938, Ann. Ent. Soc. Amer., **21**: 429, pl. 2, figs. 11–14, 16 (Oracle, Arizona; *Tenuirostritermes tenuirostris* Desneux; Chicago Natural History Museum).

Record.—Sonoita, Arizona.

Color light-brown; sides of pronotum and elytral apices paler. Head broader than long, sides moderately convex. Eyes elongate oval, seven-tenths as broad as long; one and one-third times their length from base of head. Head with a sparse vestiture of short, stiff hairs, moderately dense at base of head and on postgenae, and a pair of short, erect setae medial to each eye. Antennae relatively slender, segments 4–10 subequal, twice as long as broad, segment 11 fusiform, longer than 10. Segments 4 and 5 of maxillary palpi conjointly three-fourths as long as segment 3.

Pronotum a trifle less than three-fourths as long as broad; surface dull, with a circular area of disc densely punctulate, otherwise sparsely punctate and setose; 11 setae on each half as follows: 3 feeble setae in medial row, 3 longer setae in a lateral row, and 5 short marginal setae (posterior two submarginal). Elytra three-fifths as long as wide; its apical angles right; surface dull; densely setulose laterally, otherwise sparsely so; with 3 discal setae and one on lateral margin. Tergites 3–6 with 6 macrosetae, tergite 7 with 4 setae. Spiracles large, crescentic. Seventh sternite very deeply emarginate, its apical angles acute; apex with a prominent medial arcuation.

Length, 2.25 mm.

Termitonidia jaliscensis, new species. Figure 20, *c*.

Testaceous; elytra brown, lateral and basal borders of pronotum and elytral apices pale. Head one-sixth wider than long, sides moderately convex. Eyes oval, five-sixths as wide as long, four-fifths their length from base of head. Head with a transverse row of 6 macrosetae at level of hind margin of eyes, and 2 medial setae farther cephalad; sparsely pubescent. Antennal segments 3–6 subequal in length, segment 3 a trifle stouter than the others, segments 4–6 two-thirds as broad as long, segments 7–10 gradually shorter and broader; segment 11 one-third longer than 10. Segments 4 and 5 of maxillary palpi conjointly two-thirds as long as segment 3.

Pronotum slightly less than three-fourths as long as wide; surface shining; pubescence short and sparse; each half with 10 macrosetae in four longitudinal rows of 3, 2, 2, 3 setae, respectively. Elytra three-fourths as long as wide; their apical angles truncated; surface shining, with numerous longitudinal rows of short hairs, and with 3 very long marginal macrosetae and 4 on dorsum (3 in front of middle, one behind). Tergites 3–7 with a row of 4 very long macrosetae (longer than tergite); sternites with three or four rows of long, curved setae, pubescence very fine and sparse. Inner paratergites two-ninths as broad as tergites. Spiracles small, oval. Seventh sternite unmodified.

Length, 1.75 mm.

Holotype from El Molino, Jalisco, Mexico (5,000 feet elevation, 25 miles south of Guadalajara); collected July 26, 1941, by Charles H. Seevers; with *Tenuirostritermes*, n. sp. In collection of Chicago Natural History Museum.

Paratypes.—Four specimens, same data as type.

Termitonidia michoacani, new species

Testaceous, elytra darker, lateral margins of pronotum and apical margin of elytra pale. Head two-fifths wider than long, sides strongly convex, obtuse-angulate behind eyes. Eyes oval, five-sixths of their length from base of head. Head with an occipital row of 4 macrosetae; pubescence short, very sparse. Antennal segments 4–6 subequal in length, two-thirds as broad as long; 7–10 shorter, increasing in width; 8–10 as broad as long; segment 11 conical, one-third longer than 10. Segments 4 and 5 of maxillary palpi conjointly two-thirds as long as segment 3.

Pronotum three-fifths as long as broad; surface shining; very minutely and sparsely punctulate; with 7 macrosetae on each half in three longitudinal rows of 3, 2, 2 setae, respectively, beginning with marginal row. Elytra slightly more than one-half as long as broad; apical angles feebly truncated; surface shining; sparsely setulose; with five irregular longitudinal rows of very long macrosetae comprised of 3, 2, 2, 3, 3 setae, respectively, beginning with outer marginal row. Tergites 3–6 with a subapical row of 6 very long macrosetae (longer than tergite); tergite 7 with a subapical row of 6 setae and 2 sub-basal setae; sternites with numerous long, erect setae in 3 or 4 transverse rows. Seventh tergite one-third longer than sixth; inner paratergites one-tenth as wide as tergites. Spiracles small, oval. Seventh sternite unmodified.

Length, 2 mm.

Holotype from Tuxpan, Michoacan, Mexico (about 17 miles west of Zitácuaro); collected July 23, 1941, by Charles H. Seevers; with *Tenuirostritermes*, n. sp. In collection of Chicago Natural History Museum. No paratypes.

Termitonidia tarascani, new species

Head and pronotum light-brown, elytra darker brown; lateral borders of pronotum and lateral and apical borders of elytra pale, abdomen testaceous. Head about as long as broad, sides feebly convex. Eyes elongate, about three-fourths as broad as long; one and one-half times their length from base of head. Head with four longitudinal rows of 3, 4, 4, 3 macrosetae, respectively. Antennae moderately stout, segments 3–7 increasing slightly in length, segments 8–10 decreasing; segments 3–10 increasing feebly in width; segment 11 conical, nearly twice as long as 10. Segments 4 and 5 of maxillary palpi conjointly a trifle shorter than third.

Pronotum nine-tenths as long as broad; surface shining; sparsely pubescent; with 9 macrosetae in four longitudinal rows of 4 (weak), 1, 2, 2 setae, respectively, beginning at outer margin. Elytra a little more than one-half as long as wide; apical angles rounded; surface shining; lateral two-fifths densely pubescent, otherwise very sparsely so; with 3 long marginal setae and 3 on dorsum (2 in a basal row, one behind middle). Tergites 3–6 with 5 long, subapical macrosetae; tergite 7 with a subapical row of 4 setae; sternites with a number of moderately long, fine semi-recumbent setae, somewhat densely pubescent on sides, sparsely so at middle. Inner paratergites one-third as wide as tergites. Spiracles large, crescentic. Seventh sternite unmodified.

Length, 2.25 mm.

Holotype from Tuxpan, Michoacan, Mexico, collected July 23, 1941, by Charles H. Seevers; with *Tenuirostritermes*, n. sp.

Subtribe TERMITOCHARINA

The Madagascan genus *Termitochara* Wasmann is almost certainly a member of the Corotocini but it does not fit well into any of the preceding subtribes. I tentatively assign it to a separate subtribe, but this viewpoint may be modified as more material from Madagascar and Africa becomes available. In some respects, *Termitochara* is most closely related to the Abrotelina of the Neotropical Region.

TERMITOCHARA Wasmann

Termitochara Wasmann, 1893, Wiener Ent. Zeitung, **12**: 247; Fenyes, Gen. Insect., **173A**: 65. Type species: *Termitochara kraatzi* Wasmann.

Head one-fifth broader than long; dorsum unmodified; clypeus short, slightly declivous. Antennae 11-segmented, geniculate; scape short; segments 2 and 3 stout, segments 4–10 incrassate; terminal segment with a pair of polytrichous foveae; third segment with a sensory fovea. Gula very narrow, only about one-sixteenth as broad as head; gular sutures parallel. No infraorbital carina present. Mentum-submentum relatively short; prementum long; labial palpi with first two segments short and broad; third segment more slender, with a terminal spicule. Maxillary palpi relatively small; segment 2 very thin medio-laterally; segment 3 slender, fusiform; segment 4 slender, with a terminal spicule; apex of third segment with a circle of filiform sensilla.

Pronotum one-sixth broader than head and one-sixth broader than long; convex, not impressed; apex very feebly arcuate, sides almost straight, base straight at middle, posterior angles strongly arcuate; sides deflexed, hypomera not visible from side. Elytra with apices oblique; sutural length about two-thirds that of maximum length at outer margin. Wings reduced to strap-like structures.

Mesocoxal acetabula separated by the very narrow fused meso- and metasternal processes; acetabula moderately deep, finely margined externally. Mesosternum moderately long, metasternum quite long. Hind coxae triangular, not produced laterally beyond its articulation. Metepimeron large. Tarsi short; 4, 4, 4-segmented.

Abdomen broadly inflated; sclerites of adjacent segments narrowly separated by membranous integument. Tergites moderately convex. Inner paratergites large; those of segments 3–6 about one-fourth as broad as the tergite, those of segment 7 almost one-third as broad. Abdominal segments 3–7 broad; broadest at fifth segment. Relative widths of body at various levels: head (36), pronotum (24), elytra (56), abdomen, segment 3 (80), 4 (90), 5 (94), 6 (90), 7 (80).

Termitochara kraatzi Wasmann

Termitochara kraatzi Wasmann, 1893, Wiener Ent. Zeit., **12:** 247 (Madagascar; *Capritermes capricornis* Wasmann and *Microcerotermes sikorae* Wasmann; Wasmann coll.).

Material examined.—One specimen, Madagascar (Bernhauer coll.).

Vertex of head with a semicircle of 4 setae; pronotum with 6 setae on anterior margin, 3 on each lateral margin, 2 on basal margin, and about 5 on each half of disk. Elytra with about 5 discal setae and 3 on deflexed side. Tergites with about 4 moderately long, dark setae and a few pale hairs. Antennae (10 : 5 : 5 : 4 : 3.5 : 4 : 4 : 4.5 : 5 : 5 : 10) with segments 2 and 3 broader than long; segment 4 a little shorter and narrower than 3, slightly transverse; segment 5 a little shorter and narrower than 4, feebly transverse; segments 6–10 increasing a little in length and considerably in width.

Length, 1.8 mm.

Subtribe COROTOCINA

The members of this subtribe are characterized by remarkable post-imaginal development that results in the most highly specialized abdominal and thoracic structures in the tribe. Perhaps the most easily observed diagnostic feature results from prolongation of the medial metasternal articulating processes so that the hind coxae are not contiguous with the metasternum for most of their width.

KEY TO THE GENERA OF COROTOCINA

1. Abdomen with three pairs of lateral membranous appendages. *Spirachtha* Schiødte
   Abdomen without lateral appendages 2
2. Prothorax greatly inflated; with large areas of non-sclerotized integument .. 3
   Prothorax not inflated 4
3. Third abdominal segment greatly hypertrophied, extending caudad and dorsad, its sternite on the upper surface of abdomen; fourth and fifth segments also extremely large; sixth and seventh segments smaller than the preceding. *Thyreoxenus* Mann
   Third abdominal segment only slightly hypertrophied; segments 3–7 increasing in size; segment 7 the largest (Africa) ..... *Oideprosoma* Silvestri
4. Abdomen extremely large and membranous, constricted between the fourth and fifth segments, and between the fifth and sixth segments. *Termitomimus* Trägårdh
   Abdomen not as above 5
5. Pronotum robust, its surface irregularly impressed ..... *Corotoca* Schiødte
   Pronotum small, its surface without impressions 6
6. Antennae compact, i.e., the segments slightly telescoped so that their pedicels are invisible (Neotropical Region) ..... *Eburniola* Mann
   Antennal segments not telescoped, their pedicels visible (Old World tropics). *Termitopullus* Reichensperger or *Termitoptocinus* Silvestri

COROTOCA Schiødte

Corotoca Schiødte, 1853, Proc. Zool. Soc. London, **21**: 101; 1854, Vid. Selsk. Skr. naturw. Afd., **4B**: 8; 1856, Ann. Sci. nat. Zool., (4), **5**: 171; Fenyes, 1918, Gen. Insect., **173A**: 61; Warren, 1919, S. Afr. Jour. Sci., **16**: 102; Kemner, 1925, Ark. Zool., **18A**, no. 10, p. 17; Silvestri, 1946, Mem. Atti Acad. Naz. Lincei, (8), **1**: 1. Type species: *Corotoca melantho* Schiødte.

Head robust; clypeus declivous, almost vertical in some species. Eyes very large. Antennae very long, all segments elongated except the second. Gula narrow at apex. Labial palpi 3-segmented. Pronotum transverse, comparatively robust, its surface rather irregularly impressed. Prothorax not hypertrophied. Inner margins of elytra somewhat shorter than outer margins; the apical margins very oblique and the outer apical angles acute. Physogastric individuals with the wings reduced to membranous pads. Legs very long; tarsi especially long, the hind tarsi about as long as the tibiae. Abdomen distinctive (fig. 21); segment 3 comparatively small; segments 4–6 greatly hypertrophied. Sternites transverse, generalized; the integument between the sternites proper also sclerotized, although less heavily. This sclerotized integument evidently includes the paratergites, which are not distinguishable as such. Tergite 6 short, its apex emarginate; tergite 7 elongated, six times as long as 6, its arcuate base contiguous with the apex of tergite 6. Tergal gland of tergite 7 single, but broad.

Remarks.—The species of *Corotoca* are restricted to the nests of *Constrictotermes*, a small genus probably limited to an area east of the Andes from the Guianas south to the state of São Paulo, Brazil. An interesting aspect of the genus is the occurrence of three species with *C. cyphergaster* in Brazil. Quite frequently *phylo* and *melantho* occur together and in one case these species as well as *araujoi* were found in the same nest. It would be interesting to know whether or not the species occur throughout the range of the host or, more likely, in restricted ranges that overlap in certain areas.

KEY TO SPECIES OF *COROTOCA*

1. Third segment of maxillary palpi robust; broader than the second and almost three times as long; occiput with an incision in the median line. . . . *guyanae* Mann

   Third segment of maxillary palpi small, subequal in size to the second; occiput without median incision 2

2. Sternites 5–8 glabrous except for a very few pale hairs; pronotum, middle and hind femora, and tibiae black . . . . *araujoi*, new sp.

   Sternites 5–8 with dense vestiture of very fine pubescence and moderately numerous dark macrosetae; pronotum, femora, and tibiae dark rufous to rufo-piceous 3

3. Mentum-submentum with 2 long submarginal setae on each side; median and lateral lobes of aedeagus subequal in length and comparatively long. . . . *melantho* Schiødte

   Mentum-submentum with 3 or 4 setae near each lateral margin and 2 median bristles; median lobe of aedeagus shorter than lateral lobes, all three relatively short . . . . *phylo* Schiødte

Corotoca melantho Schiødte

Corotoca melantho Schiødte, 1854, Vid. Selsk. Skr. naturw. Afd., **4B**: 9, pl. 1 (Lagôa Santa, Minas Gerais, Brazil; with termites; Schiødte coll.); 1856, Ann. Sci. nat. Zool., (4), **5**: 172, pl. 1, figs. 1–16; Silvestri, 1903, Redia, **1**: 198; Reichensperger, 1936, Arb. physiol. angew. Ent., **3**: 188, fig. 3; Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), **1**: 4, text figs. 1–3.

Material examined.—A series from Olinda, Pernambuco, Brazil (ex Reichensperger coll.); a series from Rio Pardo de Minas and Montes Claros, Minas Gerais, Brazil, collected by R. L. Araujo; all specimens with *Constrictotermes cyphergaster* Silvestri (determined by R. L. Araujo).

Records.—Urucum, Mato Grosso, Brazil (Silvestri, 1903); Itú and Alto do Palácio, São Paulo, Brazil (Silvestri, 1946c); all with *Constrictotermes cyphergaster* Silvestri.

Head with a fine, irregular strigulation and a few punctures; vertex with 4 macrosetae in a transverse row; infra-orbital setae absent. Mentum-submentum with 2 long setae near lateral margin. Segments 2 and 3 of maxillary palpi small, subequal. Antennae (34 : 6 : 18 : 18 : 14 : 14 : 12 : 11 : 10 : 9 : 20) not incrassate; scape broader than the following segments. Pronotum three-fifths broader than long; two moderately conspicuous tuberosities on the disk, and a rather large pit in front of each. These pits are continued medially and caudally but, as a rule, do not join; the surface between the oblique impressions is not elevated sufficiently to form a medial tuberosity. Median and lateral lobes of aedeagus subequal in length, relatively long.

Remarks.—Reichensperger (1936) published a photograph of this species with a well-developed larva protruding from the abdomen. In the original description Schiødte had stated that *Corotoca* is larviparous, and figured larvae that he had dissected from female specimens. It is my experience that a series of specimens usually has several females bearing larvae; these are readily observed if the abdomen is cleared.

Corotoca phylo Schiødte. Figure 21, *a, b*.

Corotoca phylo Schiødte, 1854, Vid. Selsk. Skr. naturw. Afd., **4B**: 9, pl. 1 (Lagôa Santa, Minas Gerais, Brazil; with termites; Schiødte coll.); 1856, Ann. Sci. nat. Zool., (4), **5**: 172, pl. 1, figs. 17, 18; Silvestri, 1903, Redia, **1**: 198; Hegh, 1922, Les Termites, p. 611, text fig. 413; Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), **1**: 6, text fig. 4.

Material examined.—A series from Rio Pardo de Minas and Montes Claros, Minas Gerais, Brazil, collected by R. L. Araujo; a series from Olinda, Pernambuco, Brazil (ex Reichensperger coll.); one specimen from Cuyabá, Mato Grosso, Brazil (Calif. Acad. Sci. coll.); all with *Constrictotermes cyphergaster* Silvestri (determined by R. L. Araujo).

Records.—Coxipó, near Cuyabá, Mato Grosso (Silvestri, 1903); Camassari, Bahia, and Itú, Mogi-Guassú, and Alto do Palácio, São Paulo (Silvestri, 1946c); all with *Constrictotermes cyphergaster* Silvestri.

Closely related to *C. melantho*, this species differs in the following respects: Mentum-submentum with 3 or 4 long setae near each lateral margin and 2 median setae; pronotum "trituberculate," i.e., with a pair of conspicuous tuberosities on the disk, a moderately deep V-shaped impression medial to them, and a low medial elevation in front of the impression; median lobe of aedeagus shorter than lateral lobes, all three relatively short.

Length, 3–3.25 mm. (abdomen recurved).

Corotoca araujoi, new species. Figure 21, *d*.

Distinguished from *melantho* and *phylo*, which occur with the same host and even in the same nest, by its smaller size, distinctive coloration, glabrous, non-setose to weakly setose sternites, absence of vertexal setae, and in having the pronotum one-half broader than long.

Head reddish-brown, occiput and vertex bordering the eyes piceous, pronotum uniformly black, elytra very pale and translucent, abdominal sternites 3–7 pale flavo-rufous; sternites 8 and 9 dark rufous. Antennae pale, sternum pale brown, coxae light-brown tinged with piceous; anterior femora light-brown, middle and hind femora black, front tibiae piceous, middle and hind tibiae black, tarsi light-brown.

Head smooth, shining, strigulose only at base of occiput and on postgenae. Clypeus with pale setae, vertex not setose. Mentum-submentum with a long seta at each apical angle and 2 setae farther caudad. Segments 2 and 3 of maxillary palpi small, subequal in size. Pronotum one-half broader than long, its surface irregular, with small tuberosities and impressions, but without a pronounced pattern, perhaps weakly "trituberculate," with shallow impressions.

Abdominal integuments somewhat less heavily sclerotized than in the other species; the sides membranous, except for suggestions of sclerotization. Sternites separated by areas of membranous integument, with less secondary sclerotization of the intermediate integument than in other species. Second sternite scarcely visible. Sternite 3 sparsely setose, the setae small and inconspicuous; sternite 4 more sparsely setose; sternites 5–8 glabrous except for a few short, fine hairs.

Antennae (27 : 5 : 15 : 15 : 14 : 13 : 12 : 11 : 10 : 9 : 18) with segments of approximately the same proportions as those of *melantho* and *phylo*.

Length, 2–2.25 mm.; width of abdomen, 0.9 mm.

Holotype from Rio Pardo de Minas, Minas Gerais, Brazil; collected January 10, 1952, by R. L. Araujo; with *Constrictotermes cyphergaster* Silvestri (determined by R. L. Araujo). In collection of Chicago Natural History Museum.

Paratypes.—Four specimens, same data as holotype, two from the same nest and two from a second nest. In collections of Chicago Natural History Museum and Instituto Biológico, São Paulo, Brazil.

Corotoca guyanae Mann. Figure 21, *c*.

Corotoca guyanae Mann, 1923, Zoologica, **3**: 327 (Kartabo, British Guiana; U. S. Nat. Mus.; *Constrictotermes cavifrons* Holmgren).

Material examined.—Type series.

Distinguished from the other species by the following characteristics: Slightly paler in color, testaceous to rufo-testaceous, the legs, pronotum, and tergites a little darker; a median occipital incision present; head moderately coarsely punctate, but without strigulation; segment 3 of maxillary palpi spindle-shaped, twice as long as broad, more than twice as long and much broader than segment 2; eyes relatively large; antennal proportions (32 : 8 : 20 : 18 : 18 : 16 : 14 : 12 : 11 : 10 : 24) slightly different; mentum-submentum with four transverse rows of 3, 3, 4, 3 setae, respectively; vertex with a pair of macrosetae; postgenae with 3 long setae beneath each eye; pronotum less strongly impressed, with a fairly distinct V-shaped impression on disk.

SPIRACHTHA Schiødte

Spirachtha Schiødte, 1853, Proc. Zool. Soc. London, **21**: 101; 1854, Vid. Selsk. Skr. naturw. Afd., **4B**: 12; 1856, Ann. Sci. nat. Zool., (4), **5**: 176; Fenyes, 1918, Gen. Insect., **173A**: 64; Warren, 1919, S. Afr. Jour. Sci., **16**: 102;

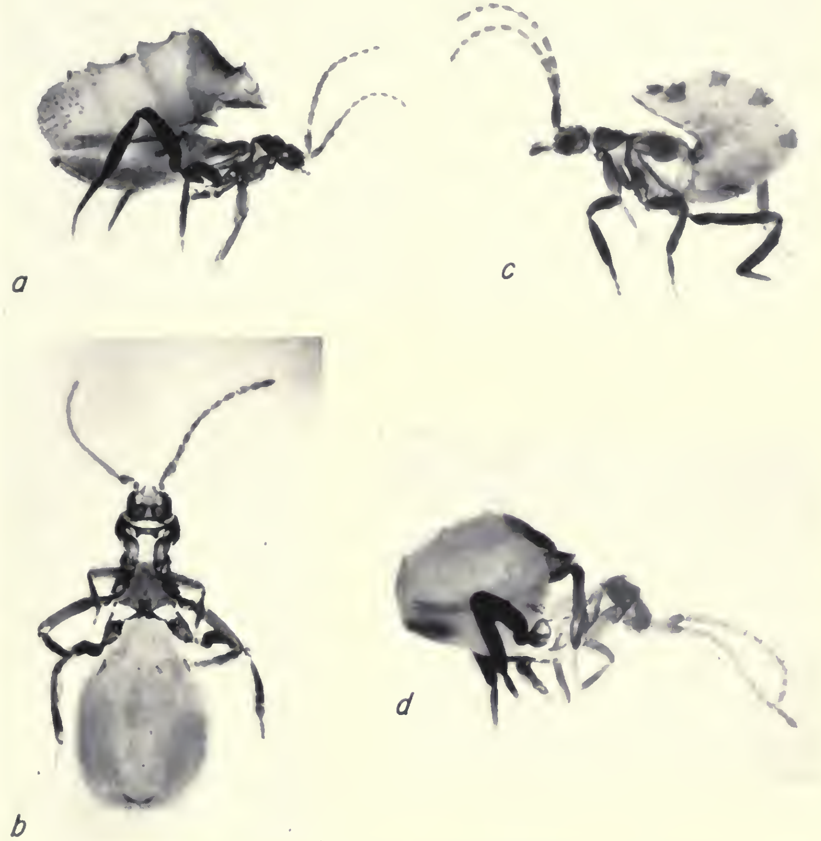


FIG. 21. (a, b) *Corotoca phylo* Schiødte; lateral and ventral views. (c) *Corotoca guyanae* Mann. (d) *Corotoca araujoi* Seevers.

Kemner, 1925, Ark. Zool., 18A, no. 10, p. 17; Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), 1: 8. Type species: *Spirachtha eurymedusa* Schiødte.

Head unmodified, small; clypeus short. Antennal scape moderately long; segments 2–10 subquadrate to rather long. Mandibles small, their apices short, slender. Segments 2 and 3 of maxillary palpi relatively short and stout, segment 4 almost as long as 3. Labial palpi minute, one or two-segmented. Prothorax inflated a little, with small areas of exposed membranous integument (insignificant by comparison with *Thyreoxenus*). Pronotum small, slightly transverse, subelliptical in form. Elytra with short inner margins, their apices oblique.

Abdomen very distinctive; with extensive areas of non-sclerotized integument, and with three pairs of membranous appendages arising from segments 4–6.

Segment 2 inflated slightly; segment 3 very large, strongly inflated in a caudal direction and then upturned, its sternite on the upper surface; segments 4–6 smaller. Tergites 3–5 transverse, tergite 6 short medially, its apex emarginate; tergite 7 longer than the other tergites, its arcuate base contiguous with the sixth. Sternites generalized; sides of abdomen not secondarily sclerotized; paratergites not recognizable.

KEY TO SPECIES OF *SPIRACHTHA*

1. Appendages of fourth abdominal segment very much elongated, cylindrical in form; appendages of segments 5 and 6 shorter, inflated distally, with numerous setigerous tubercles . . . . *mirabilis* Mann
   Abdominal appendages not appreciably different 2
2. Abdominal appendages constricted once or twice, thus appearing segmented; gula without macrosetae . . . . *eurymedusa* Schiødte
   Abdominal appendages not constricted, distally clavate; gula with a pair of long, stout setae . . . . *schioedtei* Mann

Spirachtha eurymedusa Schiødte

Spirachtha eurymedusa Schiødte, 1854, Vid. Selsk. Skr. naturw. Afd., **4B**: 13, pl. 2 (Lagôa Santa, Minas Gerais, Brazil; Schiødte coll.); 1856, Ann. Sci. nat. Zool., (4), **5**: 177, pl. 1, figs. 19–25; Hegh, 1922, Les Termites, p. 611, text fig. 414; Wheeler, 1928, The Social Insects, p. 267, pl. 42, fig. 69; Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), **1**: 10, fig. 5.

Material examined.—This species has not been available.

Records.—Itú and Mogi-Guassú, São Paulo, Brazil, with *Constrictotermes cyphergaster* Silvestri (Silvestri, 1946c).

Antennae shorter than in the other species (0.9 mm.); scape subequal to segments 2 and 3 combined; segments 2–10 subquadrate, subequal; segment 11 one-third longer than 10. Head broader than long. Head, pronotum, and elytra without macrosetae; mentum-submentum with one pair of very long bristles and a shorter pair in front of these; gula without setae; postgenae with six long bristles. All abdominal appendages with the same general form, cylindrical throughout their length, except that they are constricted at several points and thus appear segmented.

Spirachtha schioedtei Mann

Spirachtha schioedtei Mann, 1923, Zoologica, **3**: 326 (Kartabo, British Guiana; *Constrictotermes cavifrons* Holmgren; United States National Museum); Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), **1**: 13, text fig. 7; Allee et al, 1949, Prin. Anim. Ecol., fig. 259, *a*.

Material examined.—Type series.

Antennae moderately long (1 mm.); scape longer than segments 2 and 3 combined; segments 2–10 subcylindrical, feebly elongated, subequal in length; segment 11 one-third longer than 10. Head a little broader than long. Head, pronotum, and elytra without macrosetae; mentum-submentum with one long and one short seta near each basal angle; gula with one pair of long, stout setae.

All abdominal appendages of the same general form: relatively short, their distal ends swollen, globose, and bearing setae.

Spirachtha mirabilis Mann. Figure 22.

Spirachtha mirabilis Mann, 1923, Zoologica, **3**: 323, text fig. 28 (Kartabo, British Guiana; *Constrictotermes cavifrons* Holmgren; United States National Museum); McIndoo, 1923, Zoologica, **3**: 367, text figs.; Wheeler, 1928, The Social Insects, p. 267, pl. 42, fig. 70; Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), **1**: 11, text fig. 6; Allee et al, 1949, Prin. Anim. Ecol., fig. 259, *b*, *c*.

Material examined.—Paratypes.

Antennae much longer than in the other species (1.8 mm.); all segments elongated; scape subequal to segments 2 and 3 combined; segment 2 shorter than 3; segments 3–7 elongated, subequal; segments 8–10 elongated, but a little shorter than preceding segments; segment 11 longer than 10. Head subequal in length and width. Head, pronotum, and elytra without macrosetae; mentum-submentum with three short subapical setae near each lateral margin; gula with two longitudinal rows of long setae (4 or fewer in each row) and 2 shorter setae near its apex; postgena with a pair of long setae lateral to gula. Abdominal appendages not all of the same general form; those of segment 4 very long, cylindrical, bent into a U-form; those of segments 5 and 6 claviform, the greatly swollen distal ends bristling with short setae set in conical elevations.

TERMITOPULLUS Reichensperger

Termitopullus Reichensperger, 1922, Ent. Mitteil., **11**: 34. Type species: *Termitopullus sociusculus* Reichensperger.

Termitoscapha Bernhauer, 1938, Ann. Mus. Stor. nat. Genova, **60**: 119. Type species: *Termitoscapha gestroi* Bernhauer. New synonymy.

Head small, dorsum simple, clypeus very short. Antennae geniculate; scape subequal to segments 2–4 combined; segments 2–10 uniform in size, short, slightly transverse; segments not telescoped, all pedicels visible. Postgenae with a fine carina (visible in slide mounts) from ventral margin of eye to base of head, paralleling the gular sutures. Gula broad at base, narrower at apex; mentum-submentum relatively narrow, the submentum not widening much in front of the gula, its sides parallel. Labial palpi 3-segmented.

Pronotum small, quadrangular, its surface smooth; disk with a large hyaline triangle from base to apex. Prothorax often with a membranous fold between head and pronotum. Elytra small, weakly sclerotized, somewhat sac-like. Wings functional. Tarsi 4, 4, 4-segmented; basal segment not swollen or particularly elongated.

Abdomen moderately enlarged; third and subsequent segments inflated, upturned. Segment 2 moderately inflated, with considerable non-sclerotized integument, and bearing on its dorsal surface a pair of short, membranous appendages. Tergites 6 and 7 not typical of the Corotocina; the apex of sixth tergite not emarginate, the seventh tergite transverse, its base not arcuate, and its anterior angles strongly produced. Sternite 2 present as a thin, transverse rod; sternite 3 very large, shield-shaped; sternites 4–6 rather large, transverse;

sternite 7 also broad, but very narrow, and frequently hidden by membrane. Sides of abdomen sclerotized beyond the sternites proper, but the paratergites not recognizable.

Remarks.—Examination of the type of *Termitoscapha gestroi* Bernhauer reveals that it is the same as *Termitopullus sociusculus* Reichensperger.

Termitopullus sociusculus Reichensperger. Figure 23, *c*.

Termitopullus sociusculus Reichensperger, 1922, Ent. Mitteil., **11**: 35, pl. 7, fig. 7 (Stanleyville, Belgian Congo; *Eutermes* sp.; Reichensperger coll.).

Termitoscapha gestroi Bernhauer, 1938, Ann. Mus. Stor. nat. Genova, **60**: 123; text figs. 1–3 (Alto Uelle, Belgian Congo; *Trinervitermes* sp.; Chicago Natural History Museum). New synonymy.

Material examined.—A series from Rwindi Camp, Belgian Congo, collected by A. E. Emerson, with 3 colonies of *Nasutitermes usambarensis* Sjöstedt. Type and cotypes of *Termitoscapha gestroi* Bernhauer.

Head very pale testaceous, almost hyaline; pronotum testaceous except for a median hyaline triangle; elytra feebly sclerotized, hyaline with brownish areas; legs testaceous; tergites rufo-flavate, with anterior margins brown; sternites rufo-flavate to pale brown, not uniformly pigmented; sides of abdomen paler. Head, pronotum, elytra, and tergites 3–7 without macrosetae, almost glabrous. Eighth tergite with 4 terminal setae, ninth tergite with about 10 dark setae; lateral plates of ninth segment with 4 or more setae. Sternites weakly setose.

Remarks.—The identification of the host of *Termitoscapha gestroi* as a species of *Trinervitermes* is probably incorrect; it is doubtful that *Trinervitermes* occurs at the type locality.

TERMITOPTOCINUS Silvestri

Termitoptocinus Silvestri, 1921, Boll. Lab. Zool. Portici, **15**: 15; Reichensperger, 1922, Ent. Mitteil., **11**: 35. Type species: *T. australiensis* Silvestri.

This genus has not been available for study, but it is evident from Silvestri's figures that it is very close to *Termitopullus*. This name has priority over the latter should it prove necessary to merge the two genera.

Termitoptocinus australiensis Silvestri

Termitoptocinus australiensis Silvestri, 1921, Boll. Lab. Zool. Portici, **15**: 16, text figs. 9, 10, 11 (Black Jungle near Darwin, Northern Territory, Australia; *Eutermes fumipennis* Walker; Silvestri coll.).

Silvestri's figures of the imago and larva of this species are very good, but I shall not attempt to characterize it.

FIG. 22. *Spirachtha mirabilis* Mann. (a) The abdomen is recurved over the thorax in its normal position; it bears three pairs of remarkable membranous appendages (those of the right side are absent in both figures). The thorax is scarcely visible. (b) Dorsal view; only the bases of the right abdominal appendages are visible.

EUTERMITOPTOCHUS Silvestri

Eutermitoptochus Silvestri, 1921, Boll. Lab. Zool. Portici, **15**: 20. Type species: *Eutermitoptochus novaehollandiae* Silvestri.

Eutermitoptochus is based on a species of which only the larva is known. The genus is included at this point only because the larva seems to resemble that of *Termitoptocinus*. It is unfortunate that Silvestri gave generic and trivial names to this and other larvae not as yet associated with imagos.

Eutermitoptochus novaehollandiae Silvestri

Eutermitoptochus novaehollandiae Silvestri, 1921, Boll. Lab. Zool. Portici, **15**: 23, text figs. 12, 13, 14 (Brock's Creek, Northern Territory, Australia; *Eutermes* sp.; Silvestri coll.).

This species was based on the larval stage, which fortunately was well illustrated by Silvestri.

EBURNIOLA Mann

Eburniola Mann, 1923, Zoologica, **3**: 333. Type species: *Eburniola leucogaster* Mann.

Very similar to *Termitoptocinus* and *Termitopullus* of the Old World tropics, differing from *Termitopullus*, which I have studied, in the following respects: Antennae geniculate, the scape shorter than segments 2–4 combined, segments 2–10 almost uniform in size, segments feebly telescoped so that their pedicels are invisible; pronotal disk uniformly sclerotized, not hyaline; gula very feebly sclerotized, hyaline; second abdominal segment not appreciably inflated, and without a pair of membranous appendages.

Remarks.—The three species of *Eburniola* are closely allied, so it seems desirable to summarize the most important diagnostic characters.

1. Head width compared to a constant dimension, the pronotal length:
   Width of head equal to pronotal length . . . . *gastrovittata*.
   Width of head slightly less than pronotal length . . . . *leucogaster*.
   Width of head only four-fifths the pronotal length . . . . *lujae*.
2. Pronotal width:
   Pronotum one-fifth broader than long . . . . *leucogaster*, *gastrovittata*.
   Pronotum very slightly broader than long . . . . *lujae*.
3. Elytral width:
   Elytron about two-thirds as broad as long; epipleuron vertical. *leucogaster*, *gastrovittata*.
   Elytron about four-fifths as broad as long; epipleuron oblique . . . . . . *lujae*.
4. Condition of sternite visible from side:
   Hyaline, weakly pigmented; usually not margined basally . . . . *leucogaster*.
   Hyaline, weakly pigmented; with dark marginal line . . . . *lujae*.
   Reddish-brown, with dark marginal line . . . . *gastrovittata*.

5. Elytral vestiture:
   Elytra glabrous . . . . *leucogaster, lujae.*
   Elytra with a vestiture of fine, pale hairs, especially on the sides. *gastrovittata.*

Eburniola leucogaster Mann. Figure 23, *a*.

Eburniola leucogaster Mann, 1923, Zoologica, 3: 334, text fig. 31 (Kartabo, British Guiana; *Nasutitermes guayanae* Holmgren; United States National Museum); Emerson, 1935, Ann. Ent. Soc. Amer., **28**: 369, text fig. 2; Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 5.

Material examined.—Eleven specimens from Kartabo, British Guiana. Seven specimens from Long Stretch, Trinidad; with *Nasutitermes guayanae* Holmgren.

Very pale brown; tergites reddish-brown, with dark-brown anterior margins; sternites very pale except for a dark-brown marginal line that is incomplete, not extending onto the sides of the abdomen; sternite on sides of abdomen almost hyaline, scarcely pigmented. Head finely reticulated; with only a few extremely minute hairs; with the usual non-pigmented median strip. Pronotum shining,

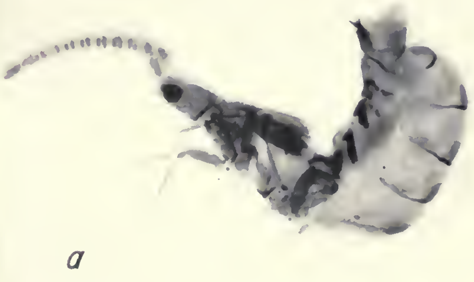


FIG. 23. *Eburniola leucogaster* Mann. (b) *Eburniola lujae* Seevers. (c) *Termitopullus sociusculus* Reichensperger.

without surface sculpture, very sparsely and minutely punctulate. Elytron shining, glabrous except for a few almost imperceptible hairs, its surface finely reticulated. Head width a little less than pronotal length. Pronotum one-fifth broader than long. Elytra about two-thirds as broad as long; epipleuron in a vertical plane, its ventral margin invisible from above.

Length, 1.5 mm. (abdomen recurved).

Eburniola gastrovittata Seevers

Eburniola gastrovittata Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 4, pl. 2, fig. 11 (Barro Colorado Island, Panama Canal Zone; *Nasutitermes ephratae* Holmgren; Chicago Natural History Museum).

Material examined.—Type series. A series from Puerto Berrio, Antioquia, Colombia, collected by C. Seevers, with *Nasutitermes ephratae* Holmgren; and specimens from Río Frio and Santa Anna, Colombia (USNM), collected by W. M. Mann, with *Nasutitermes meinerti* Wasmann.

Head and pronotum pale brown, elytra very pale, almost hyaline; tergites reddish-brown, tergites 3–6 with dark-brown basal margins; sternites light-brown medially, reddish-brown on sides of abdomen, base with a dark-brown marginal line. Head finely reticulated; with sparse, fine hairs. Pronotum glabrous except for a few pale hairs near apical angles. Elytral sides with a moderately dense vestiture of fine, pale hairs; much sparser on disk. Head width equal to pronotal length. Pronotum one-fifth broader than long. Elytron two-thirds as broad as long; epipleuron in a vertical plane, its ventral margin invisible from above.

Length, 1.5 mm. (abdomen extended).

Eburniola lujae, new species. Figure 23, *b*.

Head, pronotum, and elytra pale brown; tergites light-brown, with darker anterior margins; sternites pale-brown ventrally, pale and hyaline on sides of abdomen, base with a complete dark marginal line. Head finely reticulated, with only a few extremely minute hairs; with the usual pale, medial groove. Pronotum shining, without surface sculpture; very sparsely, minutely punctulate. Elytra shining, glabrous except for a few almost imperceptible hairs; inner apical quadrant and apical margin not pigmented; surface feebly reticulated in places, obsolescent in most areas. Head relatively narrow, only about four-fifths as broad as pronotal length. Pronotum only slightly broader than long. Elytra four-fifths as broad as long; exceptionally broad due to the fact that the epipleuron is not vertical but oblique, and its ventral margin is visible from above; elytra contiguous for about two-thirds their length and then divergent, the inner apical angle strongly truncated.

Length, 1 mm. (abdomen recurved).

Holotype from the state of Minas Gerais, Brazil, collected by E. Luja (ex Reichensperger coll.), with *Nasutitermes jaraguae* Holmgren. In collection of Chicago Natural History Museum.

Paratypes.—Six specimens, same data as holotype, in collections of Chicago Natural History Museum, A. Reichensperger, and United States National Museum.

TERMITOMIMUS Trägårdh

Termitomimus Trägårdh, 1907, Zool. Stud. till. Tullberg (Upsala), p. 173; Fenyes, 1918, Gen. Insect., **173A**: 60; Warren, 1919, S. Afr. Jour. Sci., **16**: 101; Kemner, 1925, Ark. Zool., **18A**, no. 10, p. 17. Type species: *Termitomimus entendveniensis* Trägårdh.

Termitomimus is distinguished by its very remarkable abdomen (fig. 24). It was apparently derived from *Termitopullus*-like stock, judging from the marked similarity in head and pronotal structures in the two genera. The head capsule, antennae, labium, maxillae, pronotum, and legs are very similar, even to the hyaline area of the pronotum. The abdomen of *Termitomimus* is so distinctive, however, that there is no question about generic separation.

Head small, oval, clypeus very short. Antennal scape subequal to segments 2–4; segments 2–10 subquadrangular, uniform in size. Maxillary palpi with segment 2 clavate; segment 3 more robust, subovate, segment 4 awl-shaped, with a terminal spicule. Gula broad at base, moderately broad at apex; mentum-submentum small, its sides subparallel. Labial palpi one-segmented in *entendveniensis* (according to Trägårdh); 3-segmented in *latipes* and *emersoni;* segment 2 very short, but distinct, and segment 3 very slender. Pronotum flat, quadrangular, broader than head; with a median hyaline triangle at apex. Elytra thin, hyaline, longer than pronotum. Wings functional in stenogastric individuals; thin-walled non-functional sacs in physogastric individuals. Legs long, stout. Abdomen greatly inflated; constricted by two deep circular sulci (resulting in Trägårdh's "pseudoabdomen, pseudothorax, and pseudocaput"), one between the fourth and fifth segments, the second between the fifth and sixth segments. Tergite 2 stout, heavily sclerotized; tergites 3 and 4 narrow, projecting laterally as strong arches to support the curving abdomen; tergites 5 and 6 saddle-shaped, tergite 5 with its antero-lateral angles prolonged, 6 with the postero-lateral angles projecting as very long struts extending far caudad; tergites 6 and 7 contiguous, tergite 7 elongated, its basal margin arcuate. Sternite 2 small, U-shaped; sternites 3–7 on upper surface of abdomen, strongly sclerotized, variable in form, usually with their posterior lateral angles prolonged. Aedeagus large; occupying most of the apical subdivision of the abdomen.

KEY TO SPECIES OF *TERMITOMIMUS*

1. Ventral and lateral areas of second and third abdominal segments sclerotized, appearing bright yellow, and polished . . . . *entendveniensis* Trägårdh
   Second and third abdominal segments membranous, milky-white 2
2. First segment of hind tarsi swollen, four times as broad as the other tarsomeres. *latipes*, new sp.
   First segment of hind tarsi twice as broad as the other tarsomeres. *emersoni*, new sp.

Termitomimus entendveniensis Trägårdh

Termitomimus entendveniensis Trägårdh, 1907, Zool. Stud. till. Tullberg, p. 174, text figs. 1–10, pl. 1, figs. 1–18 (Entendweni Bush, Zululand, near junction of Black and White Umfolozi; *Eutermes* sp.); Warren, 1920, Ann. Natal Mus., 4: 300.

Record.—Pietermaritzburg, Natal; with *Trinervitermes trinerviformis* Holmgren (Warren, 1920).

This species has not been available for study. Trägårdh's description and figures of the morphology of *Termitomimus* are good, but characters useful for species diagnosis are not given. The characteristics used in the key to separate this species from the two new species seemed to be the best available, although there must be better diagnostic features.

Termitomimus emersoni, new species. Figure 24, *a–c*.

Head, antennae, and mouth parts very light-brown; head frequently very pale and hyaline; pronotum light-brown, with a median hyaline triangle; elytra a little darker than head and thorax; coxae light-brown, femora and tibiae brown to piceous, basal segment of tarsi brown, remaining segments usually pale. Abdomen milky-white; tergites brown, sternites pale reddish-brown with darker areas; ventral and lateral areas of second and third segments not bright yellow or polished.

Head, pronotum, and elytra without setae. Mentum-submentum with one pair of short setae; maxillae with a pair of very long setae. Tergites and sternites with a very few inconspicuous hairs; the ventral surface of the membranous third abdominal segment bearing long fine hairs, sparse in many areas but numerous near the caudal curvature of the segment.

Antennae with segments 2–10 subequal, subquadrate, cylindrical. Basal segment of hind tarsi twice as broad as the other segments. Abdomen differing from *entendveniensis* as follows: Basal subdivision of abdomen more elongated, not as oval; third and fourth sternites large and well sclerotized; fourth sternite some distance from fifth and not on anterior face of "pseudoabdomen"; second sternite visible.

Basal segment of hind tarsi about twice as broad as the other tarsomeres. Length, 2.5–3 mm. (abdomen recurved).

Holotype from Rwindi Camp, Belgian Congo, collected May 5, 1948, by A. Emerson; with *Nasutitermes usambarensis* Sjöstedt. In collection of Chicago Natural History Museum.

Paratypes.—Fifty-eight physogastric and stenogastric individuals, same data as holotype, from four colonies of termites; in the collections of Chicago Natural History Museum and Emerson.

Termitomimus latipes, new species

Related to *emersoni* from which it differs in the following respects: Basal segment of hind tarsi swollen, four times as broad as the other tarsomeres, and

FIG. 24. *Termitomimus emersoni* Seevers; three views illustrating post-imaginal development. (a) Stenogastric individual. (b) Intermediate physogastry. (c) Physogastric individual. Three specimens from the same termite colony.

about two-fifths as broad as long; head, pronotum, and elytra darker brown; sternites flavo-testaceous, paler than those of *T. emersoni;* eighth sternite with two rows of long, curved bristles (each row of about 4–6 hairs); a general tendency for all setae to be longer; legs stouter, more robust; abdomen with a membranous "collar" between sixth and seventh sternites, the collar constricted to form a medial and two lateral subdivisions, and a second "collar" between the fifth and sixth sternites, the medial part of which is very low, although the sides are conspicuously elevated.

Length, 3 mm. (abdomen recurved).

Holotype from Stanleyville, Belgian Congo, collected June 1, 1948, by A. Emerson; with *Nasutitermes maculiventris* Sjöstedt. In collection of Chicago Natural History Museum.

Paratypes.—Five specimens, same data as holotype; in collections of Chicago Natural History Museum and Emerson.

THYREOXENUS Mann

Thyreoxenus Mann, 1923, Zoologica, **3**: 329; Seevers, 1946, Rev. Ent., **17**: 256; Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), **1**: 14. Type species: *Thyreoxenus parviceps* Mann.

Head small, usually covered to middle of eyes by the membranous prothorax. Antennae short, geniculate; segments 2–10 short, transverse. Gula moderately broad. Labial palpi minute; 2-segmented (3-segmented according to Silvestri). Maxillary palpi small, segment 3 ovoidal. Prothorax extremely large (fig. 25), with extensive areas of non-sclerotized integument; with a median, feebly bilobed, membranous production beneath head. Pronotum with a narrow, median, weakly sclerotized strip. Elytra small. Wings present as oval, membranous pads in physogastric individuals. Abdomen distinctive (fig. 25). Legs long, as a rule darkly pigmented; tarsi 4, 4, 4-segmented.

KEY TO SPECIES OF *THYREOXENUS*

1. Second tarsal segment produced as a spinous process; tibiae shorter than femora; two postgenal setae present; abdominal collar well developed except in *albidus* 3
   Second tarsal segment unmodified; tibiae subequal to femora or longer; three postgenal setae present; abdominal collar obsolescent 2
2. Anterior femora acutely dentate at middle (Solomon Islands). *solomonensis* Seevers
   Anterior femora not dentate (Neotropical Region) . . . . *major* Mann
3. Abdominal collar obsolete . . . . *albidus* Seevers
   Abdominal collar well developed 4
4. Abdominal collar forming a hood over the terminal segments of the abdomen. *cucullatus* Seevers
   Abdominal collar not as above 5
5. Tibiae slightly more than one-half as long as femora; antennal scape longer than segments 2–5 combined; abdominal collar low and broad. *brevitibialis* Seevers
   Tibiae about two-thirds as long as femora; antennal scape shorter than segments 2–5 combined; abdominal collar variable 6
6. Pronotum longitudinally convex, with an arcuate carina about one-fourth of the distance from base to apex, strongly declivous behind carina; median pronotal incision broad, wider basally; pronotal setae very long; eyes not sulcate . . . . *convexinotus* Seevers
   Pronotum scarcely elevated near base; with only a narrow declivous area before base; median incision of pronotum narrow, not appreciably wider posteriorly; pronotal setae moderate in length; eyes sulcate 7
7. Median unsclerotized, non-setose areas of upper surface of abdominal segments 4 and 5 margined by dark rims along their anterior and lateral borders; this area of segment 5 quadrate . . . . *parviceps* Mann
   Median areas of segments 4 and 5 margined by dark rims along anterior border but for only a short distance along lateral border; this area of segment 5 much longer than broad 8

8. Abdominal collar constricted along its entire base, the constricted area hyaline, transparent; collar also transversely constricted (medially and on each side). *boliviae* Seevers

Abdominal collar not as above 9

9. Pronotum with a moderately dense vestiture of short hairs; prosternum rather densely setose . . . . *autuorii* Silvestri

Pronotal pubescence very minute; prosternum with only a few erect setae. *pulchellus* Mann

Thyreoxenus parviceps Mann. Figure 25, *c*.

Thyreoxenus parviceps Mann, 1923, Zoologica, 3: 330, text fig. 29 (St. Joseph, Trinidad, British West Indies; *Nasutitermes costalis* Holmgren; United States National Museum).

Material examined.—Paratypes. In addition, specimens from Kartabo and Georgetown, British Guiana; and from Bacolet, Tobago (ex Adamson coll.); all with *Nasutitermes costalis* Holmgren.

Head, pronotum, femora, and tibiae dark brown; other sclerites pale brown; tarsi pale yellow. Eyes sulcate. Two postgenal setae present. Antennae (20 : 3.5 : 6 : 4.5 : 4 : 4 : 4 : 4 : 4 : 4 : 13) with scape somewhat longer than segments 2–4 combined. Pronotum elevated a little near base, and with a strongly declivous basal area; anterior margin feebly arcuate, base and sides continuously rounded, the basal angles obsolete; median incision a bit wider at base. Tibiae two-thirds as long as femora. The median, unsclerotized, non-setose areas of the upper surface of abdominal segments 4 and 5 margined by a dark chitinous rim along their anterior and lateral borders. Abdomen lateral to these areas strongly sclerotized. Abdominal collar narrow, moderately high, constricted at base.

Length, 2.25 mm. (abdomen recurved).

Thyreoxenus pulchellus Mann

Thyreoxenus pulchellus Mann, 1923, Zoologica, 3: 332, text fig. 30 (Kartabo, British Guiana; *Nasutitermes ephratae* Holmgren; United States National Museum); Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), 1: 21, text fig. 12.

Material examined.—Paratypes. Specimens from Arima Valley, Trinidad, British West Indies (ex Adamson coll.), with *Nasutitermes ephratae* Holmgren; from Chavantina, Mato Grosso, Brazil (Helmut Sick), with *Nasutitermes bivalens* Holmgren; and from Rurrenabaque, Beni, Bolivia (USNM), with *Nasutitermes pilosus* Snyder.

Head, pronotum, and thoracic sclerites dark reddish-brown; legs, except tarsi, rufo-piceous; elytra and abdominal sclerites pale brown to reddish-brown; membranous integuments gray to straw-colored. Eyes sulcate. Two postgenal setae present. Antennae (20 : 5 : 6 : 5 : 4 : 4 : 4 : 4 : 4 : 4 : 14) with scape equal to segments 2–4 combined. Pronotal pubescence very minute, sparse. Pronotum not appreciably elevated at any point; with a narrow, declivous, basal area; median incision slightly broader near base; apex broadly arcuate; base and sides arcuate, the posterior angles obsolete. Tibiae two-thirds as long as femora.

Median areas of upper surface of abdominal segments 4 and 5 with dark marginal rims along anterior border but for only a short distance along lateral margins.

Length, 2.75–3 mm. (abdomen recurved).

Thyreoxenus boliviae Seevers

Thyreoxenus boliviae Seevers, 1946, Rev. Ent., **17**: 261 (Rurrenabaque, Beni, Bolivia; *Nasutitermes* sp.; United States National Museum).

Head brown; pronotum and elytra light brown; legs, except tarsi, piceous; abdomen light brown; membranous integuments light gray. Eyes sulcate. Two postgenal setae present. Antennal scape shorter than segments 2–5 combined; segments 2–10 as in *pulchellus*. Prothorax quadrate, sides nearly straight from the base to a point in front of the pronotum, where a deep constriction gives rise to a lobe on each side of the head. Pronotum as in *pulchellus*. Median areas of upper surface of abdominal segments 4 and 5 margined by dark bands along their anterior borders (in some cases for a short distance along sides); the median area of segment 4 three times as long as broad; that of segment 5 twice as long as broad. Abdominal collar distinctive; strongly constricted along its entire hyaline base and constricted transversely at middle and on each side.

Length, 3 mm.

Thyreoxenus autuorii Silvestri

Thyreoxenus autuorii Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), **1**: 19, text figs. 8–11 (São Miguel, São Paulo, Brazil; *Nasutitermes arenarius* subsp.; Silvestri coll.).

This species is closely allied to *pulchellus*. It has not been available for study, and Silvestri's lengthy description and detailed figures did not reveal many diagnostic characters. Silvestri emphasized the 3-segmented labial palpi as the principal distinguishing character, but inasmuch as all the other species have fewer segments this character should be carefully checked. Judging from Silvestri's figures, *autuorii* differs from *pulchellus* in having a moderately dense vestiture of short hairs on the pronotum, in having the prosternum rather densely clothed with short hairs, and in minor differences in the chaetotaxy of the mentum-submentum.

Thyreoxenus cucullatus Seevers. Figure 25, *a*, *b*.

Thyreoxenus cucullatus Seevers, 1946, Rev. Ent., **17**: 257 (Villavicencio, Meta, Colombia; *Nasutitermes ephratae* Holmgren; Chicago Natural History Museum).

Head dark-brown, its sides paler; prothoracic sclerites light reddish-brown; membranous areas of prothorax white to gray, streaked with rust; elytra light reddish-brown; femora and tibiae very dark-brown, tarsi light-brown; sclerites of abdomen brown, membranous integument light-gray. Eyes sulcate. Two postgenal setae present. Antennal scape longer than segments 2–5 combined;

FIG. 25. (a) *Thyreoxenus cucullatus* Seevers; dorsal view. (b) *Thyreoxenus cucullatus* Seevers; lateral view. (c) *Thyreoxenus parviceps* Mann.

segments 2–10 as in *parviceps*. Legs relatively long; anterior leg, 0.67 mm., middle leg, 0.85 mm., hind leg, 1 mm. Femora constricted slightly near middle; outer margin of hind femora somewhat arcuate proximally so that they appear somewhat bowed. Tibiae two-thirds as long as femora. Median non-setose areas of the upper surface of abdominal segments 4 and 5 narrowly margined on three sides by a dark band. Abdomen lateral to these areas rather heavily sclerotized. Abdominal collar extremely developed, produced as a hood that conceals the terminal segments of the abdomen from above; the collar notched medially.

Length, 2.5–3 mm.

Thyreoxenus brevitibialis Seevers

Thyreoxenus brevitibialis Seevers, 1946, Rev. Ent., **17**: 259 (Villavicencio, Meta, Colombia; *Nasutitermes costalis* Holmgren; Chicago Natural History Museum).

Head mottled brown and yellow, postgenae very dark; pronotum and prosternum reddish-brown; elytra brown; femora and tibiae very dark reddish-brown; tarsi light brown; membranous areas of prothorax white, streaked with rust; abdominal sclerites brown; membranous areas of abdomen straw-colored. Eyes shallowly sulcate, weakly and irregularly pigmented. Two postgenal setae present. Antennal scape as long as segments 2–6 combined; segments 2–10 transverse, subequal. Legs relatively long; anterior leg 0.9 mm., middle leg 1.1 mm., hind leg 1.35 mm. Tibiae relatively short, only a little more than one-half as long as femora, at most three-fifths as long. Tibiae broadly spindle-shaped; hind tibiae one-third as broad as long. Abdomen rather heavily sclerotized and strongly pigmented. The median non-setose areas of segments 4 and 5 margined along their anterior margins but for only one-half of the lateral margin; median area of segment 4 three times as long as broad; that of segment 5 almost twice as long as broad. Abdominal collar moderate in size, uniformly rather broad; its base not constricted.

Length, 3 mm.

Thyreoxenus albidus Seevers

Thyreoxenus albidus Seevers, 1946, Rev. Ent., **17**: 258 (Villavicencio, Meta, Colombia; *Nasutitermes ephratae* Holmgren; Chicago Natural History Museum).

Head light brown, darker beneath; femora and tibiae dark brown; tarsi light brown; abdomen feebly sclerotized; membranous integuments of prothorax and abdomen milky-white, paler than usual. Eyes shallowly sulcate. Two postgenal setae present. Antennal scape shorter than segments 2–5 combined; segments 2–10 subequal. Legs moderately long; femora relatively short, the middle and hind tibiae three-fourths as long as femora. Hind femora not arcuate; not constricted near middle. Tibiae slender, scarcely spindle-shaped; hind tibiae only one-fifth as broad as long. Median non-setose areas of abdominal segments 4 and 5 narrowly margined by well-defined dark bands along three borders; median area of segment 4 two-fifths as broad as long. Abdominal collar low and very broad, obsolescent; broadly impressed medially.

Length, 3 mm.

Thyreoxenus convexinotus Seevers

Thyreoxenus convexinotus Seevers, 1946, Rev. Ent., **17**: 260 (Rurrenabaque, Beni, Bolivia; *Nasutitermes chaquimayensis* Holmgren; United States National Museum).

Head light brown, postgenae darker, pronotum brown, elytra light brown, legs dark brown, tarsi pale, abdominal sclerites light smoky-brown, membranous integuments white to ivory. Eyes not sulcate. Two postgenal setae present. Antennal scape longer than segments 2–4 combined; segments 2–10 subquadrate, segment 3 a little longer than the others. Median ventral lobe of prothorax smaller than in the other species. Pronotum longitudinally convex, the crest of its convexity, a transverse, arcuate carina, attained about one-fourth the distance from base to apex; surface from crest to base strongly declivous; apical margin of pronotum almost straight; median incision relatively broad at level of transverse carina. Legs stout, moderately long; anterior leg 0.85 mm., middle leg 1 mm., hind leg 1.22 mm. Tibiae about two-thirds as long as femora. Tibiae broad, hind tibiae one-third as broad as long. Abdomen rather heavily sclerotized; median non-setose areas of segments 4 and 5 margined with dark bands along only their anterior borders (in a few cases for a very short distance along sides). Abdominal collar distinctive; very tall and slender; strongly constricted along its base.

Length, 3 mm.

Thyreoxenus major Mann. Figure 26.

Thyreoxenus major Mann, Zoologica, **3**: 332 (Kartabo, British Guiana; *Nasutitermes guayanae* Holmgren; United States National Museum); Emerson, 1935, Ann. Ent. Soc. Amer., **28**: 369, text fig. 1; Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 3; Silvestri, 1946, Mem. Atti Accad. Naz. Lincei, (8), **1**: 21, text fig. 12.

Material examined.—A series from Kartabo, British Guiana, with *Nasutitermes guayanae* Holmgren; and from Barro Colorado Island, Panama Canal Zone, with *N. columbicus* Holmgren.

T. major differs from the other neotropical species in a number of characteristics: larger size; more robust build; postgenae with 3 macrosetae and finer setae; antennal segments 4–10 subquadrate; relative lengths of antennal segments: 22 : 4 : 7 : 5 : 5 : 5 : 5 : 5 : 5 : 5 : 15; pronotum with arcuate apex, straight base, obtuse posterior angles, sides converging posteriorly; second tarsal segment not produced; tibiae and femora subequal in length; prosternum distinctive, produced posteriorly to form a large median triangular area not present in the other species; median non-setose areas of upper surface of abdominal segments 4 and 5 more heavily sclerotized and pigmented; abdominal collar obsolete.

Length, 3–3.5 mm. (abdomen recurved).

Remarks.—The closest known relative of this series is *solomonensis* of the far distant Solomon Islands.

Thyreoxenus solomonensis Seevers

Thyreoxenus solomonensis Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 2, pl. 1, figs. 1, 2 (Auki, Malaita, Solomon Islands; *Nasutitermes novarumhebridarum* N. and K. Holmgren; Chicago Natural History Museum).

Head, thoracic sclerites, legs, except tarsi, dark brown to black; abdominal sclerites brown; elytra pale brown. Head with many short setae; postgenae with numerous long setae. Antennae similar to those of *major;* scape slightly longer than segments 2–4 combined; segments 2–10 subquadrate, segment 3 a little longer than the others. Prothorax three times as broad as head; sides straight, not impressed; pronotum with its anterior border strongly emarginate, the border within arcuate; anterior and posterior angles rounded; pronotum with two transverse rows of 4 erect setae on disk and scattered fine hairs. Legs short and stout; anterior femora with a distinct tooth on outer ventral margin near middle. Tarsi with basal segment twice as long as segment 2 or 3; segment 2 not produced at apex.

Length, 2.8 mm.

OIDEPROSOMA Silvestri

Oideprosoma Silvestri, 1920, Boll. Lab. Zool. Portici, **14**: 313; Kemner, 1925, Ark. Zool., **18A**, no. 10, p. 17. Type species: *Oideprosoma mirandum* Silvestri.

Oideprosoma is without doubt most closely related to *Thyreoxenus,* inasmuch as both genera have a remarkably hypertrophied prothorax. The genus is apparently represented in collections only by the somewhat damaged type in the Silvestri collection. Judging from Silvestri's figures, *Oideprosoma* differs from *Thyreoxenus* chiefly in the structure of its abdomen, but how much of this is due to the condition of the specimen cannot be determined now.

Silvestri's illustrations show that the abdominal segments 3–5 are only moderately inflated and in a horizontal position, that segment 6 is turned up, and that the terminal segments are directed cephalad. Abdominal segments 3–7 gradually increase in size, with the seventh segment the largest of the abdomen. The *Oideprosoma* abdomen seems to represent an intermediate stage between that of generalized subtribal stock and *Thyreoxenus,* but this interpretation is very tentative. The single specimen may not represent the definitive condition of the physogastric abdomen of *Oideprosoma;* it may be an intermediate form in post-imaginal development.

Silvestri figured a larva which he believed to be that of *Oideprosoma,* but this is open to serious question. The larva was not collected from the same termite nest as the *Oideprosoma* imago, but from a nest of the same termite species about five hundred miles from the type locality. The larva seems to resemble that of *Para-*

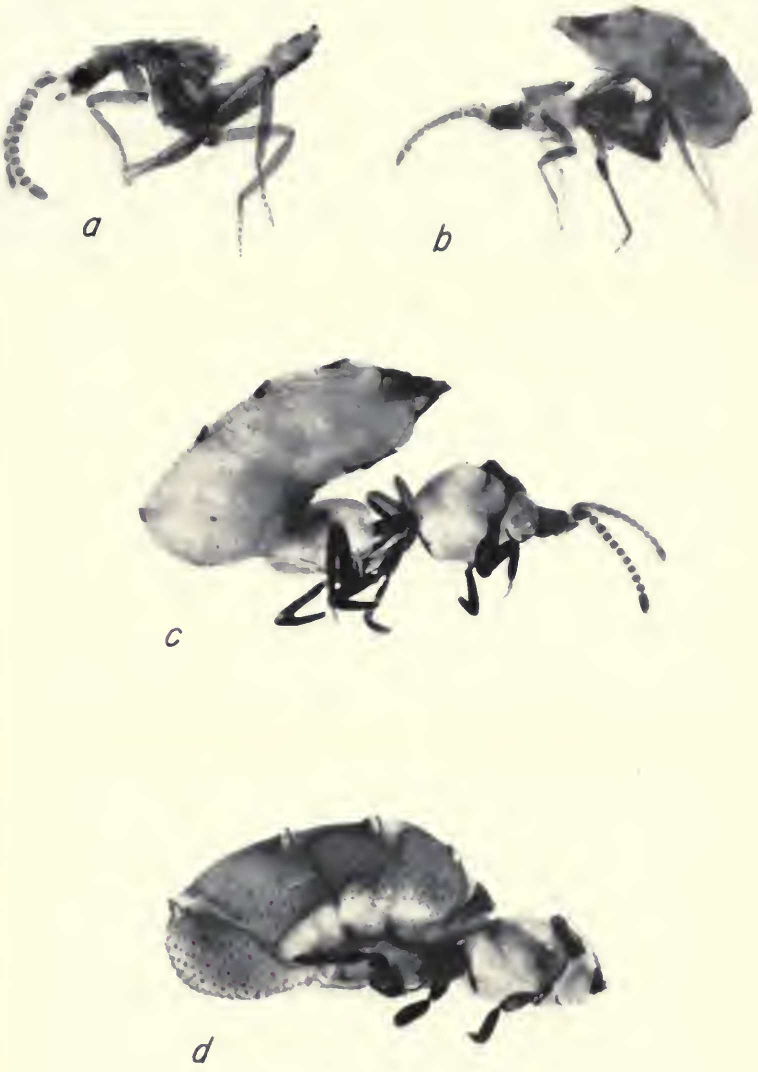


FIG. 26. *Thyreoxenus major* Mann; four individuals from the same termite colony, illustrating post-imaginal development. (a) Stenogastric individual; winged. (b, c) Intermediate stages. (d) Physogastric individual.

corotoca, figured by Warren, more than the larvae of *Thyreoxenus* that are in my collection.

Oideprosoma mirandum Silvestri

Oideprosoma mirandum Silvestri, 1920, Boll. Lab. Zool. Portici, **14**: 315, text figs. 29–32 (Kakoulima, French Guinea; *Eutermes trinervius* Rambur; Silvestri coll.).

The alleged larva of this species was collected at Thies, Senegal, French West Africa. The host *O. mirandum* is *Trinervitermes trinervius* Rambur. Silvestri's description of this species was very limited.

Tribe TERMITONANNINI

Tribe Termitonannini: Fenyes, 1918, Gen. Insect., **173A**: 17, 75.

This tribe was proposed by Fenyes for the genera of Aleocharinae with 4, 4, 5-segmented tarsi and 10-segmented antennae. It happens that only termitophilous genera related to *Termitonannus* have since been added to the tribe, so that it is a useful category. At this time I propose to broaden the concept of the tribe by including the Perinthina, a group of termitophilous genera with 4, 4, 4-segmented tarsi and 11-segmented antennae. This group almost certainly originated from the same stock of termitophilous Aleocharinae as the Termitonannina. The phylogenetic relationships of the Termitonannini have been discussed in an earlier section of the paper (see p. 42).

With the exception of one physogastric genus (*Termitonilla*), the species of the tribe are non-physogastric and in the majority of cases are limuloid. Their heads are either prognathous or hypognathous, the antennae 9–11-segmented, the terminal antennal segments bear one or more pairs of polytrichous coeloconic sensilla, the mentum is free except in certain derived genera, the mesocoxal cavities are margined, the hind coxae and metepimera are generalized except in certain derived genera, and the tarsi are either 4, 4, 4-segmented or 4, 4, 5-segmented.

Subtribe PERINTHINA

Tribe Hygronomini, subtribe Perinthi: Bernhauer and Scheerpeltz, 1926, Coleopt. Cat., **82**: 521.

The tribe Hygronomini has served merely as a convenient category into which all aleocharine genera with 4, 4, 4-segmented tarsi might be placed, and should now be broken up to provide a more natural classification.

Some of the variable characters of the Perinthina may be summarized as follows: Head prognathous in *Termitopelta, Macrognathellus,* and *Termitonicus,* and hypognathous in all other genera; a frontal cariniform line present in *Perinthus;* mentum and submentum distinct except in *Lauella, Termitonicus, Poduroides,* and probably *Macrognathellus;* ligula bifid except in *Perinthodes* and *Paraperinthus;* gula broad in front (narrow in *Perinthodes* and *Paraperinthus*); apex of galea slender and acute (broad and ciliated in *Termitopelta*); antennal segments cylindrical (compressed in *Perinthus* and *Lauella,* and some segments compressed in *Eutermitophila*); galea and lacinia subequal in all genera except *Macrognathellus* and Poduroides, which have the galea elongated; pronotum strongly convex and with deflexed sides except in *Termitopelta, Termitonicus,* and probably *Macrognathellus;* pronotal base bisinuate except in *Lauella* and *Termitonicus;* hind coxae transverse except in *Paraperinthus,* which has triangular coxae; anterior coxae broad and convex in *Perinthus, Termitocola, Termitopelta,* and *Macrognathellus,* and elongated and narrow in the other genera.

KEY TO GENERA OF PERINTHINA

1. Head prognathous; clypeus and labrum visible from above 2
   Head hypognathous; only vertex and eyes visible from above 4
2. Pronotum cordiform; elytra very broad, their sides explanate. *Termitonicus* Mann
   Pronotum not cordiform; strongly transverse, about twice as broad as long; sides of elytra not explanate 3
3. Galea much longer than lacinia; body above densely, finely pubescent; posterior elytral angles not produced .... *Macrognathellus* Silvestri
   Galea and lacinia subequal in length; body above not pubescent, strongly shining; posterior elytral angles produced, acute ..... *Termitopelta* Borgmeier
4. Elytral epipleurae visible; sides of elytra not deflexed against side of body .. 5
   Elytral epipleurae not visible; sides of elytra deflexed against side of body; Africa 9
5. Labial palpi 2-segmented (not verified); India ...... *Eutermitophila* Cameron
   Labial palpi 3-segmented 6
6. Galea much longer than lacinia, its slender apex extending beyond the other mouth parts; antennae short and compact, segments 2–11 slightly telescoped, fusiform .... *Poduroides* Mann
   Galea not as above; antennae otherwise 7
7. Front of head with a complete transverse cariniform line.... *Perinthus* Casey
   Front of head without a cariniform line 8
8. Base of pronotum bisinuate; mentum and submentum distinct. *Termitocola* Seevers
   Base of pronotum almost straight; mentum and submentum fused, no suture evident; Pacific Islands .... *Lauella* Mann

9. Pronotum and elytra robust, rufo-piceous, differing in color and texture from abdomen; pronotum and elytra without fine pubescence. *Paraperinthus*, new gen.
   Pronotum and elytra moderately large, testaceous, with the same texture and color as abdomen; pronotum and elytra with dense, fine pubescence. *Perinthodes*, new gen.

TERMITOPELTA Borgmeier

Termitopelta Borgmeier, 1950, Rev. Ent., **21**: 656. Type species: *Termitopelta fulgens* Borgmeier.

Termitopelta is noteworthy for its prognathous head; broad, almost horizontal pronotum (sides not deflexed); glabrous integuments that are neither densely reticulate nor pubescent; and large size.

Head prognathous; occiput covered by pronotum; vertex, clypeus, and labrum visible from above; frontal cariniform line absent, clypeus not declivous. Antennae elongated; all segments, except tenth, longer than broad, segments 1–10 gradually decreasing in length; segments subcylindrical, verticillate. Mandibles robust. Gula moderately wide throughout, its sutures subparallel. Submentum and mentum distinct. Labial palpi 3-segmented, the cylindrical third segment longer than the others. Galea and lacinia subequal in length; lacinia with its spinose apex incurved, its medial border with numerous setae; galea densely and finely setose at apex, its apex not produced to a very acute point. Maxillary palpi 4-segmented; second segment compressed, strongly incrassate, third strongly incrassate.

Pronotum strongly transverse, more than twice as wide as long; only feebly convex, its hyaline lateral margins explanate; apex evenly and moderately deeply bisinuate. Elytra very large, even wider than pronotum; its lateral margins arcuate, explanate; posterior angles produced, acute, its apical margins bisinuate. Epipleurae large, in a horizontal plane. Tarsi 4, 4, 4-segmented; terminal segment subequal to the other segments combined. Anterior coxae convex, but less robust than in other genera.

Termitopelta fulgens Borgmeier

Termitopelta fulgens Borgmeier, 1950, Rev. Ent., **21**: 657, text figs. 18–31 (Campinas, Goiás; *Syntermes molestus* Burmeister; Borgmeier coll.).

Material examined.—One paratype.

Rufescent throughout, strongly shining. Head, pronotum, and elytra indistinctly and sparsely punctulate and finely pubescent. Head without macrosetae; pronotum (each half) with 11 marginal setae along anterior and lateral borders and with 2 or 3 setae on disk. Elytra with 8 marginal setae and one pair of long setae and several lesser ones on disk. Second tergite with one pair of setae; tergites 3–6 with 4 strong apical bristles, 3–5 with one pair and the sixth with 4 additional setae; tergite 7 without apical setae but with 4 sub-basal ones; tergite 8 with one seta on each lateral margin. Sternites with 6 long, black, pale-tipped setae on apical margins and 6 to 8 sub-basal setae; sternites with a moderate number of pale, recumbent hairs.

Length, 3.5 mm.

PERINTHUS Casey

Perinthus Casey, 1890, Ann. N. Y. Acad. Sci., **5**: 192; Wasmann, 1902, Boll. Mus. Zool. Torino, **17**, no. 427, p. 1; Fenyes, 1918, Gen. Insect., **173A**: 64; Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 10. Type species: *Perinthus dudleyanus* Casey.

Head strongly deflexed, only a small part of its vertex and eyes visible. Head with a supra-antennal cariniform line extending across the vertex. Clypeus saddle-shaped. Entire body with a very fine-meshed reticulation and a dense vestiture of very fine pubescence. Antennae slightly geniculate, their scape short; segments 3–11 compressed, thin in profile; pedicels visible. Pronotum broad and convex, one-half broader than long; anterior border emarginate; apical angles broadly rounded; sides arcuate; pronotum widest behind middle; basal angles broadly rounded, base bisinuate. Elytra as wide as pronotum; upper surface only moderately convex; evenly so to the sharp marginal line delimiting the upper surface from the epipleuron. Epipleura strongly reflexed but almost in a horizontal plane, and easily seen in ventral view; epipleura form an acute angle with elytra.

Remarks.—With the exception of *tarsatus*, the species of *Perinthus* are very closely allied. Differences in pronotal and elytral chaetotaxy (fig. 29) seem to be satisfactory for diagnostic purposes. Some of the differences are slight, but the setal patterns are apparently constant within a population. Species of *Perinthus* more often than not occur with several host species of *Nasutitermes.*

The generic positions of *P. silvestrii* Wasmann and *P. crassicornis* Wasmann have long been uncertain, but having recently had an opportunity to examine the types of these species I am transferring the former to *Termitocola* and the latter to *Macrognathellus*.

Perinthus dudleyanus Casey. Figures 27, *a*, 28, 29, *a*.

Perinthus dudleyanus Casey, 1890, Ann. N. Y. Acad. Sci., **5**: 194 (Panama; with termites; U. S. Nat. Mus.); Wasmann, 1902, Boll. Mus. Zool. Torino, **17**, no. 427, p. 2; Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 10, pl. 3, fig. 19.

I include in this species at present all individuals of the genus having the pronotal and elytral chaetotaxy shown in figure 29, *a*. Specimens from British Guiana, Trinidad, Colombia, Panama, and Ecuador are very similar except in size. In general, the smallest individuals occur in British Guiana and Trinidad at the eastern end of the range, intermediate ones in Colombia and Panama, and the largest in Ecuador. The three size groups are tentatively recognized as subspecies.

Inasmuch as telescoping of abdominal segments makes an accurate measurement of body length almost impossible, the pronotal dimensions were measured, as they seem to reflect the body size quite well. The results of my analysis are graphically illustrated in figure 28, and a summary of means follows:

	Pronotal width mm.	Pronotal length mm.
P. dudleyanus wasmanni Mann		
Trinidad (36)	0.707	0.443
British Guiana (27)	0.711	0.441
P. dudleyanus dudleyanus Casey		
Puerto Berrio, Colombia (9)	0.745	0.480
Panama (32)	0.790	0.503
Villavicencio, Colombia (4)	0.855	0.524
Santa Anna, Colombia (8)	0.876	0.540
P. dudleyanus major, new subsp.		
Ecuador (16)	0.923	0.581

Perinthus wasmanni Mann was proposed as a full species, but this hardly seems justifiable, considering the overlap in size with *dudleyanus*. Considerably more material from various sections of the range of *dudleyanus* is required before the validity of the above hypothesis can be determined.

Eight species of host termites are involved. In only one case is there a record of two subspecies with the same host: *dudleyanus* s. str. and *wasmanni* occur with *Nasutitermes ephratae*. This is due in part to the fact that some of the host species do not occur throughout the range of *P. dudleyanus* and in part to inadequate collecting.

Perinthus dudleyanus dudleyanus Casey

Perinthus dudleyanus Casey, 1890, Ann. N. Y. Acad. Sci., **5**: 194 (Panama; with termites; United States National Museum).

Material examined.—Casey's types. Barro Colorado Island, Panama Canal Zone; with *Nasutitermes ephratae* Holmgren, *N. corniger* Motschulsky, and *N. columbicus* Holmgren. Puerto Berrio, Antioquia, Colombia, and Villavicencio, Meta, Colombia; with *N. ephratae* Holmgren. Santa Anna, Colombia; with *N. meinerti* Wasmann.

Perinthus dudleyanus wasmanni Mann

Perinthus wasmanni Mann, 1923, Zoologica, **3**: 337 (Kartabo, British Guiana; *Nasutitermes ephratae* Holmgren; United States National Museum); Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 10.

Material examined.—Types and other specimens from Kartabo, British Guiana; with *N. ephratae* Holmgren and *N. costalis* Holmgren. St. Joseph, Glyan Road, Arena Forest, St. Augustine, Río Claro, and Northern Range, Trinidad, British West Indies; with *N. ephratae* Holmgren and *N. costalis* Holmgren.

FIG. 27. (a) *Perinthus dudleyanus* Casey. (b) *Perinthus tarsatus* Mann. (c) *Lauella palauensis* Seevers. (d) *Poduroides bovingi* Mann. (e) *Termitonicus mahout* Mann.

Perinthus dudleyanus major, new subspecies

Distinguished from the other subspecies by the larger size of its individuals (see fig. 28 for pronotal dimensions).

Holotype from Gualaquiza, Ecuador, collected October 29, 1934, by Wolfgang Hagen; with *Nasutitermes dendrophilus* Holmgren. In collection of Chicago Natural History Museum.

Paratypes.—Fifteen specimens, same data as holotype, except that some occurred with *Nasutitermes peruanus* Holmgren.

Perinthus xenocostalis Seevers. Figure 29, *e*.

Perinthus xenocostalis Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 9, pl. 3, fig. 18 (St. Joseph, Trinidad, British West Indies; *Nasutitermes costalis* Holmgren; Chicago Natural History Museum).

Material examined.—A series from St. Joseph, Toco, Northern Range, and Manzanilla, Trinidad; with *N. costalis* Holmgren. Bacolet, Tobago; with *N. costalis* Holmgren. Kartabo, British Guiana; with *N. costalis* Holmgren. Huachi and Cachuela Esperanza, Bolivia; with *N. pilosus* Snyder.

Distinguished by its chaetotaxy (fig. 29, *e*): pronotum with marginal row of 8 (6 long, 2 short), its disk with 3 : 2 : 1; elytra with marginal row of 2, the disk with 1 : 1.

Perinthus bolivari Seevers. Figure 29, f.

Perinthus bolivari Seevers, 1946, Rev. Ent., **17**: 264 (Huachi, Beni, Bolivia; *Nasutitermes chaquimayensis* Holmgren; United States National Museum).

Material examined.—Huachi, Beni, and Rurrenabaque, Beni, Bolivia; with *N. chaquimayensis* Holmgren. Río Claro, Glyan Road, Mayaro, and Arena Forest, Trinidad, British West Indies; Bacolet, Tobago, British West Indies; all with *N. ephratae* Holmgren. Chavantina, Mato Grosso, Brazil (H. Sick); with *N. bivalens* Holmgren.

Distinguished by its chaetotaxy (fig. 29, *f*): pronotum with marginal row of 8 (6 long, 2 short), its disk with 3 : 2 : 2; elytra with marginal row of 2, the disk with 1 : 1.

Perinthus mayae Seevers. Figure 29, *c*.

Perinthus mayae Seevers, Rev. Ent., **17**: 263 (Malon, Honduras; *Nasutitermes corniger* Motschulsky; United States National Museum).

Material examined.—Malon and Progresso, Honduras; Bobas, Guatemala; all with *N. corniger* Motschulsky.

Distinguished by its chaetotaxy (fig. 29, *c*): pronotum with marginal row of 9 (5 long, 4 short), its disk with 3 : 2 : 0; elytra with marginal row of 2, the disk with 1.

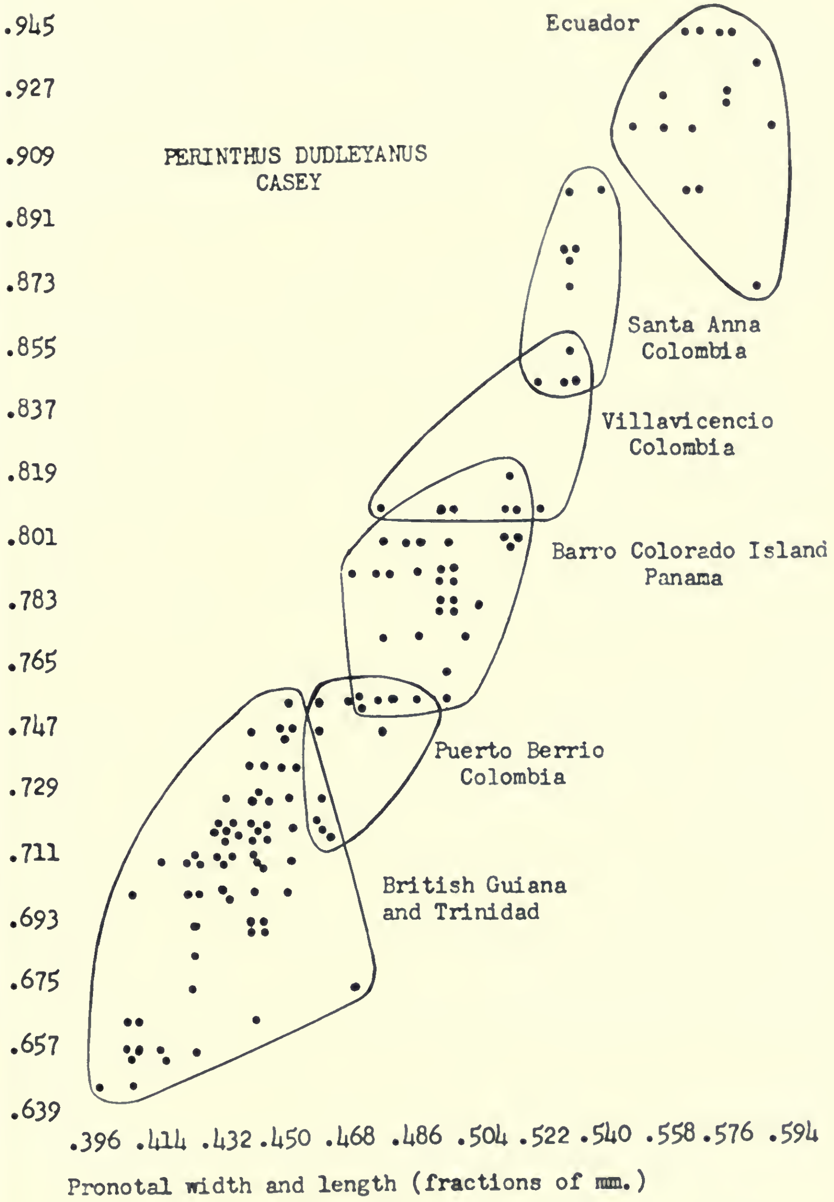


FIG. 28. *Perinthus dudleyanus* Casey; variation in size of individuals (based on pronotal proportions) in different localities.

Perinthus guatemalae Seevers. Figure 29, *b*.

Perinthus guatemalae Seevers, 1946, Rev. Ent., **17**: 262 (Izabel, Guatemala; *Nasutitermes ephratae* Holmgren; Chicago Natural History Museum).

Material examined.—Type series.

Distinguished by its chaetotaxy (fig. 29, *b*): pronotum with marginal row of 7 (5 long, 2 short), its disk with 3 : 2 : 1; elytra with marginal row of 2, the disk with 1.

Perinthus hageni Seevers. Figure 29, *d*.

Perinthus hageni Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 9, pl. 3, figs. 15, 17 (Barro Colorado Island, Panama Canal Zone; *Nasutitermes ephratae* Holmgren; Chicago Natural History Museum).

Material examined.—A series from Barro Colorado Island, Panama Canal Zone; with *N. ephratae* Holmgren and *N. corniger* Motschulsky. Hamburg Farm, Costa Rica; with *N. corniger* Motschulsky. Hacienda de Tenguel and Bucay Chico, Ecuador; with *N. peruanus* Holmgren.

Distinguished by its chaetotaxy (fig. 29, *d*): pronotum with marginal row of 4, its disk with 3 : 1; elytra with marginal row of 2, the disk with 1.

Perinthus tarsatus Mann. Figures 27, *b*, 29, *g*.

Perinthus tarsatus Mann, 1923, Zoologica, **3**: 336 (Kartabo, British Guiana; *Nasutitermes surinamensis* Holmgren; United States National Museum).

Material examined.—A series of paratypes.

Distinguished by the following characteristics: pronotum with a marginal row of 5 setae but without discal setae; elytra with 2 marginal setae and one on disk; antennal segments 3–7 slightly longer than broad, 8–10 subequal in length, 1–5 gradually broader, 5–11 subequal in width; pronotal sides more arcuate, pronotal base more strongly bisinuate; hind femora and tibiae subequal in length to pronotum (hind femora only four-fifths as long as pronotum in other species, and tibiae only three-fifths as long); hind tarsi three-fourths as long as tibiae (two-thirds as long as tibiae in other species).

TERMITOCOLA Seevers

Termitocola Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 7. Type species: *Termitocola cylindricornis* Seevers.

Distinguished from *Perinthus* in these respects: Front of head without a transverse cariniform line; antennae elongated, segments not compressed; elytral epipleura less strongly reflexed, forming an obtuse angle with the upper surface.

Termitocola cylindricornis Seevers. Figure 29, *h*.

Termitocola cylindricornis Seevers, 1937, Ann. Ent. Soc. Amer., **30**: 8, pl. 3, figs. 16, 20 (Barro Colorado Island, Panama Canal Zone; *Nasutitermes pilifrons* Holmgren; Chicago Natural History Museum).

Color reddish-brown, abdomen slightly paler. Pronotum (fig. 29, *h*) with a marginal row of 8 setae, its disk with longitudinal rows of 3 : 3 : 2; elytra with

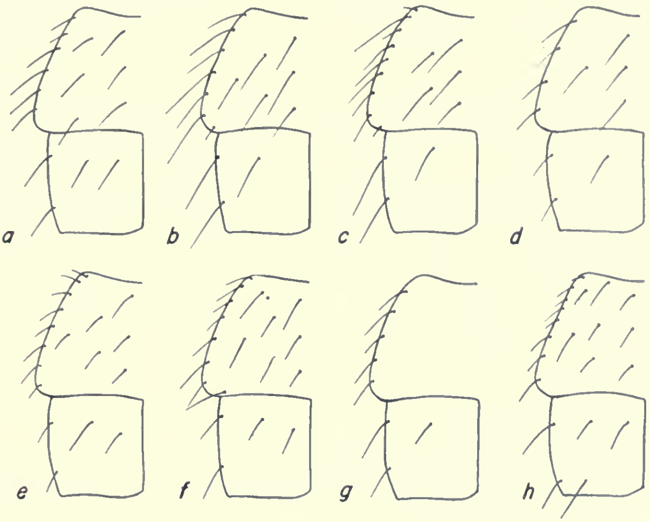


FIG. 29. Chaetotaxy of pronotum and elytra. (a) *Perinthus dudleyanus* Casey. (b) *Perinthus guatemalae* Seevers. (c) *Perinthus mayae* Seevers. (d) *Perinthus hageni* Seevers. (e) *Perinthus xenocostalis* Seevers. (f) *Perinthus bolivari* Seevers. (g) *Perinthus tarsatus* Mann. (h) *Termitocola cylindricornis* Seevers.

a marginal row of 2, the disk with rows of 1, 2 setae. Antennae very long, approximately one-half as long as body, their segments slender, cylindrical (14 : 6 : 8 : 7 : 7 : 7 : 7 : 7 : 6 : 6 : 12); first segment the broadest, segments 2 and 3 slightly broader than segments 4–11, which decrease in width. Pronotal base distinctly bisinuate, moderately deeply incurved medial to each basal angle.

Length, 2–2.2 mm.

Termitocola silvestrii Wasmann, new comb.

Perinthus silvestrii Wasmann, 1902, Boll. Mus. Zool. Torino, **17**, no. 427, p. 1 (Urucum, Corumbá, Mato Grosso, Brazil; Wasmann coll.; with termites); Silvestri, 1903, Redia, **1**: 198, pl. 6, figs. 267–272.

Material examined.—Two specimens on pin bearing type label in Wasmann collection. A series from Rio Pardo de Minas and Montes Claros, Minas Gerais, Brazil, collected January 8–10, 1952, by R. L. Araujo; with *Constrictotermes cyphergaster* Silvestri (determined by R. L. Araujo).

Coloration pale reddish-brown. Dorsum without setae, but with the usual very fine pubescence. Sternites with 6–8 setae in marginal row. Antennae cylindrical in form (10 : 6 : 6.5 : 6 : 7 : 5.5 : 5.5 : 5 : 5 : 5 : 11); segments 2–4 about two-thirds as broad as long, each tapering a little from apex to base; segment 5 longer than any of segments 2–10, subcylindrical; segments 5–10 increasing in width and decreasing in length (segment 5 about two-thirds as broad as 10). Pronotal base only feebly bisinuate, slightly incurved near basal angles.

Length, 1.75–2 mm.

Remarks.—Wasmann's description of this species was short and vague, and Silvestri's comments and figures lacked important details. Two important clues to its identification were mentioned: the absence of pronotal and elytral macrosetae, and its occurrence with *Constrictotermes.* After examining Wasmann's specimens and an additional series from Brazil, I have decided to transfer this species to *Termitocola.* It may be desirable to erect a new genus for it eventually, for its presence in *Termitocola* does broaden that genus appreciably.

MACROGNATHELLUS Silvestri

Macrognathellus Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 20. Type species: *Macrognathellus crassicornis* Wasmann (= *paraguayensis* Silvestri).

Silvestri separated this genus from *Perinthus* because of its elongated galea, which is longer than the lacinia. With the exception of *P. tarsatus,* which has a moderately elongated lacinia, the species of *Perinthus* have the galea and lacinia subequal. The pronotum of this genus is nearly twice as broad as long, about one-half broader than long in *Perinthus.* The elongated, subcylindrical antennae are unlike the compressed antennae of *Perinthus.* Silvestri's figure may give one the impression that the head of this genus is prognathous, but it is actually very similar to the condition in *Perinthus.*

Macrognathellus crassicornis Wasmann, new comb.

Perinthus crassicornis Wasmann, 1902, Boll. Mus. Zool. Torino, **17**, no. 427, p. 1 (Paraguay, *Heterotermes longiceps* Snyder; Wasmann coll.).

Macrognathellus paraguayensis Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 21, text fig. 9 (Sapucai, Paraguay; *Nasutitermes* sp.; Silvestri coll.). New synonymy.

Silvestri's figures should be consulted for details of this species. The host recorded by Wasmann for the species is so inconsistent with the host pattern for the Perinthina that it is almost certainly an error. Silvestri's record of *Nasutitermes* sp. as host of his *paraguayensis* should be regarded as correct until additional collections are made.

PODUROIDES Mann

Poduroides Mann, 1926, Proc. Ent. Soc. Wash., **28**: 151. Type species: *P. bovingi* Mann.

Poduroides has the appearance of a small *Perinthus*, but several features suggest closer relationship to *Macrognathellus*. The under side of the head and the mouth parts are apparently similar to the conditions in the latter genus; the elongated galea, the gula, the mentum, the submentum, the prementum and the labial palpi, and the unusual setose lines on the postgenae are especially suggestive. On the other hand, the head is probably more deflexed than in most genera of Perinthina and only the vertex is visible from above.

Head hypognathous, mouth parts elongated, especially the galea, the prementum, and the labial palpi. Postgenae (as seen in slide preparations) with an arcuate cariniform line almost paralleling the gular sutures; each of these lines bears about 35 long hairs. Gula not much narrower in front; submentum expanding rapidly in front of gula and becoming rather broad; mentum with sides converging rapidly for a short distance and then subparallel to apical margin. Mentum and submentum doubtfully distinct. Prementum very long; ligula bifid; labial palpi very long, basal segment twice as long as broad, second segment small, subquadrate, third more slender. Galea extending far beyond lacinia, its apex very slender and acute. Antennae geniculate, scape short; segments 3–11 cylindrical, as a group compact and fusiform; segments slightly telescoped, their pedicels not visible. Pronotum about two-thirds as long as broad, the apical margin almost straight, the sides arcuate, the base strongly bisinuate.

Poduroides bovingi Mann. Figure 27, *d*.

Poduroides bovingi Mann, 1926, Proc. Ent. Soc. Wash., **28**: 151, text figs. 1, 2 (Kartabo, British Guiana; *Nasutitermes gaigei* Emerson; United States National Museum).

Material examined.—Paratypes.

Color testaceous throughout; finely pubescent and punctulate; pronotum with a marginal row of 5 setae, its disk with rows of 3, 2, 2, 1 setae; elytra with one or two marginal setae, disk with 1, 2, 2, 2 setae; tarsi all very short.

TERMITONICUS Mann

Termitonicus Mann, 1926, Proc. Ent. Soc. Wash., **28**: 153; Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 22. Type species: *Termitonicus mahout* Mann.

Termitonicus is a very distinctive genus and bears little superficial resemblance to the other Perinthina; nevertheless its characteristics definitely place it in this subtribe. The prognathous head, non-limuloid form, and distinctive pronotum and elytra indicate that *Termitonicus* differentiated from basic subtribe stock.

Head prognathous, slightly broader than long. Antennae rather long, subcylindrical; intermediate segments elongated, more distal segments transverse; very feebly incrassate. Pronotum cordiform and distinctive; moderately convex but feebly explanate laterally; apex broadly and deeply emarginate, anterior angles broadly rounded, sides strongly arcuate and continuous with the oblique basal margin, base strongly produced medially. Elytra very broad; at base only as broad as pronotum, but the arcuate sides diverging strongly; elytra convex but becoming explanate laterally; epipleura very broad, in a horizontal plane. Anterior coxae long and slender; hind coxae transverse. Ninth tergite with a dense vestiture of unusual setae, the enlarged distal ends of which are heart-shaped.

Termitonicus mahout Mann. Figure 27, *e*.

Termitonicus mahout Mann, 1926, Proc. Ent. Soc. Wash., **28**: 153 (Kartabo, British Guiana; *Velocitermes beebei* Emerson; United States National Museum); Emerson, 1949, Prin. Anim. Ecol., p. 720, text fig. 257.

Material examined.—A series from the type locality.

Color flavo-testaceous, abdomen slightly darker. Pronotum with 4 setae on anterior margin, 5 on each lateral margin, and each half of disk with 2, 1, 1 setae. Elytra with 2 small marginal setae, the disk with 2 setae in a transverse row. Mentum with about 16 setae in irregular rows. Tergites with a subapical row of 4 setae. Relative lengths of antennal segments: 15 : 6 : 10 : 8 : 8 : 7 : 7 : 6 : 6 : 5 : 13; scape two and one-half times as long as segment 2; the latter about three-fifths as long as segment 3.

Length, 2 mm.

Termitonicus uroclaviger Silvestri

Termitonicus uroclaviger Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 23, text fig. 12 (Jabaquara, São Paulo; *Nasutitermes diversimilis* Silvestri; Silvestri coll.).

Record.—Loreto, Misiones, Argentina (Silvestri, 1946b).

This species is apparently very close to *T. mahout* Mann. Silvestri differentiated *uroclaviger* on the basis of its color and its having the second antennal segment a little shorter than the third. *T. uroclaviger* may be darker than *mahout* but the other character is a dubious one inasmuch as the second antennal segment of *mahout* is also shorter than the third. However, there are apparently two transverse rows of setae on the elytral disk of *uroclaviger* while there is only one row in *mahoui*, and the former has only 4 setae on the mentum while *mahout* has about 16.

LAUELLA Mann

Lauella Mann, 1921, Psyche, **28**: 54. Type species: *Lauella vitiensis* Mann.

Closely related to *Termitocola* of the Neotropical Region, especially in the structure of its head and mouth parts; distinguished from that genus by having the mentum fused to the submentum and some antennal segments compressed. The pronotal form differs from that of *Termitocola*, the anterior coxae are more slender and elongated, and the elytra are narrower and more convex.

Pronotum very convex, sides more strongly deflexed than in *Termitocola*, apex only slightly emarginate, sides almost straight, base feebly arcuate but not bisinuate, posterior angles obsolete. Elytra strongly convex, only three-tenths as broad as long (three-fifths as broad as long in *Termitocola*); epipleura visible.

KEY TO SPECIES OF *LAUELLA*

1. Head, pronotum, and elytra almost devoid of punctation, pubescence, and ground sculpture; only antennal segments 9–11 somewhat compressed. *vitiensis* Mann

   Head, pronotum, and elytra densely pubescent and punctulate; antennal segments 2–11 compressed 2

2. Pronotal disk with longitudinal rows of 2, 2, 3, 3 setae, beginning with median row (excluding setae of anterior and lateral margins); pronotum less than two-thirds broader than head . . . . *palauensis*, new sp.

   Pronotal disk with longitudinal rows of 2, 2, 2, 3 setae; pronotum nearly three-fourths broader than head . . . . *javana*, new sp.

Lauella vitiensis Mann

Lauella vitiensis Mann, 1921, Psyche, **28**: 54 (Vunisea, Kadavu, Fiji Islands; *Nasutitermes olidus* Hill; United States National Museum).

Hetairotermes leai Cameron, 1927, Rec. S. Australian Mus., **3**: 269 (Taveuni, Fiji Islands; "with a termite;" South Australian Museum). New synonymy.

Material examined.—The holotype of *L. vitiensis* and a paratype of *H. leai* in the Cameron collection, British Museum (Natural History). In addition, a specimen from Suva, Viti Levu, Fiji Islands (Chicago Natural History Museum, K. P. Schmidt leg.), collected with *N. olidus* Hill.

Head, pronotum, and elytra rufous, abdomen testaceous. Head, pronotum, and elytra with few traces of sculpture, punctation, or pubescence; abdomen minutely and densely punctulate and densely pubescent. Head with 18 or more short, erect hairs. Pronotum with 8 marginal setae and about 20 setae in 4 or 5 irregular rows on each half of disk. Elytra with a marginal row of 7 setae and disk with 18–20 in irregular longitudinal rows. Antennal scape stout, its upper surface shallowly concave; segments 2–11 slightly telescoped, pedicels invisible, segments 2–7 stout, cylindrical, 8–11 compressed, eleventh thin in profile; segments elongated except segment 2, which is three-fifths as long as third; segments 3–8 subequal in size, 9 and 10 a little shorter.

Length, 2.75 mm.

Lauella palauensis, new species. Figure 27, *c*.

Distinguished from *vitiensis* by its smaller size, coloration, chaetotaxy, and antennal structure, and the presence of the punctulation and pubescence so characteristic of a majority of species of Perinthina.

Pale brown; minutely, densely punctulate, and densely, finely pubescent. Head with a few short hairs; pronotum with 4 setae on each lateral margin, 6 on anterior margin, and with longitudinal rows of 2, 2, 3, 3 setae on each half of disk, beginning with median row; elytra with 2 marginal setae and 3 in a transverse row on disk. Antennal scape slightly concave above, broader than segments 2–11; segments 2–11 compressed, all except segment 2 elongated; segments slightly telescoped, pedicels not visible.

Length, 1.8–2 mm.

Holotype from Garakayo Island, Palau Islands, Micronesia; collected August 9, 1945, by Henry S. Dybas; with *Nasutitermes brevirostris* Oshima. In collection of Chicago Natural History Museum.

Paratypes.—Ten specimens, same data as holotype.

Lauella javana, new species

Closely allied to *palauensis;* differentiated by the characters of the key and by its broader, more robust build and paler coloration.

Testaceous; densely punctulate and pubescent. Pronotum with 4 setae on lateral margins, 6 on anterior margin, and rows of 2, 2, 2, 3 setae on each half of disk, beginning with median row. Elytra with 2 setae on lateral margin and 3 in a transverse row on disk. Pronotum almost three-fourths broader than head (81 : 47); base with feeble sinuation. Antennae long and slender, scape broader and longer than other segments; segments 2–11 compressed, all except segment 2 longer than broad; segments 4–10 about two-thirds longer than broad.

Length, 1.9 mm.

Holotype from Preange, Tjigembong, Java; collected by J. B. Corporaal on September 28, 1915; with *Nasutitermes corporaali* Wasmann. In Wasmann collection, Natuurhistorisch Museum, Maastricht, The Netherlands.

Paratype.—One specimen, same data as type, in Chicago Natural History Museum.

EUTERMITOPHILA Cameron

Eutermitophila Cameron, 1939, Fauna Brit. India, Staphyl., 4: 41. Type species: *Eutermitophila fletcheri* Cameron.

Eutermitophila has not been available, but there is no doubt that it is very closely related to *Lauella*. Cameron stated that *Eutermitophila* differs from *Lauella* in having 2-segmented labial palpi. Cameron's description mentions several characteristics of interest: Antennae with segments 8–11 slightly compressed, similar to those of *Lauella vitiensis;* anterior border of pronotum broadly emarginate, base bisinuate (base straight in *Lauella*); elytra strongly emarginate (not so in *Lauella*), anterior coxae almost as long as femora (longer in *Lauella*).

Eutermitophila fletcheri Cameron

Eutermitophila fletcheri Cameron, 1939, Fauna Brit. India, Staphyl., 4: 42, text fig. 6, pl. 1, fig. 3 (Coimbatore, Madras, India; *Eutermes biformis* Wasmann; Cameron coll.).

Color ferrugineous; head, pronotum, and elytra extremely finely, closely punctulate and pubescent. Antennae with first segment a little longer than second; segment 3 slightly longer than 2; segments 3 and 4 equal, 5–7 decreasing, 8–10 subequal, slightly compressed.

The host is *Trinervitermes biformis* Wasmann.

PERINTHODES, new genus

Type species: *Perinthodes africanus*, new species.

Perinthodes resembles *Perinthus, Termitocola,* and *Eutermitophila* in appearance and seems to be most closely allied to the last-named genus. It differs from *Eutermitophila* in having the elytra strongly convex and closely appressed to the body, and their epipleura small and not visible, even in ventral view. The hind coxae are intermediate in form between those of the foregoing genera and *Paraperinthus*, new genus; these coxae are transverse, but the medial portion is somewhat produced so that the coxae are three-fourths as long as broad (one-half as long as broad in other genera).

Body densely, finely punctulate and pubescent. Head hypognathous. Antennal segments cylindrical, feebly telescoped, pedicels not visible; none of the segments compressed. Mentum separated from submentum by a very weak suture; gula narrower in front than in the foregoing genera; labial palpi 3-segmented, small, basal segment longer than broad, second segment short, third segment longer, cylindrical. Galea slender, the apex not acutely pointed. Pronotum strongly convex, anterior margin almost straight, sides arcuate, base strongly bisinuate. Elytra strongly convex, sides closely appressed to body, epipleura small and not visible; posterior margin of elytra almost straight, not emarginate. Anterior coxae longer than femora, relatively slender. Hind coxae with thicker medial part somewhat produced, their maximum length about three-fourths the width; laterally, the coxae are nearly contiguous with the elongated metepimera.

Perinthodes africanus, new species

Head, pronotum, and elytra light brown, abdomen testaceous. Pronotum with 9 or 10 setae on each lateral margin, and 3 small setae on each half of the disk; elytra with 5 marginal setae and one pair of discal setae. Tergites 3–6 with an apical row of 6 fine setae, tergite 7 without marginal setae but with one submarginal seta on each side; tergite 8 with two rows of 4 setae each; tergite 9 with a cluster of long bristles. Antennal scape moderately broad, its upper surface concave; segments 2–11 cylindrical, segment 2 shorter than 3 but no less robust, segments 3–5 slightly elongated, 6–10 slightly transverse, decreasing a little in length.

Length, 2.1–2.6 mm.; slender in build.

Holotype from Camp Putnam, Epulu, Belgian Congo, collected May 15, 1948, by A. E. Emerson; with *Nasutitermes latifrons* Sjöstedt. In collection of Chicago Natural History Museum.

Paratypes.—Seven, same data as holotype. Twelve, Camp Putnam, Belgian Congo, collected May 16, 1948, by A. E. Emerson: with *N. latifrons* Sjöstedt. Seven, Yangambi, Belgian Congo, collected May 29, 1948, by A. E. Emerson; with *N. incurvus* Sjöstedt.

PARAPERINTHUS, new genus

Type species: *Paraperinthus pauciseta*, new species.

Most closely allied to *Perinthodes*, from which it is distinguished by the following characteristics: Pronotum and elytra distinctive in form, size, texture, color, punctulation, pubescence, and chaetotaxy; hind coxae triangular and metepimera short. The hind coxae and metepimera are unique within the Perinthina, and bear very close resemblance to those which distinguish the Corotocini.

Head finely punctulate and minutely pubescent, but the pronotum, elytra, and abdomen with only faint traces of punctulation and pubescence. Upper surface of the body without setae and sternites with a few inconspicuous hairs. Head hypognathous. Pronotum two-thirds as long as broad, robust, somewhat coriaceous in texture, very shiny; disk strongly convex, moderately reflexed laterally so as to be feebly explanate; anterior margin almost straight, anterior angles evenly and broadly rounded, sides almost straight, basal angles rounded, base strongly bisinuate, its medial two-thirds more arcuately produced than usual. Elytra similar in robustness and texture to pronotum; sides almost straight, apical angles almost rectangular, apical margins feebly oblique; epipleura not visible. Anterior coxae long and relatively slender, their upper surface convex; front femora five-sixths as long as coxae; front tibiae four-fifths as long as femora. Hind coxae with medial part somewhat produced, the apical margin strongly oblique so that the general form is triangular; coxal length equal to width; laterally the hind coxae scarcely extend beyond the point of articulation. Metepimera short.

Paraperinthus pauciseta, new species

Head brown, pronotum and elytra rufo-piceous, abdomen testaceous. Antennae with segments 2–11 robust, cylindrical; scape moderately broad, slightly concave above; segment 2 three-fourths as long as third, but not as broad; segments 3 and 4 slightly longer than broad, 5–10 subquadrate to slightly transverse. Hind femora and tibiae equal in length; hind tarsi about two-thirds as long as tibiae.

Length, 2.5–3.25 mm.

Holotype from Yangambi, Belgian Congo, collected May 29, 1948, by A. E. Emerson; with *Nasutitermes incurvus* Sjöstedt. In collection of Chicago Natural History Museum.

Paratypes.—Seven, same data as type, from two colonies of *N. incurvus* Sjöstedt. One pupa was collected with this series.

Subtribe TERMITONANNINA

Tribe Termitonannini: Fenyes, 1918, Gen. Insect., **173A**: 17, 75.

Distinguished from the subtribe Perinthina by their 9- or 10-segmented antennae and 4, 4, 5-segmented tarsi.

All genera except *Termitonilla* stenogastric. Derived stenogastric species usually limuloid in form. Head prognathous to hypognathous; clypeus and labrum visible from above in *Nannellus*, not in some species of *Termitonannus*. Head capsule generalized in *Nannellus*; short, transverse, and specialized in other genera. Antennae 10-segmented as a rule, 9-segmented in *Eunannodes*, moderately elongated in *Nannellus* to short and compact in *Termitonannus;* in many species, segments 4 and 5 extremely short. Antennae usually inserted under vertexal arcade; antennal fossae facing cephalad, shallow in *Nannellus*, deep in most genera. Gula and postgenae relatively short in species with hypognathous heads; mentum distinct in some species, fused to submentum in others. Labial palpi 3-segmented. Ligula incised except acutely produced in *Macrotrichuris*.

NANNELLUS Silvestri

Nannellus Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 17. Type species: *Nannellus anoplotermitis* Silvestri.

This genus has not been available for study; the brief characterization is based on Silvestri's figures. *Nannellus* is apparently the most generalized known member of the subtribe.

Body form generalized, slender, not limuloid. Head prognathous, clypeus and labrum visible from above; head transverse but not unusually short, only partly covered by pronotum; antennal fossae shallow, not beneath a vertexal arcade. Gula broad; mentum and submentum not separated by a suture in Silvestri's figure. Labial palpi small, slender. Antennae 10-segmented, relatively long; segments 1–3 elongated, 4 and 5 subquadrate, segment 5 a little larger than 4, segments 6–9 elongated, increasing in length. Pronotum relatively small, transverse, one-half broader than long; apex broadly emarginate.

Nannellus anoplotermitis Silvestri

Nannellus anoplotermitis Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 19, text fig. 10 (Lagôa Santa, Minas Gerais, Brazil; *Anoplotermes* sp.; Silvestri coll.).

The structural details of this species were well illustrated by Silvestri.

EUNANNODES Silvestri

Eunannodes Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 15. Type species: *Eunannodes reconditi* Silvestri.

Eunannodes is evidently most closely related to *Nannellus*, from which it was distinguished by Silvestri on the basis of its 9-segmented antennae. The head is short and transverse, more deeply set in the pronotum, and has the vertex more strongly deflexed than in *Nannellus*.

Eunannodes reconditi Silvestri

Eunannodes reconditi Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 16, text fig. 9 (Jabaquara, São Paulo, Brazil; *Anoplotermes* sp.; Silvestri coll.).

This species was well illustrated by Silvestri.

TERMITONANNUS Wasmann

Termitonannus Wasmann, 1902, Boll. Mus. Zool. Torino, (2), **17**, no. 427, p. 2; Silvestri, 1903, Redia, **1**: 199; Fenyes, 1918, Gen. Insect., **173A**: 75; Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 341; Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 1. Type species: *Termitonannus schmalzi* Wasmann.

Tetraphilus Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 2 (subgenus). Type species: *Termitonannus* (*Tetraphilus*) *brachycerus* Silvestri.

Body form limuloid; head more or less hypognathous, to a degree that the anterior margin of the body is broadly arcuate. Head usually broad and short; vertex strongly deflexed in front, clypeus and labrum usually not visible from above. Antennae inserted under a vertexal arcade, usually about one-half of scape visible. Antennae 10-segmented, cylindrical in form, segments 4–9 transverse, 4 and 5 usually extremely short. Gula usually very short, mentum apparently fused to submentum in most species (distinct in *vagans* Silvestri).

Remarks.—Only a few of the species of *Termitonannus* have been available for study, and thus a revision of the genus is not feasible at this time. Wasmann's species were inadequately described, and I am not confident that specimens at hand are all correctly determined. Silvestri's species were well described and figured and should be recognized as they become available.

Species of *Termitonannus* are very small and slide preparations of material are almost essential for detailed studies. Silvestri's figures were evidently prepared after study of slide mounts, and satisfactory comparison of dry specimens is often not possible.

The best diagnostic characters for species differentiation seem to be the following: chaetotaxy of pronotum, elytra, tergites, sternites, mentum-submentum, and legs; proportions of antennal segments; head proportions; variations in galea and lacinia; form of eighth sternite and ninth tergite; size.

Termitonannus schmalzi Wasmann

Termitonannus schmalzi Wasmann, 1902, Boll. Mus. Zool. Torino, (2), **17**, no. 427, p. 3 (Joinville, Santa Catarina, Brazil; *Anoplotermes ater* Hagen; Silvestri coll.); Silvestri, 1903, Redia, **1**: 200, pl. 6, figs. 274–279.

Material examined.—One cotype, Joinville, Brazil (Bernhauer coll., CNHM). Fourteen specimens, Blumenau, Santa Catarina, Brazil (ex Reichensperger coll.), with *Anoplotermes* sp.; Rio Negro, Paraná, Brazil (ex Reichensperger coll.), with *Anoplotermes* sp.; and Ilha Grande, Rio de Janeiro, Brazil (H. Sick), with *Anoplotermes pacificus* Fr. Müller.

Flavo-testaceous. Head with one seta behind each eye; pronotum with one seta near each apical angle and 3 very close to each lateral margin; without discal setae; elytra with 3 curved marginal setae and one on disk near humerus. Tergites sparsely setose, 3–6 with one curved bristle on each lateral margin, 5–6 with an additional pair on apical margin, tergite 7 with 4 short setae on apical margin. Sternites with one long seta on each lateral margin, sternites 5–7 with about 4 black setae on apical margin. Head twice as broad as long. Antennae with segments 6–9 transverse, more than twice as broad as long; segment 10 equal to segments 8 and 9 combined.

Length, 0.8 mm.

Termitonannus silvestrii Wasmann

Termitonannus silvestrii Wasmann, 1902, Boll. Mus. Zool. Torino, (2), **17**, no. 427, p. 3 (St. Catilinas, Buenos Aires, Argentina; *Anoplotermes morio* Hagen; Wasmann coll.); Silvestri, 1903, Redia, **1**: 200, pl. 6, fig. 280.

There is little information available about this species; it is a small species, about the same size as *schmalzi*, and is said to differ from that species in some details of antennal structure. According to Silvestri, antennal segments 8 and 9 are unusually large, and the terminal segment is twice as long as the ninth, but much narrower.

The host is *Anoplotermes meridianus* Emerson.

Termitonannus major Wasmann

Termitonannus major Wasmann, 1902, Boll. Mus. Zool. Torino, (2), **17**, no. 427, p. 3 (Tacurúpucú, Paraguay; *Anoplotermes pacificus* F. Müller; Wasmann coll.); Silvestri, 1903, Redia, **1**: 200, pl. 6, figs. 281–282; Hegh, 1922, Les Termites, p. 613, text fig. 418, *a*.

This species was very poorly characterized by Wasmann. The dorsum was stated to be devoid of setae but it is doubtful if this can be taken literally. The antennal figure given by Silvestri is not very satisfactory and distinctive qualities are not evident.

Length, 1.8 mm.

Termitonannus vagans Silvestri. Figure 30, *b*.

Termitonannus vagans Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 3, text fig. 1 (Jabaquara and Itapetininga, São Paulo, Brazil; *Anoplotermes reconditus* Silvestri; Silvestri coll.).

Material examined.—Specimens from Santo Amaro, São Paulo, Brazil; collected by J. F. Prado; probably with a species of *Speculitermes.*

Head not as short as that of most species of *Termitonannus.* Gula broad but not very short; mentum distinct; galea shorter than lacinia. Chaetotaxy distinctive; pronotum with 5 setae on each lateral margin, 4 on anterior margin, and 2 on disk; elytra with 3 on lateral margin and 3 on disk. Eighth sternite produced at middle to an acute apex.

Length, 2 mm.

Silvestri's excellent figures should be consulted. The host is *Speculitermes reconditus* Silvestri.

Termitonannus domunculi Silvestri

Termitonannus domunculi Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 4, text fig. 2 (Saladillo, Santa Fe, Argentina; *Cornitermes striatus* Hagen; Silvestri coll.).

Pronotum with 4 short setae on each lateral margin; elytra with 3 lateral setae and 2 short setae near apical margins. Antennae very similar to those of *vagans.* Galea and lacinia subequal. Mentum apparently fused to submentum. Eighth sternite not as in *vagans.*

Length, 1.95 mm.

FIG. 30. (a) *Macrotrichurus brasiliensis* Silvestri. (b) *Termitonannus vagans* Silvestri. (c) *Termitonilla luteola* Borgmeier.

Silvestri's figures must be examined for diagnostic characters. The host is *Procornitermes striatus* Hagen.

Termitonannus proximatus Silvestri

Termitonannus proximatus Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 6, text fig. 3 (Lagôa Santa, Minas Gerais, Brazil; *Anoplotermes* sp.; Silvestri coll.).

Pronotum with 5 short setae on each lateral margin; elytra with 3 lateral setae and 2 setae near apical margins. Antennae very similar to those of *vagans*. Head short, gula short and broad; mentum fused to submentum. Chaetotaxy of abdominal segments distinctive.

Length, 1.6 mm.

Silvestri's figures must be examined for diagnostic characters.

Termitonannus microsomatis Silvestri

Termitonannus microsomatis Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 7, text fig. 4 (Caçapava, São Paulo, Brazil; *Nasutitermes microsoma* Silvestri, var.; Silvestri coll.).

Pronotum with 5 setae on each lateral margin; elytra with 3 moderately long lateral setae and many shorter ones, and 2 short setae on apical margins. Head short, gula short and broad, mentum fused to submentum. Abdominal chaetotaxy distinctive. Antennae similar to those of *proximatus* but with segments 7–9 shorter.

Length, 1.4 mm.

Silvestri's figures must be consulted for diagnostic features. The host is *Subulitermes microsoma* Silvestri.

Termitonannus parvulus Silvestri

Termitonannus parvulus Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 9, text fig. 5 (Alto da Serra, São Paulo, Brazil; *Anoplotermes ? minimus;* Silvestri coll.).

Pronotum with 5 setae on each lateral margin and 8 discal setae; elytra with 3 long lateral setae and numerous short setae and 2 sub-basal setae on disk. Antennae rather similar to those of *microsomatis*. Abdominal chaetotaxy distinctive.

Length, 1.5 mm.

Silvestri's figures must be consulted for diagnostic characters. The host is apparently a new species of *Anoplotermes*.

Termitonannus brachycerus Silvestri

Termitonannus (*Tetraphilus*) *brachycerus* Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 10, text fig. 6 (Jabaquara, São Paulo, Brazil; *Anoplotermes* sp.; Silvestri coll.).

Silvestri placed this species in the subgenus *Tetraphilus* because of the presence of two pairs of polytrichous sensory foveae on the terminal antennal segment (in contrast to the usual pair).

Pronotum with 5 short setae on each lateral margin; elytra apparently without setae. Antennae short, segments 3-9 very short. Abdominal chaetotaxy distinctive.

Length, 1.4 mm.

Silvestri's figures should be consulted for diagnostic characters.

Termitonannus echinoides Seevers

Termitonannus echinoides Seevers, 1946, Rev. Ent., 17: 264 (Ivon, Beni, Bolivia; *Anoplotermes* sp.; United States National Museum).

Color testaceous. Pronotum with 28-30 long, stout, yellow-tipped bristles, about one-half as long as pronotum. Elytra with about 22 irregularly dispersed setae. Tergites 3-6 with a row of 8 very long bristles and numerous short pale hairs; tergite 8 with 6 bristles. Sternites 3-7 with a subapical row of about 16 long, slender setae and numerous pale hairs in addition. Lateral plates of ninth abdominal segment with numerous long, curving bristles. Antennae with segments 1 and 2 short, elongated; segment 3 small, segments 4 and 5 very short, transverse, 6-9 transverse.

Length, 1.2 mm.

Termitonannus setosus Seevers

Termitonannus setosus Seevers, 1941, Ann. Ent. Soc. Amer., 34: 344, pl. 3, figs. 42, 43 (Barro Colorado Island, Panama Canal Zone; *Anoplotermes*, new sp. [Emerson cat. no. 152b]; Chicago Natural History Museum).

Color testaceous, polished. Pronotum with one long seta near each apical angle and 3 on each lateral margin; elytra with 3 conspicuous setae on lateral margins, one small seta on posterior margin, and one on disk. Dorsum of abdomen with 4 longitudinal rows of long, stout bristles. Head very short and broad; gula and mentum-submentum short. Galea slender, longer than lacinia and with a few fine hairs. Antennae with segments 1 and 2 short and stout, segment 3 small, obtrapezoidal, segments 4 and 5 extremely short, transverse, 6-9 transverse, moderately long, segment 10 about as long as segments 7-9.

Length, 1.2 mm.

Termitonannus gatuni Seevers

Termitonannus gatuni Seevers, 1941, Ann. Ent. Soc. Amer., 34: 345 (Barro Colorado Island, Panama Canal Zone; *Anoplotermes*, new sp. [Emerson cat. no. 152b]; Chicago Natural History Museum).

Color flavo-testaceous. Pronotum with 3 very feeble setae on each lateral margin; elytra with one seta at outer apical angles. Tergite 6 with one small seta on lateral margins; tergite 7 with an apical row of 6 small setae; tergite 8 with two transverse rows of 4 setae. Sternites 3-8 with one stout seta at outer apical angles and 4 fine setae on apical margin. Antennae as in *setosus*.

Length, 1 mm.

TERMITOCOMES Seevers

Termitocomes Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 342. Type species: *Termitocomes wasmanni* Seevers.

Distinguished from *Termitonannus* by these characters: Antennal segments 6–10 strongly compressed; segment 4 of maxillary palpi distinctive, large, conoidal in form; ligula acute, not bifid; galea unusually long.

Head short, transverse, a small area of occiput covered by pronotum. Vertex strongly deflexed, forming a rounded frontal arcade. Antennae inserted in broad, deep fossae; basal half of scape concealed. Antennae with first and second segments moderately long; segment 3 small, conical; segments 4 and 5 very short, transverse; 6–9 longer than broad; segment 10 about as long as segments 8 and 9; segments 6–10 strongly compressed. Gula large, transverse, submentum short, strongly transverse; mentum trapezoidal. Ligula long, slender, not incised. Galea somewhat longer than lacinia, apex slender and finely ciliated. Maxillary palpi with segment 4 large, conoidal. Pronotum large, convex, its anterior margin feebly emarginate, its sides diverging, nearly twice as broad at base as at apex; base bisinuate. Abdomen conical, tapering strongly at apex. Ninth tergite of male divided to form two long, slender, styliform processes.

Termitocomes wasmanni Seevers

Termitocomes wasmanni Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 344, pl. 3, figs. 40, 41 (Kartabo, British Guiana; *Speculitermes silvestrii* Emerson; Chicago Natural History Museum).

Color testaceous; shining. Pronotum with 6 setae on apical margin, 4 on each lateral margin and 10 on disk (8 in a transverse row at middle, and one sub-basal pair). Elytra with one basal and one apical seta on disk and 2 long setae and a number of fine hairs on lateral margins. Tergite 3 with 4 dark setae; tergites 4–6 with 6 setae in subapical row; tergite 7 with a row of 6 setae near middle; tergite 8 with a basal row of 4 bristles and a subapical row of 4. Sternites 4 and 5 with subapical rows of 8 setae; sternite 6 with 6 setae; sternite 7 with 4 setae; sternite 8 with a medial transverse row of 4 setae. Tergites and sternites densely clothed with pale yellow hairs, those of sternites rather long. Surface of abdomen reticulated, appearing finely rugulose.

Length, 2.6 mm.

Remarks.—The original description of the pronotal chaetotaxy was incorrect; some of the setae were missing from the holotype.

Termitocomes trinidadensis, new species

Distinguished from *wasmanni* by pronotal, elytral, and abdominal chaetotaxy.

Color rufo-testaceous. Head, pronotum, and elytra smooth and shining, not punctulate or pubescent. Abdomen not reticulated or rugulose. Pronotum with 4 setae on lateral margins, 4 on anterior margin, and 8 on disk (6 in transverse row about middle, 2 sub-basal). Elytra with 3 setae on lateral margins, 2 basal setae, and 2 apical setae on disk. Tergites with strong, black, pale-tipped setae as follows: 3–7 with five rows of 4, 6, 6, 6, 6 setae, respectively; tergite 8 with two rows of 4 setae each. Tergites rather densely clothed with pale, recumbent hairs. Sternites densely clothed with fine, yellow hairs, many of which are moderately long; sternites with transverse row of about 4 dark setae. Antennae very similar to those of *wasmanni;* relative lengths of segments: 8 : 7 : 6 : 2 : 3 : 7 : 8 : 8 : 9 : 18. Antennae strongly compressed, segment 3 obconical, segments 4 and 5 more than twice as broad as long, segment 6 a little broader than long, segments 7–9 subquadrate, segment 10 more slender than 9.

Length, 2.5 mm.

Holotype from Arena Forest, Trinidad, British West Indies; collected February 22, 1945, by S. A. Omenai and F. O. Iwenjora (A. M. Adamson coll.); with *Labiotermes labralis* Holmgren, new subspecies. In collection of Chicago Natural History Museum.

MACROTRICHURUS Silvestri

Macrotrichurus Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 11. Type species: *Macrotrichurus brasiliensis* Silvestri.

Macrotrichurus apparently differs from *Termitonannus* in having an unusually long prementum; an acute ligula; and stout labial palpi. Other differences include the distinctive galea and lacinia; an elongated, more generalized head; an emarginate mentum; the cylindrical ninth tergite, which is not deeply divided as in *Termitonannus;* and the vestiture of the ninth tergite.

Antennae 10-segmented; segments 4–8 transverse; 4 and 5 very short; segment 9 elongated. Head prognathous, slightly transverse but not very short, vertex declivous in front, antennae moderately deeply inserted under vertexal arcade. Gula short, broad, mentum fused to submentum; mentum deeply emarginate in front. Ligula acute. Ninth tergite distinctive, its lateral margins deflexed; thus the sclerite is somewhat cylindrical, narrow, and stout in dorsal view.

Macrotrichurus brasiliensis Silvestri. Figure 30, *a*.

Macrotrichurus brasiliensis Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 13, text fig. 7 (Jabaquara, São Paulo; *Anoplotermes pacificus* Müller, var.; Silvestri coll.).

Material examined.—A series from São Paulo, Brazil; with *Cornitermes cumulans* Kollar (R. L. Araujo); and Morumbí, São Paulo, Brazil; with undetermined host.

Head with 2 long vertexal setae and 2 behind each eye; pronotum with 2 long setae and several short ones on each lateral margin, disk with three longitudinal rows of 3 setae on each half; elytra with 5 or 6 long setae and numerous shorter ones on lateral margins or submarginal, disk with three longitudinal rows of 3, 2, 2 setae.

Length, 2.2 mm.

Silvestri's figures should be consulted.

Macrotrichuris notabilis Silvestri

Macrotrichuris notabilis Silvestri, 1946, Rend. Accad. Sci. Fis. Math. Soc. Reale Napoli, (4), **14**: 14, text fig. 8 (Tabalão, Brazil; *Anoplotermes ? pacificus* Müller; Silvestri coll.).

Distinguished from *brasiliensis* by chaetotaxy of pronotum, elytra, and abdomen, and by proportions of antennal segments.

Silvestri's figures must be consulted for diagnostic details.

TERMITONILLA Borgmeier

Termitonilla Borgmeier, 1950, Rev. Ent., **21**: 651. Type species: *Termitonilla luteola* Borgmeier.

Due to its physogastry this is perhaps the most noteworthy genus of the subtribe. Superficially, *Termitonilla* bears a strong resemblance to *Eburniola* of the Corotocini, but this is without doubt due to convergence.

Head, pronotum, and elytra generalized in appearance. Head prognathous, vertex and clypeus moderately declivous from eye level; opening of antennal fossae cephalad, but antennae not inserted under a vertexal arcade. Head transverse, occiput covered by pronotum. Antennae 10-segmented, segments 1 and 2 moderately long, segment 3 short, obtrapezoidal, segments 4 and 5 very short, transverse, 6–9 transverse. Gula moderately broad, its sides subparallel; mentum distinct; labial palpi small, ligula incised, galea and lacinia subequal. Pronotum large, convex, anterior margin straight, sides and base arcuate, posterior angles almost obsolete; pronotal hypomera relatively small, visible from side. Abdomen very large, strongly physogastric, almost all sclerites except those of terminal segments isolated by non-sclerotized integument. Tergites, sternites, and paratergites generalized.

Termitonilla luteola Borgmeier. Figure 30, *c*.

Termitonilla luteola Borgmeier, 1950, Rev. Ent., **21**: 652, text figs. 1–8 (Campinas, Goiás, Brazil; *Anoplotermes* sp.; Borgmeier coll.).

Material examined.—One paratype, same data as holotype. The hosts have been determined as *Anoplotermes ? ater* Hagen.

Head, pronotum, and elytra reddish-yellow; under side of thorax and abdominal sclerites pale yellow, somewhat hyaline; terminal abdominal segments darker. Head with an irregular transverse row of 5 or 6 bristles between eyes, and a pair of occipital bristles. Pronotum with 8 setae on anterior margin, 3 on lateral margins, and about 10 on each half of disk. Elytra with 4 lateral bristles and about 4 irregular rows on disk. Tergite 3 with 4 apical bristles, tergites 4–6 with 6 apical bristles; sternites 4–6 with 12 basal setae and 14–16 on apical margins.

Tribe TERMITOHOSPITINI

Tribe Termitohospitini: Seevers, 1941, Ann. Ent. Soc. Amer., 34: 331.

This tribe was proposed to separate a small group of neotropical termitophiles from the large heterogeneous tribe Bolitocharini. These species were characterized by limuloid body-form, large pronota that cover or almost cover the deflexed head, very large, deep antennal fossae, distinctive mouth parts, and 4, 4, 5-segmented tarsi.

Study of termitophilous Aleocharinae with the same tarsal formula from other zoogeographic regions reveals that most of them belong to this tribe. Four subtribes are proposed: the Termitohospitina of the Neotropical Region, the Hetairotermitina of the Oriental and Australian Regions, the pantropical Termitospectrina, and the Ethiopian Termitusina. The first three of these subtribes occur with the subfamily Nasutitermitinae, but the Termitusina are guests of *Cubitermes* of the Termitinae. The phylogenetic and evolutionary interrelationships with the host termites are discussed elsewhere (p. 48).

Tribal characteristics: Tarsi 4, 4, 5-segmented. Antennae 11-segmented; without polytrichous foveae on terminal segment. Mentum distinct; prementum elongated, ligula slender, nearly filiform; labial palpi 2- or 3-segmented, very long and slender, segments filiform, basal segment often greatly elongated. Galea and lacinia very long and slender. Antennal fossae large and usually deep; antennae inserted under a vertexal arcade. Anterior tentorial pits located at medial, inferior angles of antennal fossae. Middle coxae contiguous, mesosternal process very short, metasternum not produced between coxae; mesocoxal acetabula very large; metasternum behind them very short. Abdomen not physogastric.

Subtribe Termitohospitina: Body-form limuloid. Head strongly deflexed; concealed by large, shield-like pronotum except in *Paratermitosocius* (in which a small part of the vertex is visible). Pronotum with anterior and lateral margins continuously arcuate; surface not impressed. Anterior margin of submentum straight or slightly arcuate but not emarginate; anterior angles of mentum produced, apex of mentum emarginate. Abdomen slender, acuminate. Ninth tergite bifid, but otherwise unmodified.

Subtribe Hetairotermitina: Body-form more or less limuloid. Head slightly deflexed; covered to the eyes by pronotum. Pronotum large, transverse; anterior border almost straight, not continuously arcuate, with lateral margins. Anterior margin of submentum arcuately emarginate. Anterior angles of mentum produced, apex emarginate. Abdomen slender, acuminate.

Subtribe Termitospectrina: Body-form not limuloid. Head scarcely deflexed, almost prognathous. Pronotum distinctive (fig. 31); its surface with strong sulci. Anterior angles of mentum not produced, apex straight. Abdomen not acuminate, recurved.

Subtribe Termitusina: Body-form limuloid. Head strongly deflexed, usually with the long axis vertical; a small part of vertex visible from above. Pronotum large, shield-like; its sides strongly arcuate, converging anteriorly but anterior margin transverse, anterior angles evident. Anterior margin of submentum emarginate. Anterior angles of mentum not produced, apex straight. Abdomen acuminate. Ninth tergite deeply bifid, the two parts elongated as stout processes.

KEY TO NEOTROPICAL GENERA OF TERMITOHOSPITINI

1. Pronotum with two deep longitudinal sulci on disk; pronotal apex very deeply emarginate . . . . *Termitospectrum* Mann
   Pronotum not as above 2
2. Pronotum completely covering head 3
   Pronotum truncate in front, a small area of deflexed head visible from above. *Paratermitosocius* Seevers
3. Antennae elongated; segments longer than broad or subquadrate but never transverse; segments 3–10 not incrassate 4
   Antennae shorter; some or all of the segments transverse, segments 3–10 to some degree incrassate 5
4. Antennae very slender; all segments elongated, subcylindrical; abdominal bristles extremely long and conspicuous . . . . *Blapticoxenus* Mann
   Antennae more robust; segments 4–10 subquadrate to feebly elongated; abdominal bristles moderately long . . . . *Termitosodalis* Seevers
5. Mouth parts extremely elongated, galea very long and slender, lacinia strongly sclerotized, spinose; labial palpi extremely long and thin, second palpomere seven times as long as broad; third antennal segment longer than broad . . . . *Termitosocius* Seevers
   Mouth parts moderately long, galea and lacinia not unusually long; labial palpi moderately long, second palpomere only slightly longer than broad; third antennal segment usually transverse, at most subquadrate. *Termitohospes* Seevers

Subtribe TERMITOHOSPITINA

TERMITOHOSPES Seevers

Termitohospes Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 333. Type species: *Termitohospes miricorniger* Seevers.

Head deflexed, completely covered by pronotum. Head short, transverse; labrum, maxillae, and labium not greatly elongated. Antennal segments 3–10 usually transverse, in some species a few segments subquadrate; segments 3–10 incrassate. Pronotum very large, its lateral and anterior margins continuously arcuate; pronotum from one-tenth to seven-tenths broader than long.

KEY TO THE SPECIES OF *TERMITOHOSPES*

1. Pronotum approximately two-thirds broader than long . . . . . . *limulus*, new sp.
   Pronotum not more than one-half broader than long and usually somewhat less 2
2. Smaller species, 1.25–1.5 mm. in length 3
   Larger species, 1.8–2.25 mm. in length 5

3. Third antennal segment very short, transverse, produced medially and bearing a long bristle . . . . *miricorniger* Seevers
   Third antennal segment subquadrate, not produced medially 4
4. Antennal scape about as long as segments 2–5 combined. *panamensis* Seevers
   Antennal scape about as long as segments 2 and 3 combined. *guianae* Seevers
5. Pronotal base almost straight, basal angles rounded; pronotum one-tenth to one-fourth broader than long 6
   Pronotal base emarginate or sinuate; pronotum two-fifths to one-half broader than long 7
6. Pronotum one-tenth to one-seventh broader than long. *tachyporoides*, new sp.
   Pronotum one-fifth to one-fourth broader than long . . . . . . *silvestrii*, new sp.
7. Antennal segments 3–5 very short, about one-fourth as long as second; tergites 3–6 with 4 erect marginal setae . . . . *brasiliana*, new sp.
   Antennal segments 3–5 about one-half as long as second; tergites 3–6 with one seta near each apical angle . . . . *unicolor* Silvestri

Termitohospes miricorniger Seevers

Termitohospes miricorniger Seevers, 1941, Ann. Ent. Soc. Amer., 34: 335, pl. 3, figs. 33, 37, 44, 45 (Kartabo, British Guiana; *Nasutitermes ephratae* Holmgren; Chicago Natural History Museum).

Material examined.—Kartabo, British Guiana, with *Nasutitermes ephratae* Holmgren and *N. costalis* Holmgren. Manzanilla, Mayaro, Mt. Tabor, and Northern Range, Trinidad, British West Indies (ex Adamson coll.); with *N. ephratae* Holmgren. Manzanilla and Northern Range, Trinidad, with *N. costalis* Holmgren.

Testaceous; strongly shining. Front of head between antennal fossae at narrowest point one-sixth as broad as head. Antennal scape ovoidal; segment 2 obconical; segment 3 very short and broad, its medial apical surface produced and bearing a long seta; segment 4 very short; segments 4–10 transverse, increasing in length and slightly incrassate; segment 11 as long as segments 8–10 combined. Head with a sparse vestiture of fine hairs which are longer on front of head. Pronotum and elytra minutely punctulate and pubescent. Pronotum with 2 short setae on lateral margins. Tergites 3–8 sparsely pilose and with a marginal row of pale setae. Sternites 3–6 with a pair of setae on apical margin near each side and 1 medial seta; eighth sternite with 8 setae (2 on apical margin, 4 in subapical row, and 1 on each lateral margin); all sternites densely clothed with recumbent hairs.

Length, 1.25–1.5 mm.

Termitohospes brasiliana, new species

Related to *miricorniger*, from which it differs in larger size, antennal structure, chaetotaxy, and slightly broader pronotum.

Pilosity of head as in *miricorniger*. Pronotal margin with a continuous row of about 16 short setae; elytral margin with 3 setae. Tergites 3–6 with 4 marginal setae; tergite 7 not setose; tergite 8 with two pairs of setae. Sternites 3–7 with 6 erect setae on apical margins; sternite 8 with a prominent subapical pair of setae and 6 on arcuate apical margin. Sternites with a moderately dense covering of fine, pale, recumbent hairs, becoming shorter and finer on more posterior segments. Antennal segments with the following relative lengths: 12 : 4 : 1 : 1 : 1.5 : 2 : 2 : 2 : 2 : 2.5 : 7. Antennae with segments 3–10 short, transverse; segment 3 very short, but not produced medially as in *miricorniger;* segments 4–10 gradually incrassate; segment 10 twice as long and broad as segments 3 or 4. Pronotum two-fifths broader than long.

Length, 1.9 mm.; width, 0.85 mm.

Holotype and one paratype from Blumenau, Santa Catarina, Brazil (ex Reichensperger coll.); with *Nasutitermes aquilinus* Holmgren. In collection of Chicago Natural History Museum.

Termitohospes guianae Seevers

Termitohospes guianae Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 335, pl. 3, fig. 34 (Kartabo, British Guiana; *Nasutitermes surinamensis* Holmgren; Chicago Natural History Museum).

Distinguished from *miricorniger* by having antennal segments 3–7 subquadrate, not as short or as broad; segments 8–10 slightly transverse, but not as short, and segment 3 not produced medially.

Termitohospes panamensis Seevers

Termitohospes panamensis Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 336 (Barro Colorado Island, Panama Canal Zone; *Nasutitermes columbicus* Holmgren; Chicago Natural History Museum).

Closely related to *guianae* from which it is distinguished by slight antennal differences and distinctive chaetotaxy: Antennal scape longer and more slender, almost equal to segments 2–5 combined (in *guianae* equal to segments 2 and 3); pronotum with 2 setae on anterior margin and 5 on lateral margins (middle 3 setae much longer); elytra with 3 strong setae on lateral margins; tergites 3–6 with 4 setae on apical margin; tergite 7 without setae; tergite 8 with 2 small apical and 2 subapical setae; sternites 3–7 with 6 apical setae (middle pair weak except on sternite 7).

Termitohospes unicolor Silvestri, new comb. Figure 31, *a*.

Termitomus unicolor Silvestri, 1947, Arch. Zool. Ital., **31**: 142, fig. 8 (Jabaquara, São Paulo, Brazil; *Cornitermes similis* Silvestri; Silvestri coll.).

Fig. 31. (a) *Termitohospes unicolor* Silvestri. (b) *Termitoecia fabulosa* Bernhauer; the holotype without elytra. (c) *Termitoecia wilsoni* Cameron. (d) *Termitana perrieri* Fairmaire. (e, f) *Termitospectrum thoracicum* Mann; dorsal and lateral views.


a
b
c
d
e
f

Material examined.—Thirty-four specimens from 10 colonies of *Cornitermes cumulans* Kollar (determined by R. Araujo) from localities in the vicinity of São Paulo, Brazil (Ibirapuéra, Morumbí, Eldorado, Interlagos, Sacoman, Congonhas, Vila Formosa); collected by R. L. Araujo, J. F. Prado, and W. A. Maluf. Silvestri's *Cornitermes similis* is the same as *C. cumulans* Kollar.

Rufo-castaneous to rufo-testaceous. Head with about 5 medially directed pale setae along inner margins of antennal fossae, vertex finely setose and pubescent except between antennal fossae. Pronotum microscopically punctulate and pubescent; anterior and lateral margins bearing 25–30 short, fine hairs. Elytral margins with 2 moderately long, black setae. Tergites 3–6 with a long seta near each apical angle. Chaetotaxy of terminal abdominal sclerites figured by Silvestri (1947). Front of head between antennal fossae at narrowest point almost one-third as broad as head. Antennal segments with the following relative lengths: 18 : 6 : 3 : 2 : 2.5 : 3 : 3.5 : 3.5 : 4 : 4.5 : 10. Antennal segments 4–10 transverse, incrassate, segment 10 twice as broad as segment 4. Pronotum about one-half broader than long.

Length, 2–2.2 mm.

Termitohospes limulus, new species

Distinguished from other species of the genus by the different body proportions: *limulus* is short and very broad; the pronotum is one-third broader than long; the abdomen is broad at base but tapers rapidly to a narrow apex; the abdomen comprises only one-third the total length of the body (one-half the length of the body in the other species).

Rufo-testaceous, shiny. Head with 5 or more fine, pale hairs along inner margins of antennal fossae. Apical margin of pronotum with 25–30 very short, fine setae. Elytral margins with 2 conspicuous setae and several finer ones. Abdominal setae unusually long; tergites 3–6 with one seta near each posterior angle; tergite 7 without setae; tergite 8 with 2 setae on each half; tergites 3–7 with a few recumbent hairs, but without the moderately dense vestiture of the other species; sternites with a dense covering of long, pale hairs and with a few longer, dark bristles near lateral margins. Pronotum and elytra microscopically punctulate and with an almost imperceptible pubescence; tergites very minutely and sparsely punctulate; tergite 7 longitudinally strigulose. Head between antennal fossae relatively broad, at narrowest point one-fourth to one-third as broad as head. Antennal fossae relatively long and narrow, reaching apical margin of head. Eyes moderately large but smaller than antennal fossae. Antennal segments with the following relative lengths: 14 : 5 : 3 : 3 : 3 : 3 : 3 : 3 : 3.5 : 3.5 : 10; segments 3–10 strongly incrassate. Pronotum about one-third broader than long, base bisinuate (broadly emarginate, middle of emargination feebly arcuate), posterior angles rounded, apical margin of elytra bisinuate, but anterior angles not truncated.

Length, 1.4 mm.; width, 1 mm.

Holotype from Passa Quatro, Minas Gerais, Brazil (ex Reichensperger collection), with *Cornitermes* sp. In Chicago Natural History Museum.

Paratypes.—Thirteen specimens, same data as holotype, in Chicago Natural History Museum and Reichensperger collections.

Termitohospes silvestrii, new species

Rufo-testaceous, very shiny. Pronotum and elytra minutely punctulate, and with extremely fine pubescence; intervals smooth. Tergites uniformly, minutely punctulate and pubescent, and with extremely fine, transverse strigulation. Front of head with a number of fine, pale hairs; pronotum with 2 lateral and 2 short anterior setae; elytral margin with a row of about 18 closely placed, moderately long, obliquely directed setae. Tergites 3–6 with 4 moderately long apical setae; tergite 7 without setae; tergite 8 with one long and one short seta on lateral margins and one additional pair of short setae. Sternites 3–6 with 8 long, erect setae on apical margin (some of these setae may be small and indistinct on sternites 3 and 4); sternite 7 with 6 setae; tergite 8 with 2 setae. Sternites with numerous pale setae, recumbent to semi-erect; near base of each sternite these hairs are short, but they are quite long near apex.

Head short and broad; front between antennal fossae one-fifth as broad at narrowest point as head width. Eyes larger than antennal fossae, strongly convex. Antennal fossae broad and deep, but not elongated. Antennal segments with relative lengths as follows: 14 : 7 : 3.5 : 3 : 4 : 4 : 4 : 4 : 4 : 4 : 15; segment 2 obconical; segment 3 narrow at base, at apex one-third broader than long; segments 5–8 increasing in width; 8–10 subequal in width.

Pronotum one-fifth to one-fourth broader than long; base straight, posterior angles broadly rounded. Outer apical angles of elytra truncated; maximum length of each elytron about one-fourth as great as distance from lateral margin to suture.

Length, 2–2.2 mm.

Holotype from Blumenau, Santa Catarina, Brazil (ex Reichensperger collection), with *Nasutitermes aquilinus* Holmgren. In Chicago Natural History Museum.

Paratypes.—Seven specimens, same data as type; in Chicago Natural History Museum and Reichensperger collection.

Termitohospes tachyporoides, new species

Closely related to *silvestrii*, from which it differs in these respects: narrower, more strongly deflexed pronotum, the sides of which are more closely appressed against the body (pronotum only one-tenth to one-sixth as broad as long); sides of pronotum more nearly parallel near base, the apical margin thus more elliptical; width of head between antennal fossae only one-seventh as broad as head. Chaetotaxy similar to that of *silvestrii* except that the vestiture of the sternites is more dense and conspicuous; the fine, pale bristles are numerous and many are quite long; the erect setae of the sternites are not, as a rule, as well developed as in *silvestrii*.

Length, 2–2.2 mm.

Holotype from Passa Quatro, Minas Gerais, Brazil (ex Reichensperger collection, with *Cornitermes* sp. (according to accompanying label; no specimens of the host were available). In collection of Chicago Natural History Museum.

Paratypes.—Forty-three specimens, same data as type; in collections of Chicago Natural History Museum, Reichensperger, Borgmeier, and Instituto Biológico, São Paulo, Brazil.

Remarks.—Several larger species of *Termitohospes* resemble some species of the tachyporine genus *Tachyporus*, and this species has the facies of that genus to a marked degree.

TERMITOSOCIUS Seevers

Termitosocius Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 338. Type species: *Termitosocius microps* Seevers.

Closely related to *Termitohospes*, from which it is distinguished by the structure of its head and mouth parts.

Head long and slender, subtriangular in outline; labium, maxillae, and labrum much elongated, somewhat beak-like in appearance. Eyes small. Antennal fossae relatively small; vertex between fossae about one-fourth as broad as head. Labium similar in structure to that of *Termitohospes* but its parts very much elongated; labial palpi extremely long and filiform, basal segment seven times as long as broad, segments 2 and 3 longer than broad. Mandibles about two-thirds as long as head capsule, straight except for slightly incurved apices. Galea and lacinia very long and slender, the former with an apical tuft of hairs, the latter strongly sclerotized, dentate (laciniae extending beyond mandibles, for which they may be mistaken).

Termitosocius microps Seevers

Termitosocius microps Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 339, pl. 3, figs. 31, 35, 38, 46 (Kartabo, British Guiana; *Nasutitermes octopilis* Banks; Chicago Natural History Museum).

Coloration uniformly flavate. Head clothed with semi-erect yellow hairs. Pronotum and elytra very minutely and sparsely punctulate and pubescent. Pronotum with three longitudinal rows of setae on each half; an inner row of 3, a middle row of 5, and a marginal row of 5 setae. Elytra with similar rows of 2, 2, 1 setae, respectively, and a comb of about 10 moderately long, yellow hairs on the margin. Tergites 3–6 with 4 stout black setae on posterior margins; tergite 8 with 2 apical and 2 subapical setae. Sternites 3–8 with 6 black setae on apical margin. Antennal segments with relative lengths as follows: 10 : 8 : 5 : 3 : 3 : 3 : 3 : 3 : 3 : 3 : 8; scape ovoidal; segment 3 slender, longer than broad; segments 4–10 subequal in length but somewhat incrassate; segment 10 more than twice as broad as segment 3.

Length, 1.75 mm.

PARATERMITOSOCIUS Seevers

Paratermitosocius Seevers, 1941, Ann. Ent. Soc. Amer., 34: 340. Type species: *Paratermitosocius vestitus* Mann.

Closely related to *Termitosocius;* distinguished by having the smaller pronotum truncate at the apex so that the head is visible from above, and by having antennal segments 5–10 longer than broad.

Paratermitosocius vestitus Mann

Perinthus vestitus Mann, 1923, Zoologica, 3: 337 (Kartabo, British Guiana; *Nasutitermes octopilis* Banks; United States National Museum).

Paratermitosocius vestitus Mann, Seevers, 1941, Ann. Ent. Soc. Amer., 34: 340.

Material examined.—Type series.

Color brown, integuments rather dull. Pronotum and elytra with a dense vestiture of pale hairs. Pronotum with 4 moderate setae on each lateral margin; elytral margins with 3 longer, stouter setae. Tergites 3–6 with one prominent seta near each apical angle; sternites 3–7 with 2 apical setae near each side; sternite 8 with 2 apical and 4 subapical setae; tergites and sternites with a dense covering of fine, pale, semi-erect hairs.

Length, 2 mm.

BLAPTICOXENUS Mann

Blapticoxenus Mann, 1923, Zoologica, 3: 362. Type species: *Blapticoxenus brunneus* Mann.

Termitocolonus Seevers, 1941, Ann. Ent. Soc. Amer., 34: 336. Type species: *Termitocolonus ericiogaster* Seevers. New synonymy.

Distinguished from *Termitohospes* by its distinctive antennal structure and distinctive abdominal setae.

Head deflexed, completely covered by the large pronotum; head smaller in proportion to body size than in *Termitohospes.* Antennal fossae broad and deep; vertex between the fossae narrow. Eyes prominent. Antennae geniculate, very much elongated (three times as long as the antennae of *Termitohospes*); scape fusiform, segments 2–10 subcylindrical, twice to three times as long as broad, terminal segment shorter than preceding segments. Gula large, a little more than one-half as long as broad; submentum shorter than gula; mentum with apical border emarginate, its anterior angles acutely produced. Abdomen beset with extremely long, aciculate bristles, most of which are thickened at base.

Blapticoxenus brunneus Mann

Blapticoxenus brunneus Mann, 1923, Zoologica, 3: 363 (Kartabo, British Guiana; *Velocitermes beebei* Emerson; United States National Museum).

Termitocolonus ericiogaster Seevers, 1941, Ann. Ent. Soc. Amer., 34: 337, pl. 3, figs. 32, 39 (Kartabo, British Guiana; *Velocitermes beebei* Emerson; Chicago Natural History Museum). New synonymy.

Color flavo-testaceous. Head, pronotum, and elytra without setae; head with sparse, recumbent pubescence, pronotum and elytra sparsely and very minutely punctulate and pubescent. Abdominal macrosetae about one-half longer than the corresponding abdominal segment; stout and dark at base, pale and aciculate distally. Tergites 3–6 with 4 setae on apical margins; tergite 7 without setae; tergite 8 with 2 setae on apical margin and 2 on each lateral margin; tergite 9 with 3 setae on each half, lateral plates of ninth segment with 3 setae. Sternites 3–6 with 10 to 12 macrosetae; sternite 7 with 8 setae; sternite 8 with 6 subapical and 2 apical setae.

Length, 1.5 mm.

TERMITOSODALIS Seevers

Termitosodalis Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 337. Type species: *Termitosodalis barticae* Seevers.

Termitomus Silvestri, 1947, Arch. Zool. Ital., **31**: 138; Borgmeier, 1950, Rev. Ent. **21**: 639. Type species: *Termitomus fasciatus* Silvestri. New synonymy.

Distinguished from *Termitohospes* by its antennal structure: Antennae three times as long as those of *Termitohospes;* scape moderately long; segments 2–10 cylindrical, elongated, or subquadrate but not transverse, segment 3 usually the longest.

Remarks.—Borgmeier placed *Termitomus* Silvestri in synonymy with *Termitohospes* Seevers but that is incorrect as *Termitomus fasciatus* is congeneric with *Termitosodalis barticae.*

Termitosodalis barticae Seevers

Termitosodalis barticae Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 338, pl. 3, fig. 36 (Kartabo, British Guiana; *Velocitermes beebei* Emerson; Chicago Natural History Museum).

Coloration dull brown. Antennae with segment 2 smaller than scape, cylindrical; segment 3 elongated, cylindrical, equal to segments 1 and 2 combined; segments 4–10 slightly elongated, subequal except segment 5, which is a little longer. Pronotum, elytra, and abdomen with a dense covering of fine, pale hairs. Pronotum with three irregular longitudinal rows of setae on each half comprised of 2 (inner), 2 (middle), and 3 (submarginal) setae; elytra with similar rows of 1, 2, 2 setae. Tergites 3–6 with 4 rather long, stout setae in subapical rows; tergite 7 without setae; tergite 8 with a basal pair of setae and one on each side. Sternite 3 with 6 erect setae and numerous long, recumbent hairs on apical margin; sternites 4–6 with 8 submarginal setae; sternite 7 without setae; sternite 8 with 2 setae near apex and 6 in a transverse row near middle.

Length, 1.5 mm.

Termitosodalis fasciatus Silvestri, new comb.

Termitomus fasciatus Silvestri, 1947, Arch. Zool. Ital., **31**: 140, fig. 7 (Pernambuco, Brazil; *Nasutitermes diversimilis* Silvestri; Silvestri coll.).

Termitohospes fasciatus Silvestri, Borgmeier, 1950, Rev. Ent., **21**: 647.

Distinguished from *barticae* by the chaetotaxy of pronotum, elytra, and abdominal sclerites, and by the proportions of the antennal segments. Silvestri's figures should be consulted.

Color reddish-brown. Antennae with segments 2 and 3 elongated, apparently subequal in length; segments 3–10 appear to decrease gradually in length. Pronotum covered with very short hairs and about 24 longer, dark setae; elytra each with about 11 setae. Tergites 3–6 with 6 long, black setae in apical rows; tergite 7 without setae; tergite 8 with 2 sub-basal and 2 subapical setae. Sternites with 10 setae in apical rows.

Length, 2 mm.

Subtribe HETAIROTERMITINA

HETAIROTERMES Cameron

Termophila Lea, 1910, Proc. Roy. Soc. Victoria, **23**: 136; Fenyes, 1918, Gen. Insect., **173A**: 91. Type species: *Termophila latebricola* Lea.

Hetairotermes Cameron, 1920, Trans. Ent. Soc. London, **1920**: 223 (for *Termophila* Lea, preoccupied, *Termophila* Grassi, 1887); 1921, Trans. Ent. Soc. London, **1921**: 357, 387.

Head, pronotum, and elytra smooth, highly polished; abdomen less so. Head prognathous, scarcely deflexed; covered to eyes by pronotum. Dorsum rather strongly declivous between antennal fossae and margined in front by a fine, U-shaped line. Clypeus almost vertical, convex at middle and becoming concave laterally, where it forms one surface of the moderately deep antennal fossae. Antennae inserted under a short arcade. Eyes large. Antennae robust, moderately long. Gula very broad, scarcely narrower in front. Submentum broad, its apex emarginate. Mentum very broad and short, its apex concave, its apical angles narrowly produced. Labial palpi 3-segmented, very long and slender, filiform. Galea and lacinia subequal, long and slender. Pronotum one-half to two-thirds broader than long; anterior margin slightly arcuate to moderately emarginate, base arcuate, sides strongly rounded, basal angles rounded. Mesosternal process slender, acute; middle coxae nearly contiguous. Legs densely pubescent, usually bearing long setae.

The species of *Hetairotermes* have been very superficially described. Perhaps the following notes may aid in determinations, but the genus needs a thorough revision. *Hetairotermes leai* Cameron is a synonym of *Lauella vitiensis* Mann.

Hetairotermes latebricola Lea

Termophila latebricola Lea, 1910, Proc. Roy. Soc. Victoria, **23**: 137 (Galston, New South Wales; "from a termite nest;" Lea coll.).

Hetairotermes latebricola Lea, Cameron, 1920, Trans. Ent. Soc. London, **1920**: 223.

Material examined.—Two cotypes, New South Wales; Cameron collection, British Museum (Natural History); and other specimens.

Testaceous-brown, pronotal and elytral margins and abdomen paler. Vertexal setae short and inconspicuous; one pair of clypeal setae. Pronotum with irregular longitudinal rows of relatively short setae arranged 4, 3, 4 (on each half); no fine hairs present. Dorsum impunctate. Antennae relatively short for the genus; less than twice as long as pronotum (95 : 50). Pronotum one-half broader than long (75 : 50); anterior margin slightly arcuate; pronotum broadest in front of middle, the sides converging moderately in front; base moderately arcuate; side margins moderately reflexed, base very feebly so. Elytral side margins only one-fourth longer than sutural length (behind scutellum). Tergites and sternites not pubescent.

Length, 1.1 mm.

Hetairotermes agilis Cameron

Hetairotermes agilis Cameron, 1920, Trans. Ent. Soc. London, **1920**: 223 (Woodlands, Singapore Island, Malaya; "with a wood-dwelling termite;" Cameron coll.).

Material examined.—The type and one other specimen, Cameron collection.

Stated by Cameron to differ from *latebricola* in having the sides of the elytra punctured, but there are much more important differences: The antennal segments have different proportions; the chaetotaxy of pronotum and head is different; the pronotum and elytra have different proportions; the sternites are densely pubescent.

Castaneous, abdomen pitchy-testaceous. Head with one pair of setae between antennae and a row of about 11 setae between eyes. Pronotum with four irregular longitudinal rows of macrosetae on each half, comprised of 4 or 5, 4, 4, and 3, respectively. Pronotum with a moderate number of fine, short hairs. Elytra with about 15 macrosetae in no perceptible pattern; sides with dense, recumbent pubescence ending at upper surface. Antennae approximately twice as long as pronotum (100 : 48); relatively short and compact; scape moderately stout, compressed; segments 4–10 incrassate; segment 3 about one-half longer than broad; segments 4–10 transverse. Antennal segments of these relative lengths: 14 : 10 : 9 : 5 : 6 : 7 : 7 : 7 : 9 : 7 : 16. Pronotum three-fifths broader than long (76 : 48); anterior margin straight; sides evenly arcuate; base slightly arcuate; side margins and base narrowly reflexed. Elytral side margins a little less than one-half longer than sutural length. Tergites 3–7 with dense, recumbent pubescence; each with 4 long, black (pale-tipped) macrosetae, middle pair with 2 shorter, pale setae between them. Sternites densely pubescent.

Hetairotermes piceus Cameron

Hetairotermes piceus Cameron, 1920, Trans. Ent. Soc. London, **1920**: 224 (Bukit Timah, Singapore, Malaya; "with a wood-dwelling termite;" Cameron coll.); 1921, Trans. Ent. Soc. London, **1921**: 387.

Material examined.—The type specimen.

Cameron's differential diagnosis of this species is very poor. It is closely related to *agilis* and may be distinguished by the appreciably longer antennae, the proportions of the antennal segments, and minor differences in chaetotaxy.

Pitchy black. No pubescence on head, pronotum, or elytra. Head setae as in *agilis;* pronotum with about 26 macrosetae in roughly five longitudinal rows, although a pattern is difficult to discern; elytra with several dozen macrosetae and many shorter finer hairs, but these grade into one another and are difficult to count. Antennae long and slender, two and three-fifths longer than pronotum; relative lengths of segments: 16 : 10 : 12 : 10 : 9 : 9 : 9 : 8 : 8 : 8 : 15; basal three segments of antennae slender; 4–10 gradually but not markedly incrassate; 2 and 3 about twice as long as broad; 4–8 longer than broad; 9–10 subequal in length and width; segment 11 twice as long as 10. Pronotum similar to that of *agilis;* three-fifths broader than long (80 : 50); anterior margin slightly emarginate; sides evenly arcuate. Elytra as in *agilis.* Chaetotaxy of abdomen as in *agilis.*

Hetairotermes bryanti Cameron

Hetairotermes bryanti Cameron, 1950, Ann. Mag. Nat. Hist., (12), **3**: 98 (Penang, Malaya, no host cited; Cameron coll.).

Material examined.—The holotype.

Cameron compared this species with *agilis,* but many of the statements that he made are incorrect. In antennal characters this species is intermediate between *agilis* and *piceus.* The pronotal apex is more emarginate than in the foregoing species, and the pronotum is widest in front of the middle.

Head with 16–18 medium-length hairs; these tend to be in rows. Pronotum with 12 or more dark macrosetae and many finer but not much shorter hairs scattered among them. Antennae two and two-fifths longer than pronotum (110 : 45); relative lengths of segments: 14 : 8 : 9 : 9 : 8 : 8 : 7 : 7 : 6 : 7 : 14; three basal antennal segments slender; 2–6 not appreciably different in length but slightly incrassate; 6–10 incrassate; 7–10 broader than long. Pronotum almost two-thirds broader than long (74 : 45); its apical margin moderately deeply emarginate; broadest in front of middle; base quite arcuate, with an indication of sinuation; side and basal margins reflexed. Lateral elytral margin about two-thirds longer than sutural margin (56 : 34). Abdominal chaetotaxy much as in *agilis* and *piceus.*

Hetairotermes punctiventris Lea

Termophila punctiventris Lea, 1910, Proc. Roy. Soc. Victoria, **23**: 137, fig. 4 (Bridgetown, West Australia; "in a nest of white ants;" Lea coll.).

Hetairotermes punctiventris Lea, Cameron, 1920, Trans. Ent. Soc. London, **1920**: 223.

According to Lea, this species is distinguished from *H. latebricola* by its peculiarly punctate seventh tergite and sternite, and by having its pronotum slightly upturned or flattened at the hind angles but not reflexed along the lateral margin.

Testaceous-brown, pronotum slightly paler. Head glabrous, pronotum and elytra with short, sparsely distributed setae; abdomen with rather sparse but more noticeable setae, more or less confined to apex and sides of segments. Antennae extending almost to apex of elytra; segments 2–10 subequal in length, gradually incrassate. Pronotum twice as broad as long; anterior angles strongly rounded; hind angles moderately so. Abdomen with sixth tergite longitudinally strigose; seventh tergite and sternite with distinct punctures.

Hetairotermes formicicola Oke

Hetairotermes formicicola Oke, 1933, Proc. Roy. Soc. Victoria, **45**: 135 (Gypsum, Victoria, Australia; *Iridomyrmex nitida;* Oke coll.).

Oke's description of this species was very general. He stated that *H. formicicola* differs from the two Australian species "in not having any 'longer setae' anywhere. Under a hand lens it appears to be almost glabrous, but under the microscope it is seen to have a close, minute pubescence. The fine puncturation of most of the surface will also distinguish this species."

Two matters relating to this species require confirmation: First, that it belongs to this genus, and, secondly, that it occurs with ants.

Hetairotermes insulanus, new species

This species apparently differs from the other members of the genus in its chaetotaxy, especially in the presence of extremely long marginal setae on pronotum and elytra.

Rufo-testaceous; abdomen paler. Head, pronotum, and elytra smooth, shiny, glabrous, impunctate. Head without setae. Lateral pronotal margins with 7 and elytral margins with 4 extremely long, curve-tipped setae. Pronotum with 2 setae on anterior margin, and its disk with 12 setae as follows: each deflexed side with a pair about the middle, a transverse row of 4 at the center of the disk just behind the middle, a pair behind this row, and a pair in front of the basal border. Elytral disk with 11–12 erect setae irregularly arranged. Tergites with numerous fine setae of varying lengths. Sternites smooth, shiny and subglabrous, but with numerous long, curve-tipped setae.

Antennal segments with the following relative lengths: 9 : 8 : 6 : 6 : 7 : 6 : 6 : 6 : 6 : 6 : 8; scape and segment 2 more slender than the following segments; segment 5 broadest, segments 6–10 a little less broad. Pronotum slightly less than twice as broad as long; anterior border shallowly emarginate; base arcuate medially, nearly straight near sides; sides arcuate, basal angle rounded. Elytra generalized. Eighth sternite very strongly produced to form a large arcuate lobe. Legs densely hairy and bearing long setae; middle tibiae with about 6 and hind tibiae with about 8 very long, fine, curve-tipped setae on their outer margins; femora with similar setae on outer margins near their apices.

Length, 1.1 mm.

Holotype from Koror Island, Palau Islands, Micronesia; collected January 16, 1948, by Henry S. Dybas (Pacific Science Board Expedition), with *Nasutitermes rufirostris* Hill. In collection of United States National Museum. No paratypes.

TERMITOBRA, new genus

Type species: *Termitobra perinthoides,* new species.

Termitobra differs from *Hetairotermes* in having the galea considerably shorter than the lacinia, the pronotum only one-half broader than long, and the integuments densely pubescent.

Head moderately deflexed, covered by pronotum to the eyes; vertex declivous between antennal fossae, which are moderately deep. Gula very broad, its sides converging moderately in front; submentum broad and short, its apex deeply emarginate; mentum distinctive in structure (its apical angles as in *Termitohospes*); prementum very long; ligula short, filiform; labial palpi 3-segmented, extremely long; relative lengths of segments 14 : 3 : 2, the basal segment about seven times as long as the maximum width; segments 2 and 3 more slender, filiform. Galea somewhat shorter than lacinia, its oblique apex setose; lacinia dentate and setose. Segment 2 of maxillary palpi club-shaped; segment 3 fusiform. Mandibles falcate, the incurved apices long and slender. Antennae feebly incrassate; segments cylindrical, slightly elongated. Pronotum transverse, one-half broader than long, anterior border almost straight, sides converging slightly in front, base slightly arcuate. Elytra generalized. Mesocoxae large, contiguous. Metasternum very short. Hind coxae large. Tarsi 4, 4, 5-segmented. Abdomen tapering, ninth tergite deeply bifid.

Remarks.—Termitobra perinthoides bears such a close resemblance to *Perinthus* and *Lauella* of the Termitonannini that it may easily be mistaken for a species of that tribe. However, the similarities are only superficial and the head capsule and mouth parts establish the relationship with the Termitohospitini.

Termitobra perinthoides, new species

Head, pronotum, elytra, tergites, and sternites densely punctulate and with a dense covering of very fine pubescence. Pronotum with four longitudinal rows of long setae on each half comprised of 3, 2, 1, 3 setae, respectively, beginning with a medial row. Elytra with similar rows of 1, 1, 2, 3 setae. Tergites 3–6 with a row of 4 subapical setae; tergites 7 and 8 each with a pair of widely separated sub-basal setae. Sternites with an apical row of about 8 long, fine setae and a similar row about the middle of each sternite.

Length, 1.2 mm.

Holotype from Peleliu Island, Palau Islands, Micronesia; collected August 4, 1945, by Henry S. Dybas, with *Nasutitermes rufirostris* Hill. In collection of Chicago Natural History Museum.

Paratypes.—Three paratypes, same data as holotype.

Subtribe TERMITOSPECTRINA

TERMITOSPECTRUM Mann

Termitospectrum Mann, 1926, Proc. Ent. Soc. Wash., **28**: 153. Type species: *Termitospectrum thoracicum* Mann.

Head not deflexed, only occipital border covered by pronotum. Vertex forming an obtuse angle between antennae, then declivous to front margin; clypeus short; antennal fossae moderately large, somewhat elongated, antennae inserted under a feeble vertexal arcade. Head broader than long; labrum large, arcuate, not emarginate, mouth parts elongated and somewhat beak-like in appearance.

Antennal scape short and broad, segments 2 and 3 slightly elongated, 4–10 subquadrate. Gula very broad, its sides scarcely converging in front; submentum very broad, its sides subparallel; mentum much narrower than submentum, semi-tubular due to inflexion of its sides; prementum very much elongated; ligula nearly filiform. Labial palpi apparently 2-segmented; filiform, first segment much longer than second. Maxillae elongated; galea and lacinia rather long, the former slender, curved, its apex with a cluster of hairs; the latter more robust and rather heavily sclerotized. Maxillary sinus very large. Segment 2 of maxillary palpi medio-laterally compressed, segment 3 longer and somewhat fusiform.

Pronotum distinctive: strongly transverse, its apical border very deeply emarginate and anterior angles produced along sides of head as far as eyes; dorsum with two broad, deep sulci extending forward from near base to vicinity of apical angles; surface lateral to sulci very convex and membranaceous in texture. Pronotal hypomera broad, reflected against pronotum, but partially visible from side. Elytra membranaceous in part, especially near apices, apical border emarginate.

Abdomen about as broad as foreparts; recurved over thorax; not obviously physogastric but with a tendency for small areas of membranous integument to show along the sides near the paratergites.

Termitospectrum thoracicum Mann. Figure 31, *e, f*.

Termitospectrum thoracicum Mann, 1926, Proc. Ent. Soc. Wash., **28**: 154 (Kartabo, British Guiana; *Nasutitermes gaigei* Emerson; United States National Museum).

Flavo-testaceous; head, sides of pronotum, tips of elytra, and parts of abdomen translucent, pale. Clypeus and anterior part of vertex with a few moderately long, dark setae; vertex with sparse, short hairs. Mentum with 4 black setae at apex and 2 in middle; submentum with a few inconspicuous hairs. Pronotum with a pair of setae on anterior margin, two pairs on disk and 4 setae on each convex area lateral to sulci. Elytra with a number of fine, pale setae. Sternite 3 with a moderate number of setae; sternite 4 with 10 or more unusually long bristles with curved tips; other sternites with setae only on apical margins. Antennal segments with the following relative lengths: 10 : 5 : 5.5 : 4 : 4 : 4 : 4 : 4 : 4 : 4 : 8; scape not much longer than broad; segments 2 and 3 subequal in width; segments 4–10 slightly transverse, not incrassate; segments verticillately setose.

TERMITOECIA Bernhauer

Termitoecia Bernhauer, 1921, Ark. Zool., **13**: 20. Type species: *Termitoecia fabulosa* Bernhauer.

Differs from *Termitospectrum* in its larger size, more robust build, distinctive elytra, pronotal form, distinctive mentum, and scaphoidal abdomen.

Moderately robust in build. Head transverse, not deflexed; vertex forming an obtuse angle between antennae, then so abruptly declivous as to be almost vertical; clypeus short. Labrum large, deeply emarginate. Antennal fossae relatively small. Antennae elongated, most segments longer than broad. Mouth parts elongated, somewhat beak-like in appearance. Gula broad, its sides scarcely converging in front; submentum broader, its apex broadly emarginate; ligula entire, moderately long, rounded; mentum large, trapezoidal, its apex straight. Labial palpi probably 2-segmented; segment 1 much elongated, segment 2 shorter and more slender, less than one-half as long as basal segment. Galea and lacinia equal in length; the former very long and slender, heavily sclerotized, its apex with a few hairs; the latter with an acute apex, spinose, its medial surface with a row of setae. Maxillary palpi with segment 2 broader distally, medio-laterally compressed; segment 3 elongated, sub-fusiform.

Pronotum three-fifths broader than long (*fabulosa*) to twice as broad as long (*wilsoni*); about three-fifths broader than head. Pronotum broadly cordiform; apex broadly, shallowly emarginate, apical angles produced a little, sides strongly arcuate, basal angles obsolete, base arcuate. Pronotal disk flat to convex; outer one-fourth explanate, membranaceous, and very feebly pigmented; explanate sides delimited from disk by shallow, incomplete sulci terminating in basal foveae. Pronotal hypomera large, visible from side. Elytra distinctive: broader than pronotum, sides strongly arcuate, apex strongly emarginate (maximum length two-fifths greater than sutural length), disk with a deep triangular impression in the distal two-thirds, the sides of elytra much swollen and convex.

Abdomen not physogastric or limuloid; capable of being reflected over fore-parts, somewhat scaphoidal in dorsal view; fourth segment about as broad as elytra, segments 5–8 decreasing in width. Paratergites large, especially the inner ones.

Termitoecia fabulosa Bernhauer. Figure 31, *b*.

Termitoecia fabulosa Bernhauer, 1921, Ark. Zool., **13**, no. 8, p. 21 (Herberton, Queensland, Australia; no host indicated; Chicago Natural History Museum).

Material examined.—The holotype. This specimen is accompanied by a termite, *Schedorhinotermes intermedius* Brauer, which may be presumed to be the host of this species.

Head and pronotum rufo-testaceous, abdomen reddish-yellow, elytra brown; pronotal sides membranaceous, very pale flavate. Head with a small, shallow pit in center of vertex, flanked by a seta on each side; head sparsely punctate and finely reticulated, and with sparse, short hairs. Pronotum with 4 apical setae, 2 or more on lateral margins, 2 on membranaceous sides, 2 along basal border; pronotum with some extremely fine punctules and pubescence, but subglabrous in appearance. Elytra very minutely punctulate and pubescent. Tergites with a marginal row of setae, usually 4 dark setae and some finer ones; tergites very finely reticulated but not punctulate or pubescent. Sternites 4 and 5 with a marginal row of about 20 long, fine setae, sternite 6 with about 10, and tergite 7 with about 6. Sternites extremely minutely punctulate and pubescent and finely reticulated. Pronotum and elytra subequal in length. Antennal segments with the following relative lengths: 30 : 18 : 18 : 13 : 12 : 12 : 12 : 12 : 12 : 12 : 25; segments 2 and 3 subequal in length and width, about three times as long as broad; segments 4–10 incrassate; segment 4 only three-fifths as broad as 10; all segments longer than broad.

Length, 3.2 mm.

Termitoecia wilsoni Cameron. Figure 31, *c*.

Termitoecia wilsoni Cameron, 1943, Ann. Mag. Nat. Hist., (11), **10**: 349 (Bogan River, New South Wales, Australia; with termites; Cameron coll.).

This species has not been available; apparently it is distinguished from *fabulosa* by its darker coloration, different proportions of antennal segments, broader pronotum, and impunctate, glabrous, non-reticulated head.

Blackish-brown to dark reddish-brown, pronotal sides brownish-yellow. Head impunctate, glabrous, and without ground sculpture; pronotum with a few extremely fine punctures and very short hairs; elytra very finely and sparingly punctured and with short stiff hairs. Elytra a little longer than pronotum. Pronotum twice as broad as long. Basal segment of antennae stout, segment 3 a little longer and stouter than 2, segments 4 and 5 a little longer than broad, 6–10 subequal in length and width.

TERMITANA Fairmaire

Termitana Fairmaire, 1899, Bull. Soc. Ent. France, **1899**: 316; Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 88; Fenyes, 1920, Gen. Insect., **173B**: 288. Type species: *Termitana perrieri* Fairmaire.

Head covered to eyes by pronotum; vertex probably unmodified (strongly impressed according to Fairmaire, but this is probably due to collapse of the thin integument, as is evidently the case in the specimen at hand). Antennal fossae and clypeus typical of the subtribe, the latter strongly convex transversely. Gula very broad, about two-fifths as broad as head, its sides scarcely converging in front; submentum broader than gula, almost one-half as broad as head and moderately long, its apex broadly concave; mentum large, trapezoidal, its apex straight. Labial palpi long and filiform (not determined whether two- or three-segmented). Pronotum almost one-half broader than long, strongly convex at middle, broadly but not deeply impressed laterally (the area adjacent to each apical angle not involved). Pronotum entirely corneous, its sides not a different texture. Pronotal shape distinctive: apex almost straight, broadest point about one-half the distance from base to apex; sides in front of broadest point converging moderately; sides behind broadest point converging at a forty-five degree angle to form a broad arc with the base. Sutural length of elytra only about one-half that of lateral margins. Elytral disk with a moderate longitudinal, submarginal impression (not as deep or as conspicuous as in *Termitoecia*). Coxae very large, anterior coxae long and spindle-shaped, middle coxae almost attaining posterior margin of metasternum, hind coxae very broad, somewhat produced beyond lateral articulation. Tarsi 4, 4, 5-segmented (not 4, 5, 5-segmented as stated by Fairmaire). Abdomen scaphoidal, broadest at level of fifth segment (about one-half broader than pronotum), sclerites not separated and with almost no exposed membranous integument. Paratergites large, elevated to a very marked degree to form a conspicuous margin.

Remarks.—The position of *Termitana* has been incorrectly deduced due to the fact that Fairmaire miscounted the tarsal segments. Study of a "cotype" in the Bernhauer collection reveals the relationship indicated here.

Termitana perrieri Fairmaire. Figure 31, *d*.

Termitana perrieri Fairmaire, 1899, Bull. Soc. Ent. France, **1899**: 316 (Betsiboka, Madagascar; "with termites;" Fairmaire coll.).

Material examined.—One specimen, labeled cotype, from Madagascar, in Bernhauer collection, Chicago Natural History Museum.

Rufo-flavate. Head without macrosetae except for those on clypeus. Pronotum with 6 fine setae on apical margin, 5 moderately long and 5 very short hairs on lateral margins, a pair of basal setae, and three longitudinal rows of 3, 2, 1 setae, on each half of disk. Elytra with a moderately dense vestiture of fine, pale hairs, more numerous on sides, disk with a few darker, erect setae. Tergites, as a rule, with only an apical row of rather long bristles; tergites impunctate and glabrous. Sternites with an apical row of setae; surface of third sternite finely pubescent, others with only sparse, very minute stubble. Head impunctate, pronotum subimpunctate, with only sparse punctures bearing short stubble. Antennae with relative lengths of segments as follows: 17 : 13 : 9 : 8 : 8 : 8 : 8 : 8 : 8 : 8 : 18; segments 1–3 longer than broad; segment 4 broader than 3; segments 4–10 similar in size and form, increasing slightly in width.

Length, 2.1 mm.

Subtribe TERMITUSINA

TERMITUSA Wasmann

Termitusa Wasmann, 1905, Rev. d'Ent., **24**: 199; 1911, Rev. Zool. Afr., **1**: 162; Fenyes, 1918, Gen. Insect., **173A**: 106. Type species: *Termitusa sjöstedti* Wasmann.

Glaphyrinus Bernhauer, 1942, *in* Bernhauer and Paulian, Rev. Zool. Bot. Afr., **35**: 375. Type species: *Glaphyrinus mundus* Bernhauer. New synonymy.

Head strongly deflexed, its long axis almost vertical; a small area of vertex visible from above. Head subtriangular in outline; mouth parts prolonged, somewhat beak-like; vertex large, convex, rather broad between the moderately large antennal fossae. Clypeus moderately long; labrum large. Antennae elongated, slender, its segments subcylindrical and usually elongated, never appreciably incrassate. Gula broad, its margins not converging much in front; submentum moderately long broad, its apex arcuately emarginate; mentum long, subtrapezoidal; ligula elongated, nearly filiform. Labial palpi 2-segmented; basal segment extremely long, robust; segment 2 more slender, slightly bowed, about one-half as long as first. Mandibles very long, falcate. Maxillae much elongated; galea and lacinia subequal in length; lacinia terminating in a long, slender, incurved spine, its medial surface with about 10 long, stout, spinose setae; apex of galea membranous, bearing many fine, ciliate hairs.

Pronotum about one-half broader than long, large, convex, shield-like, its sides deflexed; lateral margins arcuate, apex almost straight, base broadly emarginate or bisinuate. Hind coxae large, very broad, strongly produced laterally; metepimera very large. Abdomen long and slender as a rule, but rather broad in one species. Ninth tergite bifid, each half forming a long slender setose process.

Remarks.—This genus needs a complete revision of its species, but adequate material for such a task has not been available. At one time or another I have examined most of the species, but this has not been particularly satisfactory, as material for dissection purposes is required before the species can be properly compared and diagnostic features determined.

It should be noted that the dorsal bristles of *Termitusa* break off very easily and many specimens lack nearly all of them. Slide preparations reveal setigerous punctures on specimens almost completely lacking the bristles. Wasmann indicated in a key that *escalerae* lacks dorsal setae but this is not so.

Termitusa sjoestedti Wasmann

Termitusa sjöstedti Wasmann, 1905, Rev. d'Ent., 24: 200 (Cap Debundscha, Cameroons; *Cubitermes fungifaber* Sjöstedt; Naturh. Reichsmus. Stockholm); 1911, Rev. Zool. Afr., 1: 163, pl. 5, fig. 9; Hegh, 1922, Les Termites, text fig. 421.

Material examined.—Two specimens in Wasmann collection on pin bearing type label (the head of one specimen and antennae of the other are missing). In addition, a series from Longuyi, Cameroons, French Equatorial Africa; with *Cubitermes fungifaber* Sjöstedt.

Brownish, very shiny; extremely finely punctulate and pubescent. Pronotum with irregular longitudinal rows of 4, 3, 2, 4 setae on each half, beginning with medial row. Elytra with about 6 discal setae and one on lateral margins. Tergites 3–6 with 4 very strong bristles set in prominent, elongated tubercles (bristles stout, black at base, pale distally); tergite 7 with 4 slender setae; tergite 8 with a dense brush of long, fine, pale hairs; each half of tergite 9 bearing 5 or more very long, dark bristles. Lateral plates of ninth segment also attenuated and bearing bristles. Sternites with about 6 setigerous tubercles with long, black bristles;

paratergites usually with one similar bristle. Sternites finely reticulated, very finely pubescent, and finely setose. Antennae long enough to reach apex of elytra; segments with the following relative lengths: 8 : 8 : 5 : 8 : 8 : 8 : 8 : 8 : 8 : 8 : 12; all segments except third twice as long as broad.

Length, 2–2.4 mm.

Termitusa escalerae Fauvel

Termitusa escalerae Fauvel, 1906, Mem. Soc. Esp. Hist. Nat., **1**: 289 (Cabo San Juan, Biafra, Rio Muni; *Cubitermes* sp.; Fauvel coll.); Wasmann, 1911, Rev. Zool. Afr., **1**: 163 (Gabon, French Equatorial Africa).

Material examined.—One specimen in Wasmann collection from type locality labeled type; presumably this is a syntype.

This species is very closely related to *sjoestedti* and difficult to distinguish from it. The pronotal and elytral setae are considerably less conspicuous than in *sjoestedti;* its size is smaller; the scape is one-half longer than segment 2.

Rufo-testaceous. Pilosity inconspicuous; setae of pronotum and elytra long but very fine and pale. Antennae with segments of these relative lengths: 9 : 6 : 5 : 8 : 8 : 8 : 8 : 8 : 8 : 8 : 14. Antennae long and slender, feebly incrassate; all segments elongated but only about one-half longer than broad.

Length, 1.9 mm.

Termitusa hystrix Wasmann

Termitusa hystrix Wasmann, 1911, Rev. Zool. Afr., **1**: 159, 163, pl. 5, fig. 10 (Sankuru, Belgian Congo; *Cubitermes fungifaber* Sjöstedt; Wasmann coll.); Hegh, 1922, Les Termites, p. 613, fig. 421.

Material examined.—Three specimens in Wasmann collection on pin bearing type label; all with head, pronotum, or parts thereof missing. Two other complete specimens from type locality.

Flavo-testaceous, elytra darker. Integuments glabrous, except eighth tergite with a dense brush of long, pale hairs. Stout, rather long, dark, pale-tipped bristles as follows: pronotum with longitudinal rows of 3, 3, 3, 4 bristles; elytra with 2, 1, 3, 2 bristles; tergites 3–6 with 4 setae; ninth tergite with about 6 long bristles.

Antennae with segments of following relative lengths: 10 : 7 : 6 : 8 : 9 : 9 : 9 : 8 : 8 : 8 : 15. All segments longer than broad; segment 3 the most slender; segments 3–11 incrassate.

Termitusa lujae Wasmann

Termitusa lujae Wasmann, 1911, Rev. Zool. Afr., **1**: 156, 159, 164 (Sankuru, Belgian Congo; *Cubitermes sankurensis* Wasmann; Wasmann coll.).

Material examined.—Three specimens on pin labeled type in Wasmann collection. Three additional topotypes, one with *Cubi-*

termes fungifaber Sjöstedt. One specimen, Kondue, Belgian Congo, in United States National Museum.

This species and the following, *T. cameroni* Reichensperger, are distinguished by a moderately dense vestiture of nearly recumbent hairs on the head; these are almost in transverse rows and are directed caudad. The pronotum has a similar vestiture.

Coloration uniform brown. Head and pronotum with hairs as described above, those of pronotum in four transverse rows of about 7 setae each. Tergites 3–7 with a moderately dense vestiture of pale semi-recumbent hairs; tergites 3–6 with an apical row of 4 very long bristles (pale-tipped); tergite 8 with a very dense brush of long, pale setae. Antennae shorter than in most other species, reaching only to middle of elytra; their segments with these relative lengths: 8 : 7 : 4 : 5 : 5 : 6 : 6 : 5 : 5 : 5 : 10. Antennal segments 1 and 11 somewhat longer than broad; segments 3–10 subequal in length and width, slightly incrassate. Pronotum two-fifths broader than long; pronotal base strongly bisinuate.

Termitusa cameroni Reichensperger

Termitusa cameroni Reichensperger, 1929, Ent. Blätter, **25**: 136 (Ngerengere, Tanganyika Territory; *Cubitermes glebae* Sjöstedt; Reichensperger coll.).

This species is evidently closely allied to *lujae* according to Reichensperger but may be distinguished from it by its paler, more yellow coloration. It is distinguished from the other species by its pilosity. The head and pronotum are yellow-brown and the elytra dark brown.

Termitusa mundus Bernhauer, new comb.

Glaphyrinus mundus Bernhauer, 1942, *in* Bernhauer and Paulian, Rev. Zool. Bot. Afr., **35**: 375 (Edéa, Cameroons, French Equatorial Africa; in the upper galleries of a termitary; Chicago Natural History Museum).

Material examined.—Holotype in Bernhauer collection, labeled "*Glaphyrius mirandus* Bernhauer, typus." Inasmuch as the type bears the correct locality data, it seems evident that Bernhauer was negligent in checking the type label against his manuscript name. A second specimen, labeled "cotype," from Tiko, Cameroons (ex Hamburg Museum) does not belong to *Termitusa mundus*, but I have not been able to identify it with any named species of the genus.

It is impossible at present to determine whether *T. mundus* is a valid species or not as the identity of *escalerae* and *hystrix* has not been established. It is less than 2 mm. in length, light reddish-brown in color, has very long antennae resulting from the fact that segments 4–10 are almost twice as long as broad, has extremely finely and sparsely punctulate pronotum and elytra which lack pubescence, and has longitudinal rows of setae on pronotum comprised of 3, 3, 3, 3 setae (beginning with median row); similar rows on elytra with 2, 1, 3, 2 setae.

The host is probably a species of *Cubitermes*.

Termitusa quadricollis Cameron

Termitusa quadricollis Cameron, 1952, Rev. Zool. Bot. Afr., 46: 331 (Massif des Kundelungu; host not stated; Museum of Belgian Congo).

Material examined.—Two cotypes from type locality in Cameron collection, British Museum (Natural History).

Distinguished from the other species of the genus by the proportions of the pronotum, which is only about one-fifth broader than long.

Head with scattered punctures, but nearly glabrous. Pronotum minutely punctured but with little evidence of pubescence. Pronotal macrosetae fine; arranged in rows of 4, 3, 3, 3 setae, respectively, beginning with medial row. Elytral macrosetae in rows of 2, 2, 2 setae; elytra with almost no fine hairs. Tergites with few recumbent hairs; tergites 3–7 with 6 long, apical or subapical macrosetae. Pronotum one-fifth broader than long; base broadly and rather strongly arcuate; broadest near base, sides converging moderately in front of middle, apex nearly straight.

Termitusa lativentris, new species. Figure 32.

Distinguished from the other species of *Termitusa* by broad, distinctive abdomen; shorter antennae with segments of distinctive proportions; maxillary palpi; and pubescent elytra. This species may represent a new genus but it is desirable to know more about *Termitusa* before forming more generic categories.

Coloration of head, pronotum, and elytra light reddish-brown; abdomen testaceous. Antennae shorter than in most species of the genus; relative lengths of segments: 8 : 8 : 5 : 5 : 6 : 7 : 6 : 5 : 5 : 5 : 12. Segments 4–10 relatively short, only segment 6 a little longer than broad, the others subquadrate to slightly transverse; segments 2–10 moderately incrassate. Maxillary palpi unusually large, especially the fusiform third segment, which is one-third or more longer than second and twice as broad. Pronotum very finely and sparsely punctulate and very sparsely pubescent. Basal half of elytra with rather numerous fine, semi-recumbent hairs. Tergites glabrous, non-punctate and without pubescence. Pronotum with longitudinal rows of setae comprised of 4, 2, 2, 3 setae (beginning with medial row), and elytral rows of 2, 2, 2 setae. Tergites with an apical row of 4 pale, slender setae. Pronotum one-half broader than long, its base strongly bisinuate. Elytral suture about three-fifths as long as pronotum, elytral apex scarcely emarginate. Abdomen much broader than in the other species and not acuminate; possibly to some extent physogastric, although exhibiting no membranous areas. Abdomen broadest at fifth segment; upper surface somewhat scaphoidal in form, its margins somewhat raised and the paratergites broader than usual.

Holotype from Brazzaville, French Equatorial Africa; collected April 1, 1948, by A. E. Emerson, with *Noditermes cristifrons* Wasmann. In collection of Chicago Natural History Museum.

Paratypes.—Seven specimens, same data as type.

FIG. 32. *Termitusa lativentris* Seevers.

Tribe TERMITOPAEDIINI, new tribe

This tribe is proposed for a group of Old World genera formerly placed in the Myrmedoniini. The latter group as now constituted is polyphyletic, and its genera must be reclassified. Some of the assignments to the Termitopaediini must be regarded as tentative; our knowledge of the palaeotropical termitophile fauna is probably too fragmentary to permit more than preliminary judgments. An earlier section of the paper (p. 52) is devoted to a discussion of the biogeography and host relationships of the Termitopaediini.

The tribe as herein constituted contains three generic groups: *Termitopaedia, Dioxeuta, Neodioxeuta, Termitopulex,* and *Termitolinus; Termitotropha* and *Termitobaena; Termitotecna, Protermitobia,* and *Termitobia*. The tribe as a whole is not easily characterized. This may indicate that several independently derived phyletic lines of termitophiles are represented, and that a subdivision will be needed at a later date.

The tribe is not characterized by a distinctive facies; the contrast between *Termitobia* and *Termitolinus*, for example, is very striking. While the group as a whole may be said to be physogastric, some genera exhibit this character to a very minor degree. There is no common pattern of physogastry and the abdomens of various genera are appreciably different. The characters seemingly shared by the genera are as follows: tarsi 4, 5, 5-segmented; maxillary acetabula not extremely developed as in the Myrmedoniini; galea and lacinia moderate in length (in contrast to the Myrmedoniini), the galea usually foliate and membranous; terminal antennal segments without coeloconic sensilla; mesocoxal acetabula large, shallow, faintly margined externally or not at all; the broad mesosternal process rounded or angulate; middle coxae narrowly or moderately widely separated; hind coxae subtriangular, not produced beyond lateral articulation; metepimera obliquely truncated posteriorly and not prolonged beyond coxal articulation. The mentum is free in *Termitopaedia* and related genera, fused with the submentum in the other genera. It may be noted that several characters listed above also typify the Corotocini: shallow mesocoxal acetabula, triangular hind coxae, abbreviated metepimera, and fused mentum. Without much doubt these are convergences associated with the habit of termitophily and do not signify close relationship of these tribes.

KEY TO GENERA OF TERMITOPAEDIINI

1. Abdomen extremely inflated, its basal segments protruding over elytra (fig. 33, *b*, *e*) 2
   Abdomen moderately inflated at most 3
2. Abdomen as in fig. 33, *b;* Indomalaya . . . . *Neodioxeuta*, new gen.
   Abdomen as in fig. 33, *e;* Africa . . . . *Termitobia* Wasmann
3. Antennae extremely long, capable of reaching beyond middle of abdomen. *Termitopulex* Fauvel
   Antennae not as above 4
4. Body very slender (about 0.4 mm. broad); head and pronotum longer than broad; abdomen only slightly broader than elytra; Africa. *Termitolinus* Wasmann
   Body appreciably broader; abdomen moderately inflated and distinctly broader than foreparts 5
5. Abdomen with inner paratergites forming oblique margins one-fourth to one-half as broad as the tergites 6
   Abdominal inner paratergites somewhat less than one-fourth as broad as tergites 7

6. Inner paratergites one-fourth as broad as tergites; Indomalaya. *Termitobaena* Bernhauer

   Inner paratergites one-half as broad as tergites; Africa. *Termitotropha* Wasmann

7. Pronotal margins strongly deflexed; pronotal hypomera not visible in lateral view; Africa . . . . *Termitotecna* Wasmann

   Pronotal hypomera visible in lateral view 8

8. Elytral apices modified, i.e., the outer apical angles separated from elytral disk by a short longitudinal incision; Africa . . . . *Protermitobia*, new gen.

   Elytral apices not modified 9

9. Pronotum unmargined; abdomen broadly inflated and strongly membranous; Africa . . . . *Termitopaedia* Wasmann

   Pronotum margined; abdomen moderately broad, but with little membranous integument exposed; Indomalaya . . . . *Dioxeuta* Sharp

TERMITOPAEDIA Wasmann

Termitopaedia Wasmann, 1911, Rev. Zool. Afr., **1**: 114; Fenyes, 1920, Gen. Insect., **173B**: 143. Type species: *Termitopaedia kohli* Wasmann.

Head generalized, subequal in length and width; clypeus moderately declivous. Eyes small, one-third as long as head. Gula broad and long; mentum free. Second segment of maxillary palpi small, relatively slender, arcuate: third segment fusiform, two-thirds longer than second. Antennae geniculate; scape short, very thin in profile, its inner surface concave; segments 2–10 decreasing in length, incrassate.

Pronotum small, moderately convex, unmargined; slightly broader than long, broadest in front of middle; side margins sinuate. Elytra unmodified. Wings present. Abdomen strongly inflated, broadest at level of fourth segment, two and one-half times as broad as pronotum. Abdomen with considerable membranous integument exposed; the sclerites of each segment contiguous, but the sclerites of segments 3, 4, 5, and 6 well separated from those of adjacent segments. Inner paratergites moderately broad, those of fifth segment one-seventh as broad as tergite; outer paratergites relatively broad, those of fifth segment one-third as broad as tergite.

Termitopaedia kohli Wasmann

Termitopaedia kohli Wasmann, 1911, Rev. Zool. Afr., **1**: 115, pl. 5, fig. 8 (Stanleyville, Belgian Congo; *Pseudacanthotermes spiniger* Sjöstedt; Wasmann coll.); Hegh, 1922, Les Termites, p. 613, fig. 420.

Material examined.—Belgian Congo: Stanleyville. Two specimens in Wasmann collection on pin bearing type label, and several additional specimens.

Color testaceous. Head very sparsely and minutely punctulate, glabrous; with one pair of widely separated vertexal setae. Pronotum feebly and microscopically punctulate, glabrous; 6 setae on apical margin, 2 on lateral margins, and 2 on disk. Elytra with a marginal row of 3 setae, a submarginal row of 2, and 1 seta near inner margin. Tergites and sternites with an apical row of setae, but otherwise with very few hairs. Relative lengths of antennal segments:

11 : 8 : 9 : 8 : 8 : 7 : 5 : 6 : 6 : 6 : 14. Relative lengths of parts of hind leg: femur 60; tibia 54; tarsus 31; tarsomeres 8, 4, 4, 5, 10. Middle leg: femur 48; tibia 46; tarsus 23.

Length, 2.5 mm.

DIOXEUTA Sharp

Dioxeuta Sharp, 1899, Ent. Monthly Mag., (2), **10**: 205; Fenyes, 1920, Gen. Insect., **173B**: 267. Type species: *Dioxeuta microps* Sharp.

Jacobsonella Silvestri, 1910, Boll. Lab. Zool. Portici, **5**: 59; Fenyes, 1920, Gen. Insect., **173B**: 276; Franssen, 1932, Tijd. Ent., **75**, suppl., p. 170; Cameron, 1939, Fauna Brit. India, Staphyl., **4**: 495. Type species: *Jacobsonella termitobia* Silvestri. New synonymy.

Distinguished from *Termitopaedia* by its margined pronotum and somewhat longer antennae, but chiefly by its scaphoidal, much more heavily sclerotized abdomen, with scarcely any membranous integument exposed.

Head subequal in length and width; clypeus declivous. Eyes small, a little more than one-fourth as long as head. Gula broad and long; mentum free. Maxillary palpi long and very slender; second segment about two-fifths as broad as long; third segment spindle-shaped, three times as long as broad. Pronotum with a distinct raised margin; disk uniformly convex; broadest in front of middle; lateral margins sinuate; apex feebly emarginate; base arcuate. Pronotal hypomera visible in lateral view. Elytra two-fifths broader than pronotum; lateral margins diverging behind humeri to the broadest point, about two-thirds the length of elytra. Middle coxae long, contiguous; mesocoxal acetabula large, shallow, faintly margined laterally; metasternum very short behind mesocoxae. Abdomen moderately enlarged, scaphoidal in form; heavily sclerotized; sclerites contiguous so that scarcely any membranous integument is exposed; paratergites form an elevated margin.

Remarks.—For more than fifty years there has apparently been no attempt to establish the identity of Sharp's *Dioxeuta,* and the species of this genus have been assigned to Silvestri's *Jacobsonella.* Sharp's description gave few clues to the identity of *Dioxeuta,* so that I was surprised upon examining the type of *D. microps* Sharp to find that *Jacobsonella termitobia* Silvestri is the same species. Of the specialists who dealt with *Jacobsonella,* Cameron was perhaps the only one who had ready access to Sharp's types. It is surprising that he did not detect the synonymy.

Dioxeuta microps Sharp. Figure 33, *a*.

Dioxeuta microps Sharp, 1899, Ent. Monthly Mag., (2), **10**: 206 (Baram, Sarawak; *Termes malayanus*; British Museum, Natural History).

Jacobsonella termitobia Silvestri, 1910, Boll. Lab. Zool. Portici, **5**: 61, figs. I (1–10), II (1–9), III (3), (Samarang, Java; *Macrotermes gilvus* Hagen;

Silvestri coll.); Wasmann, 1916, Zool. Jahrb. Syst., **39**: 183, pl. IV, fig. 11; Kemner, 1925, Ent. Tidskr., **46**: 122; Franssen, 1932, Tijd. Ent., **75**, suppl., p. 170, text figs. 2, 4, 6; Cameron, 1939, Fauna Brit. India, Staphyl., **4**: 497. New synonymy.

Material examined.—Sarawak: Baram (type). Java: Buitenzorg (cotypes of *Jacobsonella termitobia* in Wasmann and U. S. Nat. Mus. coll.); Gelangar; Poetjoeng; and Pamanoctlam (Cameron coll., ex Franssen). Sumatra: Songei Bamban (Wasmann coll.). Malaya: Parit Brintar, Malacca (Wasmann coll.). Philippines: Manila, Luzon (Chicago Nat. Hist. Mus., ex Light coll.).

Host records.—*Macrotermes gilvus* Hagen (Sarawak, Java, Sumatra, Malaya, Philippines). Franssen (1932, p. 170) reported one record with *Odontotermes javanicus* Holmgren at Buitenzorg, Java.

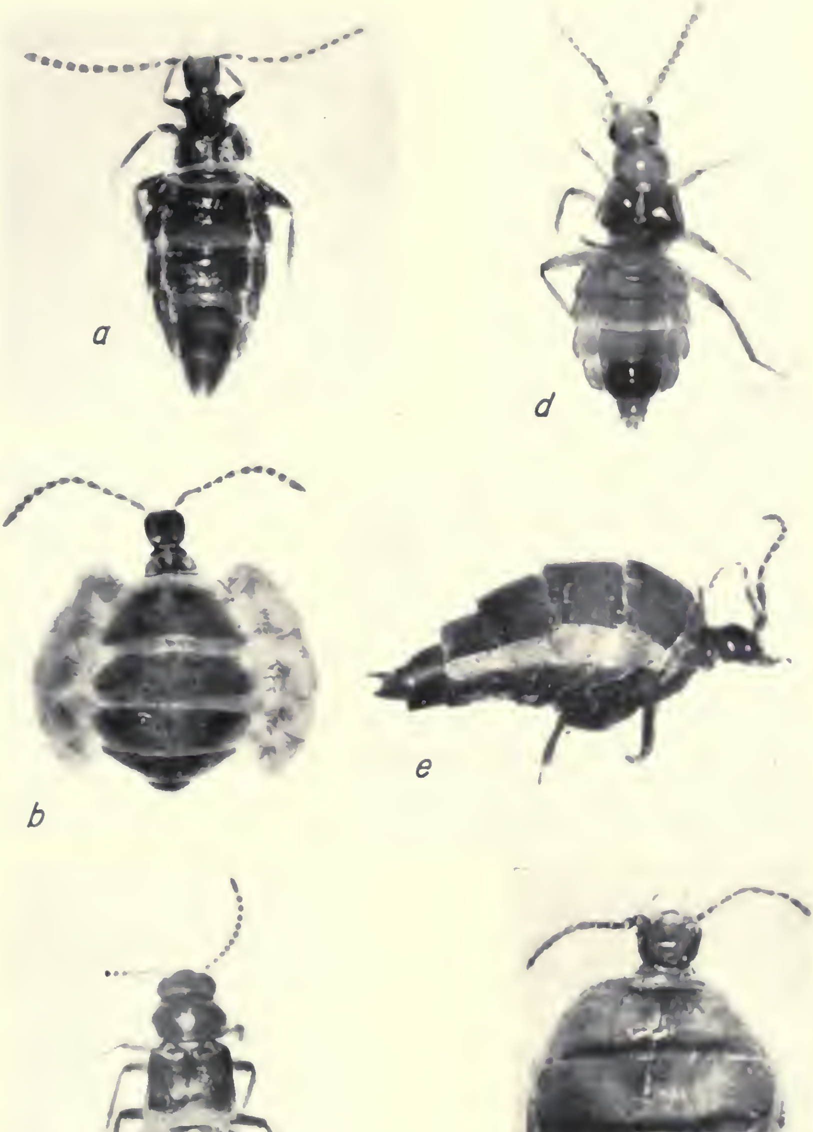
Brown to reddish-brown; head and pronotum usually darker than elytra; abdomen usually reddish. Head, pronotum, and elytra smooth, with only traces of reticulation. Head with a pair of vertexal setae, a row of occipital setae, and a few hairs behind eyes. Pronotum with 2 or 3 setae on lateral margins, 4 on anterior margin, and 5 on each half of pronotal disk. Elytra with about 20 setigerous asperities, irregularly placed. Abdomen with a moderately dense vestiture of recumbent and semi-recumbent hairs, but without strong macrosetae. Pronotum slightly less than one-half broader than long. Relative lengths of antennal segments: 20 : 8 : 12 : 14 : 12 : 11 : 11 : 11 : 10 : 9 : 18. Segment 4 longer than either 3 or 5.

Remarks.—Silvestri based *Jacobsonella termitobia* on a series that included stenogastric (ovigera form) and physogastric (gestans form) individuals and identified the latter as gravid females. Franssen (1932) concluded that the "femina gestans" individuals belong to a different species which he named *J. oudemansi*. He observed that the physogastric and stenogastric individuals differ appreciably in morphological characteristics, that there are males and females of each form, and that no intermediate forms are known. I concur with Franssen in the belief that two species are involved and go one step farther by proposing a new genus, *Neodioxeuta*, for *Jacobsonella oudemansi* Franssen.

Dioxeuta flavescens Cameron, new comb.

Jacobsonella flavescens Cameron, 1939, Fauna Brit. India, Staphyl., **4**: 496, pl. II, figs. 11, 12 (Insein, near Rangoon, Burma; in nests of termites; British Museum, Natural History).

FIG. 33. (a) *Dioxeuta microps* Sharp. (b) *Neodioxeuta oudemansi* Franssen. (c) *Protermitobia kirbyi* Seevers. (d) *Termitobaena bryanti* Bernhauer. (e, f) *Termitobia burgeoni* Cameron; lateral and dorsal views.


a
d
b
e
c
f

Material examined.—Burma: Insein (type).

Very similar to *microps* in most respects, but differing in its paler coloration and in the proportions of its antennal segments.

Color pale rufo-flavate; head and abdomen with more of a reddish tinge, pronotum less so; elytra very pale brown, with scarcely a reddish tinge. Relative lengths of antennal segments: 21 : 12 : 14 : 15 : 12 : 11 : 10 : 9 : 9 : 8 : 20. Antennae four times as long as pronotum: antennal length 170, pronotal length 42. In *microps*, antennae three and three-fourths times as long as pronotum: antennal length 150, pronotal length 40.

Remarks.—Cameron's "female" allotype of this species is herein made the holotype of a new species, *Neodioxeuta burmae*, and assigned to a different genus. Following Silvestri's example with respect to *Jacobsonella termitobia*, Cameron presumed that a strongly physogastric individual found in the same nest with *Jacobsonella flavescens* was the gravid female of the species. This interesting situation is discussed more thoroughly under the genus *Neodioxeuta*.

Dioxeuta indosinensis Silvestri, new comb.

Jacobsonella indosinensis Silvestri, 1946, Boll. Lab. Ent. Agraria Portici, 6: 317, fig. IV (1–13), (Yen Bay, Tonkino, Indo-China; *Macrotermes malaccensis* Haviland; Silvestri coll.).

This species has not been available for study; according to Silvestri it may be distinguished from the other species by its distinctive chaetotaxy of head, pronotum, and elytra and its subequal second and third antennal segments. Silvestri's detailed figures should be adequate for identifying this species.

NEODIOXEUTA, new genus

Type species: *Neodioxeuta oudemansi* Franssen (= *Jacobsonella oudemansi* Franssen).

Related to *Dioxeuta* as indicated by the structure of head and thorax but distinguished from that genus by its very distinctive abdomen (fig. 33, *b*).

Although the genus differs in specific details, the head and thorax are as in *Dioxeuta*. Abdomen very strongly inflated, more than four times as broad as thorax. Basal segments of abdomen most strongly inflated, the second and third segments protruding over thorax and pushing elytra into a vertical position; second and third tergites invisible from above. Tergites much broader than in *Dioxeuta* due to "secondary sclerotization" lateral to the "tergite proper," i.e., the setose central area. Area of membranous integument exposed variable; rather extensive in *oudemansi*, which has small paratergites, much less in *burmae*, which has large paratergites.

Neodioxeuta oudemansi Franssen, new comb. Figure 33, *b*.

Jacobsonella termitobia Silvestri (female gestans form), 1910, Boll. Lab. Zool. Portici, **5**: 61, pl. III (1–2).

Jacobsonella oudemansi Franssen, 1932, Tijd. Ent., **75**, suppl., p. 171, text figs. 1, 3, 5 (Gedangan, Java; *Macrotermes gilvus* Hagen).

Material examined.—Java: Gedangan (Cameron coll., British Museum, Natural History).

Light-brown; tergites light reddish-brown. Head with one pair of setae between antennae, a semicircle of 5 setae on vertex behind eye level and a semicircle of 4 setae on occiput. Relative lengths of antennal segments: 20 : 13 : 11 : 14 : 10 : 10 : 10 : 10 : 9 : 9 : 20; segment 4 distinctly longest of segments 3–10.

Head subequal in length and width (42); pronotum one-fourth broader than long (52 : 42). Proportions of tergites as follows (length: total width: width of setose area): third (40 : 120 : 60), fourth (40 : 130 : 65), fifth (40 : 120 : 65), sixth (35 : 100 : 62). Proportions of inner paratergites (length : width): third (26 : 8), fourth (30 : 8), fifth (30 : 9), sixth (28 : 8).

Remarks.—Silvestri (1910a) believed specimens of this species to be gravid females of his *Jacobsonella termitobia*. Franssen pointed out that there was no evidence for this hypothesis and much to be said against it. There are many morphological differences that cannot be accounted for on the basis of post-imaginal development.

There is no doubt that *Dioxeuta* and *Neodioxeuta* evolved from the same stock, but *Neodioxeuta* has undergone a remarkable series of abdominal changes. It is my opinion that these changes are so significant as to require generic separation.

Neodioxeuta burmae, new species

Distinguished from *oudemansi* by the following characteristics: pale coloration, head almost one-third broader than long, proportions of antennal segments, and marked differences in size of paratergites and tergites.

Head, antennae, and pronotum pale flavate, elytra very pale, abdominal sclerites light rufo-flavate (for coloration and general appearance of this species, see Cameron's colored figure, 1939, pl. II, fig. 12). Chaetotaxy of head and pronotum very similar to that of *oudemansi*. Relative lengths of antennal segments: 18 : 13 : 13 : 8 : 8 : 8 : 7 : 7 : 7 : 7 : 17. First two antennal segments a little broader than segments 3–11, which do not vary appreciably in width; segment 4 somewhat shorter than 3 and subequal to 5.

Head almost one-third broader than long (46 : 36); pronotum one-fourth broader than long (48 : 38). Proportions of tergites (length : total width : width of setose area): third (40 : 82 : 75), fourth (40 : 130 : 78), fifth (40 : 140 : 80), sixth (30 : 140 : 80), seventh (40 : 80 : 55). Proportions of inner paratergites (length :

width): third (42 : 23), fourth (40 : 28), fifth (32 : 26), sixth (24 : 16), seventh (22 : 6); paratergites much broader than in *oudemansi*. Seventh tergite lobated medially.

Length, 2.8 mm.; width of abdomen, 1.75 mm.

Holotype from Insein, Burma, collected February, 1914, by T. B. Fletcher, with termites. In collection of British Museum (Natural History).

Remarks.—The holotype of this species was the "female" type of Cameron's *Jacobsonella flavescens*. Cameron's presumption that this individual is a physogastric female of *Dioxeuta flavescens* was quite unwarranted; he was only following Silvestri's precedent with respect to *Jacobsonella termitobia*.

It is difficult to understand how Cameron could have compared the "male" and "female" types of *Dioxeuta flavescens* very carefully and yet concluded that they are conspecific. They differ in numerous respects: the head of *Dioxeuta flavescens* is subequal in length and width, that of *Neodioxeuta burmae* is one-third broader than long; the relative lengths of antennal segments are very different (compare ratios given under the descriptions of the two species); the abdomens are, of course, very different in numerous respects (degree of physogastry, very different proportions of tergites, paratergites, and sternites, and chaetotaxy).

TERMITOPULEX Fauvel

Termitopulex Fauvel, 1899, Rev. d'Ent., **18**: 37; Fenyes, 1920, Gen. Insect., **173B**: 290. Type species: *Termitopulex grandicornis* Fauvel.

Silvestrinus Bernhauer, 1932, Boll. Lab. Zool. Portici, **26**: 14. Type species: *Silvestrinus erythraeanus* Bernhauer. New synonymy.

Termitopulex is the African counterpart of the Indomalayan *Dioxeuta*. The two genera are very closely allied, *Termitopulex* being distinguished by its extremely long antennae, which reach to the seventh tergite, and by its very long and conspicuous abdominal bristles. Additional material from nests of the fungus-growing termites may bridge the gap between the two groups of species.

Termitopulex grandicornis Fauvel

Termitopulex grandicornis Fauvel, 1899, Rev. d'Ent., **18**: 38 (Abyssinia; with termites; Brussels Museum); Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 87; Reichensperger, 1915, Ent. Mitteil., **4**: 124.

Silvestrinus erythraeanus Bernhauer, 1932, Boll. Lab. Zool. Portici, **26**: 15 (Nefasit, Eritrea; no host given; Chicago Natural History Museum). New synonymy.

Material examined.—Ethiopia: Holotype (Fauvel coll.). Eritrea: Nefasit (holotype and paratype of *S. erythraeanus* Bernhauer).

Host record.—*Macrotermes bellicosus* Smeathman (Harar, Ethiopia; Reichensperger, 1915).

Dark testaceous. Head, pronotum, and elytra sparsely and finely punctulate, shining; not pubescent and not reticulated; with a moderate number of fine, pale hairs. Pronotal disk with 10 moderately long, stout setae; elytra with one pair of sublateral setae, and one sub-basal pair. Tergites 3–6 with an apical row of 6 very long, stout macrosetae (dark basally, pale-tipped); tergite 3 with 2 and tergites 4–6 with 4 additional setae near middle of tergite. Tergites with a number of shorter, finer setae. Sternites with a conspicuous vestiture of long, dark setae.

Head very slightly longer than broad; pronotum one-fourth broader than long. Pronotal apex shallowly emarginate; apex four-fifths as broad as base; lateral margins arcuate, becoming sinuate near base; base arcuate. Antennae capable of reaching to apex of seventh tergite; all segments at least twice as long as broad and usually more; relative lengths and widths: 24 (9) : 10 (5) : 19 (5) : 18 (5) : 18 (6) : 18 (7) : 18 (7.5) : 17 (8) : 18 (8) : 17 (8.5) : 28 (10). Basal antennal segment subfusiform; segments 3–6 very slender; 7–11 incrassate; 3–10 narrow at base and thickened apically; segment 11 ovoidal.

Remarks.—Bernhauer's *Silvestrinus erythraeanus* is a synonym of this species.

Termitopulex natalensis Wasmann

Termitopulex natalensis Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 87 (Natal, alt. 4,000 ft.; *Macrotermes natalensis* Haviland; Wasmann coll.).

Material examined.—Natal: Holotype in Wasmann collection.

Head, pronotum, and elytra very minutely punctulate; somewhat dull; not pubescent or reticulated. Head, pronotum, and elytra with a sparse vestiture of very fine, pale hairs, longer and more conspicuous on sides of elytra. Abdomen with numerous long and moderately long bristles (with a more conspicuous array of pale, fine hairs than in *grandicornis*). Pronotum slightly less than one-half broader than long (58 : 40). Antennae of type specimen missing.

Termitopulex sjoestedti Eichelbaum

Termitopulex sjöstedti Eichelbaum, 1908, *in* Sjöstedt, Zool. Kilimandjaro-Meru Exped., 7: 91 (Mt. Kilimandjaro–Kibonoto–Tanganyika Territory, "in der Steppenzone und unteren Kulturzone, 1000–1300 meters"; *Termes vadschaggae* Sjöstedt).

Material examined.—Tanganyika: Ngerengere (one specimen, ex Reichensperger coll.).

Host record.—*Microtermes vadschaggae* Sjöstedt (host of type).

Light reddish-brown; margins of pronotum, apices of elytra, and basal areas of tergites lighter. Head with several short, fine setae on dorsum, the sides and ventral surface with moderately numerous, stronger macrosetae. Pronotum with 4 macrosetae on anterior margin and a pair of short setae between the medial pair; 1 macroseta on each lateral margin and 3 forming an equilateral triangle on each half of disk. Elytra with 15 or more macrosetae on disk and a moderate number on sides. Elytra densely, asperately punctate. Tergites with a conspicuous vestiture of macrosetae and finer hairs; apical row of tergites 3–6 usually consisting of 6 very long macrosetae (about two-thirds as long as tergite) interspersed with shorter setae.

Head subequal in length and width (44 : 44); sides converging a little behind eyes. Pronotum (54 : 42) about one-fourth broader than long; apex emarginate, broadest in front of middle, side margins converging more in front than behind; apex only four-fifths (40) as broad as base (50); base arcuate.

Antennae with following relative segmental lengths: 22 : 10 : 14 : 18 : 16 : 15 : 14 : 14 : 16 : 14 : 24 (total, 210). Segments 2 and 3 very slender, 4–11 incrassate, segment 11 twice as broad as 3, segments 1–5 subcylindrical, 5–11 increasingly compressed; all segments elongated.

Legs very long; relative lengths of parts of hind leg as follows: femur, 75; tibia, 62; tarsomeres, 19, 10, 8, 8, 16. Femora and tibiae compressed; tibiae very slender at base, twice as broad at apex; femora twice as broad as tibiae.

TERMITOLINUS Wasmann

Termitolinus Wasmann, 1911, Rev. Zool. Afr., 1: 97. Type species: *Termitolinus natalensis* Wasmann.

Termitolinus is placed in the Termitopaediini with some hesitation. Specimens of the genus have not been available until very recently and the necessary comparative morphological studies preliminary to a proper placing of the genus have not been made.

Although markedly in contrast with most genera by virtue of its very slender build and non-physogastric abdomen, *Termitolinus* has several qualities suggesting relationship to *Termitopulex* and *Dioxeuta*. The abdomens of these genera are basically similar although inflated to some degree in *Termitopulex* and *Dioxeuta*.

Head one-third longer than broad (38 : 28); broadest at eye level, sides converging, the head narrowest at base. Eyes small, less than one-sixth as long as head. Head with infraorbital ridge. Pronotum one-fourth longer than broad (40 : 32); lateral margins bisinuate, the anterior one-half a little convex, the posterior one-half slightly concave; basal border feebly arcuate, the anterior border a little emarginate; basal angles slightly obtuse; pronotal hypomera completely visible; pronotum distinctly margined. Elytra subequal in length. Antennae relatively short, not capable of extending to base of pronotum; geniculate, scape short; segments 2 and 11 a little longer than broad, 3–10 strongly incrassate, 4–10 broader than long. Gula moderately broad at base, its sides converging in front. Abdomen slender, not physogastric, only a little broader at fourth and fifth segments than elytra; tergites feebly convex; paratergites slender.

Termitolinus natalensis Wasmann

Termitolinus natalensis Wasmann, 1911, Rev. Zool. Afr., **1**: 98, pl. 5, fig. 11 (Shivyre, Natal; *Macrotermes natalensis* Haviland; Wasmann coll.).

Material examined.—Type and five specimens in Wasmann collection.

Head light-brown; pronotum darker, slightly reddish-brown; elytra testaceous; abdomen light reddish-brown. Head smooth at center of vertex; a few moderately large punctures and fine setae laterally. Pronotum densely covered with coarse, elongated punctures, except for a narrow median area and a narrow basal area; pronotum clothed with fine, short hairs and a few longer setae. Abdomen with a moderate vestiture of fine, pale hairs and a few longer setae.

Length, 2 mm.; width, 0.35–0.4 mm.

TERMITOBAENA Bernhauer

Termitobaena Bernhauer, 1915, Verh. Zool. Bot. Ges. Wien, **65**: 155. Type species: *Termitobaena bryanti* Bernhauer.

Termitobaena and the following African genus, *Termitotropha*, may not belong to the Termitopaediini but I have found no adequate basis for separating them. Their most distinctive feature is probably the broad, scaphoidal abdomen, with its wide lateral "margins" formed by the inner paratergites. Otherwise, these genera have no outstanding features to distinguish them.

Head generalized, clypeus moderately declivous and moderately long. Gula narrow, only one-eighth as broad as head, scarcely converging in front. Eyes small. Pronotum with anterior margin slightly arcuate, broadest in front, sides converging slightly near base, basal angles broadly rounded, base straight, surface evenly convex. Elytra generalized. Abdomen somewhat recurved over foreparts; its dorsum almost circular, somewhat scaphoidal in appearance inasmuch as the very large inner paratergites are strongly elevated to form a broad "margin"; inner paratergites about one-fourth as broad as tergites. Eighth tergite unusually long. Relative lengths of tergites: third, 3; fourth, 8; fifth, 10; sixth, 11; seventh, 14; eighth, 22.

Termitobaena bryanti Bernhauer. Figure 33, *d*.

Termitobaena bryanti Bernhauer, 1915, Verh. Zool. Bot. Ges. Wien, **65**: 156 (Sarawak; with termites; Chicago Natural History Museum).

Material examined.—The type series. In addition, two specimens, Mt. Matang, W. Sarawak (Cal. Acad. Sci. coll.).

Head shining, nearly glabrous, with a few fine punctures; vertex with a few short, black setae. Pronotum with an apical row of 8–10 bristles and a few on disk; surface smooth, almost impunctate. Elytra smooth, shining, with few traces of sculpture; disk with scattered bristles; lateral margin with 3 or more setae. Tergites shining, weakly sculptured except that the eighth is closely, longitudinally strigulose. Relative widths of representative levels of body as follows: head, 48; pronotum, 52; elytra, 60; abdomen (maximum width), 95. Head one-fifth broader than long. Pronotum almost one-third broader than long. Abdomen a little broader than long. Relative lengths of antennal segments: 15 : 8 : 8 : 7 : 7 : 7 : 7 : 7 : 8 : 8 : 17.

TERMITOTROPHA Wasmann

Termitotropha Wasmann, 1899, Deuts. Ent. Zeitschr., **43:** 178; Fenyes, 1920, Gen. Insect., **173B:** 291. Type species: *Termitotropha o'neili* Wasmann.

Foreparts slender; abdomen broad, scaphoidal in form. Head generalized, very slightly broader than long, its sides almost straight, and its base rounded; clypeus short, feebly declivous; eyes small. Pronotum one-fourth broader than long, apex almost straight, base arcuate, broadest in front of middle, sides converging in front and behind, basal angles rounded; disk ovally impressed at center, the impression with two elongated foveae. Elytra generalized, their apices almost straight. Abdominal sclerites feebly separated or contiguous; abdomen with very little non-sclerotized integument exposed. Tergites moderately broad, approximately the same width as pronotum; paratergites forming a very broad, elevated margin which at level of segments 4, 5, and 6 is at least one-half as broad as tergites; inner paratergites especially large, comprising about three-fourths of margin. Relative widths of representative levels of body as follows: head, 48; pronotum, 52; elytra, 60; third abdominal segment, 90; fifth segment, 103; seventh segment, 85.

Remarks.—The single available topotypic specimen is mounted on a card and the under side is not visible. Inasmuch as the specimen is in a fragile condition, it was not removed for a detailed study of the ventral structures.

Termitotropha o'neili Wasmann

Termitotropha o'neili Wasmann, 1899, Deuts. Ent. Zeitschr., **43:** 179, pl. II, fig. 9, *a–c* (Dunbrody, Union of South Africa; *Amitermes unidentatus* Sjöstedt; Wasmann coll.).

Material examined.—One specimen, Dunbrody, Union of South Africa, collected January 5, 1899; probably from the type series (Bernhauer coll., Chicago Nat. Hist. Mus.).

Head, pronotum, elytra, and abdomen sub-impunctate; seventh tergite reticulated. Very sparsely and inconspicuously setose; vertex of head with 6 or more fine, short hairs; pronotum with several short marginal setae near apical angles, one or more on lateral margins and one at basal angle; elytra with a few fine, marginal hairs, and several scattered setae on disk; tergites with marginal rows of inconspicuous hairs and a few scattered elsewhere.

TERMITOBIA Wasmann

Termitobia Wasmann, 1891, Verh. Zool. Bot. Ges. Wien, **41:** 647; 1912, Zeitschr. wiss. Zool., **101:** 82; Fenyes, 1920, Gen. Insect., **173B:** 289. Type species: *Termitobia physogastra* Wasmann.

Distinguished from the other genera of the tribe by its remarkable abdomen.

Robust species of distinctive facies (fig. 33, *e*). Abdomen greatly distended, in a horizontal position, and not recurved over foreparts. Abdominal sclerites large, heavily sclerotized, not widely separated from one another; very little membranous integument exposed. Abdominal segments 3, 4, and 5 greatly enlarged; anteriorly expanded to cover much of the thorax, which is scarcely visible from above. Tergite 3 extremely large, yet visible in dorsal view only where its apical margin curves over the anterior margin of the ovate abdomen. Tergites 4–8 large, scarcely overlapping, covering the very convex dorsal surface of the abdomen. Ventral surface of abdomen almost flat. Paratergites large; arcuate inner paratergites cover the lateral margin of the abdomen and are visible from above or below.

Termitobia physogastra Wasmann. Figure 34, *b, c*.

Termitobia physogastra Wasmann, 1891, Verh. Zool. Bot. Ges. Wien, **41**: 649, pl. VI, figs. 1–15 (Akuse, Volta River region, Gold Coast; *Macrotermes bellicosus* Smeathman; Wasmann coll.); 1912, Zeitschr. wiss. Zool., **101**: 82, pl. 5, fig. 1; Gridelli, 1928, Ann. Mus. Civ. Nat. Genova, **52**: 410; Hegh, 1922, Les Termites, p. 611, fig. 411.

Termitobia gastrophysa (misspelling) Eichelbaum, 1908, *in* Sjöstedt, "Kilimandjaro-Meru Exp.," **7**: 92.

Material examined.—The type (Gold Coast) in Wasmann collection.

Color reddish-brown, pronotum black. Head with a semicircular row of about 8 vertexal setae, the inner ones farther apart than in *T. burgeoni*. Pronotum with about 18 moderately long hairs on anterior margin, 4 on lateral margin; discal hairs sparse but moderately long. Pronotum strongly shining; with circular areas of reticulated integument around each seta. Tergites with numerous elevated areas, each bearing a seta and reticulated integument.

Form of head as in figure 34, *b;* eyes relatively small, the sides of head converging very strongly behind eyes. Head two-fifths broader than long (115 : 80). Antennal segments of the following relative lengths: 32 : 34 : 34 : 22 : 24 : 22 : 21 : 20 : 20 : 18 : 30; little variation in width. First three antennal segments three times as long as broad; subequal in length.

Pronotum very strongly convex; with a broad, moderately deep impression on each side of middle.

Third tergite distinctly separable into two areas: a much enlarged non-setose area, invisible from above, and a narrow arc, visible from above, bearing setigerous tubercles. The visible arc-like area has a non-sclerotized medial gap that gives it the appearance of two sclerites. Inner paratergites broad (almost twice as broad as in *burgeoni*), their relative widths as follows: 3 (70), 4 (80), 5 (80), 6 (70), 7 (40); outer paratergites: 3 (absent), 4 (30), 5 (28), 6 (16), 7 (fused to sternite).

Remarks.—This species has been recorded from a number of African localities but the identifications were probably incorrect in most instances. The Rhodesian record is certainly erroneous;

the specimens on which this record was based belong to a new species herein described as *T. rhodesiae*. It is doubtful if the Transvaal specimens (Gridelli, 1928) collected with *Macrotermes swaziae* Fuller, the Tanganyika material (Eichelbaum, 1908) from nests of *Macrotermes goliath* Sjöstedt, or the Groot-Fontain, Damaraland, South West Africa specimens (Wasmann, 1912) collected with *Macrotermes natalensis* Haviland are conspecific with *T. physogastra*.

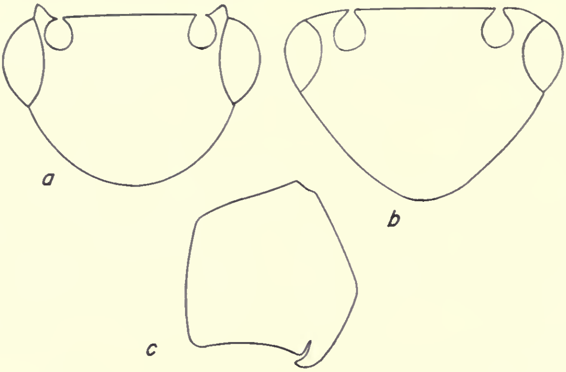


FIG. 34. (a) *Termitobia rhodesiae* Seevers, head. (b, c) *Termitobia physogastra* Wasmann, head and elytron.

Termitobia rhodesiae, new species. Figure 34, *a*.

Distinguished from *T. physogastra* by form of head, larger eyes, pronotal contours, differences in relative lengths of antennal segments, and minor differences in chaetotaxy.

Head, pronotum, elytra, and under side blackish, with tinges of red; foreparts of abdomen above brown or dark reddish-brown, becoming reddish black posteriorly. Not much membranous integument visible. Coloration in general darker than in *physogastra*. Pronotum with about 16 hairs on anterior margin and about 4 on lateral margins (shorter than in *physogastra*); discal hairs very sparse and short. Pronotal surface very dull. Tergites with elevated areas as in *physogastra*, but with the setae uniformly shorter and less conspicuous.

Form of head distinctive (fig. 34, *a*); one-half broader than long (105 : 70). Eyes larger than in *physogastra*. Antennae with segments of the following relative lengths: 30 : 30 : 26 : 22 : 20 : 20 : 19 : 17 : 17 : 17 : 26; with little variation in width after the broad scape.

Pronotum very strongly convex; with only faint traces of the surface impressions present in *physogastra*.

Holotype.—From Southern Rhodesia; collected by Dr. Brauns, with *Macrotermes natalensis* Haviland; in Wasmann collection, Natuurhistorisch Museum, Maastricht, The Netherlands.

Paratype.—One specimen, same data as type, in California Academy of Sciences.

Termitobia burgeoni Cameron. Figure 33, *e, f*.

Termitobia burgeoni Cameron, 1930, Rev. Zool. Afr., **19**: 419 (Moto, on Uele River, Belgian Congo; *Macrotermes natalensis* Haviland; Cameron coll.).

Material examined.—One specimen, Niangara, Belgian Congo (Lang-Chapin Exp., 1910), with *Macrotermes natalensis* Haviland. A series of 25 specimens, Bendija, Liberia, with *Macrotermes natalensis* Haviland (W. M. Mann, Smithsonian Firestone Exp., U. S. Nat. Mus.).

Head not as dorso-ventrally compressed as in *physogastra;* eyes smaller. Sides of head almost straight for a distance behind the eyes, then converging gradually to the base which is broader than in *physogastra;* head not triangular in outline. Head four-fifths as long as broad (65 : 80); in *physogastra* only seven-tenths as long as broad (55 : 78). Segment 2 of maxillary palpi not long and slender, medio-laterally compressed but not arcuate, broader at apex, its length less than twice its apical width; segment 3 almost twice as long as broad, somewhat compressed, its inner face flattened, only a little longer than second, its apex a little broader than that of the second. Antennal segments with the following relative lengths: 36 : 32 : 24 : 19 : 18 : 16 : 16 : 15 : 14 : 14 : 24. Vertex of head with a semicircular row of 8 long, erect setae. Tergites setose but the setae not set in tubercles as in *physogastra*. Inner paratergites much smaller, as a rule, than in *physogastra;* outer paratergites larger and more distinct. Relative widths of inner paratergites: 3, 38; 4, 44; 5, 40; 6, 40; 7, 26; of outer paratergites: 3, 40; 4, 40; 5, 32; 6, 30; 7, 16.

Remarks.—The Liberia specimens differ in minor respects from the Belgian Congo examples studied, but little significance can be attributed to these at present. The pronotum has a median sulcus and lateral impressions that are not evident in the Belgian Congo specimens, the paratergites have more and longer bristles, and the abdominal bristles in general are longer and more conspicuous.

Termitobia paolii Gridelli

Termitobia paolii Gridelli, 1928, Ann. Mus. Civ. Nat. Genova, **52**: 403, text figs. (Villaggio Duca degli Abruzzi, Italian Somaliland; *Macrotermes bellicosus* Smeathman).

TERMITOTECNA Wasmann

Termitotecna Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 88; Fenyes, 1920, Gen. Insect., **173B**: 348. Type species: *Termitotecna braunsi* Wasmann.

Head short, transverse; eyes very large, prominent. Galea a little longer than lacinia but not large and foliate. Ligula bifid. Pronotum three-fifths broader than long; sides deflexed, hypomera not visible from side; pronotal apex broadly, shallowly emarginate; humeri depressed; lateral margins strongly arcuate, continuously so with the strongly arcuate base; posterior angles obsolete. Elytra slightly longer than pronotum; apices with a slight indication of an incision just medial to the outer apical angles (this modification more pronounced in *Protermitobia* and *Termitobia*). Mesocoxal acetabula broad and shallow, distinctly margined laterally and caudally; mesosternal process short, with a median carina; metasternum behind middle coxae relatively short. Hind coxae moderately long; not produced lateral to articulation. Tarsi 4, 5, 5-segmented. Abdomen strongly physogastric (as in *Protermitobia*); abdomen about one-half broader than elytra at scutellum level. Tergites strongly convex, generalized; seventh a little longer than the others. Inner paratergites large, translucent; those of segments 4–6 about two-ninths as broad as tergites.

Remarks.—*Termitotecna* has always been assigned to the tribe Aleocharini on the basis of Wasmann's statement that the tarsi are 5, 5, 5-segmented. Recently I was able to verify a suspicion that the tarsi are 4, 5, 5-segmented and that the genus belongs here.

Termitotecna braunsi Wasmann

Termitotecna braunsi Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 89, pl. V, fig. 2, *a–c* (Bothaville, Orange Free State, Union of South Africa; *Odontotermes transvaalensis* Sjöstedt; Wasmann coll.).

Material examined.—Type and other specimens, Wasmann collection.

Head and pronotum rufo-testaceous; elytra brown; tergites testaceous; paratergites pale translucent. Head and pronotum shining; punctulation and reticulation obsolescent. Pronotum with a sparse vestiture of fine, pale, erect hairs. Tergites glabrous, shining, very indistinctly reticulated; with apical rows of fine setae and a few on general surface. Relative lengths of segments of antennae: 20 : 8 : 10 : 8 : 8 : 10 : 10 : 10 : 10 : 9 : 28. Segment 3 longer than broad, segments 4–5 transverse, 6–9 subquadrate, segment 10 transverse, 11 more than twice as long as broad; antennae feebly incrassate from segment 2.

PROTERMITOBIA, new genus

Type species: *Protermitobia kirbyi*, new species.

Protermitobia is most closely allied to *Termitotecna* but has much in common with stock from which *Termitobia* evolved. From *Termitotecna* it is distinguished by having the pronotal hypomera visible from the side; the pronotum not more than one-half broader than long; a broad, foliaceous galea; and an entire ligula. The abdomens of *Protermitobia* and *Termitotecna* are very similar. The head and thorax of *Protermitobia* and *Termitobia* are rather similar, but the abdomen of the latter is, of course, remarkably specialized. The very unusual modification of the elytral apices of *Protermitobia* and *Termitobia* (fig. 34, *c*) is strongly indicative of the fact that they are of the same phyletic line.

Robust in build, abdomen physogastric, but only moderately inflated. Head transverse, its dorsum generalized in appearance; sides converging strongly behind eyes, basal angles obsolete. Mandibles very strong, long, curved, piercing. Gula short and narrow, its sides converging so that in front it is only about one-ninth as broad as head. Submentum and mentum large, mentum apparently fused to submentum as no suture is visible. Labial palpi 3-segmented; segments elongated. Maxillae very similar to those of *Termitobia;* galea much longer and broader than lacinia, sclerotized at base, membranous distally, with outer apical margin sclerotized. Maxillary palpi with segment 2 compressed medio-laterally; segment 3 subcylindrical. Eyes small. Antennae moderately long, segments 3–10 subequal, slightly transverse, feebly obtrapezoidal; eleventh segment as long as segments 8–10 combined. Pronotum two-fifths to one-half broader than long, surface moderately convex, its side margins perhaps feebly explanate; apex slightly bisinuate, apical angles broadly rounded, sides straight, base strongly arcuate, posterior angles rounded; hypomera entirely visible from sides.

Elytra longer than pronotum; apical margins of elytra oblique, their apical angles produced and partially separated from disk by longitudinal incisions (somewhat as in *Termitobia*, fig. 34, *c*). Mesosternum and metasternum similar to those of *Termitobia*. Mesosternal process broad, margined; mesocoxae moderately separated; mesocoxal concavities very shallow, not margined. Metasternum behind coxae considerably longer than in *Termitobia*. Hind coxae shorter and broader than in *Termitobia* but not produced beyond lateral articulation. Metepisternum broader than in *Termitobia*. Tergites rather large, somewhat translucent along margins in most cases; seventh tergite longer than others; posterior angles of tergites 3–5 rounded, their apical borders slightly emarginate; tergite 6 with medial two-thirds of apical margin strongly, arcuately produced. Paratergites broad, only one on each side (indicating either fusion of inner and outer paratergites or the absence of one). Tarsi 4, 5, 5-segmented.

Protermitobia kirbyi, new species. Figure 33, *c*.

Ferrugineous, sternites and paratergites rufo-testaceous; outer apical angles of elytra flavous. Head, pronotum, and elytra very finely, very densely punctulate (fine asperities present), and in some areas very finely reticulated. Abdomen finely reticulated, the meshes not as close as on the foreparts. Vertex of head with about 18 fine, erect setae and other shorter, fine hairs; pronotum with about 15 fine hairs along anterior and lateral margins, about 10 on disk, and 6 or so along basal border; elytra with about 20 fine hairs; tergites with fairly numerous, fine hairs; sternites with a moderately dense vestiture of fine, erect hairs (mixed long and short); tibiae rather densely hairy, the hind tibiae with a posterior fringe of long, fine, curved-tipped hairs.

Length, 4.2 mm.

Holotype from Iringa, Tanganyika Territory; collected January 10, 1935, by Harold Kirby; with *Cubitermes*, n. sp. In collection of Chicago Natural History Museum. No paratypes.

Protermitobia comes, new species

Distinguished from *kirbyi* by the punctation of the head, the non-reticulated pronotum, and the pilosity of head and pronotum.

Head and pronotum reddish-brown, elytra brownish, their outer apical angles flavate; abdominal sclerites light reddish-brown. Head with 40–50 moderately coarse, umbilicate punctures, each bearing a fine, pale, curved hair; surface reticulated. Pronotum with 14–16 moderately long, fine, curved hairs on anterior margin and one or two along apical half of lateral margins; disk with about 15 similar setae on each half, the pattern not regular. Pronotal surface not reticulated, but with exceedingly fine punctules that tend to dull the surface luster. Elytra reticulated, with about 8 fine, pale hairs on disk near base and a few others along deflexed elytral sides. Sternites with a moderately dense clothing of fine, pale, semi-recumbent hairs, which become sparse on the more apical segments.

Length, 4 mm.

Holotype and one paratype from Sierra Leone, collected July 8, 1924 (ex Imperial Bureau of Entomology); with *Cubitermes subcrenulatus* Silvestri. In collection of Chicago Natural History Museum.

Tribe MYRMEDONIINI (sens. lat.)

The tribe Myrmedoniini of the Coleopterorum Catalogus (Bernhauer and Scheerpeltz, 1926, pars 82, and Scheerpeltz, 1933–34, pars 129, 130) is a large group of approximately 175 genera. Students of the Aleocharinae have relegated almost all genera with 4, 5, 5-segmented tarsi to this category, so that it is certainly polyphyletic and should be subdivided as soon as possible. The separation of the Termitopaediini in this paper helps to reduce the heterogeneity. Several other termitophilous groups within the Myrmedoniini are recognized as subtribes pending more detailed studies; these are Termitondina, Termitozyrina, and Feldina.

Bernhauer and Scheerpeltz divided the Myrmedoniini into five subtribes: Falagriae, Athetae, Schistogeniae, Hoplandriae, and Myrmedoniae. It is likely that each of these groups, with numerous modifications, will be elevated to tribal rank. The Myrmedoniae (Myrmedoniina of this paper) will be the basis for the Myrmedoniini (s. str.). This group should be restricted to *Zyras, Drusilla,* and their allies. Some termitophagous genera and a number of myrmecophilous genera are among these allies. Some doryline ant guests, but by no means all, are among the Myrmedoniina. *Lomechusa, Atemeles,* and *Xenodusa* belong in this category too.

Subtribe MYRMEDONIINA

Important subtribal characters are as follows: Maxillary sinuses extensive, larger than necessary to receive the maxillae, extending caudally beyond the cardo; galea and lacinia elongated, the former longer and usually very slender; middle coxae widely separated, mesosternal process broad and short, metasternal process broad and long; metepimera large, their posterior ends usually produced dorsad behind apices of elytra. In addition, the tarsi are 4, 5, 5-segmented, mentum free, infraorbital carina present or absent, terminal antennal segments without polytrichous coeloconic sensilla; hind coxae generalized.

Although records are not available for a good many species, it is probable that a majority, if not all, of the species of the large genera, *Zyras* and *Drusilla*, are associated in some way with ant or termite colonies. Species of these genera are not modified in any discernible way for life with social insects and are probably poorly adjusted synecthrans. Many are large, robust species by aleocharine standards and resemble free-living predatory staphylinids. Cameron (1930a, p. 13) in a short discussion of ant and termite guests of India states that there are "species not living in the nests but in the vicinity and attacking the ant or termite in the open; amongst these is the large genus *Zyras*, and I have seen one seize an ant by the thorax and shake it much as a terrier does a rat." He states that "very shortly after exposing a comb from a termite's nest a number of species arrive which in my experience are never found otherwise; such are *Quediosoma, Rhopalinda, Demerinda, Pelioptera*, etc. If, however, the comb is removed to a zone above the limit of the termite, practically nothing is attracted to it until it is again brought into the region inhabited by the termites. These genera are then, I believe, in some way dependent on termites."

ZYRAS Stephens

Zyras Stephens, 1835, Illustr. Brit. Ent., Mandibulata, **5**: 430; Bernhauer, 1928, Arch. Naturg., **92**: 19; Cameron, 1939, Fauna Brit. India, Staphyl., **4**: 497. Type species: *Zyras haworthi* Stephens.

As now constituted, *Zyras* is a very large genus of more than 300 species occurring in both hemispheres, especially in tropical areas. The only attempts to analyze this large complex have resulted in its subdivision into some 58 subgenera, most of which were proposed by Bernhauer. It is apparent that the genus has rather broad limits and numerous species groups, but the recognition of a large number of subgenera is not the best way to cope with such a complex.

Zyras has been poorly defined and no satisfactory basis for distinguishing it from *Drusilla* Leach has been found. Cameron

(1939, p. 498) states that *Zyras* is "very closely related to *Astilbus* (=*Drusilla*), from which indeed it is doubtfully separable now that a wider knowledge of tropical forms is available, . . . authors indeed appear often to have referred their species to either *Zyras* or *Astilbus*, according to which genus the general facies most corresponded." *Zyras* is supposed to include those species that have the third segment of the labial palpi as long as or longer than the second segment, *Drusilla* those species that have the third segment shorter than the second segment.

I have almost no acquaintance with the species of *Zyras* that have been recorded as inhabitants of termite nests, and can do no more than list those so recorded.

It may be advisable to point out that Tottenham (The generic names of British insects, pt. 9, 1949) and Blackwelder (1955) agree that the species long known as *Zyras collaris* Paykull is the type species of *Bolitochara* Mannerheim and that as a result *Zyras* is a synonym of *Bolitochara*. There are, as Tottenham points out, very serious objections to substituting *Bolitochara* for *Zyras*. The large number of species involved, the substantial literature dealing with *Zyras* and its ecological relationships, and the fact that two large tribes are named after these genera would make this a confusing change. Tottenham petitioned the International Commission on Zoological Nomenclature to set aside all type designations for *Bolitochara* and to designate *Aleochara pulchra* Gravenhorst (1806) as type species, and to add *Bolitochara* Mannerheim and *Zyras* Stephens (type species, *Aleochara haworthi* Stephens, 1832) to the Official List of Generic Names in Zoology. Inasmuch as I concur completely with Tottenham's viewpoint, *Bolitochara* will not be substituted for *Zyras*, pending a decision by the Committee.

LIST OF SPECIES OF *ZYRAS* RECORDED FROM TERMITE NESTS

badius Motschulsky (*Glossacantha*), =*affinis* Kraatz. Ceylon; with termites (Kraatz, 1859, p. 23; Wasmann, 1894, p. 89; Cameron, 1939, p. 520).

excisus Kraatz (*Glossacantha*). Ceylon; with termites (Kraatz, 1857b, p. 51; Wasmann, 1894, p. 89; Cameron, 1939, p. 524).

feae Wasmann (*Rhynchodonia*). Burma; with *Odontotermes feae* K. and N. Holmgren (Wasmann, 1896a, p. 620; Cameron, 1939, p. 506).

flavus Cameron (*Termitodonia*). Java (Cameron, 1936).

gestroi Wasmann (*Rhynchodonia*). Burma; with *Coptotermes curvignathus* Holmgren (Wasmann, 1896a, p. 622; Cameron, 1939, p. 505).

heimi Wasmann (*Glossacantha*). India; with *Odontotermes obesus* Rambur (Wasmann, 1899a, p. 150; Cameron, 1939, p. 527).

hoplonotus Kraatz (*Glossacantha*). Ceylon; in termite nest (Kraatz, 1857b, p. 49; Wasmann, 1894, p. 89; Cameron, 1939, p. 524).

humerosus Motschulsky (*Glossacantha*). Ceylon; in termite nest (Motschulsky, 1859, p. 90; Wasmann, 1894, p. 90; Cameron, 1939, p. 522).

inclytus Wasmann (*Ctenodonia*). Sierra Leone; with *Macrotermes bellicosus* Smeathman (Wasmann, 1894, p. 208).

insignis Cameron (*Termitelia*). Ceylon; with termites? (Cameron, 1939, p. 517).

leoninus Wasmann (*Rhynchodonia*). Sierra Leone; with termites (Wasmann, 1897b, p. 279).

motschulskyi Bernhauer and Scheerpeltz, = *laminatus* Motschulsky (*Rhynchodonia*). Ceylon; with termites (Motschulsky, 1859, p. 87; Wasmann, 1894, p. 90; Cameron, 1939, p. 508).

obscurus Fabricius (*Glossacantha*), = *tridens* Wasmann. Ceylon; with *Odontotermes obesus* Rambur (Wasmann, 1899a, p. 149; Cameron, 1939, p. 527).

peringueyi Bernhauer and Scheerpeltz (*Euryndonia*), = *termitobius* Peringuey. Rhodesia; in termite nest (Peringuey, 1904, p. 206).

puncticollis Peringuey. Rhodesia; with termites (Peringuey, 1904, p. 211).

reicherti Wasmann (*Rhynchodonia*). Orange Free State; with *Odontotermes transvaalensis* Sjöstedt (Wasmann, 1912, p. 94).

rhodesiae Bernhauer and Scheerpeltz, = *termitophilus* Peringuey. Rhodesia; in termite nest (Peringuey, 1904, p. 206).

rhodesiana Cameron. Rhodesia; with termites (Cameron, 1919, p. 85).

rubricollis Kraatz (*Glossacantha*). Ceylon; in termite nest (Kraatz, 1857b, p. 51; Wasmann, 1894, p. 90; Cameron, 1939, p. 522).

seminigra Cameron (*Zyras*). Rhodesia; with termites (Cameron, 1919, p. 86).

serraticornis Kraatz (*Crateodonia*). Ceylon; with termites (Kraatz, 1857b, p. 48; Wasmann, 1894, p. 90; Cameron, 1939, p. 515).

termitarius Wasmann (*Rhynchodonia*). Burma; with termites (Wasmann, 1897a, p. 30; Cameron, 1939, p. 503).

termitocolus Gestro (*Rhynchodonia*), = *termitobia* Wasmann. Burma; with *Coptotermes curvignathus* Holmgren (Gestro, 1886, p. 110; Wasmann, 1894, p. 90; Wasmann, 1896a, p. 622; Cameron, 1939, p. 501).

termitophilus Wasmann (*Rhynchodonia*). Burma; with termites (Wasmann, 1897a, p. 28; Cameron, 1939, p. 502).

termitovagans Bernhauer (*Glossacantha*). East Africa (Bernhauer, 1928, p. 38).

trisulcatus Wasmann. Burma; with *Odontotermes feae* K. and N. Holmgren (Wasmann, 1896a, p. 623; Cameron, 1939, p. 547).

DRUSILLA Leach

Drusilla Leach, 1819, *in* Samouelle, Entom. Compend., p. 177. Type species: *Drusilla canaliculata* Fabricius.

Astilbus Dilwyn, 1829, Memoranda . . . Coleopt. Ins. Swansea, p. 63; Cameron, 1939, Fauna Brit. India, Staphyl., **4**: 460.

Myrmedonia Erichson, 1837, Käfer Mark Branden., p. 286.

LIST OF SPECIES OF *DRUSILLA* RECORDED FROM TERMITE NESTS

impressicollis Kraatz, = *sculpticollis* Wasmann. Ceylon and India; with *Odontotermes wallonensis* Wasmann (Kraatz, 1857b, p. 53; Wasmann, 1899a, p. 151; Cameron, 1939, p. 475).

incola Fauvel. Burma; with termites (Fauvel, 1904, p. 63; Cameron, 1939, p. 463).

planaticollis Kraatz. Ceylon and India; in termites' nests (Kraatz, 1857b, p. 52; Wasmann, 1894, p. 90; Cameron, 1939, p. 467).

TERMOZYRAS Cameron

Termozyras Cameron, 1930, Rev. Zool. Afr., **19**: 420. Type species: *Termozyras politus* Cameron.

Termozyras politus Cameron

Termozyras politus Cameron, 1930, Rev. Zool. Afr., **19**: 421 (Belgian Congo; with *Macrotermes natalensis* Haviland).

URODONIA Silvestri

Urodonia Silvestri, 1946, Boll. Lab. Ent. Agr. Portici, **6**: 318. Type species: *Urodonia notabilis* Silvestri.

Urodonia notabilis Silvestri

Urodonia notabilis Silvestri, 1946, Boll. Lab. Ent. Agr. Portici, **6**: 321, text figs. 5, 6, 7 (Yen-Bay, Tonkino, French Indo-China; *Odontotermes malaccensis* Holmgren; Silvestri coll.).

Subtribe FELDINA

As a temporary measure I am assigning three Indomalayan genera to a subtribe of Myrmedoniini. *Felda* Blackwelder (=*Asticta* Wasmann), *Zunia* Blackwelder (=*Disticta* Wasmann), and *Termitobiella* Wasmann comprise a group of *Capritermes* guests. Until very recently these genera have not been available to me and there has not been sufficient time to make detailed studies of them. *Felda* and *Zunia* are probably closer than Wasmann implied, and both categories may not be necessary. Wasmann provided excellent illustrations and descriptions, and there should be no great difficulty in recognizing the genera.

The three genera are physogastric but not strongly so; their abdomens are strongly sclerotized and do not exhibit large areas of membranous integument.

ZUNIA Blackwelder

Disticta Wasmann, 1916, Zool. Jahrb. Syst., **39**: 184. Type species: *Disticta capritermitis* Wasmann.

Zunia Blackwelder, 1952, Bull. U. S. Nat. Mus., **200**: 409 (new name for *Disticta* Wasmann, preoccupied).

Zunia may be incompletely characterized as follows: Head short, transverse; antennae short, compact, basal segment elongated, segments 2 and 3 subquadrate, 4–10 transverse, slightly incrassate, apparently slightly telescoped. Pronotum short, transverse, almost twice as broad as long, broader than head, anterior margin straight, sides rounded, converging toward base, basal margin slightly arcuate, disk deeply, broadly bifoveolate. Abdomen very broad, but apparently feebly physogastric; sclerites large and only small areas of non-sclerotized integument exposed. Inner paratergites very large.

Zunia capritermitis Wasmann

Disticta capritermitis Wasmann, 1916, Zool. Jahrb. Syst., **39**: 185, pl. 4, fig. 12, pl. 5, fig. 12 (Tandjong Slamat, Sumatra; *Capritermes minor* Holmgren; Wasmann coll.).

Black, anterior part of head flavate, abdomen piceous, shining, impunctate; elytra and lateral margin of abdomen setulose.

Length, 2 mm.

Wasmann figured antenna, mandible, maxilla, labial palpi, prementum, and anterior and middle legs, but the figures are too sketchy to be of use for comparative purposes.

FELDA Blackwelder

Asticta Wasmann, 1916, Zool. Jahrb. Syst., **39**: 185. Type species: *Asticta butteli* Wasmann.

Felda Blackwelder, 1952, Bull. U. S. Nat. Mus., **200**: 165 (new name for *Asticta* Wasmann, preoccupied).

Wasmann distinguished this genus from *Zunia* by these characters: pronotum not foveolate, but indistinctly bi-impressed; terminal abdominal segments not conically produced; antennae longer, reaching middle of elytra; longer legs; distinctive mandibles, maxillae, and labial palpi.

Wasmann's sketches of the mouth parts of this genus do not provide convincing evidence that it is different from *Zunia*. The impression of the pronotum is probably a matter of degree, and the abdominal character of little value. The antennae of this genus are longer and more loosely organized and the abdomen appears more physogastric.

Felda butteli Wasmann

Asticta butteli Wasmann, 1916, Zool. Jahrb. Syst., **16**: 186, pl. 4, fig. 13, pl. 5, fig. 13 (Gap, Selangor, British Malaya; *Capritermes nemorosus* Haviland; Wasmann coll.).

Head and pronotum piceous to nigro-piceous, shining and impunctate. Elytra piceous, opaque, densely clothed with erect setae; elytral humeri dilated and densely rugulose; disk slightly impressed. Abdomen piceous, semi-shining, punctate, sides and venter testaceous. Antennal segments 3–10 subquadrate.

Length, 2 mm.

TERMITOBIELLA Wasmann

Termitobiella Wasmann, 1916, Zool. Jahrb. Syst., **39**: 187. Type species: *Termitobiella setipes* Wasmann.

Wasmann states that this genus is distinguished from *Felda* by its more slender legs, more slender antennae, which reach to the apices of the elytra, more densely setose legs, different head, and pronotal, elytral, and abdominal forms. These differences are not obvious from Wasmann's photographs.

Termitobiella setipes Wasmann

Termitobiella setipes Wasmann, 1916, Zool. Jahrb. Syst., **39:** 187, pl. 4, fig. 14 (Gap, Selangor, British Malaya; *Capritermes nemorosus* Haviland; Wasmann coll.).

Head, pronotum, and elytra black, very shiny, glabrous; abdomen rufopiceous, glabrous above, impunctate.

Length, 2.3 mm.

Subtribe TERMITONDINA

This subtribe is proposed for a genus of African termitophiles associated with *Macrotermes*. The species are limuloid in form. It is very difficult to place this genus accurately in view of the confusion existing in the Myrmedoniini.

TERMITONDA, new genus

Type species: *Termitonda liberiae*, new species.

Head much broader than long, sides broadly rounded into base; clypeus moderately declivous; antennal fossae opening cephalad from under a slight vertexal arcade extending across front of head. Gula very broad, its base two-fifths as broad as head, its sides converging in front so that apex is a little more than one-half as broad as base. Submentum short and broad, only a little more than one-third as long as broad (maximum width equal to that of gular base); mentum very short, only three-fourths as long as submentum; ligula filiform. Labial palpi long and slender; 3-segmented, first and third segments elongated, second short. Galea membranous, foliaceous; lacinia shorter, with a comb of setae. Antennae moderately long, incrassate.

Pronotum one-half broader than long; strongly convex; base bisinuate; apex deeply emarginate; sides arcuate, converging in front; hypomera broad, invisible from side. Elytra broad and short, sutural length about four-fifths the length of pronotum; epipleurae transverse, visible from below. Prosternum and mesosternum large; mesosternal process extending for about two-thirds of length of coxae; metasternal process much shorter, acute. Metasternum behind middle coxae moderately large. Hind coxae very large; metepimera large, broadly produced apically. Tarsi 4, 5, 5-segmented.

Abdomen subconical, narrowing to a slender apex; ninth tergite deeply incised, thus bearing two slender processes; abdomen densely setose, the apex of each tergite and sternite bearing a row of strong, black bristles.

Termitonda liberiae, new species. Figure 36, *a*.

Color reddish-brown. Head, pronotum, and elytra sub-impunctate (extremely minute punctules may be present) and without pubescence; shining. Head with a pair of clypeal setae near apex, a seta medial to each antennal fossa, and a small group of short setae medial to each eye. Pronotum with a subapical row of 4 setae, a submarginal row of 4 setae, and 4 discal setae in a transverse row behind the middle. Elytral margin with 3 or 4 stout, laterally directed setae and 3 or 4 finer, erect setae; elytral disk with three transverse rows of 3, 1, 4 setae, respectively; epipleura with a conspicuous row of about 12 pale setae. Tergites with numerous recumbent setae and the following black setae: tergites 3–7 with an apical row of 4, tergite 8 with 6 apical setae and 4 in a semicircle behind the middle; tergite 9 with 5 on each half. Sternites with 12–14 strong black setae in apical row interspersed with finer, pale bristles; in addition, densely clothed with short hairs.

Antennae relatively short, scarcely reaching base of pronotum; its segments with the following relative lengths: 14 : 6 : 4 : 3 : 4 : 4 : 4 : 4 : 4 : 4 : 8. Antennae geniculate, segment 2 a trifle less than one-half as long as scape; segment 3 slender, slightly elongated, only two-thirds as long as second; segments 5–10 subequal in length, incrassate; segment 4 smallest, subquadrate. Pronotum one-half broader than long.

Length, 1.75–2 mm.

Holotype from Bendija, Liberia; collected by W. M. Mann (Firestone-Smithsonian Expedition); with *Macrotermes natalensis* Haviland. In collection of United States National Museum.

Paratypes.—Twenty-one specimens, same data as type; in collections of United States National Museum and Chicago Natural History Museum.

Other material: Three specimens from Toumodi, Cote d'Ivoire, in Cameron collection, British Museum (Natural History).

Termitonda tachyporoides, new species

Distinguished from *liberiae* by chaetotaxy of elytra and abdomen and by proportions of antennal segments.

Color light reddish-brown. Head and pronotal chaetotaxy as in *liberiae.* Elytral margin with 4 erect and 4 laterally directed setae, disk with setae in several irregular transverse rows as follows: 4 in sub-basal row, 4 in sub-apical row, one near suture, and 3 near sides. Tergites with moderately numerous, pale, semi-recumbent hairs and with dark pale-tipped setae as follows: tergites 3–6 usually with 8 strong setae in a marginal row (two groups of 4 setae, widely separated); tergite 7 with a transverse row of about 6 dark setae (weaker than on preceding segments); tergite 8 with 8 or more dark setae on each half. Sternites with a marginal row of long, tsrong bristles and moderately numerous semi-recumbent pale hairs. Antennal segments with the following relative lengths: 18 : 8 : 6 : 5 : 7 : 6 : 6 : 5 : 5 : 5 : 10; segments 3 and 4 relatively larger than in *T. liberiae.*

Length, 2.5–2.8 mm.

Holotype.—From Rwindi Camp, Belgian Congo, collected May 6, 1948, by Alfred E. Emerson; with *Macrotermes natalensis* Haviland. In collection of Chicago Natural History Museum.

Paratype.—One specimen, same data as type.

Other material: Four specimens, Toumodi, Cote d'Ivoire, Cameron collection, British Museum (Natural History).

Subtribe TERMITOZYRINA

A small group of termitophilous species occurring in the Neotropical Region probably form a natural group within the Myrmedoniini. Our knowledge of the tribe is as yet too limited to permit comparison with other tribal groups.

TERMITOPHAGUS Silvestri

Termitophagus Silvestri, 1945, Comm. Pont. Acad. Sci., **9**: 530. Type species: *Termitophagus synterminus* Silvestri.

Head almost one-half broader than long (excluding labrum); inserted in pronotum to a raised occipital margin which is continuous laterally with the infraorbital carina. Eyes large, occupying a large part of the side of the head. Antennae geniculate; scape moderately large, its inner surface a little flattened; segment 2 subcylindrical; segment 3 elongated; segments 4–10 moderately incrassate; segments 5–10 transverse. Gular sutures subparallel except where diverging near base. Maxillary sinuses large, but not continued as shallow sulci to base of head. Mouth parts typical of tribe.

Pronotum twice as broad as long; strongly convex at middle, the sides becoming less so; broadest about midway between base and apex; side margins converging very strongly in front, much less so behind; apex deeply emarginate (equal to one-eighth length of pronotum); base strongly bisinuate; posterior angles prominent. Elytra a little longer than pronotum, but their sutural length only four-fifths the length of the pronotum; outer apical angles acutely produced. Scutellum large, not carinate. Mesosternal process very short, metasternal process broad and long; metasternum without raised line connecting posterior margins of mesocoxal acetabula. Femora moderately broad and thin, tibiae cylindrical. Middle tarsi with segments of the following relative lengths: 16 : 12 : 10 : 9 : 20; hind tarsi: 22 : 18 : 14 : 10 : 24.

Abdomen without noteworthy features. Eighth tergite with an apical row of very minute teeth.

Termitophagus synterminus Silvestri. Figure 35, *b*.

Termitophagus synterminus Silvestri, 1945, Comm. Pont. Acad. Sci., **9**: 532, text figs. 7, 8 (Jabaquara, São Paulo, Brazil; *Syntermes grandis* Rambur; Silvestri coll.).

Material examined.—Sixteen specimens, São Miguel Paulista, São Paulo, Brazil, October 31, 1950; 21 specimens, São Paulo, Brazil, October 31, 1950; specimens from São Paulo, June 11, 1951; all collected by R. L. Araujo; with *Syntermes wheeleri* Emerson (determined by R. L. Araujo).

Color rufo-testaceous, except head brown and pronotal disk irregularly brownish. Dorsum without erect setae; sternites 3–7 with a few short setae along apical margins; sternite 8 with 14 fine, dark setae. Head, except for impunctate clypeus, moderately densely punctate and pubescent. Pronotum uniformly moderately densely punctate and clothed with a fine, recumbent pubescence. Elytral punctation a little more dense, the slightly coarser pubescence arising from feeble asperities. Tergites, paratergites, and sternites moderately densely and asperately punctulate, the short, fine, pale hairs recumbent. Head and pronotal disk with faint traces of reticulation; sides of pronotum, elytra, and abdomen distinctly so.

Length, 4–7 mm.

TERMITONUSA Borgmeier

Termitonusa Borgmeier, 1950, Rev. Ent., **21**: 660. Type species: *Termitonusa sequax* Borgmeier.

Borgmeier stated that this genus is distinguished from *Termitophagus* by its more slender form, position of the eyes, form of the gula, and presence of an apical row of erect setae on the tergites.

Although I have not studied this genus, there does not seem to be much justification for separating it from *Termitophagus*.

Termitonusa sequax Borgmeier

Termitonusa sequax Borgmeier, 1950, Rev. Ent., **21**: 662, text figs. 32–38 (Campinas, Goiás, Brazil; *Cornitermes similis* Hagen; Borgmeier coll.).

Borgmeier's description and figures should be consulted for the characteristics of this species. The host of the holotype has been redetermined as *Procornitermes araujoi* Emerson.

IHERINGOCANTHARUS Bernhauer

Iheringocantharus Bernhauer, 1912, Verh. Zool. Bot. Ges. Wien, **62**: 47. Type species: *Iheringocantharus ypiranganus* Bernhauer.

Distinguished from the other genera of the subtribe Termitozyrina as well as from all known members of the tribe Myrmedoniini (s. str.) by its large, distinctive pronotum, which completely covers the head. The markedly limuloid body-form is a distinguishing feature of the genus, for it is quite unlike the typical myrmedonine facies.

Bernhauer placed *Iheringocantharus* in the subfamily Tachyporinae, probably because it bears a superficial resemblance to certain tachyporine genera. It is impossible to judge the correct systematic position of this genus from Bernhauer's description, as he made several errors, including the incorrect tarsal formula. The mouth parts and other structures clearly show the affinity of this genus to the Termitozyrina. *Iheringocantharus* has a facies very similar to that of *Termitohospes* and may be misidentified as a member of that genus unless the mouth parts and tarsi are examined.

Body-form limuloid, the head covered by the large, shield-shaped pronotum; pronotum very broad and long, nine-tenths broader than long, its sides and apex deflexed, the lateral and apical margins continuously arcuate; head in a vertical position but without appreciable modification.

Iheringocantharus ypiranganus Bernhauer. Figure 35, *c*.

Iheringocantharus ypiranganus Bernhauer, 1912, Verh. Zool. Bot. Ges. Wien, **62:** 48 (Ypiranga, São Paulo, Brazil; no host given; Chicago Natural History Museum).

Material examined.—The holotype in the Bernhauer collection. One specimen from Interlagos, São Paulo, Brazil, collected June 11, 1951, and one from São Miguel, Paulista, São Paulo, Brazil, collected October 10, 1950, by R. L. Araujo; both with *Syntermes wheeleri* Emerson (determined by R. Araujo).

Color dark testaceous; shining. Pronotum finely and irregularly punctulate, the punctules very minute and sparse medially but more definite and more dense toward the lateral margins. Elytra almost impunctate, with only suggestions of extremely fine punctules. Pronotum with 34 moderately long, curved setae as follows: 9 in a submarginal row along each side, a transverse row of 4 at level of last seta of submarginal row, 4 longitudinal rows of 2 setae near center of disk, and 4 setae on posterior margin. Outer elytral margins with several setae and a number of fine, pale hairs; elytral disk with 1, 3, 2, 1 setae in longitudinal rows. Tergites 3–6 with 6 long setae and several finer hairs on apical margin and one seta near lateral margin; tergite 7 with one seta near each lateral margin and a pair of subapical ones; tergite 8 with 2 setae on each lateral margin, 4 in a subapical row, and 2 on apical margin. Sternites 3–7 with a transverse row of 4 dark setae about the middle, one on each lateral margin, and 8–10 dark setae and a number of pale hairs on posterior margin; eighth sternite with 14 strong setae along the arcuate lateral and apical margins and 6 in a curving subapical row, as well as numerous fine, pale hairs. Antennae with segments of the following relative lengths: 22 : 12 : 12 : 8 : 6 : 6 : 6 : 7 : 7 : 7 : 15. Pronotal base bisinuate, posterior angles rounded. Elytral apices very deeply emarginate, the outer apical angles acutely angulate and very conspicuous; border within emargination almost straight. Eighth tergite with a marginal row of 10 strong teeth.

Length, 2.25 mm.; width, 1.3 mm.

TERMITOZYRAS, new genus

Type species: *Termitozyras adamsoni*, new species.

Distinguished from *Termitophagus* and *Termitonusa* by the much smaller size of its species; the presence of shallow sulci, margined by fine lines, along each side of the gula; the trapezoidal, less trans-

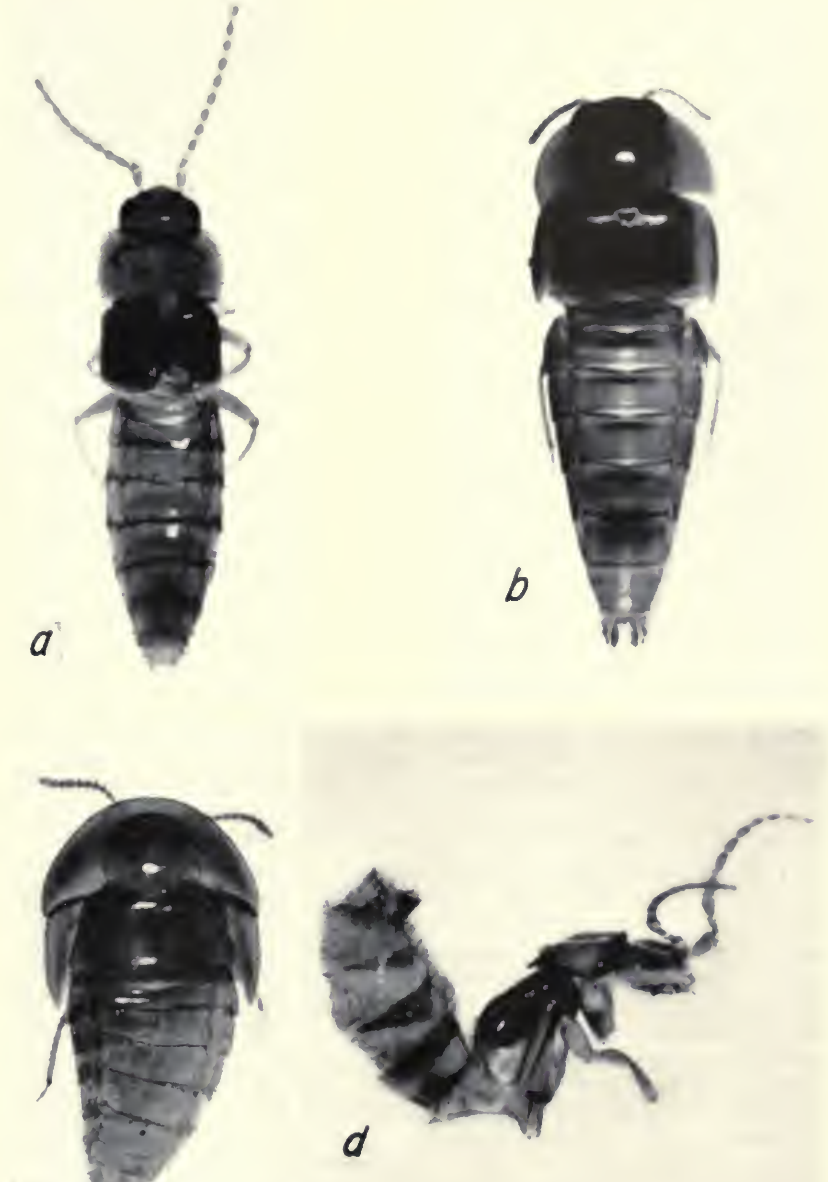


FIG. 35. (a) *Termitozyras adamsoni* Seevers. (b) *Termitophagus synterminus* Silvestri. (c) *Iheringocantharus ypiranganus* Bernhauer. (d) *Termitosymbia nitida* Seevers.

verse pronotum, which has an almost straight apex, scarcely bisinuate base, and rounded posterior angles; elytral apices not emarginate and their outer apical angles not produced; longer, more slender antennae, which are scarcely incrassate; non-pubescent integuments; and conspicuous macrosetae.

Head more than two-fifths broader than long (excluding labrum); inserted in pronotum to a raised occipital line. Eyes less than one-half as long as head. Gula rather broad, its sides converging in front. Maxillary sinuses apparently small but continued to base of head as broad, shallow depressions on each side of gula; these shallow grooves margined by fine lines (best visible in slide mounts). Infraorbital carinae continuous with raised occipital line. Mandibles tapering to very slender apices. Mentum and submentum generalized. Maxillae typical of the Zyrini except that galea is not much longer than lacinia. Maxillary palpi moderate in size; segment 2 slender at base and broader at apex; segment 3 longer than 2, twice as long as broad. Labial palpi 3-segmented, small; basal segment longer and broader than subquadrate second segments.

Pronotum two-fifths to two-thirds broader than long, evenly convex, its base broadly arcuate, with just a trace of sinuation laterally, posterior angles broadly rounded, sides feebly arcuate, converging in front, apex almost straight. Elytra about equal in length to pronotum, their apices straight, and their outer apical angles not produced. Wings with basal setose lobe. Mesosternal process broad and short; metasternal process long and slender, but chiefly at a "sub-surface" level, for there is a raised line across the metasternum from the posterior margins of the mesocoxal acetabula. Femora broad and thin. Tibiae slender, cylindrical. Tarsi 4, 5, 5-segmented. Fore-tarsi with segments 1–3 short, subequal, segment 4 equal to 2 and 3 combined. Middle tarsi with segments of the following relative lengths: 8 : 7 : 7 : 6 : 10. Hind tarsi: 12 : 9 : 8 : 7 : 12. Abdomen generalized in structure; tergites without carinae or sulci.

Termitozyras adamsoni, new species. Figure 35, *a*.

Color light reddish-brown. Head without setae. Pronotum with an apical row of 6 black setae, each lateral margin with 2, disk with transverse row of 4, and basal border with 4. Elytral margins with 3 and disk with 4 setae. Tergite 2 with a black seta near each apical angle; tergites 3–6 with a subapical row of 6 strong setae; tergite 7 with a pair of very small, apical setae; tergite 8 with 4 subapical and 4 strong, apical setae; tergite 9 with a dense clothing of short, pale setae and 6 black setae. Each outer paratergite with one strong seta. Sternites with a sub-basal row and an apical row of strong, black setae. Head with a short, sparse pubescence. Pronotum very minutely punctulate. Antennae with segments of the following relative lengths: 18 : 10 : 12 : 11 : 10 : 10 : 9 : 8 : 8 : 8 : 17; segments 1–5 subequal in width, segments slightly incrassate beyond fifth; segments, except 8–10, longer than broad; 8–10 subequal in length and width. Pronotum two-thirds broader than long; sides declivous but not strongly deflexed; width obviously greater than that of head; anterior margin not closely embracing head.

Length, 3.5 mm.

Holotype from Arena Forest, Trinidad, British West Indies; collected February 22, 1945, by R. G. Donald and F. O. Iwenjora (ex Adamson collection); with *Labiotermes labralis* Holmgren. In collection of Chicago Natural History Museum.

Paratypes.—Thirty-five, same data as type, from two colonies of termites; 21, Arena Forest, May 24, 1944, A. M. Adamson; 20, Mt. Tabor, Trinidad, December 15, 1945, E. McCallan, J. T. Davey, and G. Williams (ex Adamson coll.); all with *Labiotermes labralis* Holmgren.

Termitozyras guianae, new species

Closely related to *adamsoni*, but differing in the chaetotaxy of pronotum and elytra as follows: apical margin of pronotum with 6 setae and lateral margins with 2 but with no setae on disk or on basal margin; elytra with only 2 setae on lateral margins.

Color rufo-testaceous. Length, 2.1 mm.

Holotype from Kartabo, British Guiana, collected July 24, 1920, by Alfred E. Emerson; with *Labiotermes labralis* Holmgren. In collection of Chicago Natural History Museum.

Paratype.—One specimen, same data as holotype.

Termitozyras boliviae, new species

Distinguished from *adamsoni* by these differences in chaetotaxy: pronotal setae of same general arrangement but considerably weaker; elytral disk with short, fine setae but no dark macrosetae; head, pronotum, and elytra more minutely and sparsely punctulate and with almost imperceptible hairs. The pronotum is only two-fifths broader than long and although it is as large as in the other two species, the sides are much more strongly deflexed and it appears narrower. The pronotum is more strongly convex than in the other species and the front margin closely embraces the head so that the head is as broad as the pronotum in front.

Length, 2.2 mm.

Holotype from Cachuela Esperanza, Beni, Bolivia; collected by W. M. Mann (Mulford Expedition); with *Labiotermes labralis* Holmgren. In collection of United States National Museum.

Paratypes.—Six specimens, same data as type, in Chicago Natural History Museum and United States National Museum.

TERMITOSYMBIA, new genus

Type species: *Termitosymbia nitida*, new species.

Distinguished from all other genera of the tribe by its very distinctive physogastric abdomen. In addition, its pronotum has a distinctive form, the elytra are unusually long, and the metepimera are not produced behind the elytra.

Head a little broader than long; vertex strongly depressed in type specimens (probably due to collapse of thinly sclerotized integument). Antennae inserted under a narrow vertexal arcade, the fossae opening cephalad. Clypeus transversely convex, strongly declivous. Infraorbital carina absent. Gula long and moderately broad, its sides converging moderately in front. Labium generalized; labial palpi small. Maxillae and maxillary sinuses typically myrmedoniine.

Pronotum robust, one-half broader than long, broadest at a point three-fifths the distance from base to apex, from which point sides converge strongly to rounded basal and apical angles; base strongly arcuate, apex less so; disk with a pair of deep pits and a shallow sub-basal impression; pronotum margined. Elytra with moderately deep sulci beginning behind humeri and extending obliquely to middle of each apical margin. Middle coxae separated by a broad, short mesosternal process and a longer, narrower metasternal process. Metepimera not elongated.

Abdomen physogastric, twice as broad as pronotum, some sclerites, particularly sternites, separated by non-sclerotized integument; somewhat scaphoidal in appearance, tergites very broad, paratergites strongly elevated to form lateral margins; inner paratergites extremely broad, about three-tenths as broad as tergites; sternites strongly convex, their lateral margins curved so as to be visible from above.

Termitosymbia nitida, new species. Figure 35, *d*.

Color flavo-testaceous; tergites very pale, except 7–9, which are brown; dorsum very shiny. Head and pronotum with extremely sparse, minute punctulation and pubescence (glabrous in appearance); head with obsolescent reticulation. Scutellum reticulated, pubescent; elytra with small, darkly pigmented, sparsely distributed punctules, more numerous near base, and with extremely sparse, minute pubescence. Head with a row of about 6 setae on clypeal margin and a seta medial to each antennal fossa. Pronotum with 4 short, black setae on anterior margin, 4 on each lateral margin, 2 at base, and 4 on disk (one lateral to each pronotal fovea, and a pair behind the foveae). Elytra without setae. Tergites 3–6 without punctation or pubescence, obsoletely reticulated; tergites 7–8 with numerous longitudinal, carinulate lines; tergites with an apical row of short, fine setae. Sternites 3–7 with a distinctive vestiture of short, fine, dark, erect hairs, very dense except on sternites 3 and 7 and on sides of sternites 4–6; third sternite with a moderate number of long, black hairs in addition to apical row; sternites 4–7 with numerous long, black setae on the sides; these are especially long near lateral margins. Antennae geniculate; with relative lengths and widths as follows: 28 (16): 12 (8) : 18 (12) : 18 (11) : 16 (11) : 16 (12) : 16 (12) : 15 (12) : 15 (13) : 15 (14) : 22 (13); scape robust, segment 2 small, 3 slightly ovoidal, segments 4–8 subcylindrical, 9–10 slightly obtrapezoidal.

Length, 3 mm.

Holotype.—From Cacheula Esperanza, Beni, Bolivia, collected by W. M. Mann (Mulford Expedition); with *Labiotermes labralis* Holmgren. In collection of United States National Museum.

Paratype.—One specimen, same data as type; in collection of Chicago Natural History Museum.

Tribe PSEUDOPERINTHINI

Subfamily Pseudoperinthinae, Cameron, 1939, Fauna Brit. India, Staphyl., 4: 1.

Wasmann placed *Pseudoperinthus* in the Aleocharinae, but Cameron transferred it to a new subfamily in the belief that its head structure does not conform to the aleocharine pattern. He noted that the antennae are inserted under an arcade, and that there is a fine, cariniform line across the front.

The *Pseudoperinthus* head is by no means as unusual as Cameron implies and the genus certainly belongs to the Aleocharinae. Wasmann's choice of a generic name seems to be very appropriate, inasmuch as this genus bears a very strong resemblance to *Perinthus*, even to the point of having a frontal cariniform line (a character which does not, however, appear in all Perinthina). *Pseudoperinthus* may, indeed, be more closely allied to the Perinthina than has been suggested. Specimens of *Pseudoperinthus* have not been available until very recently and the necessary comparative studies for its correct placement have not been made. Several characteristics of the genus do not conform to the Perinthina character pattern, the 4, 5, 5-segmented tarsi and the absence of polytrichous coeloconic sensilla from the terminal antennomeres, in particular.

Cameron figured the head of *fletcheri* and Wasmann published photographs of *malayanus*, but the species were so poorly described that diagnostic features cannot be given.

PSEUDOPERINTHUS Wasmann

Pseudoperinthus Wasmann, 1916, Zool. Jahrb. Syst., 39: 194; Cameron, 1939, Fauna Brit. India, Staphyl., 4: 1. Type species: *Pseudoperinthus malayanus* Wasmann.

Body-form limuloid. Head small, hypognathous; inserted in pronotum to eyes. Front with sharp, cariniform line between eyes; antennae inserted under arcade; clypeus depressed. Eyes small. Infraorbital carina present. Antennae 11-segmented. Lacinia longer than galea, ciliate; galea slender, acute, with about 8 spines. Gula broad; mentum trapezoidal, its apex almost straight. Labial palpi 2-segmented. Ligula deeply bifid. Pronotum large, transverse, convex. Mesosternal process very narrow, elongated; middle coxae contiguous. Tarsi 4, 5, 5-segmented. Abdomen non-physogastric; fusiform; apex acute.

Length, 1.75 mm.

Pseudoperinthus malayanus Wasmann

Pseudoperinthus malayanus Wasmann, 1916, Zool. Jahrb. Syst., 39: 195, pl. 4, fig. 16, *a*, *b*, pl. 5, fig. 16, *c–h* (Tandjong Slamat, Sumatra; *Lacessititermes laborator* Haviland; Wasmann coll.).

Pseudoperinthus fletcheri Cameron

Pseudoperinthus fletcheri Cameron, 1939, Fauna Brit. India, Staphyl., 4: 3, text figs. 1, 2 (Coorg, Mercara, India; *Eutermes* sp.; Cameron coll.).

Tribe ATHETINI

The large generic complex related to *Atheta* probably deserves tribal status but it is impossible at present to characterize the Athetini. A comparative study of the genera now assigned to Myrmedoniini (s. lat.) must first be made.

Subtribe COPTOTERMOECIINA

COPTOTERMOECIA Oke

Coptotermoecia Oke, 1933, Proc. Roy. Soc. Victoria, 45: 135. Type species: *Coptotermoecia alutacia* Oke.

This genus seems to be a member of the *Atheta* complex of genera but it is impossible at present to place it accurately within the group. A characterization of the genus is difficult and will not be attempted at this time. The head and thorax of *Coptotermoecia* seem to be rather generalized, and distinctive features are not evident. The abdomen, which is somewhat scaphoidal in form and perhaps incipiently physogastric, will doubtless prove to be of importance in determining the tribe to which *Coptotermoecia* is ultimately assigned.

Oke's figure of the *Coptotermoecia* abdomen is very misleading, for it was based on specimens that were distorted in the process of drying. Specimens in alcohol, or those that are mounted dry after dehydration, have moderately inflated abdomens.

Coptotermoecia alutacia Oke

Coptotermoecia alutacia Oke, 1933, Proc. Roy. Soc. Victoria, 45: 136, text figs. 48, 84–88 (Natya and Violet Town, Victoria, Australia; *Coptotermes acinaciformis* Froggatt; Oke coll.).

Material examined.—Thirty specimens, Shannons Creek, Capital Territory, Australia; collected July, 1939, by F. J. Gay. One specimen, Mt. Keira, New South Wales, Australia; collected October 7, 1948, by C. E. Chadwick (W. O. Steel coll.). Host of all specimens: *Coptotermes acinaciformis* Froggatt (=*C. lacteus* Froggatt).

Color pale reddish-brown; antennae, mouth parts, paratergites, and elytral tips paler. Head smooth, with a very few fine punctules and very inconspicuous pubescence. Pronotum conspicuously punctate, the moderate-sized punctures irregularly arranged in about ten to twelve rows from base to apex; pronotum obsoletely reticulate. Elytra very smooth, with a few setigerous punctures and a suggestion of minute punctulation. Head with a pair of setae medio-caudad to each eye. Pronotum with 20 moderately long setae as follows: 6 on anterior margin, 6 on basal margin, 2 on each lateral margin, 4 on disk. Elytra with four irregular, longitudinal rows of setae comprised of 2 or 3, 3, 2, 3 setae, respectively, beginning with sutural row.

Tergites smooth, glabrous, non-reticulate; tergites 3–6 with 6 very long setae and a few minor ones in apical rows; tergite 7 with about 8 long setae in a subapical row; tergite 8 and terminal sclerites with a moderately dense vestiture of medium to long, pale hairs. Sternites almost glabrous, with apical rows of long setae but with only a few scattered hairs elsewhere. Antennae geniculate, with basal segment a little shorter than second and third combined; segment 2 longer than 3, both slender; segment 4 slightly transverse, obtrapezoidal; segments 5–10 transverse, subequal in length, feebly incrassate. Third segment of labial palpi much shorter than two basal segments combined. Pronotum one-half broader than long. Abdomen only slightly broader than elytra, its sides subparallel. Tergites quite convex; inner paratergites one-sixth as broad as tergites; seventh tergite scarcely, if at all, longer than other tergites.

Length, 2.5–2.7 mm.

Coptotermoecia gayi, new species. Figure 36, *b*.

Distinguished from *C. alutacia* Oke by its paler coloration; impunctate pronotum (except for extremely fine punctulation); antennal proportions; somewhat longer third segment of labial palpi; proportionately longer and narrower pronotum; proportionately broader and more strongly inflated abdomen (one-third broader than elytra); relatively broad inner paratergites; seventh tergite approximately twice as long as other tergites; distinctive abdominal chaetotaxy.

Color rufo-flavate, dorsum of abdomen brownish; antennae, mouth parts and under side paler rufo-flavate. Head smooth, shining; with a scarcely perceptible reticulation. Pronotum and elytra smooth, shining; with sparse, very fine punctules and very fine, stubbly pubescence. Head and pronotal chaetotaxy as in *C. alutacia*.

Tergites 3–7 smooth, almost glabrous; tergite 7 with a faint reticulation; tergites 3–6 with a subapical row of long, pale bristles and with a few shorter setae in addition; tergite 7 with 4 or 5 irregular rows of moderately long, fine setae that become longer apically; tergite 8 densely clothed with moderately long, fine, pale hairs and toward apex with a dense, recumbent pubescence. Paratergites with a moderate number of long setae. Sternites with a uniform vestiture of medium density, the fine, moderately long, pale hairs erect, semi-erect, or recumbent.

Antennae geniculate, segments 2 and 3 slightly elongated; segments 4–10 transverse, increasing in width and length. Basal segment of labial palpi moderately large; second segment narrower and a little shorter; third segment long and slender, almost as long as two basal segments together. Pronotum three-tenths broader than long; pronotal apex almost straight, slightly sinuate; pronotum a little broader in front of middle. Elytra generalized. Wingless. Abdomen moderately inflated; scaphoidal in form; one-third broader than elytra. Inner paratergites relatively broad, about three-tenths as broad as tergites. Seventh tergite approximately twice as long as any of the preceding tergites.

Length, 3 mm.; width of abdomen, 1 mm.

Holotype from Shannons Creek, Capital Territory, Australia; collected July, 1939, by F. J. Gay; with *Coptotermes acinaciformis* Froggatt. In collection of Division of Entomology, Commonwealth Scientific and Industrial Research Organization, Canberra.

Paratypes.—Fifty-four specimens, same data as holotype, in collections of the above institution and Chicago Natural History Museum.

Subtribe TERMITOTELINA

This category is proposed for a single genus, *Termitotelus*, recorded from a termite nest in Africa. The relationship of *Termitotelus* to the Athetini is yet to be determined. I examined the type of *Termitotelus schultzei* Wasmann but could come to no decision as to its systematic position, except that it probably does not belong to any of the other termitophile categories of this paper.

TERMITOTELUS Wasmann

Termitotelus Wasmann, 1908, Denkschr. Med.-Nat. Ges. Jena, **13**: 444. Type species: *Termitotelus schultzei* Wasmann.

Termitotelus schultzei Wasmann

Termitotelus schultzei Wasmann, 1908, Denkschr. Med.-Nat. Ges. Jena, **13**: 444, pl. 22, *a*, figs. 7, 7*a*, 7*b* (Kookfontein, Klein-Namaland, South West Africa; *Microhodotermes viator* Latreille; Wasmann coll.).

Tribe PHILOTERMITINI, new tribe

This tribe is proposed for a few species of New World termitophiles associated with *Reticulitermes* and *Coptotermes* of the Rhinotermitidae. *Philotermes* Kraatz has always been assigned to the tribe Bolitocharini because of its 4, 4, 5-segmented tarsi. The Bolitocharini are so poorly characterized at present that comparison of the Philotermitini with them is almost impossible. Tribal diagnosis is deferred until the bolitocharine complex is more carefully analyzed. The Philotermitini are ecologically distinctive, for most of the Bolitocharini are fungus inhabitants. *Philotermes*

FIG. 36. (a) *Termitonda liberiae* Seevers. (b) *Coptotermoecia gayi* Seevers.

apparently has no morphological characteristics that we associate with termitophily but inasmuch as they are obligatory guests they must certainly have some degree of physiological adaptation to the colonial life. The nature of their mouth parts suggests that they are predaceous. Six North American species and one Central American species are known.

KEY TO GENERA OF PHILOTERMITINI

Front of head strongly deflexed, clypeus and labrum vertical; head with a V-shaped frontal cariniform line extending laterally above the antennal fossae; ligula bifid; prosternum carinate; lateral lobe of aedeagus not prolonged as a slender process . . . . *Neophilotermes*, new gen.

Head slightly declivous in front; clypeus and labrum more or less horizontal; head without complete cariniform line (sometimes with a trace above antennal fossae); ligula simple; prosternum not carinate; lateral lobe of aedeagus prolonged as a slender process . . . . *Philotermes* Kraatz

PHILOTERMES Kraatz

Philotermes Kraatz, 1857, Linn. Ent., **11**: 13; Blatchley, 1910, Coleopt. Indiana, p. 343; Fenyes, 1920, Gen. Insect., **173B**: 126; Seevers, 1938, Ann. Ent. Soc. Amer., **31**: 430. Type species: *Philotermes pilosus* Kraatz.

Head prognathous; clypeus feebly declivous, transversely convex; frontal cariniform line incomplete (a raised line above antennae may extend medially). Eyes small to medium-sized. Infraorbital carinae present. Antennae robust; segments 4–10 cylindrical, broader than long. Labium generalized, mentum trapezoidal, ligula simple, rather long; labial palpi 3-segmented, two basal segments moderately robust, the third filiform. Mandibles long and strong, falcate. Galea and lacinia subequal in length; lacinia with a long comblike row of spinose setae. Maxillary palpi 4-segmented; second segment claviform, third fusiform to strongly compressed.

Pronotum transverse, one-half or more longer than broad; broadest at middle or slightly in front of middle, base and sides continuously arcuate, basal angles obsolete or very nearly so; sides deflexed, and area near anterior angles usually depressed and densely clothed with long, fine, yellow hairs. Middle coxae contiguous; mesocoxal acetabula margined externally and caudally, and broadly confluent medially; mesosternal process short, angulate, and metasternal process very short. Tarsi 4, 4, 5-segmented. Abdomen not physogastric; moderately broad, its sides subparallel. Seventh tergite with a broad, V-shaped emargination; apex of eighth tergite unmodified, emarginate, or dentate.

KEY TO SPECIES OF *PHILOTERMES* KRAATZ

1. Vertex and occiput without erect setae, and with very few fine, recumbent hairs; head without ground sculpture; medial one-half of elytra glabrous. *pilosus* Kraatz

   Vertex and occiput with some erect setae, and with a moderately dense vestiture of finer hairs; head reticulated or densely punctate; elytra entirely clothed with hairs 2

2. Eighth tergite emarginate in both sexes 3

   Eighth tergite dentate in male, unmodified in female 5

3. Sternites very densely, finely pubescent (appearing tomentose). *werneri*, new sp.

   Sternites with fine, pale, erect hairs and scattered bristles, but not pubescent . 4

4. Elytra clothed with pale, recumbent hairs; antennal segments 2–11 conjointly seven-tenths to four-fifths longer than pronotum . . . . . *cubitopilis*, new sp.

   Elytra clothed with pale, erect hairs; antennal segments 2–11 conjointly two-fifths to three-fifths longer than pronotum . . . . . *fuchsii* Kraatz

5. Tergites 3–5 with 6 setae in apical row, the second and fifth fine and pale; tergites 6–8 reticulated . . . . . *emersoni* Seevers

   Tergites 3–5 with 8 setae in apical row, the second, third, sixth, and seventh fine and pale; tergites 6–8 obsoletely reticulated . . . . . *pensylvanicus* Kraatz

Philotermes pilosus Kraatz. Figure 37, *a*.

Philotermes pilosus Kraatz, 1857, Linn. Ent., **11**: 14, pl. 1, fig. 11, pl. 2, fig. 13 (Tennessee region; with termites; ?Deuts. Ent. Inst.); Schwarz, 1889, Proc. Wash. Ent. Soc., **1**: 1; Blatchley, 1910, Coleopt. Indiana, p. 343; Fenyes, 1920, Gen. Insect., **173B**: 127, pl. 2, fig. 7; Seevers, 1938, Ann. Ent. Soc. Amer., **31**: 432, pl. 2, figs. 5, 7, 10, 15.

FIG. 37. (a) *Philotermes pilosus* Kraatz. (b) *Philotermes pensylvanicus* Kraatz. (c) *Neophilotermes laxicornis* Sharp.

Material examined.—Framingham (C. A. Frost), Melrose Heights (USNM; R. H. Timberlake), and Tyngsboro (USNM, Hubbard and Schwarz), Massachusetts. Huntington and Forest Hills, Long Island, New York. Washington, D.C. (USNM, Hubbard and Schwarz). Crawford and Posey counties, Indiana (Purdue Univ., Blatchley coll.). Turkey Run State Park, Indiana (Seevers). Olney, Illinois (A. Emerson). Host: *Reticulitermes flavipes* Kollar.

Color yellowish-brown; head, pronotum, elytra, and tergites often darker. Head very minutely and sparsely punctate and with very fine, sparsely arranged yellow pubescence, a little longer behind the eyes. Pronotum densely punctate; clothed with a yellow pubescence except for a narrow median impunctate and nearly glabrous strip. Pronotum with many dark, pale tipped setae; these are absent from the median strip and the region adjacent to anterior angles. Pronotal shoulders with a dense vestiture of long, pale hairs. Lateral half of each elytron densely clothed with fine, white, recumbent pubescence and scattered setae; median areas of elytra almost glabrous and with only one or a few setae. Tergites with a row of 6 dark setae; sternites 3–5 with fine pubescence and scattered setae, other sternites glabrous, with only two rows of dark setae near apex.

Antennae robust, segments 4–10 subequal; eleventh only three-fifths longer than tenth. Pronotum distinctive: about twice as broad as long; broader than either head or elytra; broadest just behind center; surface slightly convex medially then slightly concave laterally before leveling off toward the side margins; anterior border sinuate, anterior angles rounded and slightly depressed; the sides behind broadest point and the base continuously arcuate; posterior angles obsolete.

Anterior tibiae having their sides nearly parallel; their distal four-fifths or more with a very dense clothing of short, stiff, yellow hairs except for a strip along outer ventral margins; their outer margins with 5 or 6 slender black setae, apex with a stout spine. Middle tibiae increasing in width distally, their apices somewhat swollen; ventral surfaces glabrous but outer surfaces with a clothing of short yellow hairs on swollen distal area and extending almost to base along inner margin. Hind tibiae slender, their outer surfaces with some fine, pale hairs unlike vestiture of other tibiae.

Length, 3–4 mm.; width, 1 mm.

Philotermes fuchsii Kraatz

Philotermes fuchsii Kraatz, 1857, Linn. Ent., **11**: 15 (Tennessee region; in termite nest; ?Deuts. Ent. Inst.); Blatchley, 1910, Coleopt. Indiana, p. 343; Seevers, 1938, Ann. Ent. Soc. Amer., **31**: 433, pl. 2, fig. 9.

Material examined.—Hales Bar, Tennessee (A. Emerson); with *Reticulitermes virginicus* Banks. Chain Bridge, Virginia (USNM, T. E. Snyder); with *R. virginicus* Banks. Gainesville, Florida (O. Falls); with *R. virginicus* Banks. Crescent City, Florida (USNM, Hubbard and Schwarz).

Color light-brown. Head, pronotum, and elytra densely clothed with fine, pale, erect hairs; elytral pubescence particularly conspicuous (best viewed in profile). Head with a transverse row of about 4 dark setae on vertex and a basal row of about 6 on occiput; each half of pronotum and each elytron with about five irregular, longitudinal rows of erect setae. Antennae relatively short; segments 2–11 conjointly two-fifths to three-fifths longer than pronotum; variation of specimens as follows: Crescent City (1.4; 1.5; 1.5; 1.5; 1.5; 1.53; 1.54); Gainesville (1.5); Hales Bar (1.63); Chain Bridge (antennae broken). Pronotum two-fifths broader than long, evenly convex, anterior margin almost straight, sides arcuate, broadest about center, sides behind center continuously arcuate with base, basal angles obsolete. Eighth tergite emarginate, the emargination shallowly angulate at center. Eighth sternite slightly angulate medially.

Length, 2.1–2.4 mm.; width, 0.7 mm.

Remarks.—It is now clear that specimens previously identified as *fuchsii* belong to two species. Inasmuch as I have not seen Kraatz' type of *fuchsii*, it is difficult to determine with certainty which species it represents. The species characterized above seems to fit the original description somewhat better, especially with regard to the following features: pronotum clothed with long, very fine pubescence; elytral pubescence a little longer than on foreparts; antennal segments 4–10 broad and slightly transverse. The species commonly confused with *fuchsii* is described below.

Philotermes cubitopilis, new species

Distinguished from *fuchsii* by the recumbent pubescence of head, pronotum, and elytra, and by the relatively longer antennae. When compared to the pronotal length, which is the same in both species, the antennae are relatively longer in all specimens examined. It is difficult to attribute this increase to particular segments, as each seems to contribute to the greater length.

Color light brown. Head, pronotum, and elytra densely pubescent, the pale hairs in a recumbent position, especially on the elytra. Setae of head, pronotum, and elytra as in *fuchsii*. Antennal segments 2–11 conjointly seven-tenths to four-fifths longer than pronotum; variation of specimens as follows: Tampa (1.76; 1.77; 1.77; 1.8; 1.8); Gainesville (1.76); Daphne (1.74); Arkadelphia (1.7); Washington (1.7; 1.7). Pronotum and abdomen as in *fuchsii*.

Length, 2.1–2.5 mm.; width, 0.7 mm.

Holotype from Tampa, Florida, collected November 26, 1936, by Olive Falls; with *Reticulitermes virginicus* Banks. In collection of Chicago Natural History Museum.

Paratypes.—Four specimens, same data as type. One specimen, Gainesville, Florida, October 25, 1937, Olive Falls; with *R. virginicus* Banks. One specimen, Daphne, Alabama, December 29, 1940, B. A. Maina; with *R. virginicus* Banks. Three specimens, Washington, D.C.; USNM, Hubbard and Schwarz. One specimen, Arkadelphia, Arkansas, April 4, 1937, A. E. Emerson.

Philotermes werneri, new species

Distinguished from *fuchsii* and *cubitopilis*, to which it is most nearly related, by the broader pronotum (three-fifths broader than long), the densely pubescent sternites, the strongly compressed third segment of maxillary palpi, and the differences in chaetotaxy described below.

Color yellowish-brown. Head with a moderately dense cover of rather long, erect, pale, very fine hairs; without recumbent pubescence or dark setae. Head finely, closely reticulated. Pronotum with a dense clothing of fine, pale hairs which increase in length laterad to become long and conspicuous on the deflexed sides; in addition, with numerous longer dark setae, with fine, pale tips. Elytra with numerous fine, pale, semi-recumbent hairs, directed in general toward the outer apical angles; in addition, with erect setae, black with pale tips, which are sparse on disk but fairly numerous along the sides.

Tergites 3–6 with short, sparse, pale hairs and an apical row of much longer, semi-recumbent bristles. Third sternite with numerous erect hairs of moderate length but not pubescent; sternites 4–7 densely pubescent (almost tomentose) and with a moderate number of erect setae; sternites 3–7 with an apical row of longer setae; sternites reticulated; eighth sternite without reticulation or pubescence but with a moderate number of setigerous tubercles bearing long, fine hairs. Pronotum three-fifths broader than long; broadest a little in front of center, sides behind this point converging at about forty-five degrees and continuously arcuate with the rounded base; apex arcuate and a little sinuate; apical angles slightly obtuse, depressed. Eighth tergite broadly notched at middle; eighth sternite feebly, obtusely angulate at middle. Third segment of maxillary palpi strongly compressed (in contrast to the usual fusiform condition).

Length, 2.75 mm.; width, 0.85 mm.

Holotype from Murrells Inlet, Georgetown County, South Carolina, collected May 10, 1949, by Floyd Werner and W. Nutting; with *Reticulitermes virginicus* Banks. In collection of Chicago Natural History Museum.

Paratypes.—One specimen, same data as type. One specimen, Gainesville, Florida; collected October 3, by Hubbard and Schwarz; in United States National Museum.

Philotermes pensylvanicus Kraatz. Figure 37, *b*.

Philotermes pensylvanicus Kraatz, 1857, Linn. Ent., **11**: 15 (Pennsylvania; in termite nest; ?Deuts. Ent. Inst.); Schwarz, 1889, Proc. Wash. Ent. Soc., **1**: 1; Seevers, 1938, Ann. Ent. Soc. Amer., **31**: 434, pl. 2, fig. 6.

Material examined.—Oakridge, Pennsylvania (CNHM). Ithaca, New York (USNM, R. C. Shannon). Washington, D.C. (USNM, Hubbard and Schwarz). Clarksville, Tennessee (USNM, S. E. Crumb). Smith Station, LaPorte Co., Indiana (CNHM, A. E. Emerson). Jerseyville, Illinois (USNM, T. E. Snyder). Olney, Illinois (CNHM, A. E. Emerson). Peoria, Illinois (CNHM). Mt. Vernon, Texas (CNHM, A. E. Emerson). In all instances where the host has been collected and determined, it has been *Reticulitermes flavipes* Kollar.

Color reddish-brown. Head, pronotum, and elytra closely and rather coarsely punctate; clothed with short, recumbent pubescence; pronotum with a dense cluster of hairs near apical angles. Head with short dark setae as follows: an irregular, oblique row of 5 setae on each side from between antennal fossae to a point behind the eye; 2 on vertex between the above rows; an occipital row of 6; 2 or 3 on postgenae. Pronotum and elytra with numerous scattered setae. Sternites 3 and 4 with 5 or 6 irregular rows of setae; sternites 5 and 6 with 3 or 4 similar rows; eighth sternite with a "gland opening" surrounded by hairs of a distinctive pattern; sternites 3 and 4 sparsely and irregularly clothed with fine hairs, but not reticulated; sternites 5 and 6 with moderately numerous, rather coarse, setigerous tubercles, which are not restricted to apical half of sternite;

sternite 7 with numerous setigerous carinules; sternites 7 and 8 usually less heavily sclerotized than the others, sometimes translucent; sternite 8 arcuately produced at middle. Tibiae slender and densely pilose but not as in *P. pilosus*. Pronotum three-fifths broader than long.

Length, 3 mm.

Philotermes emersoni Seevers

Philotermes emersoni Seevers, 1938, Ann. Ent. Soc. Amer., **31**: 435, pl. 2, fig. 8 (Indiana Dunes State Park, Indiana; *Reticulitermes arenincola* Goellner; Chicago Natural History Museum).

Closely related to *pensylvanicus*, from which it may be distinguished by the following characteristics: smaller size (length, 2 mm.); the arrangement of the apical row of setae on tergites 3–6; pronotum about one-half broader than long (three-fifths broader than long in *pensylvanicus*).

Material examined.—Specimens from Beverly Shores, Indiana, Michigan City, Indiana, and Crawford County, near Wyandotte Cave, Indiana; all with *R. arenincola* Goellner.

NEOPHILOTERMES, new genus

Type species: *Neophilotermes laxicornis* Sharp (=*Philotermes laxicornis* Sharp).

Distinguished from *Philotermes* by the following characteristics: Head short, transverse, strongly deflexed in front, clypeus and labrum vertical; clypeus rather long, transversely convex; head with a V-shaped cariniform line across front and extending laterally above antennal fossae; antennae slender; their four basal segments elongated; segments 5–10 cylindrical, broader than long; ligula bifid; pronotum strongly transverse, almost twice as broad as long; elytra with apical margin sinuate; prosternum carinate; seventh tergite simple; lateral lobe of aedeagus not prolonged as a slender process.

Neophilotermes laxicornis Sharp. Figure 37, *c*.

Philotermes laxicornis Sharp, 1883, Biol. Cent. Amer., Coleopt., **1**, part 2, p. 171, pl. 5, fig. 7 (Las Mercedes, Guatemala; no host; British Museum, Natural History).

Color testaceous, shining, integuments not reticulated. Body sparsely and coarsely pubescent except for a small area of pronotal disk; the hairs recumbent except on parts of head. Abdomen with a sparse clothing of moderately long, pale setae. Antennae slender, segments 1–4 elongated, 5–10 short, incrassate.

Length, 2.25 mm.

Material examined.—A series of specimens from Hamburg Farm, Guapiles, and Iberia Farm, Costa Rica (USNM, Nevermann coll.); with *Coptotermes crassus* Snyder.

Tribe TERMITODISCINI

Subfamily Termitodiscinae: Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 91; 1916, Zool. Jahrb. Syst., **39**: 176; Bernhauer and Schubert, 1916, Coleopt. Cat., **67**: 443; Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 314; Scheerpeltz, 1933, Coleopt. Cat., **129**: 1471; Silvestri, 1947, Arch. Zool. Ital., **31**: 125.

Wasmann (1899c) originally placed *Termitodiscus* in the Aleocharinae but subsequently transferred it and *Discoxenus* to the Termitodiscinae. Staphylinid specialists have generally accepted this subfamily, placing it near the Tachyporinae or the Pygosteninae. Inasmuch as careful study of *Termitodiscus* and allied genera has revealed no character or group of characters justifying subfamily status for these species, they are herein returned to the Aleocharinae. The head capsule, mouth parts, thoracic structures, abdomen, and genitalia appear to fall within the range of variation of the Aleocharinae. The antennae are unusual, but the Aleocharinae are noted for the wide variety of antennal types.

Until recently only two genera of Termitodiscini were recognized. Silvestri (1947) elevated a subgenus of *Termitodiscus* to generic status but chose the name *Lissodiscus* Grassé and Lesperon instead of the prior name *Termitogerrus* Bernhauer, which he probably overlooked. The three genera are differentiated in the following section by a series of characters not heretofore utilized.

All genera of Termitodiscini occur with fungus-growing termites: *Termitodiscus* in India and Africa with species of *Odontotermes; Termitogerrus* in Africa with *Macrotermes;* and *Discoxenus* in India and Ceylon with *Odontotermes*. It will be of interest to know if the Indomalayan *Macrotermes* nest harbor species of this tribe.

Grassé and Poisson (1940) made some interesting observations on the behavior of one species of this tribe, *Termitogerrus lepidulus*. On a number of occasions they saw these small beetles perched on the minute "mycotetes" of the fungus gardens, and, with the aid of a lens, observed them feeding on conidia, blastospores, and fungus filaments. They also noted on numerous occasions that the beetles groomed their hosts, licking the legs and bodies of workers and nymphs with rapidly moving mouth parts. They suggest that the beetles may feed on debris, such as fungus spores, adhering to the bodies of their hosts. On no occasion did they observe the termites receiving secretions from the beetles.

The principal characteristics of the tribe are as follows: Body-form limuloid; head concealed beneath the very large pronotum; hypognathous; antennae inserted in deep fossae medial to the eyes, their scapes resting in these fossae;

antennae 10- or 11-segmented, their second and third segments small, the fourth to terminal segment forming a compact "club"; pronotum approximately twice as broad as long, its sides and apex continuously arcuate; pronotal hypomera very large, but not visible from the side; elytra broad, their epipleura very large; prosternum keeled; mesocoxae set in margined acetabula, narrowly or broadly separated; hind coxae broad, produced laterally to meet the elongated metepimera; tarsi 4, 5, 5-segmented; abdomen acuminate; aedeagus typically aleocharine in structure.

KEY TO GENERA OF TERMITODISCINI

1. Mesocoxae widely separated; antennae 10- or 11-segmented, short, not, or very slightly, visible from above; antennal segments 3–10 (or 11), strongly incrassate, usually compressed 2

   Mesocoxae narrowly separated; antennae 11-segmented, elongated, easily visible from above; antennal segments 3–11 form a robust, fusiform club. *Discoxenus* Wasmann

2. Mesocoxae separated by broad meso- and metasternal processes; mesosternum slightly declivous at middle; pronotal margin slightly flared; antennae 10-segmented . . . . *Termitodiscus* Wasmann

   Mesocoxae separated by a long, broad, metasternal process; mesosternum almost vertical at middle and thus scarcely visible from below; pronotal margin not flared; antennae 11-segmented . . . . *Termitogerrus* Bernhauer

TERMITODISCUS Wasmann

Termitodiscus Wasmann, 1899, Deuts. Ent. Zeitschr., **43**: 147; 1912, Zeitschr. wiss. Zool., **101**: 92; 1916, Zool. Jahrb. Syst., **39**: 179; Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 317; Silvestri, 1947, Arch. Zool. Ital., **31**: 125. Type species: *Termitodiscus heimi* Wasmann.

Form of body relatively broad and flat. Head broad and short; the moderately broad antennal fossae widely separated, not continued as genal grooves for reception of small intermediate antennal segments. Genae sharply carinate beneath eyes. Antennae 10-segmented, short, scarcely extending beyond pronotal margin; segments 3–10 forming a compact, incrassate, moderately compressed "club." Pronotum very large, about twice as broad as long, its arcuate margin slightly flared, its base broadly emarginate. Prosternum thinly keeled. Anterior coxae moderately broad, strongly convex. Mesocoxae small, oval, widely separated; mesosternal process about twice as long as metasternal process; mesosternum moderately declivous, longer in midline than metasternum. Hind coxae short, about three times as broad as long.

Remarks.—A species revision has not been attempted, as only a fraction of the species has been available. The African species recorded as belonging to this genus are probably congeneric, if I may judge by one African species of uncertain identity at hand.

The following key is based on descriptions and keys in Wasmann (1912, 1916), Cameron (1932), and Silvestri (1947), as well as personal observations.

1. Pronotum and elytra with numerous semi-recumbent setae of an unusual type (the feebly notched apices broader than the bases)........Indian species (2)
   Pronotum glabrous..............................African species (5)
2. Length, 1.6–1.9 mm..3
   Length, 1–1.4 mm...4
3. Antennal club two and one-half times as long as width of terminal segment, which is one-third shorter than other segments of club conjointly. *heimi* Wasmann
   Antennal club very short, only twice as long as width of terminal segment, which is as long as other segments of club conjointly. .*escherichi* Wasmann
4. Length, 1.4 mm.; coloration brighter; terminal antennal segment a little shorter than remainder of club........................*butteli* Wasmann
   Length, 1 mm.; coloration darker; terminal antennal segment much shorter than remainder of club..............................*minutus* Cameron
5. Elytra and abdomen with recumbent yellow hairs; antennal club very short and broad, strongly incrassate; terminal antennal segment a little broader than long, nearly triangular; color pitchy brown, abdomen lighter, pronotal margin yellow; length, 1 mm................*splendidus* Wasmann
   Elytra and abdomen without recumbent yellow hairs but with erect pale hairs, sparsely arranged; antennal club short, strongly tapering; terminal antennal segment as long as broad; color dark brown, abdomen only lighter at tip, pronotum with narrow yellow margin; length, 1.5 mm.....*braunsi* Wasmann
   For characteristics, see Silvestri, 1947, fig. 3 (1–22)...*transvaalensis* Silvestri

Termitodiscus heimi Wasmann. Figure 38, *a*.

Termitodiscus heimi Wasmann, 1899, Deuts. Ent. Zeitschr., **43**: 147, pl. 1, fig. 1, *a–f* (Sangamner; Wallon, Ahmednagar District, India; *Odontotermes obesus* Rambeau and *O. wallonensis* Wasmann; Wasmann coll.); 1912, Zeitschr. wiss. Zool., **101**: 93, pl. 5, fig. 4; 1916, Zool. Jahrb. Syst., **39**: 181, pl. 4, fig. 8, *a–b*, pl. 5, fig. 8, *c;* Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 318; Silvestri, 1947, Arch. Zool. Ital., **31**: 127, fig. 1 (1–7).

Termitodiscus heimi var. *vicinior* Silvestri, 1947, Arch. Zool. Ital., **31**: 127, pl. 2 (Barkuda Island, India; *Odontotermes* sp.; Silvestri coll.).

Material examined.—One cotype, Wallon, Ahmednagar District, India (Heim); 2 specimens, Sangamner, India; 1 specimen, Kendal, India; all in Bernhauer coll. (Chicago Natural History Museum).

Termitodiscus escherichi Wasmann

Termitodiscus escherichi Wasmann, 1911, *in* Escherich, Termitenleben auf Ceylon, p. 231 (Peradeniya, Ceylon; *Odontotermes redemanni* Wasmann; Wasmann coll.); 1912, Zeitschr. wiss. Zool., **101**: 94; 1916, Zool. Jahrb. Syst., **39**: 181, pl. 4, fig. 9, pl. 5, fig. 9, *a;* Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 318.

Termitodiscus escherichi var. *piceus* Wasmann, 1916, Zool. Jahrb. Syst., **39**: 181 (Peradeniya, Ceylon; *Odontotermes ceylonicus* Wasmann; Wasmann coll.).

Material examined.—One cotype (Buttel), Peradeniya, Ceylon, in Bernhauer coll. (Chicago Natural History Museum).

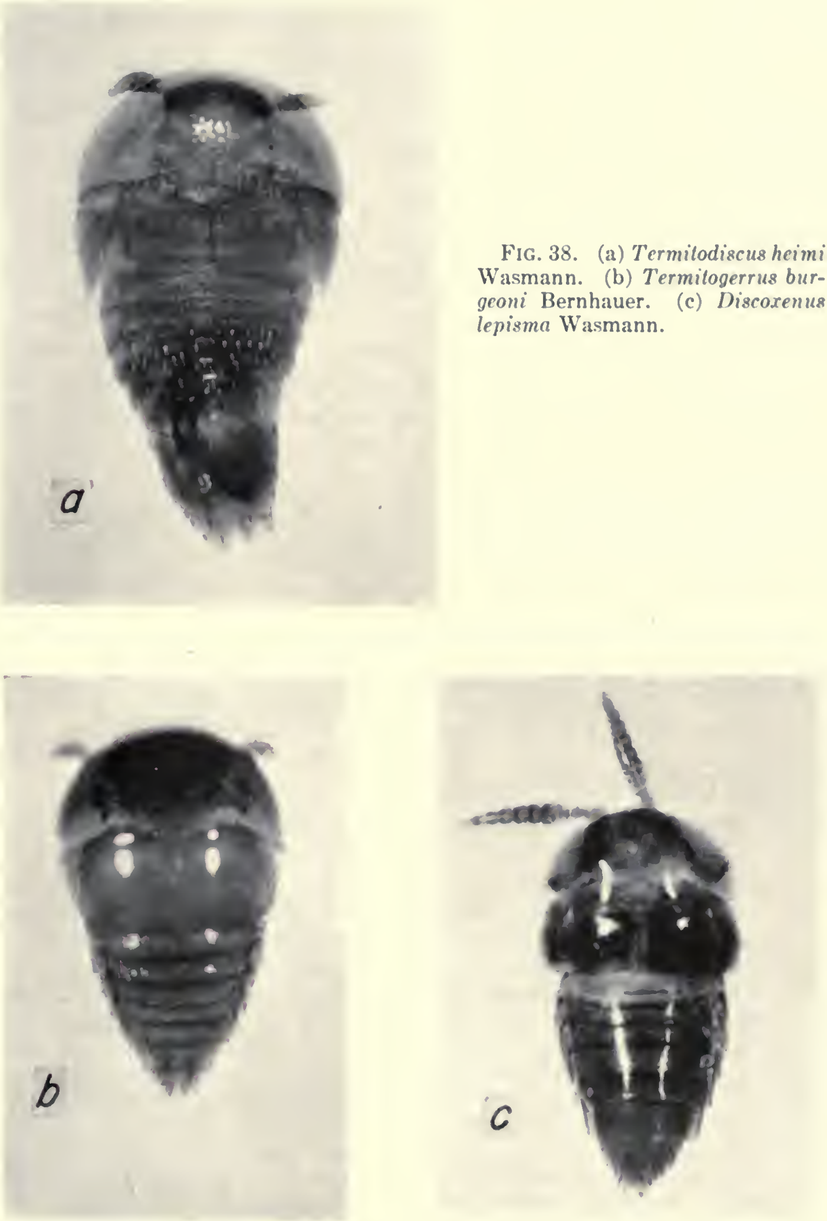


FIG. 38. (a) *Termitodiscus heimi* Wasmann. (b) *Termitogerrus burgeoni* Bernhauer. (c) *Discoxenus lepisma* Wasmann.

Termitodiscus butteli Wasmann

Termitodiscus butteli Wasmann, 1916, Zool. Jahrb. Syst., **39**: 181, pl. 4, fig. 10, pl. 5, fig. 10, *a* (Peradeniya, Ceylon; *Odontotermes obscuriceps* Wasmann; Wasmann coll.); Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 319.

Material examined.—One cotype, Peradeniya, Ceylon, in Bernhauer coll. (Chicago Nat. Hist. Mus.).

Termitodiscus minutus Cameron

Termitodiscus minutus Cameron, 1926, Trans. Ent. Soc. London, **74**: 171 (Dehra Dun, India; "in nest of termites;" Cameron coll.); 1932, Fauna Brit. India, Staphyl., **3**: 319.

Termitodiscus splendidus Wasmann

Termitodiscus splendidus Wasmann, 1899, Deuts. Ent. Zeitschr., **43**: 401 (Shivyre, Natal; *Odontotermes vulgaris* Haviland; Wasmann coll.); 1912, Zeitschr. wiss. Zool., **101**: 94, pl. 5, fig. 5.

Termitodiscus braunsi Wasmann

Termitodiscus braunsi Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 94 (Bothaville, Orange Free State; *Odontotermes transvaalensis* Sjöstedt; Wasmann coll.).

Termitodiscus transvaalensis Silvestri

Termitodiscus transvaalensis Silvestri, 1947, Arch. Zool. Ital., **31**: 129, text fig. 3 (Transvaal; *Termes angustatus* Rambur; Silvestri coll.). The host is *Odontotermes angustatus* Rambur.

TERMITOGERRUS Bernhauer

Termitogerrus Bernhauer, 1932, Rev. Zool. Afr., **22**: 157 (as subgenus of *Termitodiscus*). Type species: *Termitogerrus burgeoni* Bernhauer.

Lissodiscus Grassé and Poisson, 1940, Bull. Soc. Ent. France, **45**: 84 (as subgenus of *Termitodiscus*); Silvestri, 1947, Arch. Zool. Ital., **31**: 131. Type species: *Lissodiscus lepidulus* Grassé and Poisson. New synonymy.

Coloration piceous to dark brown. Body-form narrower and more convex than in *Termitodiscus*. Pronotum glabrous, elytra subglabrous. Head broad and moderately short; antennal fossae medium-sized, rather widely separated; genae deeply grooved between eyes and maxillae for reception of second and third antennal segments, thus giving rise to a distinctive plate adjacent to maxillae. Antennae 11-segmented (possibly 10-segmented in some species); basal segment short and stout; second and third short and more slender; segments 4–10 short and incrassate; 5–10 transverse and compressed. Gula broad and moderately long; submentum short, mentum large, trapezoidal, labial palpi 3-segmented. Galea and lacinia subequal in length; maxillary palpi long and slender.

Pronotum slightly less than twice as long as broad; large, strongly convex, sides and apex continuously arcuate, margin not flared, basal angles produced. Outer apical angles of elytra very strongly produced; apex of elytra appearing deeply emarginate. Prosternum thinly keeled. Anterior coxae very broad and flat, their ventral surfaces feebly convex. Mesosternum almost vertical at middle (only a short triangular area visible); not produced between middle coxae, which are widely separated by a broad convex metasternal process that extends forward to their anterior margins. Hind coxae very large; about twice as broad as long.

Remarks.—Termitogerrus was proposed by Bernhauer (1932a) as a subgenus of *Termitodiscus*, a fact that was apparently overlooked by Grassé and Poisson (1940), who described *Lissodiscus* as a subgenus of *Termitodiscus*, and by Silvestri (1947), who elevated *Lissodiscus* to generic rank. The genus is comprised of African species that live with *Macrotermes*. They are easily distinguished from *Termitodiscus* by the vertical mesosternum and the very large metasternal process between the widely separated mesocoxae. Additional differences are the narrower, more convex, glabrous pronotum, the larger hind coxae, the very broad, flat anterior coxae, and the 11-segmented antennae.

Inasmuch as only two species of *Termitogerrus* have been studied, no attempt will be made to present species diagnoses. Silvestri's detailed figures should be examined by one attempting to identify species of the genus.

Termitogerrus burgeoni Bernhauer. Figure 38, *b*.

Termitodiscus (*Termitogerrus*) *burgeoni* Bernhauer, 1932, Rev. Zool. Afr., **22**: 157 (Haut-Uele, Moto Tora, Belgian Congo; *Termes natalensis* Haviland; Chicago Natural History Museum).

Material examined.—Type and one cotype (Bernhauer coll.). In addition, 13 specimens, Rwindi Camp, Belgian Congo, collected May 6, 1948, by Alfred E. Emerson, with *Macrotermes natalensis* Haviland.

Termitogerrus lepidulus Grassé and Poisson, new comb.

Termitodiscus (*Lissodiscus*) *lepidulus* Grassé and Poisson, 1940, Bull. Soc. Ent. France, **45**: 84, text figs. 1–8 (Kouibli and Danané, Côte d'Ivoire, French West Africa; *Bellicositermes natalensis* Haviland).

Lissodiscus lepidulus Grassé and Poisson, Silvestri, 1947, Arch. Zool. Ital., **31**: 132.

Material examined.—Specimens from Bendija, Liberia, collected by W. M. Mann (U.S. Nat. Mus.); with *Macrotermes natalensis* Haviland.

Termitogerrus habilis Silvestri, new comb.

Lissodiscus habilis Silvestri, 1947, Arch. Zool. Ital., **31**: 132, text fig. 4 (Conakry, French Guinea, French West Africa; *Bellicositermes bellicosus* Smeathman; Silvestri coll.).

Termitogerrus quaerens Silvestri, new comb.

Lissodiscus quaerens Silvestri, 1947, Arch. Zool. Ital., **31**: 134, text fig. 5 (Thiès, Senegal, French West Africa; *Bellicositermes bellicosus* Smeathman; Silvestri coll.).

Termitogerrus bellicosi Silvestri, new comb.

Termitodiscus bellicosi Silvestri, 1905, Redia, 3: 348, fig. (Adi Ugri, Eritrea; *Bellicositermes bellicosus* Smeathman; Silvestri coll.); Wasmann, 1912, Zeitschr. wiss. Zool., **101**: 94.

Lissodiscus bellicosi Silvestri, 1947, Arch. Zool. Ital., **31**: 135, text fig. 6.

DISCOXENUS Wasmann

Discoxenus Wasmann, 1904, Zool. Jahrb., Suppl., 7: 655; 1912, Zeitschr. wiss. Zool., **101**: 92; 1916, Zool. Jahrb. Syst., **39**: 176; Cameron, 1932, Fauna Brit. India, Staphyl., 3: 315. Type species: *Discoxenus assmuthi* Wasmann.

Head longer and narrower than in the other genera. Antennal fossae longer, broader, and deeper than in the other genera to receive the relatively large basal antennal segment. Antennae 11-segmented, relatively long, projecting well beyond front margin of pronotum; scape large, fusiform; segment 2 small, more or less set in apex of scape; segments 3–11 forming a long, compact fusiform "club." Pronotum about twice as broad as long, basal angles broadly rounded, base feebly emarginate, its margin flared. Outer apical angles of elytra not produced, apices a little emarginate medially, straight toward the sides. Mesosternum almost horizontal. Mesocoxae large, narrowly separated by long metasternal process which broadens at apex before meeting the very broad mesosternal process.

KEY TO SPECIES OF *DISCOXENUS* WASMANN (from Wasmann, 1916)

1. Antennae with penultimate segment much longer than broad; slender terminal segment almost awl-shaped, three times as long as broad; elytral disk with transverse rows of numerous long yellow setae 2

   Antennae with penultimate segment not longer than broad; terminal segment bluntly cone-shaped, twice as long as broad; segments 4–7 transverse, the visible part of antennae only as long as pronotum; elytra only one-half as long as pronotum; elytral disk very sparingly setose; reddish-brown, elytra darker; 1.8 mm. in length . . . . *crassicornis* Wasmann

2. Larger species, almost 2.5 mm. in length; elytra about two-thirds as long as pronotum; antennae very robust, the visible part longer than pronotum; segments 4–7 transverse; terminal segment very small and slender, four times as long as broad; coloration yellowish-brown . . . . *lepisma* Wasmann

   Smaller species, less than 2 mm. in length; elytra about one-half as long as pronotum; visible part of antennae not longer than pronotum; terminal segment only three times as long as broad 3

3. Antennae moderately pointed; segments 5–7 not transverse; elytral disk with a few almost recumbent yellow setae; color pitch-brown; length, 1.8–1.9 mm. *assmuthi* Wasmann

   Antennae strongly pointed; segments 4–7 transverse; elytral disk thickly covered with erect yellow setae; reddish-brown with pitch-brown elytra; length, 1.8 mm. . . . . *acuticornis* Wasmann

Discoxenus lepisma Wasmann. Figure 38, *c*.

Discoxenus lepisma Wasmann, 1904, Zool. Jahrb., Suppl., 7: 656 (Kendal, Ahmednagar District, India; *Odontotermes obesus wallonensis* Wasmann; Wasmann coll.); 1916, Zool. Jahrb. Syst., **39**: 178, pl. 4, fig. 7; Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 316, pl. 3, fig. 6.

Material examined.—One specimen, Dehra Dun, India (Bernhauer coll.; Chicago Nat. Hist. Mus.).

Discoxenus assmuthi Wasmann

Discoxenus assmuthi Wasmann, 1904, Zool. Jahrb., Suppl., 7: 656 (Khandala, Bombay, India; *Odontotermes obesus* Rambur; Wasmann coll.); 1916, Zool. Jahrb. Syst., **39**: 178; Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 316.

Discoxenus crassicornis Wasmann

Discoxenus crassicornis Wasmann, 1916, Zool. Jahrb. Syst., **39**: 178, pl. 4, fig. 6 (Peradeniya, Ceylon; *Odontotermes redemanni* Wasmann; Wasmann coll.); Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 317.

Discoxenus acuticornis Wasmann

Discoxenus acuticornis Wasmann, 1916, Zool. Jahrb. Syst., **39**: 178 (Peradeniya, Ceylon; *Odontotermes obscuriceps* Wasmann; Wasmann coll.); Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 317.

Subfamily PYGOSTENINAE

Pygostenini: Fauvel, 1899, Rev. d'Ent., **18**: 5.

Pygosteninae: Wasmann, 1902, Verh. Deuts. Zool. Ges., **1902**: 91; 1916, Zool. Jahrb. Syst., **39**: 170; 1926, Ent. Mitteil., **15**: 113; Cameron, 1932, Fauna Brit. India, Staphyl., **3**: 320.

The subfamily Pygosteninae is probably most noteworthy for including both myrmecophilous and termitophilous species, a respect in which it is perhaps unique among staphylinid groups. The host situation, with minor exceptions, seems to be this: Ants of the subfamily Dorylinae (driver-ants) are hosts of some species throughout the range of the subfamily in the Ethiopian and Indomalayan regions; fungus-growing termites are hosts of most Indomalayan species of *Doryloxenus*. According to present evidence, African components of the subfamily are much more numerous, and extremely few of these, if indeed any, are truly termitophilous. The Ethiopian species of *Doryloxenus*, the first of the genus to be discovered, are guests of doryline ants, whereas their Asiatic counterparts in India, Ceylon, and Java occur with *Macrotermes* and *Odontotermes*.

Inasmuch as the Pygosteninae should be considered from a much broader viewpoint than is possible in this monograph, no aspect of the problem is included. Mr. David Kistner of Chicago is now engaged in comprehensive studies on the Pygosteninae, and the results will be published in the near future.

FIG. 39. *Doryloxenus brevicornis* Cameron.

Species of Pygosteninae recorded from termite nests are included in lists in this paper.

Subfamily TRICHOPSENIINAE

Trichopsenii LeConte and Horn (Group II, Tribe Tachyporini), 1883, Smithson. Misc. Coll., no. 507, p. 100.

Trichopsenini Eichelbaum (as a tribe of Tachyporinae), 1909, Mem. Soc. Ent. Belg., **17**: 196; Wasmann, 1916, Zool. Jahrb. Syst., **39**: 196.

Schizelythrinae Kemner, 1925, Ent. Tidskr., **46**: 122.

Trichopseniinae Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 320; Borgmeier, 1950, Rev. Ent., **21**: 642.

A discussion of certain aspects of the evolutionary history of the Trichopseniinae is presented in an earlier section of this paper.

KEY TO GENERA OF TRICHOPSENIINAE

1. Elytra split for almost their entire length, lateral half of each diverging strongly (Java) . . . *Schizelythron* Kemner
   Elytra not split lengthwise . . . 2
2. Pronotum extremely large, twice as broad as long, its anterior and lateral margins continuously arcuate; head and forelegs not visible from above; body-form limuloid . . . 7
   Pronotum not as above, its anterior angles distinct (obsolescent in *Trichopsenius*) . . . 3
3. Antennal segments 3–10 campanulate; abdomen ovoid, strongly inflated (Australia) . . . *Mastopsenius* Seevers
   Antennal segments 3–10 not campanulate; abdomen at most feebly inflated . 4
4. Inner margins of elytra beveled, forming a median V-shaped groove (United States) . . . *Xenistusa* LeConte
   Inner margins of elytra not beveled . . . 5
5. Pronotum strongly bi-impressed; metasternum behind mesocoxae about four-sevenths as long as metasternal width from median line to lateral margin (Neotropical Region) . . . *Megaxenistusa* Seevers
   Pronotum not impressed; metasternum behind mesocoxae as long as or longer than metasternal width from median line to lateral margin . . . 6
6. Sides of abdomen parallel (abdomen of physogastric individuals uniformly swollen); metasternum behind mesocoxae about equal to metasternal width from median line to lateral margin (United States) . . . *Trichopsenius* Horn
   Sides of abdomen strongly convergent apically (only basal abdominal segments physogastric); metasternum behind mesocoxae one-third greater than metasternal width from medial line to lateral margin (Neotropical Region). *Rhinotermopsenius* Seevers
7. Anterior margin of pronotum distinctly angulate; pronotum and elytra without macrosetae (Malaysia, Micronesia) . . . *Hamitopsenius* Wasmann
   Anterior margin of pronotum not angulate; pronotum and elytra conspicuously setose (Neotropical Region) . . . *Termitopsenius* Wasmann

TRICHOPSENIUS Horn

Trichopsenius Horn, 1877, Trans. Amer. Ent. Soc., **6**: 88; Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 323. Type series: *Trichopsenius depressus* LeConte.

Head strongly deflexed, partly concealed by pronotum. Antennae inserted medial to eyes; 11-segmented; segments 2–5 subquadrate, 6–10 incrassate. Pronotum one-half broader than long; sides slightly deflexed; anterior and lateral margins continuously arcuate; base arcuate, posterior angles rounded. Elytra as broad as pronotum and a little longer. Metasternal length equal to width of metasternum from median line to lateral margin. Metasternal plates covering most of trochanters and proximal part of femora. Sides of abdomen subparallel; stenogastric to slightly physogastric. Aedeagus of male remarkably large, occupying almost all of abdomen posterior to third segment; distal sclerite of its lateral lobe long and slender, protruding from abdomen.

KEY TO SPECIES OF *TRICHOPSENIUS*

1. Apical margin of female eighth tergite with a series of setigerous processes. *californicus*, new sp.
   Apical margin of female eighth tergite without setigerous processes........2
2. Pronotum two-thirds broader than long; Japan..........*japonicus*, new sp.
   Pronotum one-third to one-half broader than long........................3
3. Posterior tibiae with two rows of about ten very long, curved bristles (one-third to one-half as long as tibiae).........................*longipes* Seevers
   Posterior tibiae with scattered, relatively short setae....................4
4. Eighth tergite of female not incised..................*xenoflavipes* Seevers
   Eighth tergite of female with apical incision.............................5
5. Eighth tergite of female carinate laterally; elytral setae about one-fourth as long as elytra..................................*depressus* LeConte
   Eighth tergite of female not carinate; elytral setae about one-half as long as elytra...*frosti* Seevers

Trichopsenius depressus LeConte. Figure 40, *a*, *b*.

Hypocyptus depressus LeConte, 1863, Smithson. Misc. Coll., **6**: 30 (Louisiana; no host cited; Museum of Comparative Zoology).

Trichopsenius depressus LeConte, Horn, 1877, Trans. Amer. Ent. Soc., **6**: 88, pl. 1, figs. 1, 2; Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 323, pl. 1, figs. 3, 7, 11, pl. 2, figs. 27, 29; 1945, Pan. Pac. Ent., **21**: 69, text fig. 4.

Material examined.—Type from Louisiana; one male and one female from Columbus, Texas; one specimen from Crescent City, Florida; all in LeConte collection (Mus. Comp. Zool.). A series from Gainesville and Jacksonville, Florida, and Memphis, Tennessee; all from nests of *Reticulitermes virginicus* Banks (Chicago Nat. Hist. Mus.). The previously recorded host, *Reticulitermes hageni* Banks (Seevers, 1945, p. 69) is incorrect.

Color testaceous. Pronotum with 5 or 6 setae on lateral margins; disk with a hexagon of 6 setae medially, a group of 3 on each side, an irregular, subapical row of about 6, and a basal row of about 8. Elytra with three irregular transverse rows of about 5 bristles each. Tergites with an apical row of long bristles interspersed with short ones. Antennae of both sexes similar; segments 3 and 4 longer than broad, 5 and 6 subquadrate, 7–10 transverse. Anterior border of pronotum feebly emarginate at middle. Female with seventh tergite somewhat produced, angulate at middle; eighth tergite notched medially and elevated laterally to form a strong semicircular carina on each side; lateral plates of ninth segment broad, compressed, rounded at apex. Male with seventh tergite feebly angulate at middle; eighth tergite arcuate, its apex rounded, the converging sides forming a right angle.

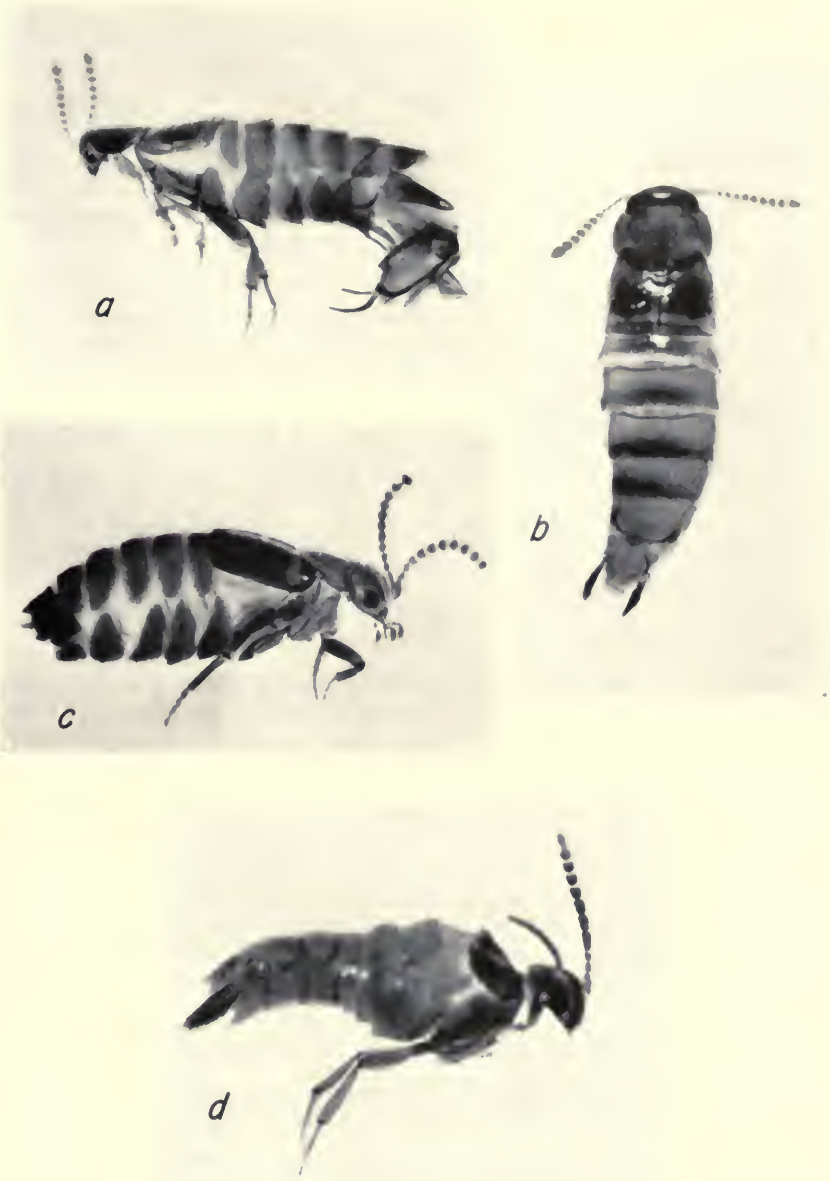


FIG. 40. *Trichopsenius depressus* LeConte: (a) male with aedeagus extruded; (b) female. (c) *Xenistusa hexagonalis* Seevers. (d) *Rhinotermopsenius saltatorius* Seevers.

Length, 1–1.5 mm. Legs relatively short: total lengths 0.55 mm., 0.72 mm., and 0.85 mm.; femora 0.25 mm., 0.28 mm., and 0.3 mm.; tibiae 0.17 mm., 0.22 mm., and 0.26 mm.; tarsi 0.14 mm., 0.23 mm., and 0.35 mm.

Trichopsenius xenoflavipes Seevers

Trichopsenius xenoflavipes Seevers, 1945, Pan. Pac. Ent., **21**: 70, text fig. 3 (Crawford County, near Wyandotte Cave, Indiana; *Reticulitermes flavipes* Kollar; Chicago Natural History Museum).

Material examined.—A series from Olney, Urbana, and Springfield, Illinois; all with *Reticulitermes flavipes* Kollar (Chicago Nat. Hist. Mus.).

Testaceous. Chaetotaxy as in *depressus* except that the setae of elytra and abdomen are one-third longer (elytral bristles about one-half as long as elytra). Antennal segments 3–7 of male longer than broad, 8–10 transverse; segments 3–6 of female longer than broad, 7–10 transverse, a little broader than in male. Anterior margin of pronotum not emarginate at middle. Female abdomen with seventh tergite evenly arcuate; eighth arcuate, not notched; lateral plates of ninth segment slender, tapering to a very acute apex. Legs as in *depressus*.

Length, 1–1.5 mm.

Trichopsenius frosti Seevers

Trichopsenius frosti Seevers, 1945, Pan. Pac. Ent., **21**: 70, text fig. 5 (Sherborn, Massachusetts; *Reticulitermes flavipes* Kollar; Chicago Natural History Museum).

Material examined.—A series from Boston, Forest Hills, and Wellesley, Massachusetts (U. S. Nat. Mus.).

Color testaceous. Chaetotaxy as in *xenoflavipes*. Female abdomen with seventh tergite very feebly arcuate, faintly sinuate on each side of middle; eighth tergite with a broad, deep incision, but otherwise unmodified. Male seventh tergite moderately and uniformly arcuate; eighth tergite broadly and obtusely arcuate; the blade-like distal end of lateral lobes of aedeagus rather stout.

Length, 1.25 mm.

Trichopsenius longipes Seevers

Trichopsenius longipes Seevers, 1945, Pan. Pac. Ent., **21**: 71 (Skull Valley, Tooele County, Utah; *Reticulitermes* sp.; United States National Museum).

Material examined.—A series from San Antonio Canyon, near Camp Baldy, San Bernardino County, California; with *Reticulitermes hesperus* Banks (Chicago Nat. Hist. Mus.).

Color flavo-testaceous. Chaetotaxy and antennae as in *T. depressus*. Anterior margin of pronotum bisinuate. Abdomen moderately physogastric, uniformly dilated, its sides scarcely converging posteriorly. Seventh and eighth tergites of female simple; lateral plates of ninth segment rather slender, apex acute. Tibiae with two rows of long, fine, curved bristles, those of hind legs much longer.

Length, 1.9 mm. (stenogastric specimens) and 2.8 mm. (physogastric specimens). Legs relatively long: total lengths 0.65 mm., 0.92 mm., and 1.1 mm.; femora 0.27 mm., 0.35 mm., and 0.35 mm.; tibiae 0.21 mm., 0.3 mm., and 0.35 mm.; tarsi 0.17 mm., 0.29 mm., and 0.44 mm.

Trichopsenius californicus, new species

Distinguished from other species by its distinctive eighth female tergite.

Testaceous. Chaetotaxy as in *depressus*. Pronotum a little more than one-half broader than long (77 : 50); broadest one-fifth the distance from base to apex; sides in front of broadest point converging rather strongly and continuously arcuate with apex; basal angles obtusely rounded; base almost straight. Hind tibiae with one row of about 10 fine setae that are one-third as long as the tibia. Legs long: hind leg 1 mm., hind femur 0.3 mm., hind tibia 0.3 mm., hind tarsus 0.4 mm.

Apex of eighth female tergite with a series of setigerous processes: a long, median process, bifid at apex, flanked on each side by a slightly shorter process, bifid or not; lateral to these processes are two very short, tubercle-like processes. Male abdomen not seen. Abdomen stenogastric.

Length, 1.4–1.5 mm.

Holotype a female from Stanford University, California; collected April 5, 1902; with *Reticulitermes hesperus* Banks. In collection of Chicago Natural History Museum.

Paratypes.—Two females, same data as type.

Trichopsenius japonicus, new species

This is the first palaearctic species of this genus to be recorded. It is probably more closely related to *longipes* than to any other American species. It resembles the latter in having two rows of long, fine setae on the lateral margins of the hind tibiae, but the setae are less than one-third as long as the tibia, and the rows consist of only 4 macrosetae. The pronotum is two-thirds broader than long, differing from all American species in this respect. The lateral plates of the ninth abdominal segment are unusually short, broad, and stout.

Color rufo-testaceous. Chaetotaxy as in *depressus*. Pronotum two-thirds broader than long (70 : 43); broadest two-fifths of distance from base to apex; sides strongly converging in front of broadest point; anterior angles obsolete; sides behind broadest point continuously arcuate with base; apex almost straight. Hind leg 0.9 mm., hind femur 0.3 mm., hind tibia 0.3 mm., hind tarsus 0.31 mm. Eighth female tergite unmodified.

Length, 1.35 mm.; width, 0.6 mm.

Holotype.—A female from Kinschin, Japan, collected by M. Yano; with *Reticulitermes speratus* Kolbe. In Wasmann collection, Natuurhistorisch Museum, Maastricht, The Netherlands.

Paratype.—One female, same data as type; in Chicago Natural History Museum.

XENISTUSA LeConte

Xenistusa LeConte, 1880, Trans. Amer. Ent. Soc., **8**: 167; Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 323. Type species: *Xenistusa cavernosa* LeConte.

Head and thorax slender; mesothorax, metathorax, and abdomen inflated slightly; sides of thorax and abdomen with some non-sclerotized integument. Head prognathous, only base of occiput concealed by pronotum; clypeus very short; labrum broadly and moderately emarginate. Gula broad, trapezoidal, gular sutures apparently terminating at posterior tentorial pits, as sides of submentum are not delimited from postgenae. Segment 2 of labial palpi globose, segment 3 without terminal spicule.

Pronotum one-half broader than long, not much broader than head. Elytra with a very narrow, slit-like groove near each lateral margin, and with the inner margins beveled, giving rise to a distinctive V-shaped groove between them. Elytral epipleura bent at right angles to elytra a short distance from the sides, which thus appear carinate. Anterior coxae slender at base, clavate distally, the ventral surfaces somewhat convex and the upper surfaces nearly flat. Mesosternum and its process very short; metasternal process long and slender. Metasternum long, strongly convex, its sides almost vertical; metasternal plates very narrow in front and not covering the femora, but expanding posteriorly to cover the medial half of the trochanters in repose.

Male with terminal abdominal segments as follows: tergite 8 with strongly arcuate apex; sternite 8 with deeply emarginate base and arcuate apex; tergite 9 smaller than 8 and concealed by it, articulating at sides with large, elongated, lateral plates of ninth segment which protrude from apex of abdomen; these plates articulate at base with long, slender apodemes that extend anteriorly as far as segment 4 and are visible through the translucent sternites. Sternite 9 small, concealed by 8. Bulbous median lobe of aedeagus with several sclerites; lateral aedeagal lobes also with several sclerites, the apical one shorter and broader than in *Trichopsenius* and not protruding from abdomen. Female with sternite 8 and tergite 8 shorter than those of male. Lateral plates of ninth segment very broad at base, the apical one-half tapered.

Xenistusa cavernosa LeConte

Xenistusa cavernosa LeConte, 1880, Trans. Amer. Ent. Soc., **8**: 167 (Columbus, Texas; no host given; Museum of Comparative Zoology); Schwarz, 1889, Proc. Wash. Ent. Soc., **1**: 1 (host, *Termes flavipes*).

Xenistusa fossata LeConte, 1880, Trans. Amer. Ent. Soc., **8**: 167 (Columbus, Texas; no host given; Museum of Comparative Zoology); Schwarz, 1889, Proc. Wash. Ent. Soc., **1**: 1 (host, *Termes flavipes*). New synonymy.

Xenistusa pressa LeConte, 1880, Trans. Amer. Ent. Soc., 8: 167 (Columbus, Texas; no host given; Museum of Comparative Zoology); Schwarz, 1889, Proc. Wash. Ent. Soc., 1: 1 (host, *Termes flavipes*). New synonymy.

Material examined.—The types of LeConte's three species.

The three species of *Xenistusa* proposed by LeConte were based on three specimens collected by E. A. Schwarz from a colony of *Reticulitermes* in a log near Columbus, Texas. Schwarz (1889) later expressed doubt, after examining the mounted specimens, that they represented three species. There have been no subsequent reports on this problem, probably because no more material has become available.

It has seemed improbable that three specimens of a genus from the same termite nest would belong to three species, yet LeConte described appreciable differences in pronotal structure. When I had an opportunity to examine briefly LeConte's specimens, I was surprised to note how different the pronota actually appear. The differences very likely resulted from distortion of the thin integuments when the specimens were dried and probably do not represent species characters. The pronotum of the *cavernosa* type specimen, described by LeConte as profoundly bilobed, has a deep, median, V-shaped sulcus. The pronotum of the *fossata* type specimen, described as having a large, very deep, triangular excavation from base to apex, has a very broad, V-shaped sulcus. The pronotum of the *pressa* type specimen is very feebly depressed. It is my conclusion that the three conditions resulted from different degrees of distortion, but as the medial depressions are remarkably symmetrical, one cannot state with finality that they are artifacts. The ultimate conclusion must be based on a study of additional specimens, preferably preserved in alcohol. Minor differences in the LeConte specimens, such as variations in lengths of elytral bristles, may be sexual differences such as were noted in the case of *hexagonalis*.

Schwarz (1889) made the interesting comment that the living beetles, with their cylindrical bodies, greatly extended abdomens, and peculiar mode of locomotion, resembled the termites much more than one would suspect from dried specimens.

Xenistusa hexagonalis Seevers. Figure 40, *c*.

Xenistusa hexagonalis Seevers, 1941, Ann. Ent. Soc. Amer., 34: 324, pl. 1, figs. 6, 10, pl. 2, figs. 19–26 (Gainesville, Florida; *Reticulitermes hageni* Banks; Chicago Natural History Museum). The host has been redetermined as *Reticulitermes virginicus* Banks.

Male with light reddish-brown head and thorax and paler abdominal sclerites (segments 3–6 testaceous, the others darker). Female generally darker than male, with head and thorax brown and abdominal sclerites light reddish-brown. Vertex of head broadly and shallowly concave; with 2 setae between antennae and 2 on margin of clypeus. Pronotum with 6 setae in form of hexagon at center of disk, 3 on each side forming a large triangle, 6 on anterior border, 4 on lateral borders, and 4 on basal border. Elytra rather densely setose, the moderately long, pale hairs arranged in 6–8 irregular, longitudinal rows of 8–10 hairs. Antennal scape somewhat compressed; segment 2 short, moderately globose; segments 3–10 increasing in width; segment 11 short, broadly transverse. Pronotum broadest a short distance behind front margin; apex bisinuate, anterior angles broadly rounded; sides converging posteriorly, forming a continuous arc with base; pronotal disk not impressed. Elytra slightly broader than pronotum and nearly twice as long. Segments 1–4 of front tarsi subequal, segment 5 longer; basal segment of middle tarsi subequal to segments 2–5 combined, segment 5 as long as segments 2–4 combined; basal segment of hind tarsi longer than segments 2–5 combined, 2–4 decreasing in length, segment 5 equal to segments 3–4 combined.

Males and females about equal in length but the latter more robust, and the head, pronotum, and elytra larger. Length, 1.9–2.1 mm. Female head 0.47 mm. broad; pronotum 0.54 mm. broad and 0.35 mm. long; elytra 0.6 mm. broad and 0.65 mm. long. Male head 0.42 mm. wide; pronotum 0.48 mm. broad and 0.33 mm. long; elytra 0.52 mm. broad and 0.55 mm. long.

MEGAXENISTUSA Seevers

Megaxenistusa Seevers, 1945, Pan-Pac. Ent., **21**: 66. Type species: *Megaxenistusa rhinotermitis* Seevers.

The closest relative of this genus may be *Xenistusa*, to which it bears a resemblance. It is distinguished from that genus by the form and proportions of the metasternum and metepisternum, and by its unmodified elytra.

Body-form cylindrical. Head strongly compressed, deflexed. Antennal scape flat, its medial surface concave; segments 2–10 subcylindrical. Gula sclerotized; mentum trapezoidal. Labial palpi with segment 2 asymmetrical, strongly compressed. Maxillary palpi long and slender, segment 2 arcuate, segment 3 fusiform, segment 4 conical. Pronotum robust, transverse, not margined; its disk bi-impressed. Elytra as broad as pronotum but longer; their surfaces somewhat irregular, with broad, shallow impressions; sutural margins not beveled.

Mesosternum short; mesocoxae slightly separated by carinate processes of mesosternum and metasternum. Metasternum relatively short and broad; its length behind mesocoxae about seven-tenths the width of metasternum from median line to metepisternum along posterior margin; each half of metasternum strongly oblique (a cross section of metasternum would be markedly V-shaped); metasternal plates moderate in size, not much larger than posterior trochanters; metepisternum large, four-fifths as broad at caudal margin as long. Femora broad, compressed; tibiae somewhat less so. Tarsi 5-segmented, basal segment of middle and hind legs extremely long, exceeding the other segments combined.

Megaxenistusa rhinotermitis Seevers

Megaxenistusa rhinotermitis Seevers, 1945, Pan-Pac. Ent., **21**: 68 (Kartabo, British Guiana; *Rhinotermes marginalis* Linnaeus; Chicago Natural History Museum).

Color reddish-brown; elytra and areas of pronotum darker. Head with 2 frontal and 4 clypeal setae. Pronotum with 4 setae on anterior margin, one subhumeral seta, and 4 longitudinal rows of setae on each half—a discal row of 4, a row of 3 in impressed area, a pair lateral to impression, and a marginal row of 3. Elytra with 5 or 6 longitudinal rows of hairs. Abdomen sparsely and regularly setose, with scattered long hairs among short ones and marginal rows of long bristles. Second antennal segment short; segments 3-6 subequal, longer than broad; 7–10 shorter, incrassate; segment 11 as long as 10 but narrower. Pronotum with two large oval impressions on the disk, extending forward from base about two-thirds the length of pronotum; anterior margin arcuate, sides arcuate, converging moderately in front; base bisinuate.

Length, 3 mm.

TERMITOPSENIUS Wasmann

Termitopsenius Wasmann, 1902, Boll. Mus. Zool. Torino, **17**, no. 427, p. 4; Silvestri, 1903, Redia, **1**: 201; 1947, Arch. Zool. Ital., **31**: 144. Type species: *Termitopsenius limulus* Wasmann.

Pulicipsenius Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 327. Type species: *Pulicipsenius acanthoscelis* Seevers. New synonymy.

Body-form limuloid. Pronotum very large, completely covering the head; strongly deflexed anteriorly and laterally, the lateral and apical margins continuously arcuate. Head broad and short, dorso-ventrally compressed; so oriented with respect to pronotum that its dorsum is ventral and its mouth parts are directed caudad. Eyes prominent. Vertex broad, antennae inserted near eyes some distance from anterior tentorial pits; clypeus extremely short; genae in front of eyes deeply excavated to receive basal antennal segment. Antennae 11-segmented; scape compressed, its inner surface concave; segments 3–10 incrassate; terminal segment membranaceous, usually reduced in size. Mandibles with a medial tooth on inner margin, but not toothed externally. Gula and submentum very short due to shortening of head and its position with respect to pronotum. Mesosternum very short, its process between middle coxae very slender, slightly carinate. Metasternum extremely large, its metasternal plates large. Abdomen acuminate.

Termitopsenius limulus Wasmann. Figure 41, *b*.

Termitopsenius limulus Wasmann, 1902, Boll. Mus. Zool. Torino, **17**, no. 427, p. 5 (Posadas, Misiones, Argentina; *Capritermes opacus* Hagen; Wasmann coll.); Silvestri, 1903, Redia, **1**: 201, pl. 6, figs. 283, 284; Bruch, 1938, Notas Mus. La Plata, **3**: 155; Silvestri, 1947, Arch. Zool. Ital., **31**: 146, fig. 9.

Material examined.—One specimen from Rio Negro, Paraná, Brazil; with *Neocapritermes opacus* Hagen (ex Reichensperger coll.).

Color rufo-testaceous, pronotal disk darker, head reddish-brown. Head with 2 vertexal setae and 2 on clypeus. Pronotum with two transverse subapical rows of 4 setae each, 2 or more setae on lateral margins, and disk with two longitudinal rows of 3 and 2 setae, respectively. Pronotal disk with an extensive non-setose area. Elytra with four rows of 2, 3, 3, 4 long, fine setae. Tergites 3–7 and sternites 3–8 with 6 long setae on apical margin. Third tergite pubescent, third sternite with short pale semi-erect hairs; other sclerites glabrous. Antennal scape two-thirds as broad as long, its inner surface concave; scape too broad to fit in genal groove. Antennal segments with the following relative lengths: 18 : 6 : 6 : 4 : 5 : 6 : 8 : 8 : 8 : 8 : 6; terminal segment small, membranaceous; segments 3–5 subequal in width, segment 6 much broader than 5, segments 6–10 scarcely incrassate. Hind tibiae with 3 large spines on outer margin and 3 at apex, as well as several short spines.

Termitopsenius acanthoscelis Seevers, new comb. Figure 42.

Termitopsenius acanthoscelis Seevers, 1941, Ann. Ent. Soc. Amer., **34**: 329, pl. 1, figs. 2, 4, 5, 9, 14, pl. 2, figs. 15–18, 28 (Kartabo, British Guiana; *Rhinotermes marginalis* Linnaeus; Chicago Natural History Museum).

Distinguished from *limulus* by smaller size; differences in chaetotaxy of pronotum, elytra, and abdomen; stouter spines of hind tibiae; and proportions of antennal segments.

Color testaceous. Head with 2 vertexal setae and 2 on clypeus. Pronotum with 4 rows of very long, slender, pale setae on each half comprised of 5, 3, 2, 2 setae, respectively, beginning with medial row. Elytra with four rows of 2, 3, 3, 3 setae. Tergites 3–7 with 4 very long setae in apical row; tergite 8 with 4 long setae and 2 shorter ones medially. Sternites 3–8 with 6 very long apical setae, sternite 8 with a few shorter ones in addition. Tergites 3 and 4 with a few short, recumbent hairs, sternite 3 pubescent (especially near middle), sternite 4 slightly so; other abdominal sclerites glabrous. Lateral plates of ninth segment with a few long setae. Hind tibiae with 4 strong spines on outer margin and 3 stout ones at apex; these spines are considerably stouter than those of *limulus*. Antennae differing from those of *limulus* in that segments 3–10 are gradually incrassate and the apical segment is not as small or as membranaceous.

Length, 1.75 mm.

HAMITOPSENIUS Wasmann

Hamitopsenius Wasmann, 1916, Zool. Jahrb. Syst., **39**: 198. Type species: *Hamitopsenius caudatus* Wasmann.

Hamitopsenius is very closely allied to the neotropical *Termitopsenius*, from which it may be distinguished by the following characters: anterior margin of pronotum distinctively angulate in front of and below eyes; mandibles with an unusual tooth on outer margin; mesosternal process broader between mesocoxae and more conspicuously elevated as a carina; metasternal process broader and with a rounded apex; antennal segments 3–6 considerably smaller than those of *Termitopsenius;* pronotum and elytra without macrosetae.

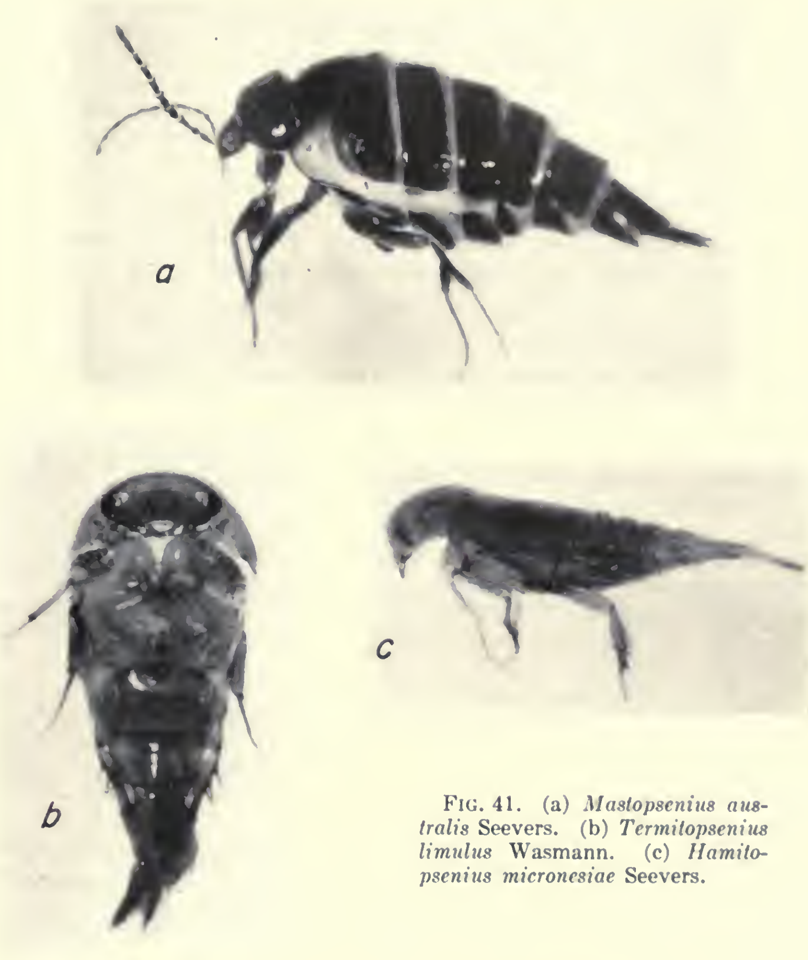


FIG. 41. (a) *Mastopsenius australis* Seevers. (b) *Termitopsenius limulus* Wasmann. (c) *Hamitopsenius micronesiae* Seevers.

Wasmann stated that the antennae are 10-segmented in this genus but I have not been able to examine the antennae of *caudatus* to determine the number of segments. The antennae of *micronesiae* are 11-segmented.

Hamitopsenius caudatus Wasmann

Hamitopsenius caudatus Wasmann, 1916, Zool. Jahrb. Syst., **39**: 201, pl. 4, fig. 17, *a–c*, pl. 5, fig. 17, *d–k* (Tandjong Slamat, Sumatra; *Amitermes dentatus* Haviland; Wasmann coll.).

Material examined.—One topotype (cotype; U. S. Nat. Mus.).

Coloration brown. Pronotum and elytra glabrous and without macrosetae. Tergites with a row of very long macrosetae on apical margin and a moderate number of pale, recumbent setae elsewhere. Pronotum three-fifths broader than long; its base strongly bisinuate. Sutural length of elytra more than one-third as long as pronotum. Lateral plates of ninth segment stout and long, nearly three-fourths as long as entire abdomen.

Hamitopsenius micronesiae, new species. Figure 41, *c*.

Distinguished from *caudatus* by its paler coloration, distinctive chaetotaxy of tergites, broader pronotum, longer elytra, and much shorter lateral plates of ninth abdominal segments.

Color light rufo-testaceous. Pronotum and elytra glabrous in appearance but with extremely fine, sparse punctulation and pubescence; without macrosetae, the elytra with a few short hairs on lateral margins. Tergites 3–6 with a row of 8–10 very long, fine macrosetae about midway between base and apex; basal half of each tergite with sparse vestiture of recumbent and semi-erect hairs, apical half glabrous; seventh tergite with 6 macrosetae; eighth tergite with 4. Sternites with numerous pale, semi-erect hairs; sternites 3–7 with a pair of long, dark, closely placed bristles near each lateral margin. Pronotum three-fourths broader than long; its base feebly bisinuate, basal angles produced. Sutural length of elytra almost three-fourths as long as pronotum; elytral apices almost straight. Lateral plates of ninth abdominal segment only one-fourth as long as abdomen. Hind tibiae with two spines on lateral margin and three at apex.

Length, 1.5 mm.

Holotype from Koror Island, Palau Islands, Micronesia; collected November 22, 1947, by Henry S. Dybas (Pacific Science Board Expedition); with *Prorhinotermes*, n. sp. In collection of United States National Museum.

Paratypes.—Ten specimens, Koror Island, from three colonies of *Prorhinotermes*, n. sp.; collected November 22, 1947, January 17, 1948, and February 10, 1948, by Henry S. Dybas. In Chicago Natural History Museum, United States National Museum, and Bishop Museum.

RHINOTERMOPSENIUS Seevers

Rhinotermopsenius Seevers, 1941, Ann. Ent. Soc. Amer., 34: 329. Type species: *Rhinotermopsenius saltatorius* Seevers.

Distinguished from *Termitopsenius* by its non-limuloid form; smaller pronotum and elytra; physogastric abdomen; longer, more slender, feebly spinose hind legs; labial palpi; and absence of genal grooves.

Head small, deflexed, covered in part by pronotum; thorax and basal segments of abdomen somewhat swollen and with areas of white, non-sclerotized integument;

abdomen acuminate posterior to fourth segment. Head and mouth parts very similar to those of *Termitopsenius* but genae not grooved in front of eyes. Gula and submentum very short, the former feebly sclerotized. Segment 2 of labial palpi asymmetrical (very similar to that of *Trichopsenius*). Antennal segments 4–7 longer than those of *Termitopsenius*. Pronotum moderate in size, trapezoidal in shape, broadest at base, its sides not appreciably deflexed. Elytra moderate

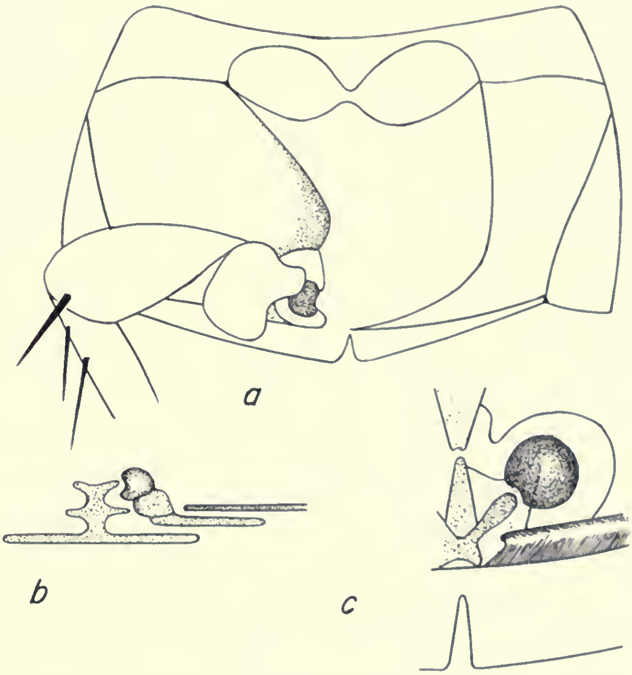


FIG. 42. *Termitopsenius acanthoscelis* Seevers. (a) Ventral view of metasternum, illustrating articulation of hind leg (right metasternal plate removed). (b) Diagrammatic section showing head of trochanter. (c) Dorsal view of trochanter head in articulation with two processes.

in size, its sides nearly straight; epipleura very small. Metasternal lobes relatively narrow. Hind legs one-half longer than those of *Termitopsenius*. Abdomen distinctive; basal segments somewhat physogastric, terminal segments acuminate.

Rhinotermopsenius saltatorius Seevers. Figure 40, *d*.

Rhinotermopsenius saltatorius Seevers, 1941, Ann. Ent. Soc. Amer., 34: 330, pl. 1, figs. 1, 8, 12, 13 (Kartabo, British Guiana; *Rhinotermes marginalis* Linnaeus; Chicago Natural History Museum).

Color light reddish-brown, abdomen lighter than foreparts. Head sparsely and microscopically punctate, the punctures usually arranged in small groups; with 2 vertexal setae medial to antennae. Pronotal disk with four longitudinal rows of 5 setae each, and with several small setae on lateral margins. Tergites and sternites 3–7 with several rows of moderately long, very pale, erect setae; tergite 8 with apical setae and a subapical row of 8 pale setae. Lateral plates of ninth segment very stout and strongly setose.

Length, 1.75–2 mm.

MASTOPSENIUS Seevers

Mastopsenius Seevers, 1945, Pan-Pac. Ent., **21**: 64. Type species: *Mastopsenius australis* Seevers.

A very distinctive genus, characterized especially by its large, conical, physogastric abdomen. The antennae, with their campanulate intermediate segments, and the elytra, with their continuously arcuate lateral and apical margins, are distinctive.

Body robust, fusiform. Head dorso-ventrally compressed; deflexed a little, not covered by pronotum. Antennae elongated, segments 3–9 campanulate. Eyes large. Gula well sclerotized; mentum and submentum strongly transverse; ligula bifid. Pronotum robust, strongly transverse, margined except for medial one-half of base, which is strongly deflexed. Elytra narrower than pronotum, their lateral and apical margins continuously arcuate, the outer apical angles obsolete. Winged. Prosternum broadly tuberculate. Mesosternum large. Meso- and metasternal processes slender, carinate. Metasternum relatively short and narrow behind middle coxae, its width from median line to side margin scarcely greater than width of the large metepimeron. Metasternal plates moderately large, about equal to posterior trochanters. Mesothorax, metathorax, and basal abdominal segments greatly inflated, exposing considerable white, non-sclerotized integument. Abdomen conical.

Mastopsenius australis Seevers. Figure 41, *a*.

Mastopsenius australis Seevers, 1945, Pan-Pac. Ent., **21**: 65, text figs. 1, 2 (Townsville, Queensland, Australia; *Mastotermes darwiniensis* Froggatt; Chicago Natural History Museum).

Head brown; antennal segments 1–3 flavo-testaceous, segments 4–10 with basal one-third black and apex brown; pronotum dull to shining black, with a reddish median area; elytra piceous to dark brown; abdominal sclerites bright reddish-brown; legs brown, coxae, trochanters, and femora with dusky margins. Head with 2 vertexal setae between antennae. Pronotum with four irregular, transverse rows each with about 10 fine hairs. Elytra with four very irregular rows of fine hairs. Abdominal sclerites sparsely and uniformly clothed with fine, erect hairs. Basal antennal segment strongly clavate, its medial surface concave; segment 2 one-third as long; segments 3 and 4 subequal in length, 5–7 a trifle longer, 8–10 decreasing in length.

Length, 5.5–6.2 mm.

SCHIZELYTHRON Kemner

Schizelythron Kemner, 1925, Ent. Tidskr., **46**: 110. Type species: *Schizelythron javanicum* Kemner.

The position of this genus within the subfamily is not apparent at present but it certainly belongs here. Kemner, recognizing its remarkable qualities, proposed a subfamily to receive it, but in so doing ignored the existence of its closest relatives. The genus is well illustrated and described by Kemner and may be recognized at once by its unique elytra, which are split lengthwise from a point near the base. Inasmuch as I have not examined specimens of *Schizelythron,* I shall not attempt to characterize it in detail. The mouth parts seem to be typical of the subfamily. The head is moderately deflexed but not covered by the pronotum. The pronotum has a deep pit on each side of the disk and a broad deep impression near the base. The abdomen is more or less cylindrical, not unlike that of *Megaxenistusa,* and appears to be moderately physogastric.

Schizelythron javanicum Kemner

Schizelythron javanicum Kemner, 1925, Ent. Tidskr., 46: 119, text figs. 1–3, pl. 3 (Buitenzorg, Java; *Schedorhinotermes javanicus* Kemner; ?Kemner coll.).

Subfamily TACHYPORINAE

Termitophily is an insignificant feature of the Tachyporinae, yet brief mention must be made of the genus *Termitoplus* Silvestri. A few years ago Silvestri, although recording this genus with *Syntermes,* placed it near *Wasmannotherium* Bernhauer, a neotropical genus associated with *Eciton* (army ants). It is apparent from Silvestri's excellent illustrations that *Termitoplus* is not closely allied to *Wasmannotherium* (in fact does not belong to the same tribe), and an examination of the genus confirmed this viewpoint. *Wasmannotherium* and *Vatesus* comprise a small group of distinctive tachyporine species that are always found in the company of *Eciton,* and it would be a serious mistake to distort the host pattern by linking them with the termitophilous genus *Termitoplus.*

Termitoplus is in fact related to *Erchomus* Motschulsky (= *Coproporus* Kraatz), a large genus of free-living tachyporines, and my preliminary comparison of the two genera did not reveal a significant basis for separation. However, I am not familiar enough with *Erchomus* to state that *Termitoplus* is a synonym of it. More than seventy species of *Erchomus,* mostly collected from logs, under bark, and from vegetable debris, have been recorded from the Neotropical Region alone.

Termitoplus grandis Silvestri, the only known species, is apparently a regular inhabitant of *Syntermes* mounds, but whether or not it has an obligatory relationship to the *Syntermes* societies is yet to be determined. For a description and illustrations of this species, the interested reader is referred to Silvestri's paper.

TERMITOPLUS Silvestri

Termitoplus Silvestri, 1945, Comm. Pont. Acad. Sci., **9**: 547. Type species: *Termitoplus grandis* Silvestri.

Termitoplus grandis Silvestri

Termitoplus grandis Silvestri, 1945, Comm. Pont. Acad. Sci., **9**: 551, text figs. 13, 14 (Jabaquara, São Paulo, Brazil; and Jaguariahiva, Paraná, Brazil; *Syntermes grandis* Rambur; Silvestri coll.).

Record.—Silvestri also recorded this species from Loreto, Misiones, Argentina, with *Syntermes obtusus* Holmgren.

Material examined.—Brazil: São Paulo (Interlagos), São Paulo, June 5, 1951, with *Syntermes wheeleri* Emerson (determined by R. Araujo); and São Paulo (Congohas), São Paulo, July 3, 1951, with *Syntermes dirus* Burmeister (determined by R. Araujo); both collections by R. L. Araujo.

Subfamily HYPOCYPHTINAE

This is a small subfamily which, although sometimes classed as a tribe of the Tachyporinae, is almost certainly more closely related to the Aleocharinae. A detailed comparative study is needed to establish the validity of the subfamily category or to place this group in its proper subfamily.

At present the subfamily includes *Cypha* Leach (=*Hypocyphthus* Gyllenhal) and a few related genera. Only a few species are associated in any way with termites, and it is doubtful if these have an obligatory relationship to termite societies. It is probable, therefore, that they do not conform to the definition of termitophiles used in this revision. Some species have been recorded so frequently with termites that they cannot be ignored, even if at other times they occur under bark of logs or even in ant colonies.

Species of *Anacyptus* are extremely minute, being less than one millimeter in length. They are probably the smallest staphylinids, except for the subterranean Leptotyphlinae. *Anacyptus* has a very wide distribution in the Americas, where it has been recorded with *Reticulitermes*, *Coptotermes*, and *Diversitermes* as well as in logs and under bark. I have material that was collected with *Eciton* in North Carolina. The host-guest relationship is apparently so weak that *Anacyptus* is extremely polyxenous.

I recently examined, in the Cameron collection of the British Museum (Natural History), an undescribed genus that was collected with termites in Angola. This genus (*Mesoporus* Cameron, MS) will soon be described in a posthumous paper by Cameron. Although believed by Cameron to represent a new subfamily, it doubtless has a position close to *Anacyptus* in the Hypocyphtinae.

ANACYPTUS Horn

Anacyptus Horn, 1877, Trans. Amer. Ent. Soc., 6: 87. Type species: *Anacyptus testaceus* LeConte.

Microcyptus Horn, 1883, Trans. Amer. Ent. Soc., **10**, proc., p. 1.

Anacyptus testaceus LeConte

Hypocyptus testaceus LeConte, 1853, Smithson. Misc. Coll., 6: 30 (Athens, Georgia; under pine bark; Museum of Comparative Zoology).

Anacyptus testaceus LeConte, Horn, 1877, Trans. Amer. Ent. Soc., 6: 87, 125; Schwarz, 1878, Proc. Amer. Phil. Soc., **17**: 440; Blackwelder, 1943, Bull. U. S. Nat. Mus., **182**: 532.

Microcyptus testaceus LeConte, Schwarz, 1889, Proc. Ent. Soc. Wash., **1**: 160; Blatchley, 1910, Coleopt. Indiana, p. 442.

Records.—Blackwelder records this species from Arizona, Texas, and Florida (U. S. Nat. Mus. coll.), Georgia (LeConte coll.), Georgia and Arizona (Horn, 1877), Lake Superior (Casey coll.), Cayamas, Cuba (Schwarz coll., U. S. Nat. Mus.), and Montserrat (Hubbard coll., U. S. Nat. Mus.).

Material examined.—Florida: North Miami, December 4, 1940, E. M. Miller, with *Prorhinotermes simplex* Hagen; Royal Palm State Park, March 23, 1941, V. Dropkin and A. Emerson, with *Neotermes castaneus* Burmeister; Tampa, November 15, 1936, O. Falls, with *Reticulitermes hageni* Banks. North Carolina: Southern Pines, April 16, 1949, M. Wing, with *Eciton* (*Neivamyrmex*) *nigrescens* Cresson. Arkansas: Hot Springs, July 1, 1935, C. Seevers, with *Reticulitermes tibialis* Banks.

Other material, possibly not belonging to this species, was collected in Mexico: Penuela, Vera Cruz, August 17, 1941, H. Dybas, under bark; and Huichihuayan, San Luis Potosi, June 18, 1941, H. Dybas, under bark.

CALLOPSENIUS Wasmann

Eupsenius Wasmann, 1902, Boll. Mus. Zool. Torino, **17**: 5. Type species: *Eupsenius clavicornis* Wasmann.

Callopsenius Wasmann, 1903, Deuts. Ent. Zeitschr., **1903**: 236 (for *Eupsenius*, preoccupied, LeConte, 1850).

Callopsenius was placed by Wasmann in the subfamily Cephaloplectinae, which has since been shown (Seevers and Dybas, 1943) to be extremely artificial. *Cephaloplectus* and related genera were transferred to the family Limulodidae (more closely allied to the Ptiliidae than to the Staphylinidae), while other genera were assigned to existing staphylinid subfamilies. I have since examined the type of Wasmann's *Callopsenius clavicornis,* which unfortunately lacks a head and part of the thorax, and can only conclude that it belongs to the Hypocyphtinae. The hind coxae are particularly indicative of relationship to this group; they bear large lamellar plates that partially conceal the hind femora.

Callopsenius clavicornis Wasmann

Eupsenius clavicornis Wasmann, 1902, Boll. Mus. Zool. Torino, 17, no. 427, p. 6 (Tacurúpucú, Paraguay; *Heterotermes longiceps* Snyder; Wasmann coll.); Silvestri, 1903, Redia, 1: 202, pl. 6, figs. 285, 286.

IV. Systematic Catalogues

A CLASSIFICATION OF THE TERMITOPHILOUS STAPHYLINIDAE, INCLUDING HOST RECORDS

Subfamily **ALEOCHARINAE**

Tribe **COROTOCINI**

Subtribe **Timeparthenina**

Termituncula Borgmeier		
gracilipes Borgmeier	*Procornitermes araujoi* Emerson	Brazil
Autuoria Silvestri		
elegantulum Silvestri	*Paracornitermes emersoni* Araujo	Brazil
Termitozophilus Silvestri		
laetus Silvestri	*Cornitermes cumulans* Kollar	Brazil Argentina Paraguay
mirandus Mann	*Cornitermes pugnax* Emerson	British Guiana
Timeparthenus Silvestri		
regius Silvestri	*Anoplotermes hageni* Snyder and Emerson	Brazil
oglobini Silvestri	*Anoplotermes bequaerti* Snyder and Emerson	Argentina
Ptocholellus Silvestri		
mimus Silvestri	*Anoplotermes turricola* Silvestri	Brazil

Subtribe **Termitogastrina**

Termitophya Wasmann		
amica Mann	*Nasutitermes guayanae* Holmgren	British Guiana Trinidad
araujoi Borgmeier	*Nasutitermes proximus* Silvestri	Brazil
ecuadoriensis Seevers	*Nasutitermes peruanus* Holmgren	Ecuador
emersoni Seevers	*Nasutitermes ephratae* Holmgren	British Guiana Panama
flaviventris Mann	*Nasutitermes costalis* Holmgren	British Guiana Trinidad
heyeri Wasmann	*Nasutitermes* sp. (see p. 73)	Brazil

holmgreni Wasmann	*Nasutitermes mojosensis* Holmgren	Bolivia
	Nasutitermes chaquimayensis Holmgren	Peru
inornata Seevers	*Nasutitermes dendrophilus* Holmgren	Ecuador
piliventris Seevers	*Nasutitermes columbicus* Holmgren	Panama
punctata Mann	*Nasutitermes similis* Emerson	British Guiana
Termitopithus Seevers		
crassiusculus Seevers	*Nasutitermes aquilinus* Holmgren	Brazil
Termitosyne Seevers		
platygastra Seevers	*Nasutitermes aquilinus* Holmgren	Brazil
Termitosynodes Seevers		
williamsi Seevers	*Nasutitermes nigriceps* Haldeman	Ecuador
Termitomorpha Wasmann		
costaricensis Seevers	*Nasutitermes corniger* Motschulsky	Costa Rica
fissipennis Casey	*Nasutitermes costalis* Holmgren	British Guiana
	Nasutitermes corniger Motschulsky	Panama
huachii Seevers	*Nasutitermes* sp.	Bolivia
manni Seevers	*Nasutitermes peruanus* Holmgren	Bolivia
	Nasutitermes pilosus Snyder	
meinerti Wasmann	*Nasutitermes meinerti* Wasmann	British Guiana
	Nasutitermes costalis Holmgren	Grenada
		Venezuela
Trachopeplus Mann		
disjunctipennis Seevers	*Nasutitermes nigriceps* Haldeman	Ecuador
setosus Mann	*Nasutitermes nigriceps* Haldeman	British Guiana
Termitogaster Casey		
beniensis Seevers	*Nasutitermes chaquimayensis* Holmgren	Bolivia
bicolor Seevers	*Nasutitermes dendrophilus* Holmgren	Ecuador
brevis Mann	*Nasutitermes costalis* Holmgren	British Guiana
		Trinidad
chavantinae Seevers	*Nasutitermes bivalens* Holmgren	Brazil
diversicollis Seevers	*Nasutitermes ephratae* Holmgren	Colombia
emarginatus Seevers	*Nasutitermes globiceps* Holmgren	Brazil
emersoni Mann	*Nasutitermes ephratae* Holmgren	British Guiana
		Trinidad
impressicollis Seevers	*Nasutitermes peruanus* Holmgren	Ecuador

insolens Casey	*Nasutitermes corniger* Motschulsky	Panama
		Honduras
magdalenae Seevers	*Nasutitermes ephratae* Holmgren	Colombia
nigricollis Silvestri	*Nasutitermes sanctaeanae* Holmgren	Brazil
	Nasutitermes pluriarticulatus Holmgren	
	Nasutitermes bivalens Holmgren	Argentina
puncticeps Seevers	*Nasutitermes peruanus* Holmgren	Bolivia
testaceus Seevers	*Nasutitermes corniger* Motschulsky	Costa Rica
wasmanni Holmgren	*Nasutitermes mojosensis* Holmgren	Bolivia
wenzeli Seevers	*Nasutitermes bivalens* Holmgren	Brazil
Neotermitogaster Seevers		
colonus Seevers	*Nasutitermes peruanus* Holmgren	Ecuador
Termitoides Seevers		
marginatus Seevers	*Nasutitermes peruanus* Holmgren	Ecuador
Xenogaster Wasmann		
fossulata Mann	*Nasutitermes intermedius* Banks	British Guiana
glabriventris Seevers	*Nasutitermes jaraguae* Holmgren	Brazil
inflata Wasmann	*Nasutitermes aquilinus* Holmgren	Brazil
	Nasutitermes itapocuensis Holmgren	
inquilina Borgmeier	*Nasutitermes proximus* Silvestri	Brazil
	Nasutitermes itapocuensis Holmgren	
nana Seevers	*Nasutitermes jaraguae* Holmgren	Brazil
pilosula Seevers	*Nasutitermes ehrhardti* Holmgren	Brazil
reichenspergeri Seevers	*Nasutitermes jaraguae* Holmgren	Brazil
	Nasutitermes hageni Emerson	
subnuda Seevers	*Nasutitermes itapocuensis* Holmgren	Brazil
Xenopelta Mann		
cornuta Mann	*Nasutitermes guayanae* Holmgren	British Guiana
	Nasutitermes columbicus Holmgren	Panama
tricornis Mann	*Nasutitermes similis* Emerson	British Guiana
Termitotima Wasmann		
assmuthi Wasmann	*Trinervitermes biformis* Wasmann	India
Idiogaster Wasmann		
escherichi Wasmann	*Trinervitermes rapulum* Sjöstedt	Eritrea
Affinoptochus Kemner		
exclusus Kemner	*Bulbitermes constrictoides* Holmgren	Java
	Nasutitermes matangensis Haviland	

Termitella Wasmann		
foveolata Reichensperger	*Nasutitermes torquatus* Sjöstedt	Belgian Congo
gridellii Bernhauer	?*Nasutitermes* sp.	Belgian Congo
lujae Wasmann	*Nasutitermes torquatus* Sjöstedt	Belgian Congo
	Nasutitermes maculiventris Sjöstedt	
rubricollis Seevers	*Nasutitermes torquatus* Sjöstedt	Belgian Congo
Termitellodes Seevers		
lativentris Seevers	*Nasutitermes usambarensis* Sjöstedt	Belgian Congo
Idioptochus Seevers		
lehmensicki Seevers	*Grallatotermes africanus* Harris	Tanganyika
Termitoptochus Silvestri		
indicus Silvestri	*Bulbitermes singaporiensis* Haviland	Malaya
philippinus Silvestri	*Nasutitermes luzonicus* Oshima	Philippines
?*luzonicus* Silvestri	*Nasutitermes luzonicus* Oshima	Philippines
?*ceylonicus* Silvestri	*Nasutitermes ceylonicus* Holmgren	Ceylon
?*peninsularis* Silvestri	*Trinervitermes heimi* Wasmann	India
?*sumatranus* Silvestri	*Hospitalitermes butteli* Holmgren	Sumatra
Millotoca Paulian		
mirotermitidis Paulian	?*Termes baculiformis* Holmgren	Madagascar
tanganyikae Seevers	*Grallatotermes africanus* Harris	Tanganyika
Paracorotoca Warren		
akermani Warren	*Trinervitermes trinerviformis* Holmgren	Natal

Subtribe **Corotocina**

Corotoca Schiødte		
araujoi Seevers	*Constrictotermes cyphergaster* Silvestri	Brazil
guyanae Mann	*Constrictotermes cavifrons* Holmgren	British Guiana
melantho Schiødte	*Constrictotermes cyphergaster* Silvestri	Brazil
phylo Schiødte	*Constrictotermes cyphergaster* Silvestri	Brazil
Eburniola Mann		
gastrovittata Seevers	*Nasutitermes ephratae* Holmgren	Panama
	Nasutitermes meinerti Wasmann	Colombia
leucogaster Mann	*Nasutitermes guayanae* Holmgren	British Guiana
lujae Seevers	*Nasutitermes jaraguae* Holmgren	Brazil

Termitopullus Reichensperger		
sociusculus Reichensperger	*Nasutitermes usambarensis* Sjöstedt	Belgian Congo
Termitoptocinus Silvestri		
australiensis Silvestri	*Nasutitermes fumipennis* Walker	Australia
Termitomimus Trägårdh		
emersoni Seevers	*Nasutitermes usambarensis* Sjöstedt	Belgian Congo
entendveniensis Trägårdh	*Trinervitermes trinerviformis* Holmgren	Natal
latipes Seevers	*Nasutitermes maculiventris* Sjöstedt	Belgian Congo
Spirachtha Schiødte		
eurymedusa Schiødte	*Constrictotermes cyphergaster* Silvestri	Brazil
mirabilis Mann	*Constrictotermes cavifrons* Holmgren	British Guiana
schioedtei Mann	*Constrictotermes cavifrons* Holmgren	British Guiana
Thyreoxenus Mann		
albidus Seevers	*Nasutitermes ephratae* Holmgren	Colombia
autuorii Silvestri	*Nasutitermes ?arenarius* Silvestri	Brazil
boliviae Seevers	*Nasutitermes* sp.	Bolivia
brevitibialis Seevers	*Nasutitermes costalis* Holmgren	Colombia
convexinotus Seevers	*Nasutitermes chaquimayensis* Holmgren	Bolivia
cucullatus Seevers	*Nasutitermes ephratae* Holmgren	Colombia
major Mann	*Nasutitermes guayanae* Holmgren	British Guiana
	Nasutitermes columbicus Holmgren	Panama
parviceps Mann	*Nasutitermes costalis* Holmgren	British Guiana
		Trinidad
pulchellus Mann	*Nasutitermes ephratae* Holmgren	British Guiana
	Nasutitermes pilosus Snyder	Brazil
	Nasutitermes bivalens Holmgren	Bolivia
solomonensis Seevers	*Nasutitermes novarumhebridarum* Holmgren and Holmgren	Solomon Islands
Oideprosoma Silvestri		
mirandum Silvestri	*Trinervitermes trinervius* Rambeau	French Guinea

Subtribe **Abrotelina**

Abroteles Casey		
badia Seevers	*Nasutitermes coxipoensis* Holmgren	Brazil
beaumonti Casey	*Nasutitermes corniger* Motschulsky	Panama
	Nasutitermes ephratae Holmgren	Costa Rica
	Nasutitermes meinerti Wasmann	Colombia

bisetosus Seevers	*Nasutitermes dendrophilus* Holmgren	Ecuador
compacticornis Borgmeier	*Nasutitermes proximus* Silvestri	Brazil
	Nasutitermes jaraguae Holmgren	
lobata Seevers	*Nasutitermes globiceps* Holmgren	Brazil
philetaerus Silvestri	*Nasutitermes fulviceps* Silvestri	Argentina
pubicollis Seevers	*Nasutitermes jaraguae* Holmgren	Brazil
rurrenabaquensis Seevers	*Nasutitermes peruanus* Holmgren	Bolivia
	Nasutitermes pilosus Snyder	
	Nasutitermes chaquimayensis Holmgren	
Termitoiceus Silvestri		
anastrephoproctus Silvestri	*Velocitermes heteropterus* Silvestri	Brazil
simulans Silvestri	*Velocitermes heteropterus* Silvestri	Brazil
	Diversitermes sp.	
Oecidiophilus Silvestri		
mimellus Silvestri	*Nasutitermes* (s. lat.) Silvestri	Argentina
Fonsechellus Silvestri		
bicolor Silvestri	*Nasutitermes* (s. lat.) Silvestri	Brazil
diversicolor Silvestri	*Nasutitermes* (s. lat.) Silvestri	Brazil
fragilis Seevers	*Subulitermes* sp.	Brazil
Parvidolum Silvestri		
microsomatis Silvestri	*Subulitermes microsoma* Silvestri	Brazil
Perlinctus Silvestri		
foveicollis Seevers	*Diversitermes* sp.	Brazil
quaesitus Silvestri	*Diversitermes diversimilis* Silvestri	Brazil
Mormellus Silvestri		
bicolor Silvestri	*Subulitermes microsoma* Silvestri	Brazil
Termitosius Silvestri		
pauciseta Silvestri	*Velocitermes heteropterus* Silvestri	Paraguay
Eburniogaster Seevers		
anahuaci Seevers	*Tenuirostritermes*, new sp.	Mexico
termitocola Seevers	*Tenuirostritermes*, new sp.	Arizona
texana Brues	*Tenuirostritermes cinereus* Buckley	Texas
Termitonidia Seevers		
jaliscensis Seevers	*Tenuirostritermes*, new sp.	Mexico
lunata Seevers	*Tenuirostritermes tenuirostris* Desneux	Arizona
michoacani Seevers	*Tenuirostritermes*, new sp.	Mexico
tarascani Seevers	*Tenuirostritermes*, new sp.	Mexico

	Subtribe Termitocharina	
Termitochara Wasmann		
kraatzi Wasmann	*Capritermes capricornis* Wasmann	Madagascar
	Microcerotermes sikorae Wasmann	
	Tribe TERMITONANNINI	
	Subtribe Perinthina	
Termitopelta Borgmeier		
fulgens Borgmeier	*Syntermes molestus* Burmeister	Brazil
Termitocola Seevers		
cylindricornis Seevers	*Nasutitermes pilifrons* Holmgren	Panama
silvestrii Wasmann	*Constrictotermes cyphergaster* Silvestri	Brazil
Macrognathellus Silvestri		
crassicornis Wasmann	*Nasutitermes* sp.	Paraguay
Perinthus Casey		
bolivari Seevers	*Nasutitermes chaquimayensis* Holmgren	Bolivia
	Nasutitermes ephratae Holmgren	Brazil
	Nasutitermes bivalens Holmgren	Trinidad
dudleyanus dudleyanus Casey	*Nasutitermes ephratae* Holmgren	Panama
	Nasutitermes corniger Motschulsky	Colombia
	Nasutitermes columbicus Holmgren	
	Nasutitermes meinerti Wasmann	
dudleyanus wasmanni Mann	*Nasutitermes ephratae* Holmgren	British Guiana
	Nasutitermes costalis Holmgren	Trinidad
dudleyanus major Seevers	*Nasutitermes peruanus* Holmgren	Ecuador
	Nasutitermes dendrophilus Holmgren	
guatemalae Seevers	*Nasutitermes ephratae* Holmgren	Guatemala
hageni Seevers	*Nasutitermes ephratae* Holmgren	Panama
	Nasutitermes corniger Motschulsky	Costa Rica
	Nasutitermes peruanus Holmgren	Ecuador
mayae Seevers	*Nasutitermes corniger* Motschulsky	Honduras
		Guatemala
tarsatus Mann	*Nasutitermes surinamensis* Holmgren	British Guiana
xenocostalis Seevers	*Nasutitermes costalis* Holmgren	British Guiana
	Nasutitermes pilosus Snyder	Trinidad
		Bolivia

Poduroides Mann		
bovingi Mann	*Nasutitermes gaigei* Emerson	British Guiana
Termitonicus Mann		
mahout Mann	*Velocitermes beebei* Emerson	British Guiana
uroclaviger Silvestri	*Diversitermes diversimilis* Silvestri	Brazil
Lauella Mann		
javana Seevers		Java
palauensis Seevers	*Nasutitermes brevirostris* Oshima	Palau Islands
vitiensis Mann	*Nasutitermes olidus* Hill	Fiji Islands
Eutermitophila Cameron		
fletcheri Cameron	*Trinervitermes biformis* Wasmann	India
Perinthodes Seevers		
africanus Seevers	*Nasutitermes latifrons* Sjöstedt	Belgian Congo
Paraperinthus Seevers		
pauciseta Seevers	*Nasutitermes incurvus* Sjöstedt	Belgian Congo

Subtribe **Termitonannina**

Nannellus Silvestri		
anoplotermitis Silvestri	*Anoplotermes* sp.	Brazil
Eunannodes Silvestri		
reconditi Silvestri	*Anoplotermes* sp.	Brazil
Macrotrichurus Silvestri		
brasiliensis Silvestri	*Anoplotermes pacificus* Müller	Brazil
	Cornitermes cumulans Kollar	
notabilis Silvestri	*Anoplotermes* (?) *pacificus* Müller	Brazil
Termitonilla Borgmeier		
luteola Borgmeier	*Anoplotermes* (?) *ater* Hagen	Brazil
Termitonannus Wasmann		
brachycerus Silvestri	*Anoplotermes* sp.	Brazil
domunculi Silvestri	*Procornitermes striatus* Hagen	Argentina
echinoides Seevers	*Anoplotermes* sp.	Bolivia
gatuni Seevers	*Anoplotermes*, new sp.	Panama
major Wasmann	*Anoplotermes bequaerti* Snyder and Emerson	Paraguay
microsomatis Silvestri	*Subulitermes microsoma* Silv.	Brazil

parvulus Silvestri	*Anoplotermes* sp.	Brazil
proximatus Silvestri	*Anoplotermes* sp.	Brazil
schmalzi Wasmann	*Anoplotermes ater* Hagen	Brazil
	Anoplotermes pacificus Müller	
setosus Seevers	*Anoplotermes*, new sp.	Panama
silvestrii Wasmann	*Anoplotermes meridianus* Emerson	Argentina
vagans Silvestri	*Speculitermes reconditus* Silvestri	Brazil
validus Silvestri	*Syntermes grandis* Rambur	Brazil
Termitocomes Seevers		
trinidadensis Seevers	*Labiotermes labralis* Holmgren	Trinidad
wasmanni Seevers	*Speculitermes silvestrii* Emerson	British Guiana

Tribe **TERMITOHOSPITINI**

Subtribe **Termitohospitina**

Termitohospes Seevers		
brasiliana Seevers	*Nasutitermes aquilinus* Holmgren	Brazil
guianae Seevers	*Nasutitermes surinamensis* Holmgren	British Guiana
limulus Seevers	*Cornitermes* sp.	Brazil
miricorniger Seevers	*Nasutitermes ephratae* Holmgren	British Guiana
	Nasutitermes costalis Holmgren	Trinidad
panamensis Seevers	*Nasutitermes columbicus* Holmgren	Panama
silvestrii Seevers	*Nasutitermes aquilinus* Holmgren	Brazil
tachyporoides Seevers	*Cornitermes* sp.	Brazil
unicolor Silvestri	*Cornitermes cumulans* Kollar	Brazil
Termitosocius Seevers		
microps Seevers	*Nasutitermes octopilis* Banks	British Guiana
Paratermitosocius Seevers		
vestitus Mann	*Nasutitermes octopilis* Banks	British Guiana
Blapticoxenus Mann		
brunneus Mann	*Velocitermes beebei* Emerson	British Guiana
Termitosodalis Seevers		
barticae Seevers	*Velocitermes beebei* Emerson	British Guiana
fasciatus Silvestri	*Diversitermes diversimilis* Silvestri	Brazil

	Subtribe **Hetairotermitina**	
Hetairotermes Cameron		
agilis Cameron	"With wood-dwelling termites"	Malaya
bryanti Cameron		Malaya
insulanus Seevers	*Nasutitermes rufirostris* Hill	Palau Islands
latebricola Lea	"With termites"	New South Wales
piceus Cameron	"With wood-dwelling termites"	Malaya
punctiventris Lea	"With termites"	Western Australia
Termitobra Seevers		
perinthoides Seevers	*Nasutitermes rufirostris* Hill	Palau Islands
	Subtribe **Termitospectrina**	
Termitospectrum Mann		
thoracicum Mann	*Nasutitermes gaigei* Emerson	British Guiana
Termitoecia Bernhauer		
fabulosa Bernhauer	"With termites"	Queensland
wilsoni Cameron	"With termites"	New South Wales
Termitana Fairmaire		
perrieri Fairmaire	"With termites"	Madagascar
	Subtribe **Termitusina**	
Termitusa Wasmann		
cameroni Reichensperger	*Cubitermes glebae* Sjöstedt	Tanganyika
escalerae Fauvel	*Cubitermes* sp.	Rio Muni
hystrix Wasmann	*Cubitermes fungifaber* Sjöstedt	Belgian Congo
lativentris Seevers	*Noditermes cristifrons* Wasmann	French Equatorial Africa
lujae Wasmann	*Cubitermes sankurensis* Wasmann	Belgian Congo
	Cubitermes fungifaber Sjöstedt	
mundus Bernhauer	Not stated	Cameroons
quadricollis Cameron	*Cubitermes* sp.	Belgian Congo
sjoestedti Wasmann	*Cubitermes fungifaber* Sjöstedt	Cameroons

Tribe **TERMITOPAEDIINI**

Termitopaedia Wasmann		
kohli Wasmann	*Pseudacanthotermes spiniger* Sjöstedt	Belgian Congo
Termitopulex Fauvel		
grandicornis Fauvel	*Macrotermes bellicosus* Smeathman	Ethiopia
		Eritrea
natalensis Wasmann	*Macrotermes natalensis* Haviland	Natal
sjoestedti Eichelbaum	*Microtermes vadschaggae* Sjöstedt	Tanganyika
Dioxeuta Sharp		
flavescens Cameron	"In termite nest"	Burma
indosinensis Silvestri	*Macrotermes malaccensis* Haviland	Indo-China
microps Sharp	*Macrotermes gilvus* Hagen	Java
		Borneo
		Philippines
Neodioxeuta Seevers		
burmae Seevers	"In termite nest"	Burma
oudemansi Franssen	*Macrotermes gilvus* Hagen	Java
		Philippines
Termitolinus Wasmann		
natalensis Wasmann	*Macrotermes natalensis* Haviland	Natal
Termitobaena Bernhauer		
bryanti Bernhauer	*Macrotermes gilvus* Hagen	Sarawak
Termitotropha Wasmann		
o'neili Wasmann	*Amitermes unidentatus* Wasmann	South Africa
Protermitobia Seevers		
comes Seevers	*Cubitermes subcrenulatus* Silvestri	Sierra Leone
kirbyi Seevers	*Cubitermes*, new sp.	Tanganyika
Termitotecna Wasmann		
braunsi Wasmann	*Odontotermes transvaalensis* Sjöstedt	Orange Free State
Termitobia Wasmann		
burgeoni Cameron	*Macrotermes natalensis* Haviland	Belgian Congo
		Liberia
paolii Gridelli	*Macrotermes bellicosus* Smeathman	Italian Somaliland
physogastra Wasmann	*Macrotermes bellicosus* Smeathman	Gold Coast
rhodesiae Seevers	*Macrotermes natalensis* Haviland	Rhodesia

Tribe **MYRMEDONIINI** (s. lat.)

Subtribe **Myrmedoniina**

Zyras Stephens		
Drusilla Leach		
Termozyras Cameron		
Urodonia Silvestri		

Subtribe **Feldina**

Felda Blackwelder		
(*Asticta* Wasmann)		
butteli Wasmann	*Capritermes nemorosus* Haviland	Malaya
Zunia Blackwelder		
(*Disticta* Wasmann)		
capritermitis Wasmann	*Capritermes nemorosus* Haviland	Sumatra
Termitobiella Wasmann		
setipes Wasmann	*Capritermes nemorosus* Haviland	Malaya

Subtribe **Termitondina**

Termitonda Seevers		
liberiae Seevers	*Macrotermes natalensis* Haviland	Liberia
tachyporoides Seevers	*Macrotermes natalensis* Haviland	Belgian Congo

Subtribe **Termitozyrina**

Termitophagus Silvestri		
synterminus Silvestri	*Syntermes grandis* Rambur	Brazil
	Syntermes wheeleri Emerson	
Termitonusa Borgmeier		
sequax Borgmeier	*Procornitermes araujoi* Emerson	Brazil

Iheringocantharus Bernhauer		
ypiranganus Bernhauer	*Syntermes wheeleri* Emerson	Brazil
Termitozyras Seevers		
adamsoni Seevers	*Labiotermes labralis* Holmgren	Trinidad
boliviae Seevers	*Labiotermes labralis* Holmgren	Bolivia
guianae Seevers	*Labiotermes labralis* Holmgren	British Guiana
Termitosymbia Seevers		
nitida Seevers	*Labiotermes labralis* Holmgren	Bolivia
	Tribe **PSEUDOPERINTHINI**	
Pseudoperinthus Wasmann		
fletcheri Cameron	*Eutermes* sp.	India
malayanus Wasmann	*Lacessititermes laborator* Haviland	Sumatra
	Tribe **ATHETINI**	
	Subtribe **Coptotermoeciina**	
Coptotermoecia Oke		
alutacia Oke	*Coptotermes acinaciformis* Froggatt	Australia
gayi Seevers	*Coptotermes acinaciformis* Froggatt	Australia
	Subtribe **Termitotelina**	
Termitotelus Wasmann		
schultzei Wasmann	*Microhodotermes viator* Latreille	Southwest Africa
	Tribe **PHILOTERMITINI**	
Philotermes Kraatz		
cubitopilis Seevers	*Reticulitermes virginicus* Banks	United States

emersoni Seevers	*Reticulitermes arenincola* Goellner	United States
fuchsii Kraatz	*Reticulitermes virginicus* Banks	United States
pensylvanicus Kraatz	*Reticulitermes flavipes* Kollar	United States
pilosus Kraatz	*Reticulitermes flavipes* Kollar	United States
werneri Seevers	*Reticulitermes virginicus* Banks	United States
Neophilotermes Seevers		
laxicornis Sharp	*Coptotermes crassus* Snyder	Guatemala
		Costa Rica
	Tribe **TERMITODISCINI**	
Termitodiscus Wasmann		
braunsi Wasmann	*Odontotermes transvaalensis* Sjöstedt	Orange Free State
butteli Wasmann	*Odontotermes obscuriceps* Wasmann	Ceylon
escherichi Wasmann	*Odontotermes redemanni* Wasmann	Ceylon
	Odontotermes ceylonicus Wasmann	
heimi Wasmann	*Odontotermes obesus* Rambur	India
minutus Cameron	"In termite nest"	India
splendidus Wasmann	*Odontotermes vulgaris* Haviland	Natal
transvaalensis Silvestri	*Odontotermes angustatus* Rambur	Transvaal
Termitogerrus Bernhauer (*Lissodiscus* Grassé and Poisson)		
bellicosi Silvestri	*Macrotermes bellicosus* Smeathman	Eritrea
burgeoni Bernhauer	*Macrotermes natalensis* Haviland	Belgian Congo
habilis Silvestri	*Macrotermes bellicosus* Smeathman	French Guinea
lepidulus Grassé and Poisson	*Macrotermes natalensis* Haviland	Ivory Coast
quaerens Silvestri	*Macrotermes bellicosus* Smeathman	Senegal
Discoxenus Wasmann		
assmuthi Wasmann	*Odontotermes obesus* Rambur	India
acuticornis Wasmann	*Odontotermes obscuriceps* Wasmann	Ceylon
crassicornis Wasmann	*Odontotermes redemanni* Wasmann	Ceylon
lepisma Wasmann	*Odontotermes wallonensis* Wasmann	India
	Subfamily **PYGOSTENINAE**	
Doryloxenus Wasmann		
brevicornis Cameron	"In termite nest"	India

butteli Wasmann	*Odontotermes obscuriceps* Wasmann	Ceylon
ceylonicus Wasmann	*Odontotermes redemanni* Wasmann	Ceylon
eutermitis Wasmann	*Trinervitermes biformis* Wasmann	India
longesetosus Cameron	"In termite nest"	India
peradenyiae Wasmann	*Odontotermes redemanni* Wasmann	Ceylon
splendidus Wasmann	*Odontotermes obscuriceps* Wasmann	Ceylon
termitophilus Wasmann	*Odontotermes obesus* Rambur	India
transfuga Wasmann	*Odontotermes wallonensis* Wasmann	India
triarticulatus Kemner	*Odontotermes javanicus* Holmgren	Java
wasmanni Cameron	"In termite nest"	Belgian Congo
Pygostenus Kraatz		
termitophilus Wasmann	*Cubitermes fungifaber* Sjöstedt	Belgian Congo

Subfamily **HYPOCYPHTINAE**

Anacyptus Horn		
(*Microcyptus* Horn)		
testaceus LeConte	*Reticulitermes* spp.	United States
		Mexico
goeldii Wasmann	*Coptotermes testaceus* Linnaeus	Brazil
Callopsenius Wasmann		
clavicornis Wasmann	*Heterotermes longiceps* Snyder	Paraguay

Subfamily **TRICHOPSENIINAE**

Trichopsenius Horn		
californicus Seevers	*Reticulitermes hesperus* Banks	United States
depressus LeConte	*Reticulitermes virginicus* Banks	United States
frosti Seevers	*Reticulitermes flavipes* Kollar	United States
japonicus Seevers	*Reticulitermes speratus* Kolbe	Japan
longipes Seevers	*Reticulitermes hesperus* Banks	United States
xenoflavipes Seevers	*Reticulitermes flavipes* Kollar	United States
Xenistusa LeConte		
cavernosa LeConte	*Reticulitermes* sp. indet.	United States
hexagonalis Seevers	*Reticulitermes virginicus* Banks	United States

Megaxenistusa Seevers		
rhinotermitis Seevers	*Rhinotermes marginalis* Linnaeus	British Guiana
Rhinotermopsenius Seevers		
saltatorius Seevers	*Rhinotermes marginalis* Linnaeus	British Guiana
Schizelythron Kemner		
javanicum Kemner	*Schedorhinotermes javanicus* Kemner	Java
Mastopsenius Seevers		
australis Seevers	*Mastotermes darwiniensis* Froggatt	Australia
Termitopsenius Wasmann		
acanthoscelis Seevers	*Rhinotermes marginalis* Linnaeus	British Guiana
limulus Wasmann	*Neocapritermes opacus* Hagen	Argentina
Hamitopsenius Wasmann		
caudatus Wasmann	*Amitermes dentatus* Haviland	Sumatra
micronesiae Seevers	*Prorhinotermes*, new sp.	Palau Islands

Subfamily **TACHYPORINAE**

Termitoplus Silvestri		
grandis Silvestri	*Syntermes dirus* Burmeister	Brazil
	Syntermes grandis Rambur	
	Syntermes obtusus Holmgren	
	Syntermes wheeleri Emerson	

A LIST OF TERMITES AND THEIR STAPHYLINID GUESTS

Family **Mastotermitidae**

Mastotermes darwiniensis Froggatt	
Mastopsenius australis Seevers	Australia

Family **Rhinotermitidae**

Coptotermes crassus Snyder	
Neophilotermes laxicornis Sharp	Guatemala, Costa Rica
Coptotermes acinaciformis Froggatt	
Coptotermoecia alutacia Oke	Australia
Coptotermoecia gayi Seevers	Australia
Prorhinotermes, new sp.	
Hamitopsenius micronesiae Seevers	Palau Islands
Reticulitermes arenincola Goellner	
Philotermes emersoni Seevers	United States
Reticulitermes flavipes Kollar	
Philotermes pensylvanicus Kraatz	United States
Philotermes pilosus Kraatz	United States
Trichopsenius frosti Seevers	United States
Trichopsenius xenoflavipes Seevers	United States
Reticulitermes hesperus Banks	
Trichopsenius californicus Seevers	United States
Trichopsenius longipes Seevers	United States
Reticulitermes speratus Kolbe	
Trichopsenius japonicus Seevers	Japan
Reticulitermes virginicus Banks	
Philotermes cubitopilis Seevers	United States
Philotermes fuchsii Kraatz	United States
Philotermes werneri Seevers	United States
Trichopsenius depressus LeConte	United States
Xenistusa hexagonalis Seevers	United States
Reticulitermes sp. indet.	
Xenistusa cavernosa LeConte	United States
Rhinotermes marginalis Linnaeus	
Megaxenistusa rhinotermitis Seevers	British Guiana
Rhinotermopsenius saltatorius Seevers	British Guiana
Termitopsenius acanthoscelis Seevers	British Guiana
Schedorhinotermes intermedius Brauer	
Termitoecia fabulosa Bernhauer	Australia
Schedorhinotermes javanicus Kemner	
Schizelythron javanicum Kemner	Java

Family **Termitidae; Nasutitermitinae**

Bulbitermes constrictoides Holmgren	
Affinoptochus exclusus Kemner	Java
Bulbitermes singaporiensis Haviland	
Termitoptochus indicus Silvestri	Malaya
Constrictotermes cavifrons Holmgren	
Corotoca guyanae Mann	British Guiana
Spirachtha schioedtei Mann	British Guiana
Spirachtha mirabilis Mann	British Guiana
Constrictotermes cyphergaster Silvestri	
Corotoca araujoi Seevers	Brazil
Corotoca melantho Schiødte	Brazil
Corotoca phylo Schiødte	Brazil
Spirachtha eurymedusa Schiødte	Brazil
Termitocola silvestrii Wasmann	Brazil
Cornitermes cumulans Kollar	
Macrotrichurus brasiliensis Silvestri	Brazil
Termitohospes unicolor Silvestri	Brazil
Termitozophilus laetus Silvestri	Brazil, Argentina, Paraguay
Cornitermes pugnax Emerson	
Termitozophilus mirandus Mann	British Guiana
Cornitermes, sp. indet.	
Termitohospes limulus Seevers	Brazil
Termitohospes tachyporoides Seevers	Brazil
Diversitermes diversimilis Silvestri	
Perlinctus quaesitus Silvestri	Brazil
Termitonicus uroclaviger Silvestri	Brazil
Termitosodalis fasciatus Silvestri	Brazil
Diversitermes, new sp.	
Perlinctus foveicollis Seevers	Brazil
Grallatotermes africanus Harris	
Idioptochus lehmensicki Seevers	Tanganyika
Millotoca tanganyikae Seevers	Tanganyika
Hospitalitermes butteli Holmgren	
Termitoptochus sumatranus Silvestri (larva)	Sumatra
Labiotermes labralis Holmgren	
Termitosymbia nitida Seevers	Bolivia
Termitozyras boliviae Seevers	Bolivia
Labiotermes labralis Holmgren, new subsp.	
Termitocomes trinidadensis Seevers	Trinidad
Termitozyras adamsoni Seevers	Trinidad
Termitozyras guianae Seevers	British Guiana
Lacessititermes laborator Haviland	
Pseudoperinthus malayanus Wasmann	Sumatra
Nasutitermes aquilinus Holmgren	
Termitohospes brasiliana Seevers	Brazil
Termitohospes silvestrii Seevers	Brazil
Termitopithus crassiusculus Seevers	Brazil
Termitosyne platygastra Seevers	Brazil
Xenogaster inflata Wasmann	Brazil
Nasutitermes ? arenarius Silvestri	
Thyrcoxenus autuorii Silvestri	Brazil

Nasutitermes bivalens Holmgren	
Perinthus bolivari Seevers	Brazil
Termitogaster chavantinae Seevers	Brazil
Termitogaster nigricollis Silvestri	Brazil
Termitogaster wenzeli Seevers	Brazil
Thyreoxenus pulchellus Mann	Brazil
Nasutitermes brevirostris Oshima	
Lauella palauensis Seevers	Palau Islands
Nasutitermes ceylonicus Holmgren	
Termitoptochus ceylonicus Silvestri (larva)	Ceylon
Nasutitermes chaquimayensis Holmgren	
Abroteles rurrenabaquensis Seevers	Bolivia
Perinthus bolivari Seevers	Bolivia
Termitogaster beniensis Seevers	Bolivia
Termitophya holmgreni Wasmann	Bolivia, Peru
Thyreoxenus convexinotus Seevers	Bolivia
Nasutitermes columbicus Holmgren	
Perinthus dudleyanus Casey	Panama
Termitohospes panamensis Seevers	Panama
Termitophya piliventris Seevers	Panama
Thyreoxenus major Mann	Panama
Xenopelta cornuta Mann	Panama
Nasutitermes corniger Motschulsky	
Abroteles beaumonti Casey	Panama
Perinthus dudleyanus Casey	Panama
Perinthus hageni Seevers	Panama, Costa Rica
Perinthus mayae Seevers	Honduras, Guatemala
Termitogaster insolens Casey	Panama, Honduras
Termitogaster testaceus Seevers	Costa Rica
Termitomorpha fissipennis Casey	Panama
Termitomorpha costaricensis Seevers	Costa Rica
Nasutitermes costalis Holmgren	
Perinthus dudleyanus wasmanni Mann	British Guiana
Perinthus xenocostalis Seevers	British Guiana, Trinidad
Termitogaster brevis Mann	British Guiana, Trinidad
Termitohospes miricorniger Seevers	British Guiana, Trinidad
Termitomorpha meinerti Wasmann	British Guiana, Grenada
Termitomorpha fissipennis Casey	British Guiana
Termitophya flaviventris Mann	British Guiana, Trinidad
Thyreoxenus brevitibialis Seevers	Colombia
Thyreoxenus parviceps Mann	British Guiana, Trinidad
Nasutitermes coxipoensis Holmgren	
Abroteles badia Seevers	Brazil
Nasutitermes dendrophilus Holmgren	
Abroteles bisetosus Seevers	Ecuador
Perinthus dudleyanus major Seevers	Ecuador
Termitogaster bicolor Seevers	Ecuador
Termitophya inornata Seevers	Ecuador
Nasutitermes ehrhardti Holmgren	
Xenogaster pilosula Seevers	Brazil
Nasutitermes ephratae Holmgren	
Abroteles beaumonti Casey	Panama
Eburniola gastrovittata Seevers	Panama
Perinthus bolivari Seevers	Trinidad

Perinthus dudleyanus Casey	Panama
Perinthus dudleyanus wasmanni Mann	British Guiana, Trinidad
Perinthus guatemalae Seevers	Guatemala
Perinthus hageni Seevers	Panama, Costa Rica
Termitogaster diversicollis Seevers	Colombia
Termitogaster emersoni Mann	British Guiana, Panama
Termitogaster magdalenae Seevers	Colombia
Termitohospes miricorniger Seevers	British Guiana, Trinidad
Termitophya emersoni Seevers	British Guiana, Panama
Thyreoxenus albidus Seevers	Colombia
Thyreoxenus cucullatus Seevers	Colombia
Thyreoxenus pulchellus Mann	British Guiana, Trinidad
Nasutitermes fulviceps Silvestri	
Abroteles philetaerus Silvestri	Argentina
Termitophya heyeri Wasmann	Brazil
Xenogaster inflata Wasmann	Brazil, Uruguay
Nasutitermes fumipennis Walker	
Termitoptocinus australiensis Silvestri	Australia
Nasutitermes gaigei Emerson	
Poduroides bovingi Mann	British Guiana
Termitospectrum thoracicum Mann	British Guiana
Nasutitermes globiceps Holmgren	
Abroteles lobata Seevers	Brazil
Termitogaster emarginatus Seevers	Brazil
Nasutitermes guayanae Holmgren	
Eburniola leucogaster Mann	British Guiana
Termitophya amica Mann	British Guiana, Trinidad
Thyreoxenus major Mann	British Guiana
Xenopelta cornuta Mann	British Guiana
Nasutitermes, new sp.	
Xenogaster reichenspergeri Seevers	Brazil
Nasutitermes incurvus Sjöstedt	
Paraperinthus pauciseta Seevers	Belgian Congo
Perinthodes africanus Seevers	Belgian Congo
Nasutitermes intermedius Banks	
Xenogaster fossulatus Mann	British Guiana
Nasutitermes itapocuensis Holmgren	
Termitophya heyeri Wasmann	Brazil
Xenogaster inflata Wasmann	Brazil
Xenogaster inquilina Borgmeier	Brazil
Xenogaster subnuda Seevers	Brazil
Nasutitermes jaraguae Holmgren	
Abroteles compacticornis Borgmeier	Brazil
Abroteles pubicollis Seevers	Brazil
Eburniola lujae Seevers	Brazil
Termitophya heyeri Wasmann	Brazil
Xenogaster nana Seevers	Brazil
Xenogaster glabriventris Seevers	Brazil
Xenogaster reichenspergeri Seevers	Brazil
Nasutitermes latifrons Sjöstedt	
Perinthodes africanus Seevers	Belgian Congo
Nasutitermes luzonicus Oshima	
Termitoptochus luzonicus Silvestri (larva)	Philippines
Termitoptochus philippinus Silvestri	Philippines

Nasutitermes maculiventris Sjöstedt	
Termitella lujae Wasmann	Belgian Congo
Termitomimus latipes Seevers	Belgian Congo
Nasutitermes matangensis Haviland	
Affinoptochus exclusus Kemner	Java
Nasutitermes meinerti Wasmann	
Abroteles beaumonti Casey	Colombia
Eburniola gastrovittata Seevers	Colombia
Perinthus dudleyanus Casey	Colombia
Termitomorpha meinerti Wasmann	Venezuela
Nasutitermes minimus Holmgren	
Termitophya holmgreni Wasmann	Bolivia
Nasutitermes mojosensis Holmgren	
Termitogaster wasmanni Holmgren	Bolivia
Termitophya holmgreni Wasmann	Bolivia
Nasutitermes nigriceps Haldeman	
Termitosynodes williamsi Seevers	Ecuador
Trachopeplus setosus Mann	British Guiana
Trachopeplus disjunctipennis Seevers	Ecuador
Nasutitermes novarumhebridarum Holmgren and Holmgren	
Thyreoxenus solomonensis Seevers	Solomon Islands
Nasutitermes octopilis Banks	
Paratermitosocius vestitus Mann	British Guiana
Termitosocius microps Seevers	British Guiana
Nasutitermes olidus Hill	
Lauella vitiensis Mann	Fiji Islands
Nasutitermes peruanus Holmgren	
Abroteles rurrenabaquensis Seevers	Bolivia
Perinthus dudleyanus major Seevers	Ecuador
Perinthus hageni Seevers	Ecuador
Termitoides marginatus Seevers	Ecuador
Neotermitogaster colonus Seevers	Ecuador
Termitogaster impressicollis Seevers	Ecuador
Termitogaster puncticeps Seevers	Bolivia
Termitomorpha manni Seevers	Bolivia
Termitophya ecuadoriensis Seevers	Ecuador
Nasutitermes pilifrons Holmgren	
Termitocola cylindricornis Seevers	Panama
Nasutitermes pilosus Snyder	
Abroteles rurrenabaquensis Seevers	Bolivia
Perinthus xenocostalis Seevers	Bolivia
Termitomorpha manni Seevers	Bolivia
Thyreoxenus pulchellus Mann	Bolivia
Nasutitermes pluriarticulatus Silvestri	
Termitogaster nigricollis Silvestri	Brazil
Nasutitermes proximus Silvestri	
Abroteles compacticornis Borgmeier	Brazil
Termitophya araujoi Borgmeier	Brazil
Xenogaster inquilina Borgmeier	Brazil
Nasutitermes rufirostris Hill	
Hetairotermes insulanus Seevers	Palau Islands
Termitobra perinthoides Seevers	Palau Islands

Nasutitermes sanctaeanae Holmgren	
Termitogaster nigricollis Silvestri	Argentina
Nasutitermes similis Emerson	
Termitophya punctata Mann	British Guiana
Xenopelta tricornis Mann	British Guiana
Nasutitermes surinamensis Holmgren	
Perinthus tarsatus Mann	British Guiana
Termitohospes guianae Seevers	British Guiana
Nasutitermes torquatus Sjöstedt	
Termitella foveolata Reichensperger	Belgian Congo
Termitella lujae Wasmann	Belgian Congo
Termitella rubricollis Seevers	Belgian Congo
Nasutitermes usambarensis Sjöstedt	
Termitellodes lativentris Seevers	Belgian Congo
Termitomimus emersoni Seevers	Belgian Congo
Termitopullus sociusculus Reichensperger	Belgian Congo
Nasutitermes, sp. indet.	
Termitomorpha huachii Seevers	Bolivia
Thyreoxenus boliviae Seevers	Bolivia
Nasutitermes (s. lat.) spp., Silvestri	
Oecidiophilus mimellus Silvestri	Argentina
Fonsechellus bicolor Silvestri	Brazil
Fonsechellus diversicolor Silvestri	Brazil
Macrognathellus crassicornis Wasmann	Paraguay
Paracornitermes emersoni Araujo	
Autuoria elegantulum Silvestri	Brazil
Procornitermes araujoi Emerson	
Termitonusa sequax Borgmeier	Brazil
Termituncula gracilipes Borgmeier	Brazil
Procornitermes striatus Hagen	
Termitonannus domunculi Silvestri	Argentina
Subulitermes microsoma Silvestri	
Mormellus bicolor Silvestri	Brazil
Parvidolum microsomatis Silvestri	Brazil
Termitonannus microsomatis Silvestri	Brazil
Subulitermes, new sp.	
Fonsechellus fragilis Seevers	Brazil
Syntermes dirus Burmeister	
Termitoplus grandis Silvestri	Brazil
Syntermes grandis Rambur	
Termitonannus validus Silvestri	Brazil
Termitophagus synterminus Silvestri	Brazil
Syntermes molestus Burmeister	
Termitopelta fulgens Borgmeier	Brazil
Syntermes wheeleri Emerson	
Iheringocantharus ypiranganus Bernhauer	Brazil
Termitophagus synterminus Silvestri	Brazil
Tenuirostritermes cinereus Buckley	
Eburniogaster texana Brues	United States
Tenuirostritermes, new sp.	
Termitonidia jaliscensis Seevers	Mexico
Tenuirostritermes tenuirostris Desneux	
Eburniogaster termitocola Seevers	United States
Termitonidia lunata Seevers	United States

Tenuirostritermes, new sp.	
Eburniogaster anahuaci Seevers	Mexico
Termitonidia michoacani Seevers	Mexico
Termitonidia tarascani Seevers	Mexico
Trinervitermes biformis Wasmann	
Doryloxenus eutermitis Wasmann	India
Eutermitophila fletcheri Cameron	India
Termitotima assmuthi Wasmann	India
Trinervitermes heimi Wasmann	
Termitoptochus peninsularis Silvestri (larva)	India
Trinervitermes rapulum Sjöstedt	
Idiogaster escherichi Wasmann	Eritrea
Trinervitermes trinerviformis Holmgren	
Paracorotoca akermani Warren	Natal
Termitomimus entendveniensis Trägårdh	Natal
Trinervitermes trinervius Rambeau	
Oideprosoma mirandum Silvestri	French Guinea
Velocitermes beebei Emerson	
Blapticoxenus brunneus Mann	British Guiana
Termitonicus mahout Mann	British Guiana
Termitosodalis barticae Seevers	British Guiana
Velocitermes heteropterus Silvestri	
Termitoiceus anastrephoproctus Silvestri	Brazil
Termitoiceus simulans Silvestri	Brazil
Termitosius pauciseta Silvestri	Paraguay

Family **Termitidae; Macrotermitinae**

Macrotermes bellicosus Smeathman	
Termitobia physogastra Wasmann	Gold Coast
Termitobia paolii Gridelli	Italian Somaliland
Termitogerrus bellicosi Silvestri	Eritrea
Termitogerrus habilis Silvestri	French Guinea
Termitogerrus quaerens Silvestri	Senegal
Termitopulex grandicornis Fauvel	Ethiopia
Macrotermes gilvus Hagen	
Dioxeuta microps Sharp	Sarawak, Java, Sumatra, Malaya, Philippines
Neodioxeuta oudemansi Franssen	Java
Macrotermes goliath Sjöstedt	
Termitobia sp.	Tanganyika
Macrotermes malaccensis Haviland	
Dioxeuta indosinensis Silvestri	Indo-China
Macrotermes natalensis Haviland	
Termitonda liberiae Seevers	Liberia, Ivory Coast
Termitonda tachyporoides Seevers	Belgian Congo, Ivory Coast
Termitobia burgeoni Cameron	Belgian Congo, Liberia
Termitobia rhodesiae Seevers	Rhodesia
Termitogerrus burgeoni Bernhauer	Belgian Congo
Termitogerrus lepidulus G. and L.	Ivory Coast
Termitopulex natalensis Wasmann	Natal
Macrotermes swaziae Fuller	
Termitobia sp.	Transvaal

Macrotermes, sp. indet.	
Dioxeuta flavescens Cameron	Burma
Neodioxeuta burmae Seevers	Burma
Microtermes vadschaggae Sjöstedt	
Termitopulex sjoestedti Eichelbaum	Tanganyika
Odontotermes angustatus Rambur	
Termitodiscus transvaalensis Silvestri	Transvaal
Odontotermes ceylonicus Wasmann	
Termitodiscus escherichi Wasmann	Ceylon
Odontotermes javanicus Holmgren	
Doryloxenus triarticulatus Kemner	Java
Odontotermes obesus Rambur	
Discoxenus assmuthi Wasmann	India
Doryloxenus termitophilus Wasmann	India
Termitodiscus heimi Wasmann	India
Odontotermes obscuriceps Wasmann	
Discoxenus acuticornis Wasmann	Ceylon
Doryloxenus butteli Wasmann	Ceylon
Doryloxenus splendidus Wasmann	Ceylon
Termitodiscus butteli Wasmann	Ceylon
Odontotermes redemanni Wasmann	
Discoxenus crassicornis Wasmann	Ceylon
Doryloxenus ceylonicus Wasmann	Ceylon
Doryloxenus peradenyiae Wasmann	Ceylon
Termitodiscus escherichi Wasmann	Ceylon
Odontotermes transvaalensis Sjöstedt	
Termitodiscus braunsi Wasmann	Orange Free State
Termitotecna braunsi Wasmann	Orange Free State
Odontotermes vulgaris Haviland	
Termitodiscus splendidus Wasmann	Natal
Odontotermes wallonensis Wasmann	
Discoxenus lepisma Wasmann	India
Doryloxenus transfuga Wasmann	India
Termitodiscus heimi Wasmann	India
Pseudacanthotermes spiniger Sjöstedt	
Termitopaedia kohli Wasmann	Belgian Congo

Family Termitidae; Amitermitinae

Amitermes dentatus Haviland	
Hamitopsenius caudatus Wasmann	Sumatra
Amitermes unidentatus Sjöstedt	
Termitotropha o'neili Wasmann	South Africa
Anoplotermes ater Hagen	
Termitonannus schmalzi Wasmann	Brazil
Termitonilla luteola Borgmeier	Brazil
Anoplotermes bequaerti Snyder and Emerson	
Termitonannus major Wasmann	Paraguay
Timeparthenus oglobini Silvestri	Argentina
Anoplotermes hageni Snyder and Emerson	
Timeparthenus regius Silvestri	Brazil
Anoplotermes meridianus Emerson	
Termitonannus silvestrii Wasmann	Argentina

Anoplotermes pacificus Müller	
Macrotrichuris brasiliensis Silvestri	Brazil
Macrotrichuris notabilis Silvestri	Brazil
Termitonannus schmalzi Wasmann	Brazil
Anoplotermes turricola Silvestri	
Ptocholellus mimus Silvestri	Brazil
Anoplotermes, new sp.	
Termitonannus gatuni Seevers	Panama
Termitonannus setosus Seevers	Panama
Anoplotermes, sp. indet.	
Eunannodes reconditi Silvestri	Brazil
Nannellus anoplotermitis Silvestri	Brazil
Termitonannus brachycerus Silvestri	Brazil
Termitonannus echinoides Seevers	Bolivia
Termitonannus parvulus Silvestri	Brazil
Termitonannus proximatus Silvestri	Brazil
Speculitermes reconditus Silvestri	
Termitonannus vagans Silvestri	Brazil
Speculitermes silvestrii Emerson	
Termitocomes wasmanni Seevers	British Guiana

Family **Termitidae; Termitinae**

Capritermes capricornis Wasmann	
Termitochara kraatzi Wasmann	Madagascar
Capritermes nemorosus Haviland	
Felda butteli Wasmann	Malaya
Termitobiella setipes Wasmann	Malaya
Zunia capritermitis Wasmann	Sumatra
Cubitermes fungifaber Sjöstedt	
Termitusa hystrix Wasmann	Belgian Congo
Termitusa lujae Wasmann	Belgian Congo
Termitusa sjoestedti Wasmann	Cameroons
Cubitermes glebae Sjöstedt	
Termitusa cameroni Reichensperger	Tanganyika
Cubitermes sankurensis Wasmann	
Termitusa lujae Wasmann	Belgian Congo
Cubitermes subcrenulatus Silvestri	
Protermitobia comes Seevers	Sierra Leone
Cubitermes, sp. indet.	
Termitusa escalerae Fauvel	Rio Muni
Termitusa mundus Bernhauer	Cameroons
Termitusa quadricollis Cameron	Belgian Congo
Microcerotermes sikorae Wasmann	
Termitochara kraatzi Wasmann	Madagascar
Neocapritermes opacus Hagen	
Termitopsenius limulus Wasmann	Argentina
Noditermes cristifrons Wasmann	
Termitusa lativentris Seevers	French Equatorial Africa
Termes baculiformis Holmgren	
Millotoca mirotermitidis Paulian	Madagascar

REGIONAL LIST OF TERMITOPHILOUS STAPHYLINIDAE

I. Neotropical Region

ARGENTINA

Abroteles philetaerus Silvestri
Occidiophilus mimellus Silvestri
Termitogaster nigricollis Silvestri
Termitonannus silvestrii Wasmann
Termitonannus domunculi Wasmann
Termitonicus uroclaviger Silvestri
Termitopsenius limulus Wasmann
Termitozophilus laetus Silvestri
Timeparthenus oglobini Silvestri

BOLIVIA

Abroteles rurrenabaquensis Seevers
Perinthus bolivari Seevers
Perinthus xenocostalis Seevers
Termitogaster beniensis Seevers
Termitogaster puncticeps Seevers
Termitogaster wasmanni Holmgren
Termitomorpha huachii Seevers
Termitomorpha manni Seevers
Termitonannus echinoides Seevers
Termitophya holmgreni Wasmann
Termitosymbia nitida Seevers
Termitozyras boliviae Seevers
Thyreoxenus boliviae Seevers
Thyreoxenus convexinotus Seevers
Thyreoxenus pulchellus Mann

BRAZIL

Abroteles badia Seevers
Abroteles compacticornis Borgmeier
Abroteles lobata Seevers
Abroteles pubicollis Seevers
Autuoria elegantula Silvestri
Corotoca araujoi Seevers
Corotoca melantho Schiødte
Corotoca phylo Schiødte
Eburniola lujae Seevers
Euannodes reconditi Silvestri
Fonsechellus bicolor Silvestri
Fonsechellus diversicolor Silvestri
Fonsechellus fragilis Seevers
Iheringocantharus ypiranganus Bernhauer
Macrotrichurus brasiliensis Silvestri
Macrotrichurus notabilis Silvestri
Mormellus bicolor Silvestri
Nannellus anoplotermitis Silvestri
Parvidolum microsomatis Silvestri
Perinthus bolivari Seevers
Perlinctus quaesitus Silvestri
Perlinctus foveicollis Seevers
Ptocholellus mimus Silvestri
Spirachtha eurymedusa Schiødte
Termitocola silvestrii Wasmann
Termitogaster chavantinae Seevers
Termitogaster emarginatus Seevers
Termitogaster nigricollis Silvestri
Termitogaster wenzeli Seevers
Termitohospes brasiliana Seevers
Termitohospes limulus Seevers
Termitohospes silvestrii Seevers
Termitohospes tachyporoides Seevers
Termitohospes unicolor Silvestri
Termitoiceus anastrephroproctus Silvestri
Termitoiceus simulans Silvestri
Termitonannus brachycerus Silvestri
Termitonannus microsomatis Silvestri
Termitonannus parvulus Silvestri
Termitonannus proximatus Silvestri
Termitonannus schmalzi Wasmann
Termitonannus vagans Silvestri
Termitonannus validus Silvestri
Termitonicus uroclaviger Silvestri
Termitonilla luteola Borgmeier
Termitonusa sequax Borgmeier

Termitopelta fulgens Borgmeier
Termitophagus synterminus Silvestri
Termitophya araujoi Borgmeier
Termitophya heyeri Wasmann
Termitopithus crassiusculus Seevers
Termitoplus grandis Silvestri
Termitosodalis fasciatus Silvestri
Termitosyne platygastra Seevers
Termitozophilus laetus Silvestri
Termituncula gracilipes Borgmeier
Timeparthenus regius Silvestri
Thyreoxenus autuorii Silvestri
Thyreoxenus pulchellus Mann
Xenogaster glabriventris Seevers
Xenogaster inflata Wasmann
Xenogaster inquilina Borgmeier
Xenogaster nana Seevers
Xenogaster pilosula Seevers
Xenogaster reichenspergeri Seevers
Xenogaster subnuda Seevers

BRITISH GUIANA

Blapticoxenus brunneus Mann
Corotoca guyanae Mann
Eburniola leucogaster Mann
Megaxenistusa rhinotermitis Seevers
Paratermitosocius vestitus Mann
Perinthus dudleyanus wasmanni Mann
Perinthus tarsatus Mann
Perinthus xenocostalis Seevers
Poduroides bovingi Mann
Rhinotermopsenius saltatorius Seevers
Spirachtha mirabilis Mann
Spirachtha schioedtei Mann
Termitocomes wasmanni Seevers
Termitogaster brevis Mann
Termitogaster emersoni Mann
Termitohospes miricorniger Seevers
Termitohospes guianae Seevers
Termitomorpha meinerti Wasmann
Termitomorpha fissipennis Casey
Termitonicus mahout Mann
Termitophya amica Mann
Termitophya emersoni Seevers
Termitophya flaviventris Mann
Termitophya punctata Mann
Termitopsenius acanthoscelis Seevers
Termitosocius microps Seevers
Termitosodalis barticae Seevers
Termitospectrum thoracicum Mann
Termitozophilus mirandus Mann
Termitozyras guianae Seevers
Thyreoxenus major Mann
Thyreoxenus parviceps Mann
Thyreoxenus pulchellus Mann
Trachopeplus setosus Mann
Xenogaster fossulatus Mann
Xenopelta cornuta Mann
Xenopelta tricornis Mann

COLOMBIA

Abroteles beaumonti Casey
Eburniola gastrovittata Seevers
Perinthus dudleyanus Casey
Termitogaster diversicollis Seevers
Termitogaster magdalenae Seevers
Thyreoxenus albidus Seevers
Thyreoxenus cucullatus Seevers
Thyreoxenus brevitibialis Seevers

COSTA RICA

Abroteles beaumonti Casey
Neophilotermes laxicornis Sharp
Perinthus hageni Seevers
Termitogaster testaceus Seevers
Termitomorpha costaricensis Seevers

ECUADOR

Abroteles bisetosus Seevers
Neotermitogaster colonus Seevers
Perinthus dudleyanus major Seevers
Perinthus hageni Seevers
Termitogaster bicolor Seevers
Termitogaster impressicollis Seevers
Termitoides marginatus Seevers
Termitophya ecuadoriensis Seevers
Termitophya inornata Seevers
Termitosyne williamsi Seevers
Trachopeplus disjunctipennis Seevers

GUATEMALA

Neophilotermes laxicornis Sharp
Perinthus guatemalae Seevers
Perinthus mayae Seevers

HONDURAS

Perinthus mayae Seevers
Termitogaster insolens Casey

MEXICO

Eburniogaster anahuaci Seevers
Termitonidia jaliscensis Seevers
Termitonidia michoacani Seevers
Termitonidia tarascani Seevers

PANAMA

Abroteles beaumonti Casey
Eburniola gastrovittata Seevers
Perinthus dudleyanus Casey
Perinthus hageni Seevers
Termitocola cylindricornis Seevers
Termitogaster insolens Casey
Termitohospes panamensis Seevers
Termitomorpha fissipennis Casey
Termitonannus gatuni Seevers
Termitonannus setosus Seevers
Termitophya emersoni Seevers
Termitophya piliventris Seevers
Thyreoxenus major Mann

PARAGUAY

Macrognathellus crassicornis Wasmann
Termitonannus major Wasmann
Termitosius pauciseta Silvestri
Termitozophilus laetus Silvestri

PERU

Termitophya holmgreni Wasmann

TRINIDAD, TOBAGO, GRENADA

Eburniola leucogaster Mann
Perinthus dudleyanus wasmanni Mann
Perinthus bolivari Seevers
Perinthus xenocostalis Seevers
Termitocomes trinidadensis Seevers
Termitogaster brevis Mann
Termitogaster emersoni Mann
Termitohospes miricorniger Seevers
Termitomorpha meinerti Wasmann
Termitophya amica Mann
Termitophya flaviventris Mann
Termitozyras adamsoni Seevers
Thyreoxenus parviceps Mann
Thyreoxenus pulchellus Mann

URUGUAY

Xenogaster inflata Wasmann

VENEZUELA

Termitomorpha meinerti Wasmann

II. Nearctic Region

UNITED STATES

Eburniogaster termitocola Seevers
Eburniogaster texana Brues
Philotermes cubitopilis Seevers
Philotermes emersoni Seevers
Philotermes fuchsii Kraatz
Philotermes pilosus Kraatz
Philotermes pensylvanicus Kraatz
Philotermes werneri Seevers
Termitonidia lunata Seevers
Trichopsenius californicus Seevers
Trichopsenius depressus LeConte
Trichopsenius frosti Seevers
Trichopsenius longipes Seevers
Trichopsenius xenoflavipes Seevers
Xenistusa cavernosa LeConte
Xenistusa hexagonalis Seevers

III. Palaearctic Region

JAPAN

Trichopsenius japonicus Seevers

IV. Indomalayan Region

BORNEO

Dioxeuta microps Sharp
Termitobaena bryanti Bernhauer

BURMA

Dioxeuta flavescens Cameron
Neodioxeuta burmae Seevers

CEYLON

Discoxenus acuticornis Wasmann
Discoxenus crassicornis Wasmann
Doryloxenus butteli Wasmann
Doryloxenus ceylonicus Wasmann
Doryloxenus peradenyiae Wasmann
Doryloxenus splendidus Wasmann
Termitodiscus butteli Wasmann
Termitodiscus escherichi Wasmann
Termitoptochus ceylonicus Silvestri

INDIA

Discoxenus assmuthi Wasmann
Discoxenus lepisma Wasmann
Doryloxenus brevicornis Cameron
Doryloxenus eutermitis Wasmann
Doryloxenus longesetosus Cameron
Doryloxenus termitophilus Wasmann
Doryloxenus transfuga Wasmann
Eutermitophila fletcheri Cameron
Pseudoperinthus fletcheri Cameron
Termitodiscus heimi Wasmann
Termitodiscus minutus Cameron
Termitoptochus peninsularis Silvestri
Termitotima assmuthi Wasmann

INDO-CHINA

Dioxeuta indosinensis Silvestri

JAVA

Affinoptochus exclusus Kemner
Dioxeuta microps Sharp
Doryloxenus triarticulatus Kemner
Lauella javana Seevers
Neodioxeuta oudemansi Franssen
Schizelythron javanicum Kemner

MALAYA

Dioxeuta microps Sharp
Felda butteli Wasmann
Hetairotermes agilis Cameron
Hetairotermes bryanti Cameron
Hetairotermes piceus Cameron
Termitobiella setipes Wasmann
Termitoptochus indicus Silvestri

PHILIPPINE ISLANDS

Dioxeuta microps Sharp
Neodioxeuta sp.
Termitoptochus luzonicus Silvestri
Termitoptochus philippinus Silvestri

SUMATRA

Dioxeuta microps Sharp
Hamitopsenius caudatus Wasmann
Pseudoperinthus malayanus Wasmann
Termitoptochus sumatranus Silvestri
Zunia capritermitis Wasmann

V. Australian and Papuan Regions

AUSTRALIA

Coptotermoecia alutacia Oke
Coptotermoecia gayi Seevers
Hetairotermes latebricola Lea
Hetairotermes punctiventris Lea
Mastopsenius australis Seevers
Termitoecia fabulosa Bernhauer
Termitoecia wilsoni Cameron
Termitoptocinus australiensis Silvestri

FIJI ISLANDS

Lauella vitiensis Mann

PALAU ISLANDS

Hamitopsenius micronesiae Seevers
Hetairotermes insulanus Seevers
Lauella palauensis Seevers
Termitobra perinthoides Seevers

SOLOMON ISLANDS

Thyreoxenus solomonensis Seevers

VI. Ethiopian Region

BELGIAN CONGO

Doryloxenus wasmanni Cameron
Paraperinthus pauciseta Seevers
Perinthodes africanus Seevers
Pygostenus infimus Wasmann

Pygostenus termitophilus Wasmann
Termitella foveolata Reichensperger
Termitella gridellii Bernhauer
Termitella lujae Wasmann
Termitella rubricollis Seevers
Termitellodes lativentris Seevers
Termitonda tachyporoides Seevers
Termitobia burgeoni Cameron
Termitogerrus burgeoni Bernhauer
Termitomimus emersoni Seevers
Termitomimus latipes Seevers
Termitopaedia kohli Wasmann
Termitopullus sociusculus Reichensperger
Termitusa hystrix Wasmann
Termitusa lujae Wasmann
Termitusa quadricollis Cameron

THE CAMEROONS

Termitusa mundus Bernhauer
Termitusa sjoestedti Wasmann

ERITREA

Idiogaster escherichi Wasmann
Termitopulex grandicornis Fauvel
Termitogerrus bellicosi Silvestri

ETHIOPIA

Termitopulex grandicornis Fauvel

FRENCH EQUATORIAL AFRICA

Termitusa lativentris Seevers

FRENCH WEST AFRICA

Oideprosoma miranda Silvestri (French Guinea)
Termitonda liberiae Seevers (Ivory Coast)
Termitonda tachyporoides Seevers (Ivory Coast)
Termitogerrus habilis Silvestri (French Guinea)
Termitogerrus lepidulus Grassé and Poisson (Ivory Coast)
Termitogerrus quaerens Silvestri (Senegal)

GOLD COAST

Termitobia physogastra Wasmann

ITALIAN SOMALILAND

Termitobia paolii Gridelli

LIBERIA

Termitobia burgeoni Cameron
Termitogerrus lepidulus Grassé and Lesperon
Termitonda liberiae Seevers

RIO MUNI

Termitusa escalerae Fauvel

SIERRA LEONE

Protermitobia comes Seevers

TANGANYIKA TERRITORY

Idioptochus lehmensicki Seevers
Millotoca tanganyikae Seevers
Protermitobia kirbyi Seevers
Termitopulex sjoestedti Eichelbaum
Termitusa cameroni Reichensperger

UNION OF SOUTH AFRICA

Paracorotoca akermani Warren
Termitobia rhodesiae Seevers
Termitodiscus braunsi Wasmann
Termitodiscus transvaalensis Silvestri
Termitodiscus splendidus Wasmann
Termitomimus entendveniensis Trägårdh
Termitopulex natalensis Wasmann
Termitotecna braunsi Wasmann
Termitotropha o'neili Wasmann

VII. Malagasy Region

MADAGASCAR

Millotoca mirotermitidis Paulian
Termitana perrieri Fairmaire
Termitochara kraatzi Wasmann

A LIST OF DOUBTFULLY TERMITOPHILOUS SPECIES

Subfamily STAPHYLININAE

Belonuchus penetrans Silvestri, 1945, Comm. Pont. Acad. Sci., **9**: 522, text figs. 3, 4 (Brazil; *Syntermes silvestrii* Holmgren, *S. molestus* Burmeister).

Quediosoma sericoilius Cameron, 1920, Ent. Month. Mag., **56**: 216 (=*termitophagum* Cameron, 1926, Trans. Ent. Soc. London, **1926**: 367) (India; after exposing combs of *Odontotermes obesus*).

Termitoquedius iheringi Bernhauer, 1912, Verh. Zool. Bot. Ges. Wien, **62**: 46 (Brazil; termitophilous or myrmecophilous). *Termitoquedius* is a genus of ecitophilous Staphylinidae.

Subfamily PAEDERINAE

Acalophaena basalis Lynch, 1884, Bol. Acad. Nac. Cienc. Cordoba, **7**: 270 (Argentina; *Procornitermes lespesii* Fr. Müller).

Astenus paranensis Lynch, 1884, Bol. Acad. Nac. Cienc. Cordoba, **7**: 299 (Argentina; *Procornitermes lespesii* Fr. Müller).

Paederus termitophilus Wasmann, 1911, Rev. Zool. Afr., **1**: 101 (Africa; *Odontotermes monodon* var. *lujana* Wasmann).

Termitosaurus insinuatus Silvestri, 1945, Comm. Pont. Acad. Sci., **9**: 525, figs. 5, 6 (Brazil; *Syntermes molestus* Burmeister).

Subfamily OXYTELINAE

Oxytelus simulans Cameron, 1930, Rev. Zool. Bot. Afr., **19**: 405 (Belgian Congo; *Macrotermes natalensis* Haviland).

Oxytelus termitophilus Cameron, 1928, Rev. Zool. Bot. Afr., **16**: 18 (Belgian Congo; *Macrotermes natalensis* Haviland).

Subfamily OSORIINAE

Osorius frater Lynch, 1884, Bol. Acad. Nac. Cienc. Cordoba, **7**: 345 (Argentina; *Procornitermes lespesii* Fr. Müller).

Thoracophorus heyeri Wasmann, 1902, Tijd. Ent., **45**: 101 (Brazil; *Nasutitermes fulviceps* Silvestri).

Subfamily TACHYPORINAE

Conosomus heathi Wasmann, 1902, Tijd. Ent., **45**: 99 (California; *Zootermopsis angusticollis* Hagen).

Conosomus termitophilus Wasmann, 1902, Tijd. Ent., **45**: 99 (Brazil; *Nasutitermes fulviceps* Silvestri).

Conosomus convexiusculus Wasmann, 1902, Tijd. Ent., **45**: 99 (Brazil; *Nasutitermes fulviceps* Silvestri).

Subfamily **EUAESTHETINAE**

Edaphus termitophilus Bernhauer, 1916, Ark. Zool., **10**, no. 5, p. 2 (Australia; no host given).

Subfamily **ALEOCHARINAE**

Atheta convivens Silvestri, 1945, Comm. Pont. Acad. Sci., **9**: 541 (Brazil; *Syntermes grandis* Rambur).

Atheta silvestrii (new name for *Atheta termitaria* Silvestri, 1945, Comm. Pont. Acad. Sci., **9**: 538; preoccupied by *A. termitaria* Bernhauer, 1932) (Argentina; *Anoplotermes bequaerti* Snyder and Emerson).

Atheta syntermitis Silvestri, 1945, Comm. Pont. Acad. Sci., **9**: 535 (Brazil; *Syntermes grandis* Rambur).

Atheta termitaria Bernhauer, 1932, Boll. Lab. Zool. Portici, **26**: 13 (French Guinea).

Atheta termitobia Wasmann, 1894, Krit. Verz., p. 211 (Brazil; *Syntermes dirus* Burmeister).

Atheta termitophila Motschulsky, 1859, Études Ent., **8**: 61 (Ceylon).

Aleochara croceipennis Motschulsky, 1858, Bull. Soc. Nat. Moscou, **31**: 238 (Ceylon; in termite nest).

Chledophila annularis Cameron, 1920, Trans. Ent. Soc. London, **1920**: 231 (Fiji Islands).

Coenonica puncticollis Kraatz, Linn. Ent., **11**: 46 (Ceylon).

Dabra termitophila Lea, 1906, Proc. Linn. Soc. N. S. Wales, **31**: 215 (Australia; *Coptotermes raffrayi* Wasmann. Also with *Iridomyrmex* in Victoria [Lea, 1910, p. 134]).

Demerinda termitophila Cameron, 1927, Ent. Month. Mag., **63**: 224 (India; frequents exposed combs of *Odontotermes* [Cameron, 1939, p. 240]).

Fenyesia nigra Cameron, 1920, Trans. Ent. Soc. London, **1920**: 270 (Malaya; with termites in rotting log).

Myrmecopora termitophila Cameron, 1948, Mem. Mus. Nat. d'Hist. Nat., (2), **20**: 237 (Ivory Coast; with a termite).

Orphnebius termitis Motschulsky (= *Hygroptera termitis*), 1859, Études Ent., **8**: 87 (Ceylon; in termite nest).

Oxypoda termitophila Bernhauer, 1901, Deuts. Ent. Zeitschr., **1901**: 252 (Madagascar; no host given).

Philotermimus setiger Reichensperger, 1915, Medd. Goteborgs Mus. Zool., **16**: 3 (Natal; *Odontotermes tragardhi* Holmgren).

Pelioptera micans Kraatz, 1857, Linn. Ent., **11**: 56 (=*Termitopora adustipennis* Motschulsky, 1859, Études Ent., **8**: 93) (Ceylon; in termite nest).

Pelioptera opaca Kraatz, 1857, Linn. Ent., **11**: 56 (Ceylon; in termite nest).

Philastilbus opulentus Bernhauer, 1929, Rev. Zool. Bot. Afr., **18**: 248 (German East Africa; possibly termitophilous).

Porus ferrugineus Kraatz, 1857, Linn. Ent., **22**: 48 (Sudan; probably termitophilous).

Porus ochraceus Westwood, 1839, *in* Royle, Illust. Bot. Himal. Mts., **1**: 55 (India). Recorded as termitophilous (Kraatz, 1857a, p. 21; Wasmann, 1894, p. 89).

Rhopalinda termitophila Cameron, 1927, Ent. Month. Mag., **63**: 223 (India; frequents the exposed combs of "*Termes*").

Termitolara opacella Bernhauer, 1927, Rev. Zool. Bot. Afr., **15**: 336 (Cameroons; with *Eutermes* sp.).

Termitolara reichenspergeri Bernhauer, 1927. Rev. Zool. Bot. Afr., **15**: 240 (Cameroons; with *Nasutitermes latifrons* Sjöstedt).

Tetrasticta polita Kraatz, 1857, Linn. Ent., **11**: 55 (Ceylon; in termite nest).

Urolitus nigeriensis Silvestri, 1947, Arch. Zool. Ital., **31**: 147, fig. 10 (Nigeria; *Odontotermes angustatus* Rambur).

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Index

I. Subfamilies, Tribes, and Subtribes

II. Genera and Subgenera

III. Species and Subspecies

Publication 815