

XP  
H947  
v. 65  
#5

# PHYTOLOGIA

An international journal to expedite botanical and phytoecological publication

Vol. 65

December 1988

No. 5

## CONTENTS

DE LAUBENFELS, D.J., & SILBA, J., <i>Notes on Asian and Trans-Pacific Podocarpaceae, II</i> .....	329
SILBA, J., <i>A new species of Cupressus L. from Tibet</i> .....	333
ESCALONA, F.D., <i>Stylagrostis a new subsection of genus Calamagrostis (Poaceae: Pooideae) and three new species from Columbia, Ecuador and Venezuela</i> .....	337
TURNER, B.L., <i>New species, names and combinations in Wedelia (Asteraceae-Heliantheae)</i> .....	348
TURNER, B.L., <i>New species and combinations in Lasianthaea (Asteraceae-Heliantheae)</i> .....	359
TURNER, B.L., <i>Perymenium oaxacanum (Asteraceae), a new species from southern Mexico</i> .....	371
TURNER, B.L., <i>A new species of Senecio (Asteraceae) from Nuevo Leon, Mexico</i> .....	373
TURNER, B.L., <i>A new species of Oxylobus (Asteraceae, Eupatorieae) from Puebla, Mexico</i> .....	375
TURNER, B.L., <i>A new species of Hidalgoa (Asteraceae, Coreopsidae) from southern Mexico</i> .....	379
TURNER, B.L., <i>New combinations in the genus Montanoa (Asteraceae)</i> .....	382
LOURTEIG, A., <i>Nomenclatura plantarum americanarum. VIII. Boraginaceae</i> .....	383
BUNTING, G.S., <i>Notes on a Guyanan Dieffenbachia (Araceae)</i> ..	390
BUNTING, G.S., <i>Urospathella, new genus of Venezuelan Araceae</i> .....	391
LOURTEIG, A., <i>Nomenclatura plantarum americanarum. VII. Leguminosae</i> .....	393
HOCKING, G.M., <i>Book reviews</i> .....	402

Published by Harold N. Moldenke and Alma L. Moldenke  
590 Hemlock Avenue N.W.  
Corvallis, Oregon 97330-3818  
U.S.A.

Price of this number \$3.00; for this volume \$16.00 in advance or \$17.00 after close of the volume; \$5.00 extra to all foreign addresses and domestic dealers; 512 pages constitute a complete volume; claims for numbers lost in the mail must be made immediately after receipt of the next following number for free replacement; back volume prices apply if payment is received after a volume is closed.

LIBRARY

MAY - 1 1969

NEW YORK  
BOTANICAL GARDEN

NOTES ON ASIAN AND TRANS-PACIFIC **PODOCARPACEAE**, II

David J. De Laubenfels

Dept. of Geography, Syracuse University, Syracuse, N.Y. 13244

John Silba

198 West Hoffman Ave., Lindenhurst, New York 11757

A revisionary study of Asian and Trans-Pacific **Podocarpaceae** taxa has revealed the existence of a number of undescribed species. Additional herbarium specimens studied and extensive field notes were gathered on various taxa from poorly known geographic areas. The exploration and collection of material in poorly explored regions by various collectors has enhanced our understanding of the Asian and Trans-Pacific **Podocarpaceae**.

Particularly of interest in this paper, is of a new prostrate **Falcatifolium** species from New Guinea. Other prostrate **Podocarpaceae** are known from New Caledonia, New Zealand and Chile. De Laubenfels (1969) had early noted the distinctiveness of a tiny leaf form of **Falcatifolium** from the Vogelkop. The lack of general field data on the specimen delayed publishing it as a new species. Now, however it seems evident that this specimen was from a mature markedly distinct prostrate plant. De Laubenfels (1988) had later again referred to the distinctiveness of the Vogelkop collection. Though under **F. papuanum**, he states juvenile leaves are usually larger than adult leaves, thus the uniqueness of this collection.

**Falcatifolium sleumeri** De Laubenfels et Silba, species nova.

**Frutex parvus, decumbens, late expansus, ad 20 cm. altus. Folia parva, falcata, linearia, 6-10 mm. longa et 1.8-2 mm. lata, costis superis prominentibus, apicibus apiculata, marginibus revolutis. Strobili masculi et strobili feminei ignoti.**

Type: **Van Royen & Sleumer 8203a** (Holo-L), Netherlands New Guinea, Vogelkop Peninsula, Nettoti Range, south slope of Mt. Nettoti, on path of Andjai-Wekari R., 1920 m. altitude.

A low, more or less flattened or prostrate shrub to 20 cm. tall or more. Bark scaly, grayish-brown. Branches numerous, erect, spreading widely, creating a flattened crown covering several square meters on the ground. Stems to 0.5 cm. in girth or more. Leaves linear or linear-ovate, falcate, 6-10 mm. long by 1.8-2 mm. wide, midrib raised above; apex apiculate with a short spine 0.2 mm. long; margins slightly revolute; petiole 0.5-0.7 mm. long. Reproductive structures not seen.

**Van Royen & Sleumer 8203a** was collected from a region much outside the range of true **Falcatifolium papuanum** De Laubenfels. **Falcatifolium papuanum** is limited to the eastern part of New Guinea in the central, Morobe and W. Highlands Districts. **Falcatifolium sleumeri** occurs in rather dark mossy forest.

Another interesting collection of *Falcatifolium* from New Guinea is **Havel & Kairo NGF 17343** (L) which has leaves 10-17 mm. long, but in all other characteristics agrees with typical *F. papuanum*. The Havel & Kairo specimen was from a tree 18.3 m. tall and was collected from the slopes of Mt. Kaindi, Morobe District, Papua New Guinea at 2134 m. altitude.

Other conifers collected from Mount Nettoti include *Podocarpus glaucus* Foxw., as **Van Royen & Sleumer 8203** (L,A,BO,K). This specimen was from the south slope of Mount Nettoti, path of Anjai-Wekari, 1920 m., from a tree 10 m. tall and d.b.h. of 25 cm.. (H.O. Sleumer, pers. comm., 5-15-1988).

In reviewing the Venezuelan *Podocarpaceae* De Laubenfels (1982) had named a new species as *Podocarpus buchholzii*. *Podocarpus buchholzii* De Laubenfels differs from *P. tepuiensis* Buchh. et Gray in its erect bud scales not forming a globular ball. Further, reduced leaves often accompany the bud in the former species. A review of recent collections of the Cerro Neblina region has revealed yet another taxon which is distinct in its long and narrow leaves and stalked male pollen cones. This latter feature is quite unique as typical *Podocarpus buchholzii* has sessile pollen cones as other South American *Podocarpus* species had also.

*Podocarpus aracensis* De Laubenfels et Silba, species nova.

Frutex vel arbor 4-6 m. alta. Gemma 4-9 mm. longa, squamis exterioribus lanceolatis, basis 0.5 mm. latis. Folia linearia vel linearia-elliptica, 2.8-8 cm. longa et 4.5-7 mm. lata, costa supra elevata et caniculata, apicibus subacutis. Strobili masculi solitarii, 17-20 mm. longis et 2-2.5 mm. latis, pedunculis 9 mm. longis. Strobili feminei ignoti.

Type: **Rosa & Lira 2317** (Holo-MG), Brazil, Terr. Amazonas, margins of R. Serra Araca.

Paratype: **Prance et al 29121** (MG, NY), Brazil, Terr. Amazonas, plateau of north massif of Serra Araca, along stream margin, 1200 m. altitude, 0°51-57' N. by 63°21-22' W., sterile, probably juvenile.

A shrub or tree 4-6 m. tall, with a trunk 10-20 cm. in diameter or more. Buds erect, scales elongated and 4-9 mm. long by 0.5 mm. wide, free at the apex. Foliage densely arranged. Leaves linear, narrow, 2.8-8 cm. long by 4.5-7 mm. wide, midrib a sunken groove, margins recurved, apex bluntly acute, narrowed at the base to a petiole 2-3 mm. long. Male cone on a scaly peduncle 9 mm. long, bracts to 2 mm. long and acute; pollen cone oblong-cylindric, 17-20 mm. long by 2-2.5 mm. wide, solitary or in small groups. Female cones not seen.

A few odd *Podocarpus* specimens from the Cerro Neblina region of southern Venezuela and northern Brazil may belong to *P. aracensis*, though more male and female specimens need to be

collected. Among these are **Maguire, Pires & Maguire 60529** (MG, NY) from Brazil, Terr. Amazonas, Serra de Neblina, Rio Negro, Rio Cauaburi, 2200 m., in open **Bonnetia** woodland. This specimen has one pollen cone on a scaly peduncle 7 mm. long.

Further, **Maguire, Wurdack & Maguire 42331** (MG, NY,US) from Venezuela, Terr. Amazonas, Cerro de la Neblina, Rio Yatua, northwest head of Canon Grande, at 1200-2200 m. from a shrub 1-3 m. tall, has a female cone on a long peduncle nearly 2 cm. long. The female cone is subtended by two bracts, the larger one 6 mm. long; seed structure globular, 9 mm. long by 7 mm. wide, with a crest.

Both specimens **Maguire et al 60529** and **Maguire et al 42331** are somewhat closer to **Podocarpus buchholzii**, however the bud scales are relatively longer. **Podocarpus aracensis** leaves are long and narrow rather than oval.

Only a small percentage of the poorly explored region of the Cerro Neblina has recently been collected in. A number of interesting collections are listed below.

**Podocarpus buchholzii** De Laubenfels. **M. Nee 30623** (NY), Venezuela, Terr. Amazonas, Cerro de la Neblina, northeast of Pico Phelps, 2100 m., 00°50'00"-12"N. by 65°58'50"W.; **M. Nee 3084** (NY) northeast of Pico Phelps, 2100-2150 m.; **M. Nee 3079** (NY) northeast of Pico Phelps, 1850 m..

**Podocarpus magnifolius** Buchh. et Gray. **Maguire, Pires & Maguire 60513** (MG, NY) Brazil, Terr. Amazonas, Rio Negro, Rio Cauaburi, 2439 m., with bud scales 5-10 mm. long.; **M. Nee 30743** (NY) Venezuela, Terr. Amazonas, Cerro de la Neblina, 5 km. northeast of Pico Phelps, Camp 7, 1900-1950 m., 00°50'30"N. by 65°58'25"W.; **M. Nee 31139** (NY), Venezuela, Cerro de la Neblina, Camp XI, 6.5 km. north-northeast of Pico Phelps, 1300 m., cloud forest, 00°52'N. by 65°58'50"W., a huge foliage form with leaves 27-29 cm. long by 2.7 cm. wide, with foliage clustered at the tips of the branchlets.

**Podocarpus steyermarkii** Buchh. et Gray. **M. Nee 30666**, (NY), Venezuela, Cerro de la Neblina, Camp 7, northeast of Pico Phelps, 1730-1850 m., west facing slopes, cloud forest, 00°50'45"N. by 65°58'10"W., female with a peduncle 18 mm. long.

De Laubenfels (1985) had recently revised the entire genus of **Podocarpus**. An interesting collection from northern Burma needs further material collected, but has unique pollen cone structures. The foliage characteristics otherwise conform rather closely with typical **Podocarpus chinensis** (Roxb.) Wall. ex Forb..

**Podocarpus chinensis** var. **wardii** De Laubenfels et Silba, varietas nova.

**Arbor parva. Gemma 3-5 mm. longis, squamis exterioribus triangularibus. Folia linearia, 5.5-11.7 cm. longa et 3.8-5 mm. lata, costis superis prominentibus, marginibus revolutis, apicibus acutis**

**vel obtusis. Strobili masculi solitarii, 1.4-1.8 cm. longis et 2-2.5 mm. latis; squamis basalis prominentibus, triangularibus, 5 mm. longis et 3-4 mm. latis. Strobili feminei ignoti.**

Type : **F. Kingdon-Ward 00521** (Holo-BM, Iso-NY, A), N. Burma, Namai Hka Valley, river-bed near high-water mark, 160 m. altitude.

A small, stout tree. Buds ovoid; scales erect, triangular, 3-5 mm. long. Foliage densely arranged. Leaves linear-oblong, narrow, 5.5-11.7 cm. long by 3.8-5 mm. wide; new growth slightly glaucous below; midrib a distinct raised ridge above, thicker and channeled below; margins revolute, narrowed at the base to a petiole 2.5 mm. long. Male cone with distinctly enlarged round bracts at the base of the pollen cone 5 mm. long by 3-4 mm. wide, apex of bracts bluntly acute or obtusish; pollen cone axillary, solitary, 1.4-1.8 cm. long by 2-2.5 mm. wide or more. Female cones not seen.

**Podocarpus chinensis** var. **wardii** is closely related to **Podocarpus Chinensis** var. **Chinensis**, but differs markedly in the pollen cones having distinctly enlarged basal bracts. In typical **Podocarpus chinensis** var. **chinensis** the pollen cone has much reduced basal bracts.

#### Literature Cited

- De Laubenfels, D.J. (1969). *J. Arn. Arb.* 50(2): 274-314.  
 ----- (1982). *Fl. Venez.* 11 (2): 7-41.  
 ----- (1985). *Blumea* 30: 251-278.  
 ----- (1988) *Fl. Malesiana. Misc. Notes.* (in Press).

A NEW SPECIES OF **CUPRESSUS** L. FROM TIBET (**CUPRESSACEAE**),

John Silba

198 W. Hoffman Ave., Lindenhurst, New York 11757

The distribution of the genus **Cupressus** in the Himalayas and western China seems to be the least known geographical area of the genus. The distribution of **Cupressus** in Tibet in particular seems to be the least known. Until recently, some species were only known from cultivated trees in the more populated cities or villages.

Franco (1969) in his review of the Sino-Himalayan **Cupressus** species listed several herbarium collections under separate species names. However, his interpretation leaves species with disjunct distributions. Notably in the case of **Cupressus duclouxiana** Hickel and **C. chengiana** Hu (or **C. fallax** Franco), species which are not in fact native to Tibet. One collection cited by Franco (1969), under his **C. fallax**, was later described as a new species as **C. gigantea** Cheng et Fu. A few other herbarium collections of Ludlow, Sherriff and Elliot from Tibet cited by Franco (1969) under **C. duclouxiana** are here described as a new species.

**CUPRESSUS DUCLOUXIANA** Hickel

Cheng et Fu (1978) only recently described the true distribution of **C. duclouxiana** in China. This species was formerly only known from cultivated trees in Yunnan, mainly near Kunming. However, Cheng et Fu (1978) list true **C. duclouxiana** as native to middle and west-northern Yunnan and west-southern Szechuan at 1400-3300 m. altitude. The species is further noted as being dispersed in dry and warm slopes, or forms small pure stands in Li-Chang and Hsueh Shan. A recent herbarium collection from Yunnan as **Sino-American Expedition No. 1580** Lunan Xian, Changu (Long Lake) 1850-2000 m. (A, PE, US), probably represents a wild population.

**CUPRESSUS GIGANTEA** Cheng et Fu

Cheng et Fu (1978) list this species from the Tsangpo River region. The type collection was from Lang Xian at 3000 m. altitude, **Quing-Zang 3318** (Holo-PE). The species had been collected earlier by Ludlow, Sherriff and Elliot. Namely, **Ludlow, Sherriff & Elliot 13345** (BM, E) from Kongbo, Nye at 3000 m., and had been included by Franco under his **C. fallax** (or more correctly **C. chengiana**).

Interestingly, **Cupressus gigantea** appears to be the highest altitude species of the genus **Cupressus**. On the **Ludlow, Sherriff & Elliot 13345** specimen is a note by the collectors that this species grows up to 3658 m. elevation on the Kongbo Nga La in Tibet.

**CUPRESSUS CHENGIANA** Hu (**C. fallax** Franco)

Cheng et Fu (1978) list **Cupressus chengiana** from western and northern Szechuan province (Mao Hsien; Wen-Chuan; Li Hsieh; Ta-Chin; Hsiao-Chin on the upper part of the Min Chiang region) and southern

Kansu province (Chou-Chu; Shih-Men and Wu-tu) at 1200-2900 m., on dry and sunny mountain slopes. Franco (1969) had listed **Ludlow, Sherriff & Elliot 13345** from Kongbo, Tibet under his **C. fallax**.

**Cupressus chengiana** Hu has flattened branchlets systems with elongated fish-tail like seasonal branchlets, and leaves with an active dorsal gland leaving a whitish dot on the leaves. This is more apparent in young trees. **Cupressus gigantea** has much more thickened branchlets which are some what twisted or contorted. The leaves of **C. gigantea** are more obtuse and the glands are conspicuous, but do not leave a whitish dot as conspicuously as **C. chengiana**.

#### **CUPRESSUS TORULOSA** Don

Franco (1969) listed true **Cupressus torulosa** only from north India and western Nepal at 1500-3300 m. altitude. The species has also been listed as native to Sikkim, Bhutan and southern Tibet by various authors.

**Cupressus** in Bhutan is yet another species, **C. himalaica** Silba (Silba, 1987). **Cupressus himalaica** was previously only known from cultivated trees. Whether this species or an allied species is also native in Sikkim is still not yet fully understood.

Cheng et Fu (1978) describe **C. torulosa** from limestone regions in eastern and southern Tibet, India, Nepal, Bhutan and Sikkim. However, the **Cupressus** species in south and east Tibet is well outside the geographical range of typical **C. torulosa** of north India and western Nepal. Certainly, this would be quite a disjunct distribution with two other species, namely **C. himalaica** and **C. gigantea** distributed between the eastern Tibetan and Nepal-India populations.

Herbarium collections cited by Franco (1969) from Tibet near the junction of the Po Tsangpo and Yigrong Chu are here described as a new species. This appears to be the undetected species described by Cheng et Fu (1978) as **C. torulosa** from eastern and southern Tibet.

**Cupressus austro-tibetica** J. Silba, species nova.

**Arbor ad 20-60 m. alta. Ramulis multum tenuioribus, gracilibus. Folia acuta vel obtusiuscula, 1.2-1.5 mm. longis, glandula mediana rotunda bene impressa. Strobilis ovulatis 1.2-1.6 cm. longis, squamis 10-12.**

**Type: Ludlow, Sherriff & Elliot 12141, Tibet, Trulung, Pome, 2134 m., more numerous up the river, in mixed forest (Holo-BM, Iso-E); Paratypes: Ludlow, Sherriff & Elliot 12130, Tibet, Trulung, Pome, 1981 m. (BM, E); Bailey s.n., Tibet, upper part of Tsangpo Tsangden, Yigung, 2286 m., June-Sept. 7, 1913 (E).**



A tree 20-60 m. tall. Branchlets divided into thin, thread-like segments, or somewhat flattened. Leaves bluntly acute, 1.2-1.5 mm. long; glands apparent but obscure, with a small pit. Female cones globose or subglobose, dark brown, 1.2-1.6 cm. long, with 10-12 scales, inner scales dark brown, umbos inconspicuous. Seeds dark brown, subglobose, with rounded wings, ending in an acuminate point at the end opposite the hilum.

*Cupressus austro-tibetica* is similar to *C. duclouxiana* in its thin, thread-like branchlets. However, *C. austro-tibetica* has leaves with obscure glands with a less deep pit than *C. duclouxiana*, and much smaller globose female cones which lack the deep reddish inner scales of the latter species.

The distribution of *C. austro-tibetica* is little-known. It is known from eastern and southern Tibet at 1981-2286 m. altitude. Reports indicate that this species may well occur at much higher altitudes and may represent the highest altitude species of the genus *Cupressus*.

Chang (1982) lists a Lichen species growing on a cypress tree (species not specified) in Quandu County, Tibet at 4300 m. altitude. Chang (1982) further lists the Lichen (*Lethariella sinensis*) distributed in Riwoque County, Tibet.

Wei et Jang (1982) record two Lichen species growing on a high altitude cypress tree (species not specified) in Tibet. One species, *Lethariella sinensis* Wei et Jiang is listed from cultivated forests at Chang-Tu, Ta-Roa-Ka, Tibet at 4300 m., **W.C. Li 7695-1** (PE); also distributed in Lei-Wu-Chi (Ri-Wo-Que) Tibet at 4200 m., **Y.C. ZONG & Y.Z. LIAO 260** (PE). The latin description lists the lichen as having a *Thuja* (species not specified) as its host. However, the Chinese name translates to mean the name "cypress tree". Perhaps, the flattened branchlets of *Cupressus* are here mistaken for *Thuja*, as *Thuja* or *Platycladus* is not native to Tibet (Cheng et Fu, 1978).

A second Lichen species listed by Wei et Jiang (1982) as *Lethariella cashmeriana* Krog is described as growing on its host the cypress tree (species not specified) in several areas in Tibet. *Lethariella cashmeriana* is recorded from the cypress forests at Chang-Tu, Ta-Roa-Ka, Tibet, 4300 m., **W.H. Li 76-95** (PE); Lei-Wu-Chi, 4000 m., **Y.C. Zong & Y.Z. Liao 255** (PE); Jan-Wu, Tibet, 4300 m., **Y.C. Zong & Y.Z. Liao 477** (PE); Tso-Kung, Tibet, 4400 m., **Y.C. Zong & Y.Z. Liao 493** (PE).

Krog (1976) describes a lichen species, *Lethariella cladonioides* (Nyl.) Krog (Parmeliaceae) from Szechuan as **H. Smith 14017** (UPS) from Dongsergo, Huang-lung-Sse, in Rhodendron-*Juniperus* forest at 4000-4300 m. altitude.

Cheng et fu (1978) record the genus *Juniperus* (under *Sabina* Mill.) occurring in Szechuan and Tibet as high as 4600-4900 m. altitude. It seems more likely that the Lichen species described

from Tibet by Wei et Jiang (1982) and Chang (1982) are probably associated with a **Juniperus** species, as it is also associated in Szechuan (Krog, 1976). However, it may be possible that **Cupressus austro-tibetica** also occurs at much higher altitudes than the Ludlow, Sherriff and Elliot collections were discovered.

Special thanks go to Chih-Hua Tsou and Chung-Fu Shen for translations of Chinese texts at the New York Botanical Garden. Also, to Frank T. Callahan, II, of Central Point, Oregon for bringing the attention of the high altitude lichen species to my knowledge.

#### Literature Cited

- Chang, C.W. (1982). The Alpine Plants of China. 134 p., illus. Gordon & Breach, N.Y., p. 68 & photo.
- Cheng, W.C. & L.K. Fu (1978). Fl. Reip. Pop. Sin., Tomus 7, Gymnospermae. 542 p., Science Press, Peking.
- Franco, J. do Amaral (1969). On Himalayan-Chinese Cupresses. Portug. Acta Biol., Ser. B. 9: 183-195.
- Krog, H. (1976). **Lethariella** and **Protosnea**, two new lichen genera in **Parmeliaceae**. Norw. J. Bot. 23: 83-106.
- Silba, J. (1987). Nomenclature of the weeping Himalayan cypress. (**Cupressus**, **Cupressaceae**). **Phytologia** 64(1) : 78-80.
- Wei, J.C. & Jiang, Y.M. (1982). New Materials for Lichen Flora from Xizang. Acta Phytotax. Sin. 20 (4): 496-501.

STYLAGROSTIS A NEW SUBSECTION OF GENUS CALAMAGROSTIS  
(POACEAE: POOIDEAE) AND THREE NEW SPECIES  
FROM COLOMBIA, ECUADOR AND VENEZUELA\*

Flavia D. Escalona

Iowa State University, Department of Botany, Ames, Iowa 50011\*\*

INTRODUCTION

The genus Calamagrostis Adans., (Poaceae: Pooideae), is heterogeneous with about 250 species, distributed worldwide (Bjoerkman, 1969; Chase and Niles, 1962; Clayton and Renvoize, 1986) including approximately 70 poorly known species in the paramo and puna of south America.

"Identification of Calamagrostis species is difficult, not only because of the large number, but because of the limited variety of of characters distinguishing the species" (Stebbins, 1930). As a consequence a multitude of species, varieties, and forms have been described, these differ only in minor morphological details, that may be a response to the environmental conditions. Interspecific hybridization is common in the genus Calamagrostis and "large numbers of supposed hybrids have been described" (Clarke, 1980). Many studies have shown that the taxonomic complexity within the genus is due to apomixis, introgressive hybridization, and polyploidy (Nygren, 1948, 1954a, Tateoka, Hiraoka and Tateoka, 1977). Therefore further studies are necessary in order to clarify the species relationship within the genus Calamagrostis and with closely related genera within the tribes Agrostideae and Aveneae. The genus Calamagrostis is similar to the genus Agrostis to the extent that Wasiljew (1960) considered no definite boundaries existed between them. Bjoerkman (1969) stated that it "is difficult to draw a sharp limit between Agrostis and Calamagrostis, if possible at all." The separation of Calamagrostis and Deyeuxia as genera, based on the prolongation of the rachilla and callus hair length in relation to the lemma, have been considered insatisfactory in a world context. There is still controversy as to generic boundaries for the South American species, but this will not be clarified until further studies of the genus Calamagrostis based on biochemistry, cytology, morphology, anatomy, and biogeography are done. It is hoped that this preliminary work will be a contribution in helping to understand the complicated taxonomy of this genus.

This investigation follows Koch, 1837 (cited by Wasiljew, 1960) who classified the genus Calamagrostis into two sections: Epigeios Koch, lacking the rachilla of a second floret, including the species from the old world; and Deyeuxia (Clar. ex Beauv.) Reinchenb., presenting the rachilla including the species from the

\* Field work was supported by OAS grant 92360 and FUDECO (Venezuela), grant AGR-67.

\*\* IUPEB. Apartado 615. Barquisimeto, VENEZUELA.

new world, admitted by some authors as a genus Deyeuxia Beauv. until further revision of the genus Calamagrostis and their related genera is done.

The lemma (morphology and anatomy) is a very important structure in grass classification (Foster, 1966; Thomasson, 1978a, 1978b), especially at the generic level. Foster (1966) used the lemma characteristics to describe the species of Calamagrostis for Bolivia, and Tovar (1960) to describe the species from Peru. They distinguished two groups within the genus Calamagrostis:

1. Lemma distinctly stipitate below the callus, the stipe varying in length (1-4 mm) raising the floret between the glumes (Figs. 1b, 2b, 3b), used here to describe subsection Stylagrostis;
2. Lemma sessile below the callus.

#### SUBSECTION STYLAGROSTIS

Genus: Calamagrostis; Section: Deyeuxia; subsection: Stylagrostis (Mez) Escalona, stat. nov. Based on Stylagrostis Mez, Bot. Arch. 1:20 (1922). Type: Calamagrostis ovata (Presl) Steud., Nom. Bot. 1:251. (1840). "Hab. in Peruviae montanis huanocensibus." Huanuco, Peru. Haenke (Isotype US 2105044).

Diagnosis: Spikelet: 1-flowered, laterally compressed, floret raised on a lemma stipe, that usually disjoints at the summit, the stipe remaining between the glumes. Endosperm: liquid, soft or hard. Stomata: lacking on the abaxial surface.

Perennials. Culms: erect caespitose or decumbent, 5 cm-1 m tall. Sheaths: long or short, glabrous scabrous. Ligules: 0.5-1.8 mm long, truncate, hyaline or linear, bifid at the apex or linear acuminate. Blades: 2-60 cm long, flat, conduplicate or involute, partially or permanently convolute. Panicle: 2-40 cm long, terminal, lax or spiciform, cylindrical, oval or oblong. Spikelets: 1-flowered, laterally compressed, floret raised on a stipe, this usually disjoints at the summit, the stipe remaining between the glumes. Glumes: 2, persistent, lanceolate acute, coriaceous, membranaceous or hyaline, longer than the floret, equal or the lower shorter, carinate or not, lower 1-nerved, upper 3-nerved. Lemma: rigid, shorter than the glumes, lanceolate, ovate, or truncate, with or without keel, scabrous or glabrous, 5-nerved, 2-4 mm dentate. Awn: subterminal, medial or basal, straight or bent usually twisted or rarely lacking. Callus: pilose (or exceptionally glabrous). Lemma stipe: 1-4 mm long, raising the floret between the glumes. Palea: 2-nerved, 2-keeled, scabrous or glabrous, shorter than the lemma. Ovary: 0.5 mm to 2 mm long, ovate to oblong stigmas plumose, ovate to oblong. Lodicules: two, bilobate, hyaline, glabrous, 0.5-1 mm long. Stamens: 3, anthers linear, from 0.5 mm to 4 mm long, filaments short or long. Caryopsis: ovoid or oblong, persistent, included in the glumes, with liquid, soft, or hard endosperm. Rachilla extension: usually pilose, sometimes glabrous and sometimes reduced, rarely subtending a rudimentary lemma or complete floret. Habitat and distribution: cool regions of the Andes in South America (páramo and puna, 2,500-5,500 m) and probably in temperate and montane environments of

the world.

Subsetion *Stylagrostis* is named after "*Stylagrostis*" novum Graminearum genus published by Carl Mez in *Botanisches Archiv*, 1: 20 (1922). Mez listed 14 species that were primarily described under the genera *Deyeuxia*, *Agrostis*, and *Calamaagrostis*, grouping them on the basis of the rachilla extension raising the floret. He transferred these species to the new genus *Stylagrostis*, but did not list a type species nor provide species descriptions. The type species here selected for this subsection is *Calamaagrostis ovata* described by Presl in 1830.

#### SPECIES DESCRIPTIONS

The terminology used to describe microcharacters is adapted from Ellis (1976, 1979).

*Calamaagrostis cleefii* Escalona, sp. nov. Type: COLOMBIA: Meta, Páramo de Sumapaz, en el lado oeste del superpáramo, 4,100 m, 13 Nov., 1973, Antoine Cleef, 7768 (Holotype, US 2785746). Fig. 1.

Perennis. Culmi: erecti, caespitosis (10-25 cm alti) glabri, innovationibus intravaginalibus. Vaginae: 1-2 cm longae, glabrae. Ligula: breves, 0.5 mm longae, membranaceae. Laminae: convolutae, 2-5 cm longae, apicibus acutis, 1 mm latae, paginis adaxalibus glabris minute. Panicula: Pedunculis 6-11 cm longis, laxa 3-6 cm longa, 0.5-1 cm lata, ramis verticillatis. Spiculae: 4 mm longae, lateraliter complanatae, flosculis 3 mm longis, pedicellis glabris. Glumae: 2; subaequales, flavo-purpurascens, glabrae. Gluma I: triplinervis, 4 mm longa. Gluma II: quintuplinervata, 4.5 mm longa. Lemma: 2.2-2.6 mm longa, scabra, quater dentata, hyalina. Arista: 5 mm longa, basalis, scabridus excerta, supra basin contorta. Callus: brevis cuneatus, dense pillosus, 2.3-3.5 mm longus, aliquot lemma superantibus. Stipe lemmatis: 0.2 mm longus. Palea: 2 mm longa, hyalina, binervis, bicarinata, carina scabra. Ovarium: ovatum, flavum, 1 mm longum. Lodiculae: 2; hyalinae. Stamina: 3; antherae 3; 1.5 mm longae, ovatae, flavae. Caryopsis: oblonga teres, brunnea, 1.25 mm longa, scutello per tertiam partem caryopsis aequante, endospermio molli. Extensiones rachillae: 2 mm longae, villosae ab imo ad summum.

Perennial. Culms: caespitose, glabrous, 10-25 cm tall, erect with intravaginal innovations. Sheaths: 1-2 cm long, minutely glabrous. Ligules: short (0.50 mm) and membranaceous. Blades: convolute 2-5 cm long, 1 mm wide, tapering to a point; adaxial surface glabrous. Panicle: peduncle 6-11 cm long, lax, 3-6 cm long, 0.5-1 cm wide, with verticillate branching. Spikelets: laterally compressed, 4 mm long pedicel glabrous, floret 3 mm long. Glumes: 2, sub-equal, yellow-purpuraceous, glabrous. Glume I: 3-nerved, 4 mm long. Glume II: 5-nerved, 4.5 mm long. Lemma: scabrous, four-toothed, hyaline, 2.2-2.6 mm long. Awn: 5 mm long basal, exerted, scabrous, twisted at the base. Callus: short cuneate densely hairy, hairs unequal, distributed all around the callus, 2.3-3.5 mm long, the longest ones exceeding the lemma. Lemma stipe: 0.2 mm long, raising the floret. Palea: 2 mm long, hyaline, 2-nerved, bikeeled (keels scabrous). Ovary: ovate,

yellow 1 mm long. Lodicules: 2, hyaline. Stamens: 3; anthers yellow, 1.5 mm long. Caryopsis: oblongo-terete, brown, 1.25 mm long; scutellum 1/3 as long as the caryopsis; endosperm soft. Rachilla extension: 2 mm long, hairy from base to apex, hairs shorter at the apex.

#### Microcharacters

Leaf blade: U-shaped in x-section. Adaxial ribs and furrows: six flat, scabrous-topped ribs and five deep narrow furrows, with the sides almost vertical. Stomata: sunken on the adaxial furrows. Medial vascular bundle: the leaf infold divides the blade into two asymmetrical halves. Vascular bundle arrangement: two first order vascular and four second order, located close to the abaxial epidermis, the first order are circular, with the phloem surrounded by thick-walled fibers, protoxylem and metaxylem vessels present. Vascular bundle sheaths: the inner sheath complete, surrounding all vascular bundles, with thicker cells on the abaxial surface; the outer sheath surrounding the inner one, with thin-walled cells. Sclerenchyma: adaxial, absent; in the abaxial surface the epidermal cells become thick, below each first order vascular bundle (1-2 cells thick; 3-5 cells long), sclerenchyma between vascular bundles, absent in the leaf margin, as on the abaxial surface. Mesophyll: irregular cells of different size and shape, tightly packed. Epidermal cells: abaxial outer tangential wall of individual cells, thickened and covered by a distinct, continuous thick cuticle; adaxial; very thin-walled cells with prickles, over the ridges or units. Prickles: on the adaxial epidermis, opposite to the vascular bundles. Silica bodies: horizontally elongate. Blooming: Nov.-Feb. Habitat and distribution: wet places of the superpáramo in Colombia. The major limitation in considering this species is the lack of sufficient specimens. Only one specimen was observed, the type. However, the type showed characters that differ from the other Calamagrostis species inhabiting the same or surrounding areas. This species resembles Calamagrostis pisinna but differs in the number of vascular bundles in the leaf blade cross section (6) and reduced sclerenchyma. Calamagrostis cleefii: is characterized by infolded leaves, and a two-keeled scabrous palea. The leaf cross-section shows six furrows and seven ridges, vascular bundles with two well-distinguished bundle sheaths, the inner with half of each cell thickened. This species grows in tufts in boggy places of the superpáramo, 4,100 m in Colombia.

Calamagrostis guamanensis Escalona, sp. nov. Type: ECUADOR: Prov. Napo, Road Quito-Baeza at the telecommunication antenna, north of the Guamani páramo, in the oriental Andes. Grass forming loose tufts in cushion plants of Distichia muscoides, 4,260 m (78° 09' W, 0° 17' S), March 3, 1985, F. Escalona and S. Gallegos 390 (Holotype ISC, Isotypes MO, K, QCA, US, VEN). Fig. 2.

Perennis. Culmi: teretes, erecti, (6-15 cm alti) innovationibus intravaginalibus, 6-15 cm alti. Vaginae: apertae, 2-5 cm longae, fibrosae, glabrae, albae, glaucae. Ligulae: brevis, truncata, glabra 1 mm longa, membranacea. Laminae:

plicata, inflata basin versus, 2-8 cm longa, 2-3 cm lata, paginis abaxialibus glabri, scabra, marginibus sacbris. Panicula: panicula aperta laxa, 5-8 cm longa, 1-2 cm lata, rachis glabra, pedunculus folios excedens 7-14 cm longus. Spicula: complanata lateraliter 4 mm longa, pedicellis glabris. Glumae: 2; 4-5 mm longae, triplinervis, purpuratae ad apicem. Lemma: 2.5-3 mm longum, quadridentatum, fissura ad dimidium carinae attingens. Arista: recta vel flexuosa, incisura lemmatis exoriens scaberula, 7-8 mm longa. Callus: brevis pilosus aequaliter ad dimidium lemmatis attingens. Stipes lemmatis: capitatus, 1 mm longus. Palea: hyalina, 2 mm longa, carina scabrosa. Ovarium: ovatum, flavum, 1 mm longum. Lodiculae: 2, hyalina. Stamina: 3; antherae 3, purpuratae flavascentes, 1 mm longae. Caryopsis: ovata, embryo recto, endospermio liquido. Extensio rachillae: 2 mm longa, capitata e basi pilose dense, pilis 2 mm longis.

Perennial. Culms: growing in loose tufts among the cushion plants, 6-15 cm tall, erect with intravaginal innovations. Sheaths: open, fibrous, 2-5 mm long, glossy-white. Ligules: short, truncate, glabrous, membranaceous, 1 mm long. Blades: folded, medial vascular bundle distinguishable, 2-8 cm long, 2-3 mm wide; blade-sheath junction swollen, abaxial surface glabrous, with margin scabrous. Panicle: an open loose panicle, 5-8 cm long, 1-2 cm wide, rachis glabrous, peduncle exceeding the leaves, 7-14 cm long. Spikelets: laterally compressed, 4 mm long, pedicels glabrous. Glumes: 2; 4-5 mm long, 3-nerved, purple at the apex; Lemma: 2.5-3 mm long, (split half way at the keel), scabrous, 4-toothed. Awn: straight or curved, arising from the lemma notch, scabrous, 7-9 mm long. Callus: short, cuneate, evenly hairy, half as long as the lemma. Lemma stipe: capitate, 1 mm long. Palea: hyaline, 2 mm long, scabrous on the keels. Ovary: ovate and yellow, 1 mm long. Lodicules: 2, hyaline. Stamens: 3; anthers 1 mm long, purple. Caryopsis: ovate, embryo straight, endosperm liquid. Rachilla extension: capitate, 1.5 mm long, densely hairy from the base, terminal hairs exceeding the floret (2 mm long), reducing their size through the rachilla apex.

#### Microcharacters

Leaf blades: outline V-shaped, not permanently infolded. Adaxial ribs and furrows: ribs 11, square, flat-topped, sides angled, over all vascular bundles, furrows 10, narrow, with sides almost vertical and base fairly broad. Stomata: sunken in the furrows. Medial vascular bundle: distinguishable from the rest by size and position, sclerenchyma girder interrupting the outer vascular bundle sheath on the adaxial surface and strand of sclerenchyma on the abaxial surface, protoxylem and metaxylem present. Vascular bundle arrangement: 5 first order, 3 second order and 2 third order, the ribs over first and second order vascular bundles have flat tops, and those over 3rd order are triangular. All vascular bundles are located closer to the abaxial surface. Vascular bundle sheath: first and second order vascular bundles have inner sheath complete with cell walls thicker on the abaxial surface, outer sheath complete, third order vascular bundle with complete inner sheath but incomplete outer sheath.

Sclerenchyma: adaxial, represented by very small girders, usually not altering the epidermal cells; abaxial, represented by well-developed strands, wider than deep straight, horizontal; sclerenchyma between vascular bundles absent; in the leaf margin as a pointed cap (2-3 cells thick). Mesophyll: chlorenchyma with horizontal arrangement in the mesophyll, U-shaped between successive vascular bundles located at the base and sides of the furrows. Epidermal cells: abaxial epidermal cells with outer tangential wall thickened individually, smooth surface. Prickles: located between typical epidermal cells on the sides of the furrows. Silica cells: elongated, up to 1 mm long with sinuous edges and concave surface, located over the ribs on the adaxial surface. Blooming: October-March. Habitat and distribution: forming loose tufts in the cushions of Distichia muscoides and Plantago sp., endemic to the Guamani páramo in Ecuador, (4,100-4,200 m). Other specimens examined: ECUADOR: Prov. Napo, Road Quito-Baeza (páramo de Guamani, 4,260 m, 78° 09' W 0° 17' S). Oct. 11, 1976, B. Ollgaard & H. Balslev 10111 (MO, FM). Road Quito-Baeza, (páramo de Guamani), 4,260 m, 78° 09' W 0° 17' S), Nov, 1978, 4,000 m, Simon Laegaard 53,861 (AAU). Prov: Ibarra. Dept. Imbabura, May 9, 1954; 4,600 m. Rauh and Hirsh E153 (US).

Calamagrostis guamanensis forms loose tufts in cushions of Distichia muscoides and Plantago. It is endemic to Guamani páramo in Ecuador. C. guamanensis is characterized by a swollen sheath-blade junction, well-distinct leaf venation pattern, fibrous sheath, leaf cross-section outline V-shaped, 11 vascular bundles, and a drooping panicle. All the analyses (numerical and cladistic) revealed this species as new, no species presenting these features having been described for Ecuador. It resembles Calamagrostis ramonae, another new species found in Venezuela.

Calamagrostis ramonae Escalona, sp. nov. Type: VENEZUELA. Merida, near upper limit of paramo around the small lake between Chachopo and Los Apartaderos near El Aguila, April 15, 1944, 3,930 m, J. Steyermark 55903 (Holotype, F 1206466; Isotype US 1869496). (Fig. 3).

Perennis. Culmi: erecti, caespitosi, innovationibus intravaginalibus, 30-50 cm alti. Vaginae: 8-11 cm longae, fibrosae, albae, scabrae. Ligula: 0.5 mm longa, truncata, hyalina. Laminae: planae, inflatae basin versus, 8-19 cm longae, 3-4 mm latae, paginis adaxialis scabris minute, paginis abaxialis glabris. Panicula: 45-65 cm longa, 1.5 cm lata, laxa, cernua. Spiculae: 4-5 mm longae, pedicellis scabridisculis. Glumae: 2; 3-4 mm longae, triplinervis, pallide virides, acutae vel subacuminate, carinis scabris. Lemna: 3.5 mm longum, angustum, quinquenerve, scabrum. Arista: 5 mm longa, ad medium inserta, infrageniculata, contorta, flexa introrsum. Callus: elongatus, pilis verticillatis, 0.5 mm longus. Stipes lemmatis: 0.5 longus, noncapitatis. Palea: 3 mm longa, scabra, hyalina, binervis, bicarinata. Ovarium: ovatum flavobrunneum, 1 mm longum. Lodiculae: 2, hyalinae. Stamina: 3; antheris luteis, 0.5 mm longis. Caryopsis: oblonga teres, 1 mm longa, endospermio molli.



**Extensio rachillae:** 3 mm longa, pilis 1-2 mm longis, verticillatis.

Perennial. **Culms:** 30-50 cm tall, erect, caespitose, innovation intravaginal. **Sheaths:** 8-11 cm long, fibrose, scabrous, white. **Ligules:** 0.5 mm long, truncate, hyaline. **Blades:** flat, 8-19 cm, 3-4 mm wide, blade-sheath junction swollen, glabrous abaxially, minutely scabrous adaxially. **Panicle:** lax, drooping, 45-65 cm long, 1.5 wide. **Spikelets:** 4-5 mm long, peduncle scabridulous. **Glumes:** 3-4 mm long, 3-nerved, light green, keel scabrous, acute to subacute. **Lemma:** 3.5 mm long, 5-nerved tapering, scabrous. **Awn:** insertion medial twisted and bent inward, 5 mm long, geniculata below. **Callus:** elongated, with whorled hairs, 0.5-1 mm long. **Lemma stipe:** 0.5 mm long. **Palea:** 3 mm long, scabrous, hyaline, two-nerved, two-keeled (scabrous). **Ovary:** ovate yellow-brown, 1 mm long. **Lodicules:** 2, hyaline. **Stamens:** 3; anthers 0.5 mm long. **Carvopsis:** elongate, 1 mm long, endosperm soft. **Rachilla extension:** 3 mm long with 1-2 mm, whorled hairs.

#### Microcharacters

**Leaf blade:** V-shaped, with open angle over 90° arms straight, symmetrical on either side of the median vascular bundle. **Adaxial ribs and furrows:** ribs, 11 flat-topped, square, associated with the vascular bundles; furrows 10 with almost vertical sides, bases fairly broad, located between all vascular bundles. **Stomata:** sunken on the adaxial furrows. **Medial vascular bundle:** distinguishable from the other 1st order vascular bundles by medial position. **Vascular bundle arrangement:** 5, 1st order, associated with sclerenchyma girders adaxially and abaxially, 4 second order, associated with sclerenchyma strands adaxially and abaxially, 2 third order on the leaf margins, associated with sclerenchyma strands; 1st and 2nd order alternate, at the same level in the center of the blade. **Vascular bundle sheath:** inner sheath cell wall evenly thickened, the outer sheath hardly noticeable. **Sclerenchyma:** adaxial, inversely anchor-shaped (3-5 cells thick); abaxial, very small girders with epidermal cells not altered under girders; very small (1-2 cells thick) strands below the marginal vascular bundles; between vascular bundles, absent, leaf margin, absent. **Mesophyll:** irregular; cells of different size and shape; often with intercellular air spaces. **Epidermal cells:** adaxial, thin-walled cells associated with bundles and papillae; abaxial, very irregular shaped cells thin-walled cells, smooth surface. **Prickles:** pointed, located between epidermal cells, over the ribs. **Silica bodies:** horizontally elongate. **Blooming:** April-December. **Habitat and distribution:** bogs and humid places in the paramos of Only two specimens of this species were studied, the holotype and the isotype, collected by Steyermark in the Andes of Venezuela. It is obvious that and more field work is needed. *C. ramonae* is segregated as a different species from the rest of the group, both in cladistic and cluster analysis. It is characterized by well-developed rachilla extension, equaling the palea, with twisted hairs, and elongate callus with twisted hairs. In common with *C. guamanensis* from Ecuador, this species exhibits a swollen blade-

sheath junction.

#### ACKNOWLEDGMENTS

This paper derives from the dissertation written in partial fulfillment of requirements for a PH. D. degree and I am especially indebted to my advisor Dr. Richard W. Pohl, for his guidance during this study. I wish to express my sincere thanks to Dr. Frederick J. Peabody for his critical review of Latin descriptions.

#### REFERENCES

- BJORKMAN, S. O. 1969. Studies in Agrostis and related genera. *Symbolae Botanicae Upsalienses* XVII:1. A. B. Lundequistska Bokhandeln, Upsala.
- CHASE, A. and C. NILES. 1962. Calamagrostis. Pages 420-449 in Index to grass species. Vol. 1. G. K. Hall & Co., Boston.
- CLARKE, C. C. 1980. Calamagrostis Adanson. Pages 236-239 in T. G. Tutin, V. H. Heywood, N. A. Burges, D. H. Valentine, S. M. Walters and D. A. Webb, eds. *Flora Europaea*. Vol. 5. University Press, Cambridge.
- CLAYTON, W. D. and S. A. RENVOIZE. 1986. *Genera Graminum (Grasses of the World)*. Royal Botanical Garden Kew. Kew Bulletin Additional Series XIII. HMSO. London.
- ELLIS, R. P. 1976. A procedure for standardizing comparative leaf anatomy in the Poaceae. I. The leaf-blade as viewed in transverse section. *Bothalia* 12(1):65-109.
- \_\_\_\_\_ 1979. A procedure for standardizing comparative leaf anatomy in the Poaceae. II. The epidermis as seen in surface view. *Bothalia* 12(4):641-671.
- FOSTER, R. C. 1966. Studies in the Flora of Bolivia. *Rhodora* 775-246-259.
- NYGREN, A. 1948. Some interspecific crosses in Calamagrostis and their evolutionary consequences. *Hereditas* 34:387-413
- \_\_\_\_\_ 1954a. Apomixis in the Angiosperms. II. *Bot. Rev.* 20:577-649.
- STEBBINS, G. L. 1930. A revision of some North American species of Calamagrostis. *Rhodora* 32:35-37.
- TATEOKA, T., A. HIRAKA, and T. N. TATEOKA. 1977. Natural hybridization in Japanese Calamagrostis II. C. Langsdorffii x C. sachalinensis, an Example of an Agamic Complex. *Bot. Mag. Tokio* 90:193-209.
- THOMASSON, J. 1979a. Epidermal patterns of the lemma in some fossil and living Grasses and their phylogenetic significance. *Science* 199:975-977.
- \_\_\_\_\_ 1978b. Observations on the characteristics of the lemma and palea of the late Cenozoic Grass Panicum elegans. *Am. J. Bot.* 65:34-39.
- TOVAR, O. 1960. Revision de las especies peruanas del genero Calamagrostis. *Mem. Mus. Hist. Nat. "Javier Prado"* 11:1-98.
- WASILJEV, W. 1960. Das System der Gattung Calamagrostis Roth Feddes *Repert. Spec. Nov. Regni. Veg.* 63(3):229-251.

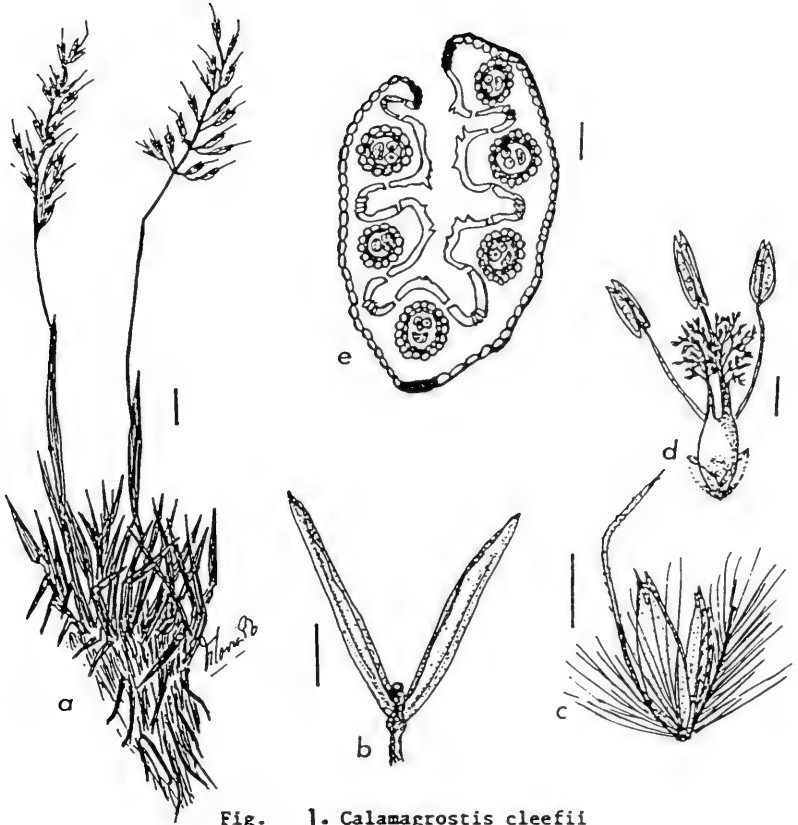


Fig. 1. Calamagrostis cleefii

a. Plant. Bar = 1. cm

b. Glumes and lemma stipe. Bar = 1.62 mm

c. Floret. Bar = 2 mm

d. Ovary and anthers. Bars = 1 mm

e. Leaf blade cross section. Bar = 1 mm

Based on Cleef 7768

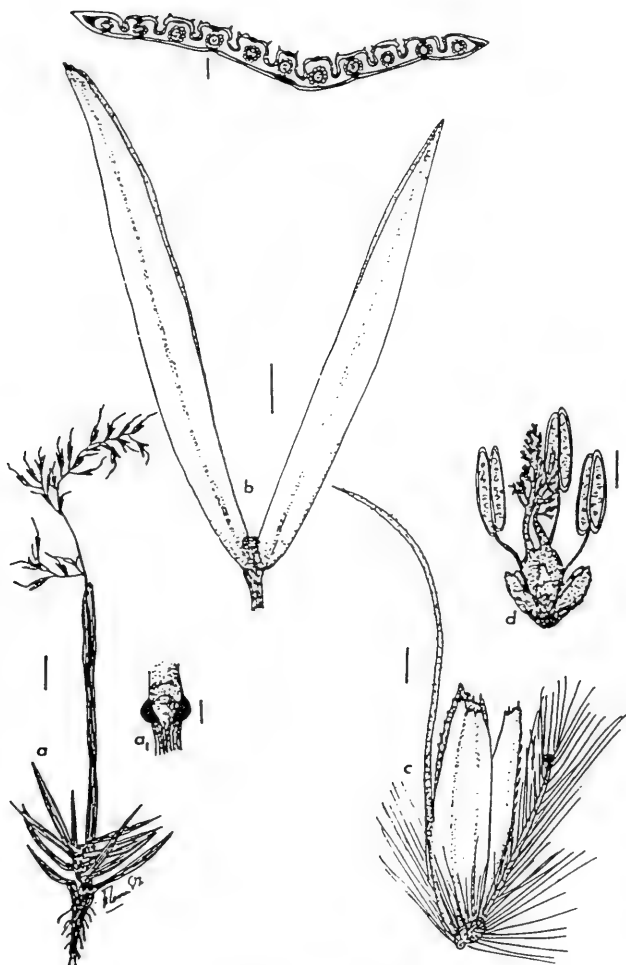


Fig. 2. *Calamagrostis guamanensis*

- a. Plant. Bar = 1.4 cm. Laegaard 54508
- a1. Swollen junction between leaf blade and sheath. Bar = 1 cm Escalona et al. E390.
- b. Glumes and lemma stipe. Bar = 4 mm. Ollgaard et al. 10111
- c. Floret. Bar = 3 mm. Ollgaard 10111
- d. Ovary and anthers. Bars = 3 mm. Ollgaard et al 10111
- e. Leaf blade cross-section. Bar = 5.6 mm. Escalona et al. E390

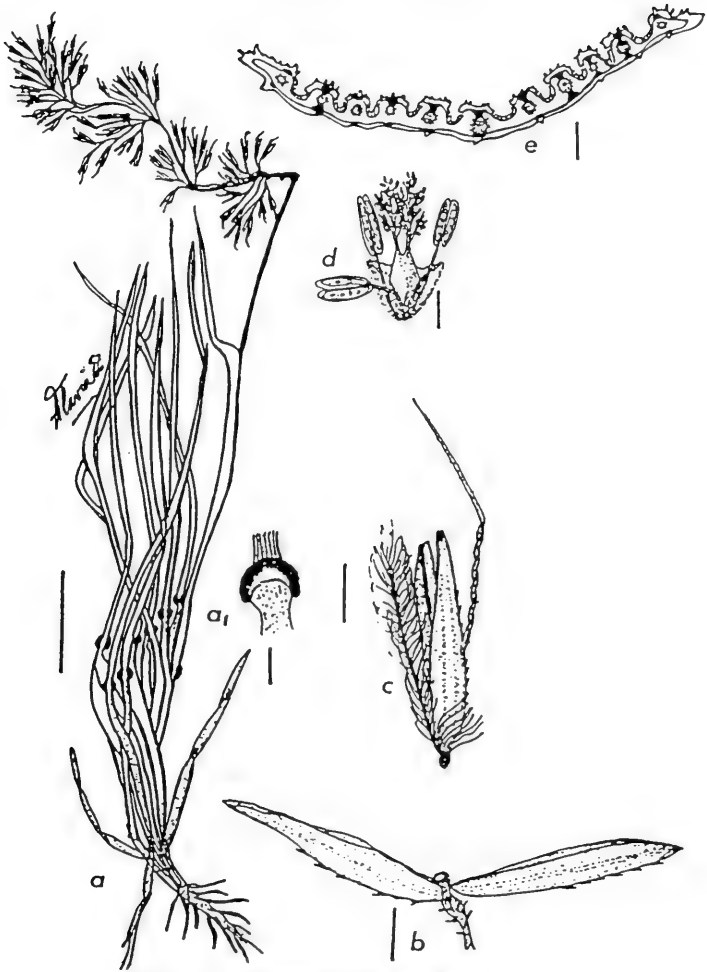


Fig. 3. *Calamagrostis ramonae*

a. Plant. Bar = 6.6 cm

a1. Swollen junction between the sheath and the blade

b. Glumes and lemma stipe. Bar = 1.5 mm

c. Floret. Bar = 1.7 mm

d. Ovary and stamens. Bar = 2 mm

e. Leaf blade cross-section. Bar = 4.3 mm

Based on Steiermark 55903

NEW SPECIES, NAMES AND COMBINATIONS IN WEDELIA  
(ASTERACEAE-HELIANTHEAE)

B. L. Turner

Dept. of Botany, University of Texas, Austin Tx, U.S.A.  
78713

ABSTRACT

Six new Mexican species of Wedelia are described: W. chihuahuana, W. cronquistii, W. gonzalezorum, W. keilii, W. tehuantepecana and W. hintoniorum; and 4 new names and/or combinations are proposed: W. aggregata (Greenm.) B. Turner, W. greenmanii B. Turner, W. purpurea (Greenm.) B. Turner, and W. scabra (Cav.) B. Turner. When appropriate, the relationships of these taxa are briefly described and pertinent synonymy is presented.

Wedelia Jacq., nom. cons., is a large, complex, genus of perhaps 100 or more species. It is widely distributed throughout the tropical world, but largely centered in South America. Most workers relate the genus to Zexmenia. The latter can be distinguished by a suite of characters, most notably its thin-winged, flatter, disk achenes which mostly possess a rather broad, sessile, crown of lacerate scales, these usually bounded by rather stout persistent awns or bristles with broadened bases. I follow McVaugh (1984) in treating the genus Aspilia within the broad fabric of Wedelia, although Robinson (1984) would maintain Aspilia, albeit with reservation.

WEDELIA AGGREGATA (Greenm.) B. Turner, comb. nov.--

Based upon Aspilia (?) aggregata Greenm., Proc. Amer. Acad. Arts 39:102. 1903.

McVaugh (1984) thought this to be an aberrant form of Wedelia rosei Greenm., which, indeed, it appears to be. If so, it predates the latter name, having priority. Regardless, if it proves distinct, the present combination will be required.

WEDELIA CHIHUAHUANA B. Turner, sp. nov.

W. texanae (A. Gray) B. Turner similis sed caulibus laxis ut videtur procumbentibus et capitulis 1-3 in pedunculios 2-8 cm longis differt.

Perennial herbs to 50 cm high. Stems laxly

ascending or somewhat trailing, 50-70 cm long, arising from a branched, lignescent, root system. Leaves opposite throughout, mostly 2-7 cm long, 1-5 cm wide; petioles 1-4 mm long; blades ovate, 3-nervate, moderately to sparsely pubescent beneath with straight hispid hairs, the margins serrate to somewhat irregularly lacerate. Heads companulate, radiate, 1-2 cm across the extended rays, borne 1 to 3 in terminal capitulescences, the ultimate peduncles strigose, 2-8 cm long. Involucres 6-10 mm high, 2-3 seriate, the bracts subequal or the outer somewhat longer, the outer series lance-ovate, hispidulous, the inner series scarious, ciliate, the outer faces with 3 purple striae. Receptacular bracts acute with purple keels. Ray florets 8-13, neuter, the ligules yellow, 5-10 mm long. Disk florets 30-50, the corollas yellow, 4.5-5.0 mm long. Achenes (immature) ca 3 mm long, pubescent, unwinged, the pappus a crown of scales ca 0.5 mm high and 1 or 2 lateral bristles, 1.0-1.5 mm long.

TYPE: MEXICO. CHIHUAHUA: SW of Tomochi, "Rocky (rhyolitic) outcrops in pine-oak forests", ca 2100 m, 25 Sep 1980 A. Cronquist 11720 (holotype TEX; isotypes NY, NY, etc.).

ADDITIONAL SPECIMENS EXAMINED: MEXICO. CHIHUAHUA: Cascada de Basaseachic, above falls near parking lot, 2000 m, ashy volcanic rocks, 14 Oct 1985, Eastoe & Clothier s.n. (LL); base of Basaseachic Waterfall, 1700 m, 4 Jul 1985, Duek & Mehrman s.n. (ARIZ); "along upper third of trail leading to bottom of Cascada de Basaseachic, 25 Jun 1987, Van Devender et al. 87-183 (ARIZ, TEX).

A very distinctive species, with heads superficially resembling W. greenmanii and leaves somewhat like those of W. hispida. The holotype is much-branched from the base having a somewhat more ascending aspect, but Cronquist on the label notes the stems to be "lax and clustered on a woody caudex with 1-several long roots." This description fits the habit of the additional collections cited.

WEDELIA GONZALEZORUM B. Turner, sp. nov.

W. aggregatae (Greenm.) B. Turner similis sed plantis brevioribus (10-25 cm altis) caulibus procumbentibus, foliis angustioribus vestimento grosse hispido in paginis inferis, et capituliis solitariis in pedunculis brevis (1-2 cm longis) differt.

Perennial herbs 10-25 cm high, the stems branched

from the base, procumbent or weakly ascending with shortened internodes, arising from a woody crown. Leaves opposite throughout, 3-5 cm long, 0.2-0.6 cm wide; petioles 0-2 mm long; blades linear-lanceolate to elliptic-lanceolate, thick and coarsely hispid on both surfaces, pinnately-veined, the margins enrolled and seemingly entire. Heads radiate, campanulate, single at the apices of primary or secondary stems, the peduncles 1-2 cm long; involucre 6-8 mm long, 2-3 seriate, the bracts subequal or the outer series somewhat longer. Ray florets 5-8, neuter, the ligules yellow, 6-10 mm long. Disk florets 15-30, the corollas yellow. Achenes broadly clavate, ca 4 mm long, 2 mm wide, purplish-black, hispidulous throughout with brownish hairs, the pappus a crown of scales ca 0.5 mm high, lateral to which are attached 2 short awns 0.5-1.0 mm long, the base bears a distinct caruncle or elaiosome.

TYPE: MEXICO. DURANGO: Mcpio. Mezquital; W de Sta. Ma. de Ocotan, a lo largo de margines de arroyo. "Vegetacion riparia en medio de Bosque de Pino-Encino.", 16 Oct 1984, M. Gonzalez & S. Acevedo 1525 (holotype TEX).

ADDITIONAL COLLECTIONS EXAMINED: MEXICO. DURANGO: Mcpio. Mezquital, 19 km de Los Charcos por el camino a Sa. Ma. Ocotan, 4 Oct 1983, S. & M. Gonzalez 2559 (TEX); Rancho de La Mesa (8 km de La Guajolota), 28 Nov 1985, I. Solis 400 (TEX).

A very distinct taxon, seemingly related to W. aggregata [including W. rosea (Greenm.) McVaugh], but distinguished by a large suite of characters, including habit, leaf-shape, vestiture, involucre size and shape, seed shape, and its color and vestiture. Actually, the relationships of W. aggregata is probably closer to W. purpurea since it has the habit, capitulescence and achenal features of the latter.

Wedelia aggregata, which occurs mostly west of the present species, largely along the Pacific slopes, is a stiffly erect suffruticose herb or shrublet to 1.5 m high. It occurs in or near the range of W. gonzalezorum and has also been collected in Mcpio. Mezquital, but at seemingly lower elevations in mostly Quercus-Arctostaphylos associations (30 km S El Troncon, por el camino a Temoaya), as exemplified by S. Gonzalez and R. Fernandez 2194, (TEX).

It is a pleasure to name this taxon for the two sisters, S. and M. Gonzalez, who first collected the species in 1983 and who have added many new species and



records to the flora of Durango through their botanical collections in the southern portions of that state.

*WEDELIA CRONQUISTII* B. Turner, sp. nov.

*W. aggregatae* (Greenm.) B. Turner similis sed praecipue differt foliis lineari-lanceolatis confertim et grosse albo-strigosis in paginis inferis et capitulis longioribus acheniis majoribus.

Suffruticose perennial herbs to 1 m high. Stems reddish, terete, roughly hispidulous. Leaves opposite throughout, 3-6 cm long, 2-6 mm wide; petioles 0-1 mm long; blades linear to linear-lanceolate, prominently pinnately nervate, densely appressed-strigose beneath with coarse hispid hairs, the margins serrulate to nearly entire. Heads mostly 2-3 in a terminal capitulescence, the ultimate peduncles 3-10 cm long. Involucres campanulate, 3-4 seriate, 10-12 mm high, the bracts graduate to subequal. Receptacles convex, the bracts linear with purple keels, mostly exceeding the disk florets. Ray florets 5-11, neuter, the ligules 6-9 mm long, yellow. Disk florets 30-50, the corollas yellow, ca 6 mm long, the tube 1 mm long, the limb cylindrical, ca 5 mm long. Achenes clavate, 4.0-4.5 mm long, ca 2 mm wide, pubescent, purplish or maculate, pubescent, the apex with a somewhat elevated, narrow, crown of united short scales 0.5-1.0 mm high, occasionally bounded by 1 or 2 short awns to 1 mm long.

TYPE: MEXICO. JALISCO. ca 23 road mi N of Guadajara (sic), on the road to San Cristobal de la Barranca, ca 4900 ft. open oak-grass savannas, 9 Nov 1962, A. Cronquist 9822 (holotype TEX; isotypes NY) NY!

McVaugh (1984) included type material of this taxon, with reservation, under his concept of *W. rosei* (= *W. aggregata* of the present treatment). He noted that "the hairs covering the lower leaf-surface are....quite different in aspect from the soft spreading hairs usually found in *W. rosei*." Leaf shape in type material of *W. cronquistii* also differs from that species in being linear-lanceolate, 2-6 mm wide, and not at all 3-nervate below. Indeed, leaf shape, pubescence and habit would appear to relate this taxon to *W. greenmanii*, standing somewhere between that species and *W. aggregata*.

*WEDELIA GREENMANII* B. Turner, nom. nov.--

Based upon *Aspilia stenophylla* Greenman, Proc. Amer. Acad. Arts 40:39. not *Wedelia stenophylla* Merrill

The type of this taxon is from Chihuahua, near Seven Star Mine, 2450 m, 28 Aug, 1899, Townsend & Barber 380 (GH!). Additional recent collections have been examined from a number of localities as follows: CHIHUAHUA: Lagotera, 5-6000 ft, 21 Jul 1965, Pennington 92 (TEX). SINALOA: 18 mi NE of Choix (20° 50'N, 108° 11'W). SONORA: 26 m W of the Chihuahua border, between Yepachic and Yecora, 24 Sep 1984, Sundberg & Lavin 2830 (TEX); La Mina Verde, 31 km de Cumpas, 23 Sep 1934, Wiggins 7417 (TEX). The Pennington collection differs in having larger leaves which are sparsely hispidulous beneath with coarse ascending hairs; it might represent an undescribed taxon.

WEDELIA HINTONIORUM B. Turner, sp. nov.

W. grayi McVaugh similis sed foliis sessilibus vel subsessilibus plerumque brevioribus linearis-oblancoatis minute hispidulis in paginis superioribus et inferioribus et caulibus apice radicis ligneo cormiformi exorientibus differt.

Perennial herbs to 25 cm high. Stems suffruticose, erect or recumbent from a woody, corn-like, root or crown ca 2.5 cm wide and 4 cm long, 3-7 mm wide; petioles absent or nearly so (0-1 mm long); blades narrowly ovate to oblanceolate, weakly 3-nervate, hispidulous above and below, the margins somewhat serrulate apically. Heads single on peduncles 3-12 mm long. Involucres 8-12 mm high, 2-3 seriate, the bracts subequal, the outermost 3-5, mostly linear oblanceolate, leaf-like. Receptacular bracts linear-lanceolate in outline, 3-fid, about as long as the florets, with purplish-keels. Ray florets 8, neuter, the ligules yellow (?), ca 9 mm long, 3 mm wide. Disk florets ca 30, the corollas ca 5 mm long, glabrous, the tube ca 1 mm long, the lobes ca 1 mm long. Anther sacs blocksih. Achenes (immature) ca 2 mm long, the pappus a crown of shut scales or bristles ca 0.5 mm long.

TYPE: MEXICO. MEXICO: Cerro Muneca, District Temascaltepec, 2300 m, 13 Aug 1932, G. B., Hinton et al. 1352 (holotype LL).

The species superficially resembles the poorly known Wedelia grayi McVaugh and W. mexicana (Sch.-Bip.) McVaugh of northeastern Mexico. It differs from both in the nearly sessile, hispidulous leaves. It does not develop a rhizomatous complex forming mats such as occurs in the white-rayed W. grayi but appears to have

the habit of *W. mexicana*. I surmise that the rays are yellow, much as in the latter species, although it is not clear in the holotype.

The species is named for the G.B. Hinton family, deceased and living, who have given so much of their time and labor to both botanical exploration and the development of Mexico as a nation, G.B.'s son Jaime and, in turn, his son George both becoming Mexican citizens and settling under the shadow of Cerro Potosi along its western slopes where they maintain a very progressive apple orchard and farming enterprise.

WEDELIA KEILII B. Turner, sp. nov. Fig. 1.

*W. mexicanae* (Schultz-Bip.) McVaugh similis sed praecipue differt plantis omnino molliter pilosis et foliis valde laceratis.

Perennial herb to 25 cm high. Stems slender, densely pubescent with spreading multicellular trichomes 1-2 mm long, beneath these there exists a much shorter vestiture of white hispidulous, often uncinata, hairs 0.5-0.7 mm long. Leaves opposite throughout, 2.5-4.0 cm long, 1.0-1.6 cm wide; petioles 5-8 mm long; blades ovate-elliptic, 3-nervate, densely hispid above and below, the margins markedly lacerate. Heads mostly single on slender peduncles 3-9 cm long, subtending each head may be found 2 bract-like leaves which appear to grade into the outer involucre bracts. Involucres campanulate, 7-8 mm high, 3-4 seriate, subequal, the inner series scarious with lacerate margins. Receptacular bracts truncate and markedly lacerate. Ray florets presumably present but sterile (ligules could not be detected but what appear to be throats were found on a few marginal abortive achenes). Disk florets 20-40, the corollas yellow. Achenes radially compressed, ca 5 mm long, sparsely pubescent, the margins with a narrow corky wing ca 0.3 mm wide, the pappus a terminal crown of short scales ca 0.7 mm high. Chromosome number,  $n=22$  pairs.

TYPE: MEXICO. MICHOACAN: 16.3 mi S of Uruapan along route 37 (21.7 mi N of Nuevo Italia), "grassy hillsides with scattered shrubs and small trees", 3600 ft, 29 Aug 1981, David Keil & M. Luckow 15201 (holotype TEX; isotypes ENCB, MEXU, OBI).

As noted by Keil et al. (1988), this previously undescribed taxon (indeed, unencountered) has a chromosome count of  $n=22$  pairs. The holotype and

isotype are apparently from the same plant since the collectors state upon the label, "One plant seen in tall grass on bank below roadside."

The grassland areas about Nueva Italia contain a number of restricted endemics including, for example, Chrysanthellum filiforme McVaugh and Stuessya michoacana B. Turner. It is a pleasure to name the species for Dr. David Keil who has discovered a number of novelties along the Pacific slopes of Mexico. His collections are always neatly preserved and his labels usually contain a wealth of information, often including chromosome counts, as noted above.

WEDELIA PURPUREA (Greenm.) B. Turner, comb. nov.

Based upon Aspilia purpurea Greenm., Proc. Amer. Acad. Arts 40:39.1904. I consider Aspilia scabrida Brandegee to be but a form of this taxon.

WEDELIA SCABRA (Cav.) B. Turner, comb. nov.--Based upon

Buphthalmum scabrum Cav., Ic. Plan. 1:53.t.167.1791.

Wedelia acapulcensis H.B.K., Nov. Gen. & Sp. 4:168.1818.

Stemmodontia scaberrima Cass., Dict. Sci. Nat. 46:407.1827. not Wedelia scaberrima Benth. (1839)

Lipochaeta strigosa DC., Prodr. 5:610.1836. Zexmenia strigosa (DC.) Sch.-Bip, in Seem. Bot. Voy. Herald 306.1856.

Wedelia fertilis McVaugh, Contr. Univ. Mich. Herb. 9:462.1972., not Wedelia strigosa Hook. & Arn.

Wedelia strigosa Hook. & Arn., Bot. Beech. Voy. 435.1841. Aspilia strigosa (Hook & Arn.) Hemsl., Biol. Centr. Amer. Bot. 2:171.1881.

Zexmenia hispida (H.B.K.) A. Gray var. ramosissima Greenm., Publ. Field Columbian Mus., Bot. Ser. 3:127.1904. Wedelia hispida (H.B.K.) var. ramosissima (Greenm.) K. Becker, Phytologia 31:25.1975.

The earliest name for the common widespread Wedelia of Mexico is apparently Buphthalmum scabrum Cav. The type figure of the latter was apparently made from garden-grown material, the seed of which was obtained in Mexico. Dr. John Beaman informs me (pers. comm.) that,

while he located several Cavanilles types of *Buphthalmum* in his visit to Madrid during the mid-1960s, he did not see or photograph any herbarium sheets of *B. scabrum*. While I have also not examined a preserved sheet, it is clear from the original description that the plant concerned belongs to the above complex and that it was probably obtained from the Pacific side of Mexico where decumbent plants with relatively large herbaceous involucre bracts occur, (as illustrated in the original plate).

McVaugh (1984) recognized *Wedelia acapulcensis* and *W. fertilis* as distinct species. As noted by McVaugh and yet others, the group is in much need of field study and until such studies are made it would seem undesirable to propose a suite of varietal names to accommodate the geographic variation that is suggested by the relatively few collections available for study.

My concept of *W. scabra* includes all of those specimens from Mexico with leaves having an indument with minute, apically-recurved hairs, (with the exception of *W. ayerscottiana* B. Turner which also possesses such hairs). I owe this observation to Dr. John Strother who called the character to my attention. While information relating to such hairs are absent in the type description of *W. scabra*, I infer that such are present (based upon yet other characters which mark the taxon). The name var. *ramosissima* (as part of *W. hispida*) has been applied to somewhat smaller-headed, shorter-peduncled, individuals that range from southern Mexico, into Central America and northward again up the Pacific side of Mexico; the var. *scabra* would apply to the larger-headed, longer-peduncled individuals. McVaugh (1984) would call the former plants *W. fertilis*; the latter *W. acapulcensis*. While he also used yet other characters to distinguish between these taxa (e.g., habit, corolla length, involucre size; etc.), I find all of these to be quite variable and difficult to apply.

WEDELIA TEHUANTEPECANA B. Turner, sp. nov.

*W. scabrae* (Cav.) B. Turner similis sed differt plantis fruticosis ramis divaricatis, foliis sine trichomatibus uncinatis, et acheniis coronis elevatis ab 2-3 setis persistentibus 3-6 mm longis definitis.

Much-branched, erect or somewhat procumbent, coarsely hispid shrubs or shrublets 0.5-1.5 m high. Leaves opposite 4-10 cm long, 1.5-4.0 cm wide; petioles 0.5-1.5 cm long, the upper portion winged; blades ovate

to subdeltoid, 3-nervate, coarsely hispid, uncinata hairs absent, the margins serrulate to coarsely and irregularly dentate. Heads radiate, mostly 1-3 in terminal cymules, the ultimate peduncles mostly 2-8 cm long. Involucres 10-12 mm high, narrowly campanulate, 2-3 seriate, the bracts subequal, the outer series greener and somewhat longer than the inner. Ray florets (5)8-11, sterile or rarely fertile, the ligules 5-10 mm long; achenes pistillate, those of the ray florets mostly abortive with a raised crown bounded by 3 bristles, those of the disk florets 5-6 mm long with a raised crown and usually 2 (rarely 3) bristles 3-6 mm long, the margins markedly winged at maturity.

TYPE: MEXICO. OAXACA: 20 km NE Juchitan, 5 km E of the junction of the Pan-American highway (190) with the Cross-isthmus highway (185), 100 m or less, 6 Nov 1970, A. Cronquist & J. Fay 10875 (holotype TEX; isotype NY).

ADDITIONAL SPECIMENS EXAMINED: MEXICO. VERACRUZ: Mcpio., Mecayapan, 7 km S of Tatahuicapan, 16 Jul 1982, Nee et al. 25131 (F, TEX, XAL). OAXACA: 17 km NW of La Ventosa, 16 Jul 1958, King 596 (MICH, TEX); 4 km NNE of Tehuantepec, 5 Jul 1959, King 1360 (MICH, TEX); 4-5 km E of Juchitan, 12 Jul 1959, King 1637 (MICH, TEX); 9-10 km E of La Ventosa, 16 Jul 1959, King 1709 (MICH, TEX). CHIAPAS. Mcpio. Cintalapa, 5 km W of Rizo de Oro, 26 Aug 1974, Breedlove 36729 (LL); 7 km N of Tuxtla Gutierrez, 16 Oct 1965, Breedlove & Raven 13372 (LL); 5 km N of Tuxtla Gutierrez, 18 Oct 1965, Breedlove & Raven 13530 (LL); 12 mi E of Tanatepec, 31 Oct 1965, Cronquist & Sousa 10454 (NY, TEX); 1.6 m E of Oaxaca-Chiapas border, 2 Sep 1965, R. Jackson 7123 (TEX).

The species is distinguished from the widespread W. scabra by a number of characters including shrubby habit, coarsely hispid, often jaggedly serrate, leaves which lack uncinata hairs, larger achenes with an elevated crown which is subtended by 2-3 persistent bristles, 3-6 mm long, the margins markedly winged. So far as known it is largely confined to the region of the Isthmus of Tehuantepec.

#### ACKNOWLEDGEMENTS

I am grateful to Dr. Guy Nesom for the Latin diagnoses and for reviewing the manuscript. Dr. John Strother also reviewed parts of the paper and added greatly to its preparation! Nancy Webber provided the line drawings.

## LITERATURE CITED

- Keil, D. J. et al. 1988. Chromosome studies in Asteraceae from the United States ...*Amer. J. Bot.* 75:652-668.
- McVaugh, R. 1984. Wedelia, in *Flora Nova-Galiciana* 12:1080-1092.
- Robinson, H. 1984. Studies in the Heliantheae (Asteraceae) XXXIII...*Phytologia* 55:415-423.

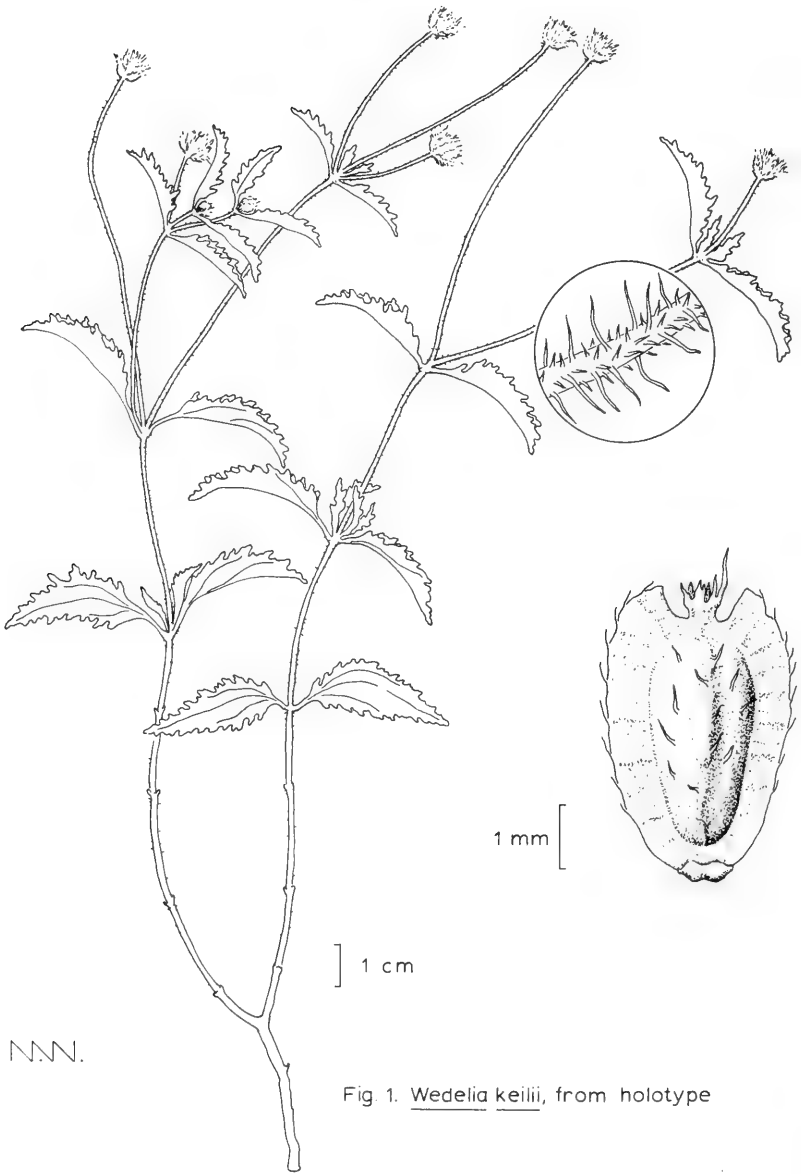


Fig 1. Wedelia keilii, from holotype



NEW SPECIES AND COMBINATIONS IN LASIANTHAEA  
(ASTERACEAE, HELIANTHEAE)

B. L. Turner

Department of Botany, Univ. of Texas, Austin, Tex, 78713,  
U.S.A.

ABSTRACT

The generic limits of Lasianthaea are expanded with the description of several new species, and the transfer of yet others from the ill-defined genus Zexmenia La Llave and the recently proposed Lundellianthus, which is a monotypic genus based upon L. petenensis H. Rob. The latter is shown to be a synonym of Zexmenia guatemalensis Donn.-Sm.

Attempts to provide treatments of the difficult genera Lasianthaea, Otopappus, Zexmenia and Wedelia for our upcoming Asteraceae of Mexico (Turner & Nesom, in prep.) has necessitated description of the following new species and new combinations. These tasks have been made easier by the recent treatments of Lasianthaea (Becker, 1979), Otopappus (Hartman and Stuessy, 1983) and the careful rendition of these two genera by McVaugh (1984) in his monumental Flora Novo-Galiciana. The unpublished manuscript by Rindos (1980) has also proved quite helpful.

In spite of the several references mentioned above, the generic lines between these several genera are drawn with considerable difficulty. This is reflected by H. Robinson's recent description of the monotypic Lundellianthus, which is a synonym of Zexmenia guatemalensis, which Becker (1979) retained in Zexmenia. Indeed, were Lundellianthus guatemalensis the only species to be accommodated within Robinson's segregate genus I might accept his treatment as perhaps valid, or at least as good as any, but with the transfer of Otopappus jaliscensis McVaugh into Lasianthaea by Hartman and Stuessy and the admittance of Zexmenia rosei Greenm. into Lasianthaea by McVaugh (1984) and especially by the detection of L. belizeana and L. breedlovei, as described herein, it seems clear that Lundellianthus can not stand as monotypic, or neatly demarcated from Lasianthaea. Of course Lundellianthus might be expanded to include L. belizeana, L. breedlovei, L. kingii, L. salvinii and perhaps other species, but these are so inextricably linked to Lasianthaea, especially the group of shrubs

centering about L. fruticosa L. that I see little point in segregating them. Indeed, they appear to be as readily incorporated into Lasianthaea as are the tuberous-rooted herbs to which Becker (1979) even deigned sectional status. But it must be admitted that an expanded Lasianthaea, as envisioned here, still presents generic problems, as it is still perhaps too close to Zexmenia for "phyletic comfort."

Robinson (1978, 1979) has retained the closely related genus Oyedaea as distinct from Zexmenia. The former is typified by Oyedaea verbesinoides DC. of Costa Rica, Panama and southwards. This species has neuter ray florets, but its fruit and floral characters are like those of Zexmenia. Robinson (1979) describes the achenes of Z. verbesinoides as "not constricted at the apex". I would describe the achenes as broadly constricted at the apex. At least the awns and scales arise from a definite bulge which, at maturity, sit within the enlarged flattened indurate margins. This is the state of the pappus in most species of Zexmenia (e.g. Z. serrata, the generotype). Indeed, species of both Oyedaea and Zexmenia occasionally possess elaisomes on the achenes, as do several species of Wedelia (Nesom, 1981). In any case I find little to distinguish between Zexmenia and Oyedaea except for the sterile ray florets. Even Blake (1921), who revised Oyedaea, commented that Oyedaea is closely related to Zexmenia but "it is readily if somewhat artificially distinguished by its neutral rays." He goes on to describe the achenes of Oyedaea verbesinoides as having pappus "Squamellae about 8 to 12, linear-lanceolate, acuminate, lacerate-fimbriate, united below into a cup, 0.8 to 2 mm long." The cup or corona (a term used in his description for the genus as a whole) is presumable found in all or most of the species, along with narrow, or not-so-narrow, marginal wings. Blake's description of the achenes of Oyedaea would apply, equally well, to most species of Zexmenia. We are left then, with but neuter florets to distinguish between the reputed genera, a notoriously inconstant character that varies among species of a given genus (e.g., commonly so in Verbesina) and within a species or even a variety (e.g., Machaeranthera pinnatifida; Turner, 1987). Robinson (1979) implied that Oyedaea may yet be naturally circumscribed and "that none of the species north of Costa Rica are true Oyedaea [i.e., not including the type species, O. verbesinoides], but alternatives to the artificial concept are provided for only two Mexican species [Oyedaea mexicana Rzed., which he correctly transferred to Otopappus (also accepted by Hartman &

Stuessy, 1983) and *Oyedaea ovalifolia* A. Gray, which he used for his monotypic *Perymeniopsis* H. Rob. (1978), which I position within an expanded *Perymenium* (Turner, 1988)]. The two Guatemalan species are retained in *Oyedaea* awaiting more natural limits for the entire complex of genera." No doubt better resolution is needed, but in my opinion the type species of *Oyedaea* belongs to *Zexmenia*.

I have defined these several genera by a combination of floral and achenal characters that I think reflects natural lineages. These are best summarized in key-fashion, as follows.

1. All of the following hold for *Lasianthaea*: Corollas with tubular or near-tubular (i.e., very narrowly funnelform) throats, the vascular-lines well-defined, the lobes short and usually well-endowed with short thick hairs; style branches slender with penicillate appendages, rarely apiculate; ray and disk achenes truncate, the lateral awns 2 or 3 between which occur 1 to several short scales, there is no noticeable neck to the achene body and the awns are seemingly extensions of the achenal margins; the disk achenes are usually unwinged and somewhat 3-4 sided at maturity but the ray achenes often possess well-developed wings.
1. One or more of the following hold for *Otopappus*, *Wedelia* and *Zexmenia* (including *Oyedaea*): Corollas somewhat funnelform to nearly tubular, the vascular lines usually weakly defined, the lobes various; style branches often broad with short apiculate, sparsely hispid, appendages; disk achenes with necks from which arise the awns and scales; if the body is truncate then the margins usually provided with well-developed wings on the adaxial side only, these extending up and onto the awn.

LASIANTHAEA BECKERI B. Turner, sp. nov. Fig. 1.

*L. rosei* (Greenm.) McVaugh similis sed flosculis radiatis et disci luteis, involucri 4-5 seriatis aequaliter et gradatim imbricatis, et squamis pappi liberis 2.5-3.5 mm longis differt.

Perennial herbs 50-60 cm high. Stems slender, spreading-strigose, arising from well-developed tubers, the internodes mostly longer than the leaves. Leaves only 4-5 pairs per stem, somewhat elliptical to obovate,

7-10 cm long, 1.5-4.0 cm wide; petioles 0.1-1.0 cm long, often winged throughout; blades penninervate, or weakly trinervate from above the base, strigose on both surfaces, the margins irregularly serrulate. Heads 4-5, borne on elongate stalks 15-20 cm long, the heads nearly sessile in much-reduced leafy bracts. Involucre 4-5 seriate, narrowly campanulate, 9-10 mm long; bracts broadly ovate, decidedly graduate, 2-10 mm long, strongly ciliate, mostly obtuse with dark green apices. Pales lanceolate, 3-lobed, shorter than the subtended florets. Ray florets 5, pistillate, fertile; corollas yellow, the tubes ca 3 mm long, the ligules 6-7 mm long, ca 3 mm wide. Disk florets 20-30; corollas yellow, narrowly funnelform, 6-7 mm wide; tube ca 1 mm long, glabrous; throat 5-6 mm long with strongly developed vascular strands, glabrous for most of its length, the lobes ca 0.5 mm long, ciliate. Anthers black. Style branches slender with narrow, penicillate, appendages. Ray achenes (immature) 3-sided, winged, the pappus of 3 awns, extending from the margins. Disk achenes (immature), with the body ca 3 mm long, obviously winged, flat; pappus of 2-3, rigid, linear, ciliate awns, 2.5-3.5 mm long, arising from the margins.

TYPE: MEXICO. JALISCO: ca 5.3 mi N Tecalitlan along highway 110, reportedly growing in secondary scrub-growths along roadside; uncommon, 17 Aug 1971; Warren D. Stephens 1432a (holotype, TEX; isotype MSC, 2 sheets).

In Becker's (1979) treatment of Lasianthaea the above specimen will key (except for its yellow ray and disk florets) to L. zinnioides (Hemsl.) Becker. The latter is superficially similar in habit (perennial herbs with 3-5 pairs of leaves to each stem) but very different in leaf shape (strongly 3-nervate and nearly sessile) and vestiture (short-hispidulous throughout).

In McVaugh's (1984) treatment of Lasianthaea the specimen will not key, but if the florets were "dark purplish red" it would key somewhere near L. zinnioides and L. rosei. The latter taxon, as noted by McVaugh, was inexplicably retained in Zexmenia by Becker, although it appears to have all of the characters of Lasianthaea. In fact, I conclude that L. beckeri is most closely related to L. rosei, possessing the habit, leaves and vestiture of that species, but differs in its yellow ray and disk florets, more evenly gradate involucre, fewer ray florets and longer, ununited, pappus scales. In any case, neither Becker or McVaugh appears to have examined material of L. beckeri; at least type material is not

cited in their treatments.

It is a pleasure to name this species for Dr. Kenneth Becker, whose monograph of *Lasianthaea* has helped to clarify specific and generic relationships among the zexmeniid elements of Mexico and Central America.

LASIANTHAEA BELIZEANA B. Turner, sp. nov.

*L. guatemalensis* (Hemsl.) B. Turner similis sed petiolis no perfoliatis non alatis, capitulis cylindricis flosculis paucioribus differt.

Weak-stemmed shrub to 3 m high. Leaves opposite throughout, mostly 8-16 cm long, 1.5-3.0 cm wide; petioles 0.6-1.6 cm long; blades linear-lanceolate, 3-nervate from somewhat above the base, strigillose beneath with closely appressed hairs, the margins entire to remotely denticulate, tapered into attenuated apices. Stems, at maturity, terete, strigose. Heads cylindrical, radiate, 2-10, arranged in terminal or subterminal clusters, the ultimate peduncles mostly 3-10 mm long. Involucres cylindrical, 10-12 mm long, 3-5 mm wide, the bracts 2-3 seriate, subequal, the outermost 2-3 in number, lanceolate to oblanceolate, strigose, the apices somewhat herbaceous; inner bracts somewhat chartaceous, like the pales. Receptacle convex, the pales acute, shorter than the subtended florets. Ray florets 3-5, the ligules 3-5 mm long, yellow, with apices weakly notched, if at all. Disk florets 6-10, the corollas yellow, 5-6 mm long, the throat cylindrical, with well-developed vascular-lines and 5, coarsely hispid, lobes ca 0.7 mm long. Anthers black, the appendages dark and spade-like. Style branches slender with penicillate appendages. Ray achenes with body ca 5 mm long, tangentially flattened, the margins winged and extending onto the 2 awns; pappus of 2 stout awns, 3-4 mm long, between these ca 6 pairs of separate scales, 0.1-2.5 mm long. Disk achenes (immature) 4-sided but presumably radially compressed, 4-5 mm long, the pappus of 4-8 oblique scales, 0.1-2.5 mm long.

TYPE: BELIZE: Gracie Rock, 1.5-4.0 mi S of Mile 22 on Western Highway, 100 m, 21 Jan 1974, R. Leisner & J. Dwyer 1475 (holotype LL; isotype MO; strother, pers. comm., also notes specimens at BM, MO, UC).

This taxon is quite distinctive, standing somewhere between *Lasianthaea salvinii* and *L. breedlovei*, possessing ray achenes with pronounced wings, and disk

florets, albeit immature, with 4 sides. The corollas and style branches are like those of Lasianthaea, but one might make a case for the treatment of these several species in an expanded Lundellianthus such as will soon be proposed by Strother (pers. comm.; ms). I prefer to place them in an expanded Lasianthaea where they relate to L. fruticosa and allies.

LASIANTHAEA BREEDLOVEI B. Turner, sp. nov., Fig. 2.

L. salvinii (Hemsl.) B. Turner similis sed foliis minoribus grosse hispidis in paginis infernis, capitulis minoribus flosculis paucioribus, et flosculis disci aristis pappi valde asymmetricis differt.

Suffrutescent shrublet or shrub. Stems at maturity, terete, brownish, minutely strigose. Leaves opposite, 5-8 cm long, 1.5-3.0 cm wide; petioles 3-10 mm long; blades ovate, pubescent above with erect, stiff, broad-based, hairs, strigillose below, the margins remotely serrulate to nearly entire, the apices acute. Heads 1-3, terminal or axillary on peduncles 0.5-3.0 cm long. Involucres 2-3 seriate, campanulate, 0.8-1.5 cm high; the outer series ovate to oblanceolate, 8-15 mm high, strigillose; the middle series ovate, ca 8 mm long; the inner series ovate, ca 4 mm long. Pales somewhat chartaceous, linear, ca 6 mm long, acute to trifid. Ray florets 8, pistillate, fertile; corollas yellow, tube ca 3 mm long, the ligules bifid, ca 8 mm long, ca 3 mm wide. Disk florets ca 50; corollas yellow; tube slender, ca 1.5 mm long; throat narrowly funnelform, ca 4 mm long, glabrous for most its length, the lobes ca 0.6 long, hispid. Anthers black, with black and white ovate appendages. Style branches slender with subulate, hispidulous, appendages. Ray achenes 3-sided, the body winged along the sides and extended into 2-3 scales, the latter 0.5-3.0 mm long. Disk achenes 4-sided, unwinged, glabrous, 3-4 mm long, surmounted by an oblique pappus of 3-7 rigid scales, 0.1-4.0 mm long, the inner-most longer than the others.

TYPE: MEXICO. CHIAPAS: 10 km SW Ocosingo along road to San Cristobal, steep slope with Pinus and Quercus, 1200 m, 23 Sep 1972, D.E. Breedlove 27848 (holotype TEX; isotype CAS).

Lasianthaea breedlovei is noteworthy for the somewhat 4-sided unwinged disk achenes which are surmounted by an oblique set of stiff scales, the longest of which extends from the margins. Except for the

wingless margins, the achenes are surprisingly like those of Otopappus jaliscensis McVaugh, which Hartman and Stuessy (1983), in my opinion, correctly transferred to Lasianthaea; indeed, the overall aspect of L. breedlovei resembles that of L. jaliscensis but the latter is readily distinguished by its larger heads with larger florets. The style branches, florets, ray achenes and position of pappus of both species suggest a closer relationship with Lasianthaea than to Otopappus.

Lasianthaea breedlovei also possesses attributes of L. guatemalensis which, as noted below, H. Robinson recently elevated to a monotypic genus, Lundellianthus, albeit in ignorance of the fact that it had been described earlier as a species of Zexmenia. Indeed, were it not for Lasianthaea breedlovei, which in its corolla and stylar features serves as a link between Lasianthaea and Lundellianthus, the latter might stand as a good genus. Lasianthaea breedlovei has the 4-sided disk achenes of L. salvinii and a strongly winged ray achene, reminiscent of that species.

LASIANTHAEA CALVA (Greenm.) B. Turner, comb. nov. .

Based upon Perymenium (?) calvum Greenm., Proc. Amer. Acad. Arts 40:41. 1904.

Damnaxanthodium calvum (Greenm.) Strother, Syst. Bot. 12:41-43. 1987.

Strother (1987), in erecting the monotypic genus Damnaxanthodium, compared this herbaceous perennial with the habitually similar Lasianthaea aurea (D. Don) K. Becker, Perymenium buphthalmoides DC. and Wedelia mexicana (Sch.-Bip.) McVaugh. He notes that it does not compare favorably with either Perymenium or Wedelia but thought it exhibited "a novel suite of traits involving organs of perennation and details of capitulescence, flowers and fruits." Actually, compared to L. aurea, as listed in Strother's Table 1, it appears to differ significantly only in its non-tuberous roots and epappose, wingless achenes. However, Damnaxanthodium, compared to Lasianthaea (sensu Becker, 1979) would differ only by its epappose, somewhat 4-sided, wingless achenes and the only difference between Damnaxanthodium and Lasianthaea (sensu B. Turner) is that of pappus. In short, I believe that Perymenium (?) calvum is an epappose species of Lasianthaea. Because of its herbaceous habit and subequal involucre bracts I would relate it to L. palmeri (W.W. Jones) Becker, from which

it differs primarily by its wingless, epappose, more turgid, achenes.

LASIANTHAEA GUATEMALENSIS (J.D. Smith) B. Turner, comb. nov.

Based upon Zexmenia guatemalensis J.D. Smith, Bot. Gaz. 13:188.1888.

Ludellianthus petenensis H. Rob., Wrightia 6:41.1978.

Robinson, apparently unaware of the earlier name, Zexmenia guatemalensis, has redescribed this taxon as the only species of a newly described genus, Ludellianthus, as noted above. Becker recognized an isotype of L. petanensis (LL!, 1975, by annotation) as Zexmenia guatemalensis and the material concerned readily keys to the latter species in his treatment of Zexmenia for the flora of Guatemala and there is little doubt that these belong to the same species.

While Zexmenia guatemalensis was kept distinct from Lasianthaea by Becker (1976), it seems more closely related to that group than it does to Zexmenia proper, especially considering the recent inclusion of such taxa as Lasianthaea rosei, L. jaliscensis, and L. breedlovei, discussed above. At least I can see no justification for the erection of Ludellianthus, the generotype possessing nothing unique. Robinson emphasized the unwinged (and presumably 4-sided) disk achenes as being different from that of Lasianthaea and Zexmenia, but Jones (1905) emphasized these very characters in his recognition of Z. guatemalensis.

LASIANTHAEA KINGII (H. Rob.) B. Turner, comb. nov.--

Based upon Zexmenia kingii H. Rob., Phytologia 41:34.1978.

Lasianthaea kingii has the corolla and achenal characters of Lasianthaea. The mature disk achenes are winged in the manner of that genus and the awns appear to be marginal extensions of the body; the scales are united into a small crown which superficially resembles a neck. Further, the anthers are yellow with appendages like Lasianthaea. It does differ from most species of the latter genus in having relatively broad stylar branches with apiculate appendages. Overall it appears to stand somewhere between the Lasianthaea fruticosa group and the



L. guatemalensis group.

LASIANTHAEA SALVINII (Hemsl.) B. Turner, comb. nov.--

Based upon Zexmenia salvinii Hemsl., Biol. Centr. Amer. Bot. 2:173.1881.

Robinson, in his description of Zexmenia kingii, comments upon the similarity of the latter to Z. salvinii, a view with which I concur. Both possess similar achenes, and the peripheral achenes tend to disarticulate at maturity as a unit with the adjacent pales, a feature also occurring in the herbaceous, tuberous-rooted, Lasianthaea rosei (Greenm.) McVaugh. The stylar appendages of L. salvinii, however, are not noticeably apiculate and the anther appendages are purplish and spade-like.

LASIANTHAEA STEYERMARKII (Blake) B. Turner, comb. nov.

Based upon Oyedaea steyermarkii Blake, Proc. Biol. Soc. Wash. 60:42.1947.

LASIANTHAEA LUNDELLII (H. Rob.) B. Turner, comb. nov.

Based upon Oyedaea lundellii H. Rob., Wrightia 6:45. 1979.

This is superficially similar to the above species. The type (Guatemala: La Cumbre, Cerro la Cueva, 22 Mar 1977, Lundell & Contreras 20642; holotype US, isotype LL!) occurs in the general vicinity of, and presumably with, L. lundellii, as may be ascertained from the several sheets of L. steyermarkii cited by Robinson (1979) from La Cumbre, Guatemala. This taxon differs from L. steyermarkii by a number of features including its longer peduncles, more foliaceous outer involucre bracts, and harsher pubescence. Indeed, Strother (pers. comm.) considers it sufficiently distinct from all of the taxa discussed here so as to be placed (possibly!) in a monotypic genus.

#### ACKNOWLEDGEMENTS

I am grateful to Dr. G. Nesom for the Latin diagnoses; Dr. J. Strother provided numerous helpful suggestions and criticisms; indeed, he first called to my attention the synonymy of Lundellianthus, noted here.

## LITERATURE CITED

- Becker, K. M. 1979. A monograph of the genus Lasianthaea (Asteraceae) Mem. New York Bot. Gard. 31:1-64.
- Blake, S.F. 1921. Revision of the genus Oyedaea. Contr. U.S. Natl. Herb. 20:411-422.
- Hartman, R. and T. Stuessy. 1983. Revision of Otopappus (Compositae, Heliantheae). Syst. Bot. 8:185-210.
- Jones, W.W. 1905. A revision of the genus Zexmenia. Proc. Amer. Acad. Arts 41:143-167.
- McVaugh, R. 1984. Lasianthaea, in Flora Novo-Galiciana 12:558-575.
- Nesom, G.L. 1981. Ant dispersal in Wedelia hispida HBK. (Heliantheae: Compositae). Southwestern Naturalist 26:5-12.
- Rindos, D. 1980. Generic delimitation in the Verbesinoid Heliantheae. I. The genus Zexmenia Llave; M.S. Thesis, Cornell Univ., 122 pp.
- Robinson, H. 1978. Studies in the Heliantheae (Asteraceae). XIII. A new genus Perymeniopsis. Phytologia 40:495-496.
- \_\_\_\_\_. 1979. Notes on Oyedaea in Central America (Heliantheae: Asteraceae). Wrightia 6:43-45.
- Turner, B.L. 1987. Taxonomic study of Machaeranthera, sections Machaeranthera and Hesperastrum (Asteraceae). Phytologia 62:207-266.
- \_\_\_\_\_. 1988. New combinations in Perymenium ...Phytologia 64:263-266.

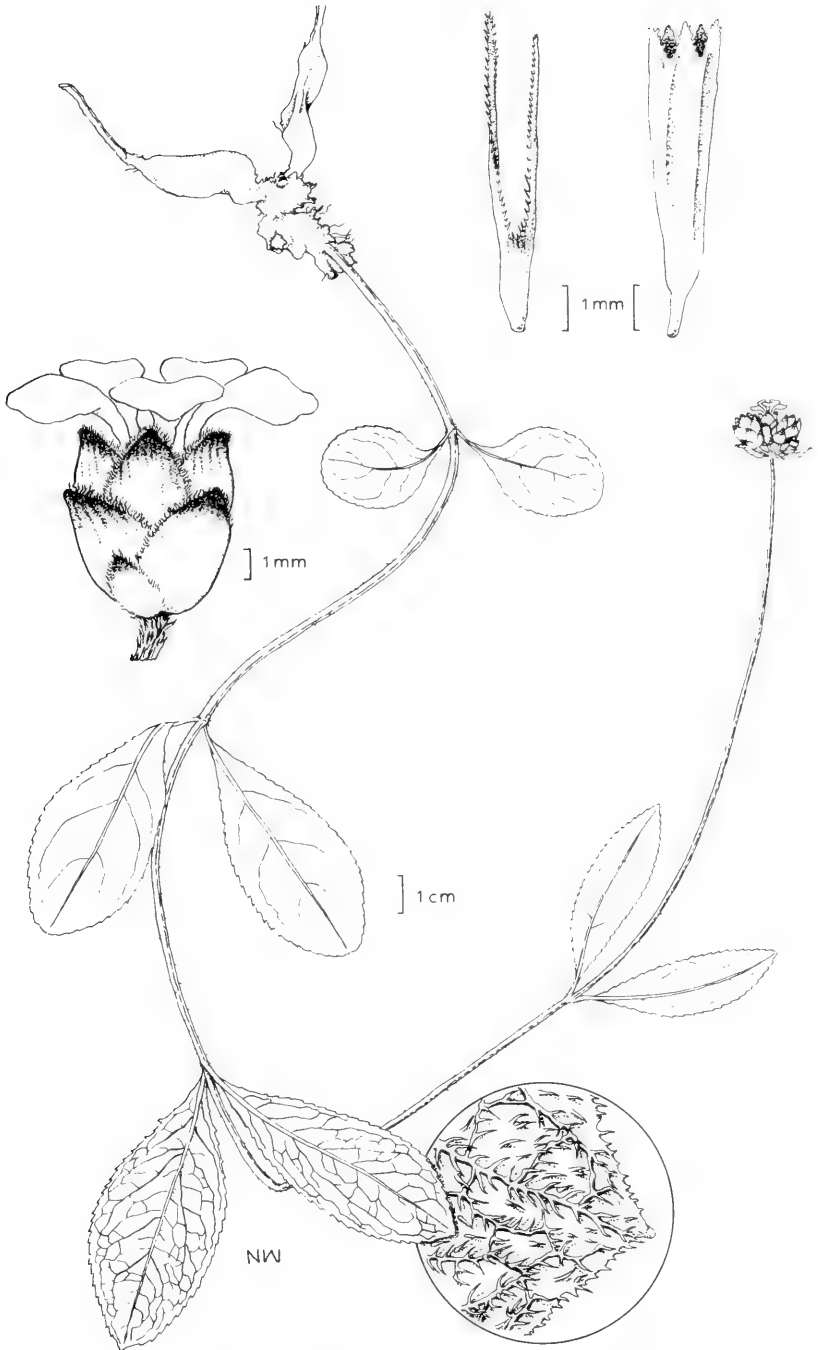


Fig 1. LASIANTHAEA BECKERI, from holotype

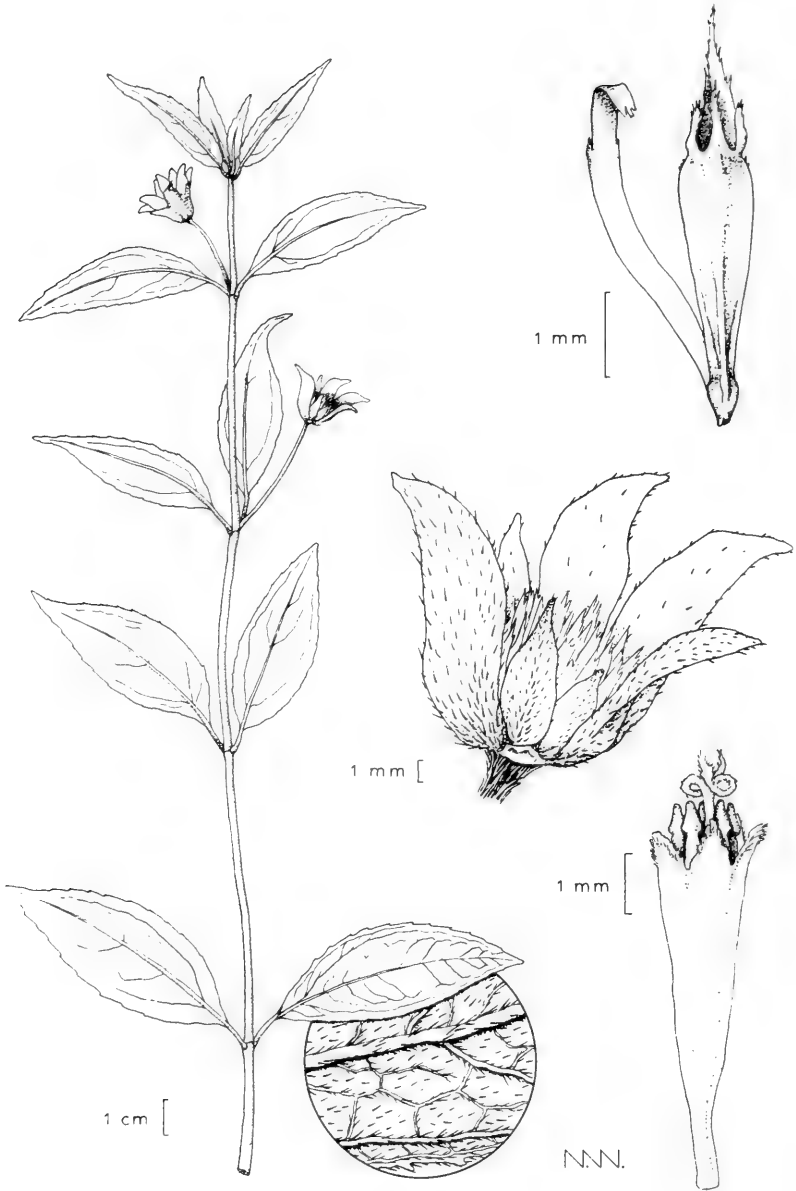


Fig 2 LASIANTHAEA BREEDLOVEI, from holotype.

PERYMENIUM OAXACANUM (ASTERACEAE), A NEW SPECIES FROM  
SOUTHERN MEXICO

B.L. Turner

Dept. of Botany, University of Texas, Austin, TX 78713, USA

Routine identification of Mexican Asteraceae has revealed the following novelty. I am grateful to Dr. D. Keil for the loan of material from OBI and to Guy Nesom for the Latin diagnosis.

PERYMENIUM OAXACANUM B. Turner, sp. nov., Fig. 1.

*P. sedasano* Fay similis sed petiolis brevioribus (2-4 mm longis) et foliis hirsutis trichomatibus patentibus differt.

Shrub or shrublets 30-100 cm high. Upper stems 4-sided and grooved, pilose with spreading white hairs ca 0.5 mm long. Leaves opposite throughout, 3.0-5.5 cm long, 1.5-2.5 cm wide; petioles 2-4 mm long; blades ovate to ovate-oval, 3-nervate, pubescent above and beneath with erect or ascending hairs, atomiferous-glandular, the margins rather evenly serrate. Heads radiate, 4-10 in terminal or subterminal cymules, the ultimate peduncles 0.5-5.0 cm long. Involucres campanulate, 3-4 seriate, 5-6 mm high, the bracts ovate, appressed, somewhat graduate, the outer series ca 4 mm long, strigose. Ray florets 11-18, pistillate, fertile, the ligules yellow, 6-8 mm long. Disk florets 40-60, the corollas yellow. Anthers brown with white appendages. Achenes (immature) ca 2 mm long, the pappus bristles 1.0-1.5 mm long.

TYPE: MEXICO.OAXACA: SE of Miahuatlan on road to Puerto Angel (16° 12'N, 96° 30'W), pine-oak forest with bunch grass understory and many herbs, ca 2400 m, 6 Jul 1969, Brian & Carol Marcks 1007 (holotype TEX; isotype WIS).

Additional Specimen Examined: OAXACA: 18.1 mi SE of Nochixtlan on Mexican Route 190, 24.3 mi NW of junction of routes 190 and 131, oak-pine woodland with grass understory, common in shade, 12 Sep 1981, Keil 15518 (OBI).

The species would key to *P. sedasanum* in Fay (1978), which is readily distinguished by its longer-petiolate leaves with finely reticulate, densely appressed-strigose vestiture, and stems with appressed hairs. Fay cites only 2 sheets of *P. sedasanum*, both from the area of Las Sedas in central Oaxaca.

The 2 collections of *P. oaxacanum* appear to belong to the same taxon, although the Keil collection is more coarsely serrate with coarser, fewer hairs. The Keil collection (cited above) was obtained from the same site-area as Keil 15517 (OBI), which is a specimen of *P. sedasanum*. The latter was said to occur in a narrow canyon. This collection is markedly different from *P. oaxacanum*, presumably occurring parapatrically with the latter, but at somewhat lower, drier sites.

LITERATURE CITED

Fay, J.J. 1978. Revision of *Perymenium* (Asteraceae-Heliantheae) in Mexico and Central America. *Allertonia* 1: 235-296.

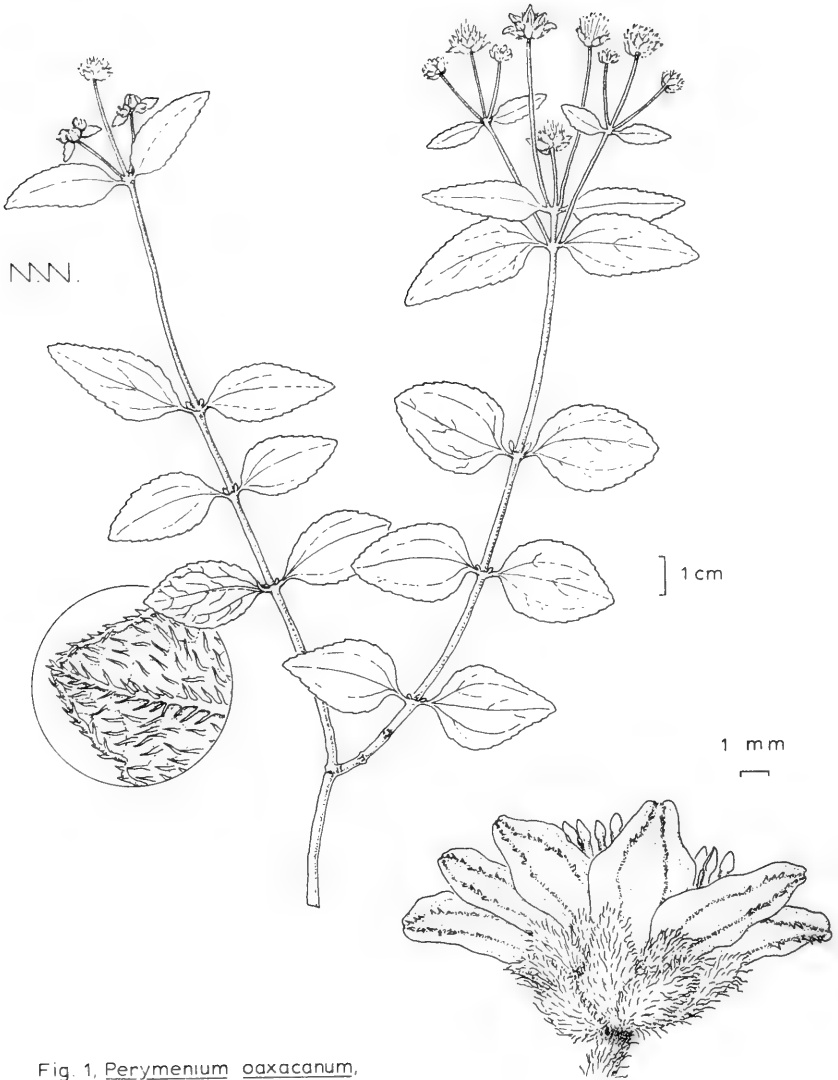


Fig. 1, *Perymenium oaxacanum*,  
from holotype

A NEW SPECIES OF *SENECIO* (ASTERACEAE) FROM NUEVO LEON, MEXICO

B. L. Turner

Department of Botany, Univ. of Texas, Austin, TX U.S.A. 78713

Routine identification of Asteraceae from northcentral Mexico has revealed the following novelty. I am grateful to Ted Barkley for his evaluation of the taxon and to Guy Nesom for the Latin diagnosis. Nancy Webber provided the illustration.

*SENECIO PATTERSONII* B. Turner, sp. nov., Fig. 1

*S. actinellae* E. Greene sed praecipue differt foliis tenuibus petiolis laminis longioribus et capitulis minoribus in pedunculis gracilibus multibracteatis.

Perennial, stoloniferous herbs 25-40 cm high. Stems at first thick (4-5 mm across) and horizontal with short, floccose, internodes, but soon erect and glabrate. Leaves 5-15 cm long, 2.5-4-5 cm wide; petioles 2-8 cm long; blades broadly elliptic-ovate, weakly pinnately veined, at first densely appressed white-flocculose beneath but soon glabrescent, the margins weakly lobed below, or unlobed and somewhat weakly sinuate. Heads borne single on bracteate peduncles 25-30 cm long. Involucres campanulate, 10-12 mm high, 8-10 mm wide (pressed), gradually tapering and greenish apically. Ray florets ca 60; corollas yellow, glabrous, the tubes ca 2 mm long, tapering into somewhat funnelliform limbs ca 4 mm long, the lobes ca 1 mm long. Achenes (immature) densely pubescent, ca 2 mm long, the pappus of numerous, delicate, easily detached, faintly ciliate, bristles ca 5 mm long.

TYPE: MEXICO. Mpio. Montemorelos, 5 km SE of La Trinidad, eastern side of Sierra Cebolla, 1900-2000 m, (25° 11'N, 100° 08' W), "Pinus-Quercus-Carya association", 7 Aug 1988, T. F. Patterson 6198 (holotype TEX; isotype MEXU).

It is pleasure to name this very distinct species for Mr. Thomas F. Patterson, graduate student in plant systematics at the University of Texas, Austin. His exploration and collections in the more inaccessible montane regions of northcentral Mexico have yielded a number of novelties, including the recently described *Senecio barkleyi* (Turner, 1986) and most remarkably, *Picea martinezi* (Patterson, 1988).

LITERATURE CITED

Patterson, T.F. 1988. A new species of *Picea* (Pinaceae) from Nuevo Leon, Mexico. Sida (In press).

Turner, B. 1986. A new species of *Senecio* (Asteraceae) from Tamaulipas, Mexico. Phytologia 59:89-90.

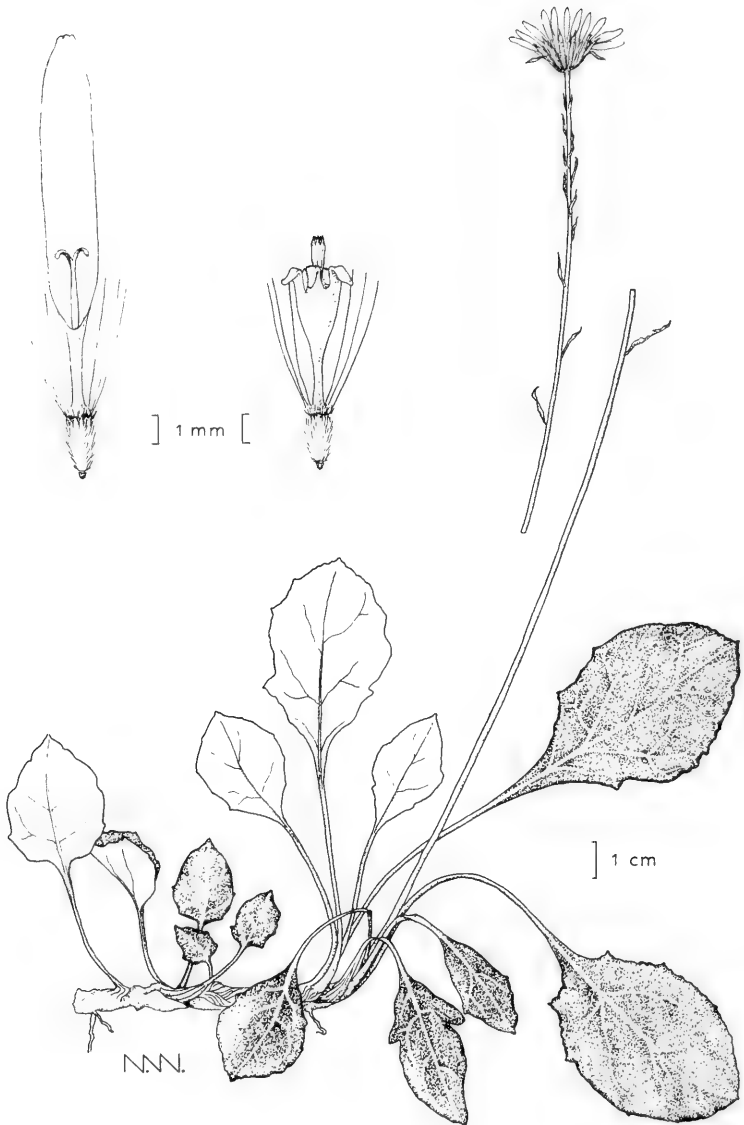


Fig. 1. *SENECIO PATERSONII*, from holotype.



A NEW SPECIES OF OXYLOBUS (ASTERACEAE, EUPATORIEAE)  
FROM PUEBLA, MEXICO.

B.L. Turner

Dept. of Botany, Univ. of Texas, Austin, TX 78713 U.S.A.

I have puzzled for several years over the holotype of the species described below. It was not known to Turner and Kerr (1985) at the time of their revisionary study of the genus. The recent discovery of another, previously unexamined collection from the same general region, has confirmed my original surmise that it might represent an undescribed taxon. In the above-mentioned treatment it will key to, or near, O. oaxacanus Blake but differs from that species in a number of characters, as noted below.

OXYLOBUS PREECEI B. Turner, sp. nov. Fig. 1.

O. oaxacano Blake similis sed habitu repenti fruticoso, foliis glandulosis anguste oblanceolatis 5-7 dentatis prope apicem, et capitulis majoribus flosculis majoribus numerosioribus differt.

Perennial suffruticose herbs or shrublets with prostrate stems 20-30 cm high. Stems slender, strigillopuberulent, prostrate and rooting at the nodes. Leaves opposite, numerous and mostly longer than the internodes, 10-18 mm long, 3-5 mm wide; petioles 0-1 mm long; blades oblanceolate, glabrous or nearly so, weakly 3-nervate from below, gradually tapering upon the petioles, the margins incurved and 3-7 dentate just below the apices. Heads 3-12 in a terminal, subfasciculate or corymbose, capitulescence, these borne on a primary peduncle mostly 3-5 cm long, the ultimate peduncles densely glandular-pubescent, mostly 5-15 mm long. Involucres narrowly turbinate, 4-6 mm high, 2-seriate, the bracts subequal, linear-lanceolate, glandular-pubescent. Disk florets 10-30, the corollas white, ca 4 mm long, the throat as long as the abruptly amplified tube. Achenes fusiform, 2.0-2.5 mm long, sparsely hispidulous, the pappus a short ciliate crown ca 0.4 mm high.

TYPE: MEXICO. PUEBLO: Mpio. Coxcatlan, al W de Tepeloyo, 22 km de Coxcatlan. "Brecha a Tepetzitintla. Veg. encinar con elementos de bosque mesofilo. Suelo amarillo arcilloso.", ca 2560 m., 15 Apr 1985, P. Tenorio L. 8804 (with J. Grimes) (holotype TEX; isotype MEXU).

Additional specimen examined: PUEBLO: above Coxcatlan between Apala and the top of Cerro Chichiltepec, oak-pine forest, 2000-2500 m, 17 Jul 1961, C.E. Smith et al. 3848 (MEXU).

The species is seemingly closely related to O. oaxacanus but differs in a number of features including habit, capitulescence borne on an extended primary peduncle, leaves oblanceolate and markedly dentate apically, the involucres smaller, etc. It also resembles O. arbutifolius, sharing several features with it including habit, vestiture and leaf size. Indeed, since it combines features of both O. arbutifolius and O. oaxacanus it is perhaps derived from these taxa by ancestral hybridization. It is unlikely that the only two collections known are the result of recent hybridization

since neither putative parent has ever been collected in or near the region where *O. preecei* occurs.

It is a pleasure to name this rare species for a rare individual, Dr. Sherman J. Preece of Bigfork, Montana, who, like the genus *Oxylobus* is a lover of high elevations and subalpine vegetation generally. He obtained his Ph.D. from Washington State University many years ago, having completed a doctoral study of the genus *Zygadenus* (Liliaceae) which was never published. He subsequently joined the faculty at the University of Montana where he served as Chairman, Department of Botany, for a lengthy period. I recently asked him, after his retirement from that institution, if he had ever been "eponymized." He answered no, with a wistful sigh. This rectifies such oversight, for he has given his life to the support of our discipline, botany and plant systematics. His care and concern for a generation of zealous biology students, both graduate and undergraduate, should not go unremembered.

I am grateful to Dr. Guy Nesom for the Latin diagnosis and to Dr. Alfonso Delgado (MEXU) for loan of pertinent material. This work was supported in part by N.S.F. Grant BSR 8402017.\*

#### LITERATURE CITED

Turner, B.L. and K.M. Kerr. 1985. Revision of the genus *Oxylobus* (Asteraceae-Eupatorieae). *Pl. Syst. Evol.* 151:73-78.

#### \*ERRATUM

Dr. James Rodman, N.S.F. Program Director for Systematics, has called to my attention that I have been negligent in not citing grant award number BSR 8402017 on the following papers, all of which were completed during the period 1985-88:

A summing up (of a symposium on Generic Concepts in the Compositae). *Taxon* 34:85-88. 1985.

A new species of *Verbesina* (Asteraceae) from gypsum outcrops in southern Nuevo Leon, Mexico. *Brittonia* 37:96-97. 1985.

Two new species of *Senecio* section *Palmatinervii* (Asteraceae) from north-eastern Mexico. *Brittonia* 37:117-120. 1985.

Revision of *Verbesina* sect. *Pseudomontanoa* (Asteraceae). *Pl. Syst. Evol.* 150:237-262. 1985.

Two new species of *Eupatorium* (Asteraceae) from northeastern Mexico. *Brittonia* 37:373-377. 1985.

(with K.M. Kerr). Revision of the genus *Oxylobus* (Asteraceae-Eupatorieae). *Pl. Syst. Evol.* 151:73-78. 1985.

(with S. Sundberg). Systematic study of *Osbertia* (Asteraceae-Astereae). *Pl. Syst. Evol.* 151:229-239. 1986.

(with M. Baker). Taxonomy of Flyriella (Asteraceae-Eupatorieae). *Sida* 11:300-317. 1986.

A new species of Coreopsis section Pseudoagarista (Asteraceae) from Mexico. *Brittonia* 38:168-170. 1986.

Taxonomy of Carminatia (Asteraceae, Eupatorieae). *Pl. Syst. Evol.* 160:169-179. 1986.

A new species of Axiniphyllum (Asteraceae: Heliantheae) from Durango, Mexico. *Madrono*. 34:165-167. 1987.

Two new species of Senecio section Palmatinervii (Asteraceae) from Eastern Mexico. *Brittonia* 40:81-84. 1988.

A new species of Ratibida (Asteraceae, Heliantheae) from Northern Coahuila, Mexico. *Sida* 13:35-37. 1988.

Two new species of Verbesina sect. Platypteris (Asteraceae) from Jalisco, Mexico. *Sida* 13:39-43. 1988.

The above action has been occasioned by the fact that the N.S.F. has issued Important Notice Number 96 to the effect that, from 1985 onwards, published papers must include the grant numbers concerned, if these are to be a part of the researcher's formal record. This was not the case before Important Notice Number 96 appeared. Since I was not aware of said Notice, I take this opportunity to place on formal record that all of the above-cited publications were, to some extent, supported by said grant. Thus, all of these should be incorporated into the body of any reports or proposals relating to the present author's work which might have been supported by the N.S.F.

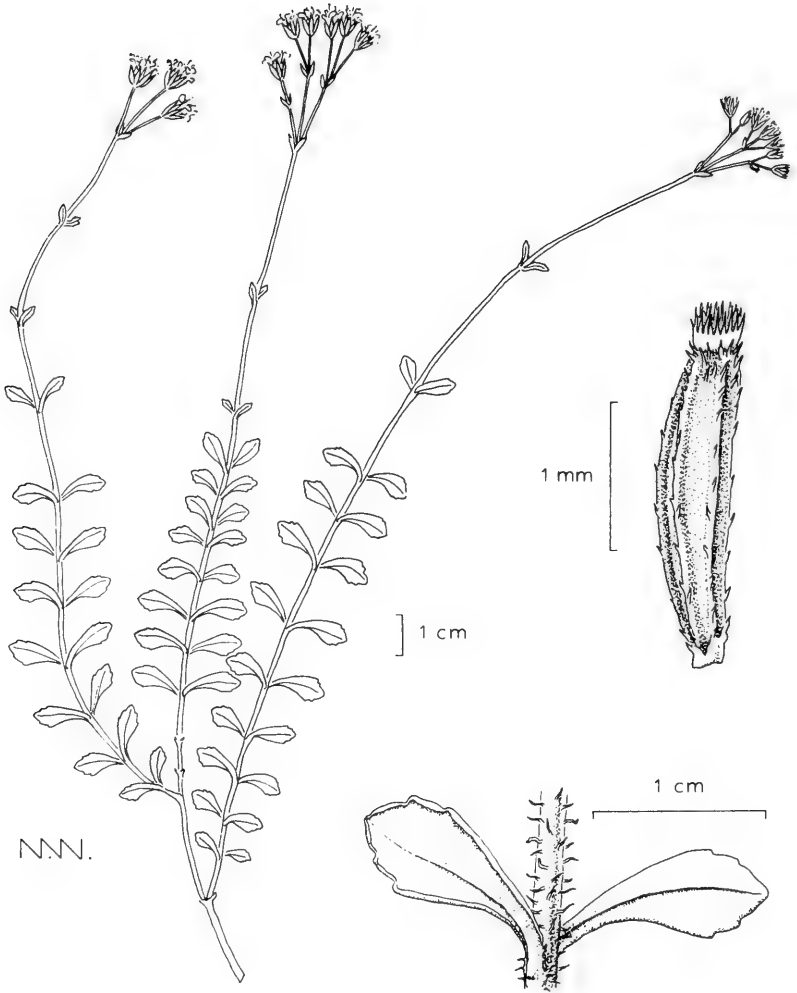


Fig. 1, *Oxylobus preecei*, from holotype.

A NEW SPECIES OF HIDALGOA (ASTERACEAE, COREOPSIDEAE) FROM  
SOUTHERN MEXICO

B. L. Turner

Dept. of Botany, Univ. of Texas, Austin, TX 78713  
U.S.A.

Attempts to identify collections from southern Veracruz along Rio Uxpanapa by Dr. Tom Wendt and assistants has revealed the following novelty.

HIDALGOA USPANAPA B. Turner, sp. nov. Fig. 1.

H. breedlovei Sherff similis sed flosculis radiatis 6-8, 23-40 mm longis luteis ubi exsiccatis et flosculis disci majoribus 14-15 longis lobis ca 2 mm longis differt.

Clambering glabrous vine in trees, the stems anchored by twisting petioles. Leaves opposite throughout, 6-10 cm long, 6-9 cm wide, 3-foliolate; leaflets ovate, the terminal ones petiolate, 4.5-6.5 cm long, 2-3 cm wide, glabrous throughout, the surfaces finely pustulate-punctate on both surfaces, the margins irregularly serrulate. Heads single, 5-8 cm wide across the rays, axillary on peduncles 10-20 cm long. Involucres 4-seriate, the bracts 4 or 5 in each of 4 alternating series, totaling 18-20 in all, the individual bracts linear-oblongate to linear-lanceolate, 13-25 mm long, 1-4 mm wide, glabrous and with strong medial nerves, the outer series somewhat spreading (but not reflexed), the inner series erect. Receptacular bracts scarious, shorter than the florets. Ray florets 6-8, pistillate, fertile, the ligules described as "anaranjadas" but drying bright yellow, 2.5-4.0 cm long, 0.8-1.0 cm wide. Disk florets 40-60, sterile, the corollas yellow, ca 15 mm long, the lobes smooth, ca 3 mm long. Anther appendages ca 0.5 mm long, the exterior surfaces covered with numerous rounded sessile brown glands. Style branches, the pubescent portion, ca 4 mm long, most of these lobed or bifid at the apex for 0.5-1.0 mm. Achenes (immature) glabrous, the apical cusps ca 3 mm long.

TYPE: MEXICO. VERACRUZ: Mopio. de Minatitlan, Rio Uxpanapa, desde el polado de Uxpanapa arriba, hasta los limites con Oaxaca. Vegetacion riparia de Ficus, Inga, Lindenia, etc. (17° 12' N, 94° 10' W), 130 m, 14 Jul 1980, Tom Wendt et al. 2568 (holotype, TEX; isotype MEXU).

Additional specimen examined: MEXICO. CHIAPAS: Mpio. Berriozabal, 13 km N of Berriozabal, limestone fissured ridge, lower montane rainforest, 900 m, 21 Nov 1972, Breedlove & Dressler 29706 (LL).

The species superficially resembles H. breedlovei but is readily distinguished by its longer rays (25-40 mm long vs 20-25 mm) which dry bright yellow (vs purplish or lavender), 4-5 seriate involucre of ca 20, mostly linear-lanceolate, bracts which are scarcely reflexed and by the larger disk corollas (ca 15 mm long vs 8-10 mm) with longer lobes, etc.

According to Dr. Wendt's field notes appended to the holotype it "appears to be a new sp: larger ligules than any spp.; 6-8 rays, but larger than H. breedlovei and with broad-linear bracts, strongly punctate leaves, etc." All of which is so, not to mention the other characters discussed above. He also notes that typical H. ternata occurs in the general region, but specimens of H. breedlovei have not been detected.

It was my intention to name this for the principal collector but he proposed the name given here, appropriate perhaps, for it is probably a regional endemic, although a single collection is also known from adjacent Chiapas.

Finally, it should be mentioned that, among the 4 species of Hidalgoa recognized for Mexico by the present author, H. breedlovei and H. ternata Llave have orange ray florets that dry reddish or violet, while H. pentameria Sherff and H. uspanapa have orange-yellow rays that dry bright yellow.

I am grateful to Guy Nesom for the Latin diagnosis and to Tom Wendt for discussions relating to the species as it occurs in nature. Nancy Webber provided the illustration.

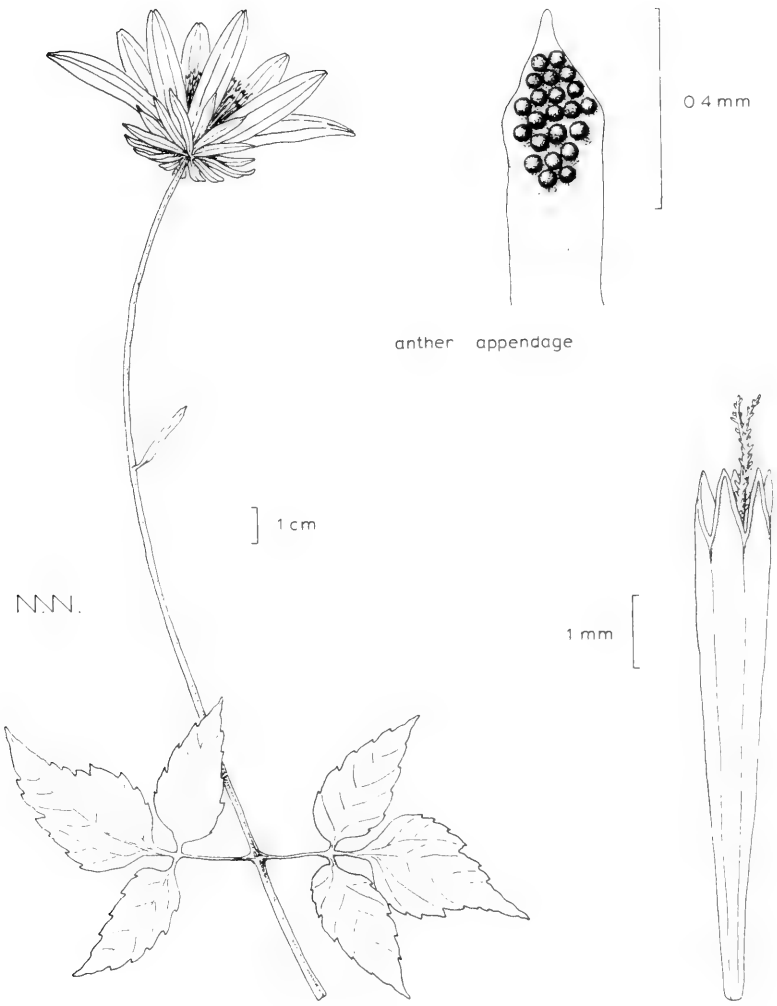


Fig 1. *Hidalgoa uspanapa*, from holotype

## NEW COMBINATIONS IN THE GENUS MONTANOA (ASTERACEAE)

B.L. Turner

Depart. of Botany, University of Texas at Austin, Austin, TX, U.S.A. 78713

In the preparation of a treatment of Montanoa for Mexico, I have utilized the very excellent account of this exceedingly difficult genus by Funk (1982). I have accepted all of her taxa as bonified, but would recognize 1 of her 4 subspecific categories within the M. tomentosa complex (M. rosei Rob. & Greenm.) as a distinct species; I treat the remaining 3 as varietyally distinct. Her 2 subspecies of M. leucantha are also reduced to varietal rank. I use the category variety in much the same sense as Cronquist (1980) and yet other workers: morphological taxa that intergrade over short distances along regions of contact. I reserve the term subspecies for clustering purposes, or for the indication of unusual subspecific divergence; thus a subspecies may house but a single, unusually distinct variety, or a group of closely related varieties. Among the M. tomentosa complex of Mexico then, I would erect the following nomenclature:

MONTANOA TOMENTOSA La Llave & Lex.

M. TOMENTOSA var. XANTHIFOLIA (Sch.-Bip. in K. Koch) B. Turner, comb. nov.

Based upon M. xanthifolia Schultz Bip. in K. Koch, Wochenschr. Vereines Beford. Gartenbaues Konigl. Preuss. Staaten 7:406.1864.

M. TOMENTOSA var. MICROCEPHALA (Sch.-Bip. in K. Koch) B. Turner, comb. nov.

Based upon M. microcephala. Schultz Bip. in K. Koch, Wochenschr. Vereines Beford. Gartenbaues Konigl. Preuss. Staaten 7:406.1864.

MONTANOA LEUCANTHA var. ARBORESCENS (DC.) B. Turner, comb. nov.

Based upon Montanoa arborescens DC., Prod. 5:566.1836.

I am grateful for the fine treatment of Montanoa rendered by Vicki Funk and for her advance perusal of this nomenclatural presentation.

### LITERATURE CITED

- Cronquist, A. 1980. Vascular Flora of the Southeastern United States 1: Asteraeae. Univ. of North Carolina Press.
- Funk, V. A. 1982. The systematics of Montanoa (Asteraceae, Heliantheae). Mem. N.Y. Bot. Gard. 36: 1-133.



## A. Lourteig

Plumier creó un género Pittonia, Catal. Gen. 5. 1703 con 7 especies, dedicado a Joseph Pitton de Tournefort, botánico francés (1656-1708). Linné adoptó el género llamándolo Tournefortia según el nombre de nobleza, en lugar del patronímico de Pitton. En su Sp. Pl. ed. 1. 140-141 describe 7 especies y 1 variedad, y en la ed. 2. 201-202, 8 especies y 1 variedad, de las cuales 6 involucran protólogos de Plumier.

Jacquin, 1760, describió I. maculata de la cual no hay ningún documento. Lamarck, Ventenat, Vahl describieron otras especies cuyos tipos existen y he estudiado.

Johnston, el botánico que más conocía esta familia, había visto materiales auténticos, planteó algunos problemas y dió soluciones a otros. Llamó la atención sobre la dificultad para discernir un grupo de especies de las Islas Antillas que hasta hoy no ha sido resuelto.

Killip estudió particularmente este género para Sudamérica; lamentablemente su Manuscrito no fué publicado (v. Nowicki, Bull. Torr. Bot. Club 10: 229, 1974), pero gracias a la Smithsonian Institution fué puesto a mi disposición, para mi estudio, lo cual me ayudó a resolver los problemas.

Los binomios que no se utilizan a ciencia cierta son particularmente: I. glabra, I. cymosa, I. laurifolia, I. maculata y I. syringaefolia.

1. I. glabra L. Linné da su propia descripción, cita Sloane y Jamaica. Esta planta está en su herbario, anotada por él mismo con el N° 6 que corresponde a su publicación y que es indiscutiblemente el Holótipo. Esta especie no figura en su ed. 2, sustituida por I. cymosa que contiene los mismos protólogos de I. glabra más uno de Plumier con ?, lo cual es un error pues se trata de I. volubilis L. No hay material alguno (comunicación personal de Ch. Jarvis). Este binomio es ilegítimo.

Killip estudió el tipo, lo describió y fotografió (v. reproducción del MSS en este trabajo, en I. foetidissima). Observó que los lóbulos de la corola son suborbiculares, anchos y obtusos, carácter que distingue bien esta especie de varias otras.

Del estudio del citado MSS, de materiales y literatura doy el resultado:

I. glabra Linnaeus, Sp. Pl. ed. 1: 141(6), Tipo: Jamaica, LINN 193.6.  
I. cymosa L., Sp. Pl. ed. 2. 202 (5) excl. protol. Plumer. Urban, Symb. Antil. 4: 523 OBS. 1910; 8: 585. 1921 excl. syn. I. macrophylla et cit. Plumer. Nom. illeg., basado en la descripción de I. glabra y Sloane.

Miller, Ann. Missouri Bot. Gard. 75: 510. 1988, cita esta especie para Panamá, con el tipo de Linné, pero su descripción no corresponde a esta especie.

I. glabra L. es rara, de área restringida (sólo Jamaica?).  
Ex.: Sólo 4 especímenes antiguos, de Antillas, con documentación incompleta se conservan en P.: S. d., P. Ex herb. Maire, P. Ex herb. Bonpland, P. Jamaica, Hooker, P.

2. I. maculata descrita por Jacquin en 1760, de Cartagena, diagnosis repetida en 1763 a la cual agregó la descripción del fruto. Johnston, J. Arn. Arb. 30: 130-131. 1949 trató este binomio con acierto e hizo notar que gracias a los caracteres específicos, especialmente del fruto <sup>(1)</sup>, sabiendo que es de Cartagena, se puede asumir la identificación de la especie. Muchas especies de Jacquin son identificadas con benevolencia, cuando no hay ilustraciones y dado que no existen materiales auténticos con los cuales se podrían tipificar. Se podría decir que en muchos casos se procede por eliminación después de identificar todos los binomios "posibles".

Los materiales antiguos están determinados con los nombres de I. syringaeifolia Vahl o I. peruviana Poiret, mejor conocidos entonces y hasta ahora.

Después de revisar muchas colecciones y estudiar tipos, leer y reflexionar, adopto la conclusión de Johnston.

Resumiendo :

I. maculata Jacquin, Enum. Pl. Carib. 14(1). 1760; Select. Stirp. Amer. 47. 1763. Johnston, l.c. Dugan, Caldasia 10: 77-78. 1969. Neótipo: Colombia, Santa Marta, 550 ft., H.H.Smith 1862 IV 1898-1901 Holót. P. Isót. COL, P, US.

Syn. I. syringaeifolia Vahl, Symb. Botan. 3: 23. 1794. Johnston, Ibid. l.c. 16: 48. 1935; in Pulle (edit.), Fl. Suriname 4: 325-326. 1936. Tipo: Guyane Francaise, Cayenne, Rohr 143, 17... Holót. et Isót. C.

I. peruviana Poiret, Encyc. Méthod. Suppl. 4: 425. 1816. Urban, Symb. Antil. 8: 524. 1921. Nomen pro I. scandens Willd. non Miller et I. volubilis R. et P. non L. Urban, l.c. 8: 586. 1921.

I. Sagraeana DC, Prodrômus 9: 522. 1845. Tipo: Cuba, Habana, R. de la Sagra, a. 1836. Isót. P.

I. surinamensis DC, l.c. 526. Tipo: Suriname, Hostmann 951, a. 1843. Isót. P.

Esta especie tiene una vasta distribución en América tropical.

Ex. : S. l. P-LA.

MEXICO. Botteri 487, P. Bourgeau, P. Pringle 4104, P. Dwyer 10944 MU, P.

COSTA RICA. Holm & Iltis 724, P. Tonduz 13914, P.

ANTILLAS. Ex herb. Surian, herb. Jussieu 6545 P-JU (v. IDC microfiches).

CUBA. S.l., de la Sagra 393, P. Linden 1790, P. Clemente 6063, US.

Wright 417, P; 1646, P. Baker 3107, US. L.S. Smith & Hodgdon 3125 P, US.

Combs 77, P. Jack 5437, 6037, P. Acuña 4425, NY, P. Eggers 5357 P, US.

JAMAICA. Harris 11047 US.

HAITI. Ekman 8086 US.

PORTO RICO. S.l., Plée 978, 895, 915, P. S.l., Richard, P.

Rep. DOMINICANA. J.J. Jiménez 3741 US. Liogier 12355, P.

AMER. MERID. S. l., Bonpland, P.

BRASIL. Glaziou 3880, P. Krukoff 1661, P. Prance et al. 7523 COL, NY, P.

Spruce s. n° ; 1129, P.

COLOMBIA. Hartweg 1320 BM. Smith 1862 COL, P, US. Romero Castañeda 1076,

COL, US. Haught 6574 COL, US. Triana s. n°, P. Goudot 2, P.

ECUADOR. Eggers 15501, P.

(1) I. laurifolia, volubilis, staminea tienen frutos semejantes, con manchas, imposibles de discernir in sicco.

GUYANE FRANCAISE. Ex herb. Barbier, P. Benoist 1247, P. Cowan 38855, P. Lemée, P. Ibid., P. Martin, P. Sagot, P. Rohr 143, C.

SURINAME. S.l. Hostmann 289, 1721, 951, P. Kappler 951, P. Splitgerber 1159, P.

TOBAGO. Broadway 4606, P.

TRINIDAD. Fendler 575, P.

VENEZUELA. Grossourdy, P.

3. I. laurifolia Ventenat, Choix des plantes... 2: tab. 2 et descr. 1803 excl. Patria Sto. Thomas. Poirlet in Lamarck, Enc. Method. Suppl. 4: 425. 1816. DC, Prodr. 9: 522. 1845. Urban, Symb. Antil. 8: 524. 1921. Tipo: Ventenat, tab. l.c., de una planta cultivada, originada de semillas de la colección Riedlé de Porto Rico, P.

La descripción y la ilustración de Ventenat son excelentes y permiten diferencias esta especie ignorada y confundida sobre todo con I. maculata Jacq.

Se diferencia por el cáliz, que Ventenat describió: "à cinq divisions profondes, droites, en lance très pointues"; los lóbulos son lanceolado-subulados, largos ca.  $\frac{1}{2}$  del largo del tubo corolino, desiguales, mientras que en I. maculata son ovados, anchos en la base, planos, agudos, cortos, iguales o uno algo más largo; la pubescencia de la inflorescencia es escasa, a veces casi inexistente, de pelos cortos, adpresos; en I. maculata es  $\pm$  hirsuta y adpresa, en general abundante. En I. laurifolia la corola es globosa en la base, no enangostada en la fauce, con lóbulos triangulares prolongados en una "arista" subulada, larga igual a  $\frac{1}{2}$  o más del largo del cáliz. En I. maculata el tubo corolino es densamente adpreso-seríceo-pubescente, delgado y algo ensanchado en la fauce, con lóbulos ovado-triangulares, obtusos, iguales  $\pm$  a  $1/5 - \frac{1}{4}$  del largo del tubo corolino.

Sólo he hallado en P, material de las Grandes Antillas.

Ex. : S.l., posiblemente Jamaica, Capitaine Baudin, P.

JAMAICA. Hooker, P.

PORTO RICO. Riedlé 24, P. 6546 P-JU., cuyas semillas dieron la planta descrita por Ventenat. Plée 377, 533, 978, P. Plée 168, P. Richard, P. Eggers 1072, P. Sintenis 1515 P.

República DOMINICANA. Abbott 305 US.

4. I. foetidissima L. Entre las especies descritas por Plumier hay dos: Pittonia alia racemosa nicotianae foliis foetidissimis, minor, Plumier MSS 6, ic. 55.

Pittonia racemosa foliis nicotianae foetidissimis, maior, Plumier, Cat. Gen. 5; MSS 6, ic. 56; Pl. Amer. Edit. Burmann 226-227, tab. 230. que han sido mal interpretadas.

Linné introdujo este protólogo, tal como figura en el Cat. l.c. (sin "minor" ni "maior") en su descripción de I. foetidissima, Sp. Pl. ed. 1. 140 (4) junto con un protólogo de Brown y otro de Plukenet y Morrison. Mexico, Jamaica. En la ed. 2. mantiene la especie agregando el Ícón de Plumier publicado por Burmann, y Sloane y Rajus.

El material de esta especie ha sido confundido con I. glabra, I. maculata, I. laurifolia. Sin embargo, es una especie bien distinta y cono-

*Tournefortia foetidissima* L. Sp. Pl. 140. 1753.

*Tournefortia macrophylla* Lam. Tabl. Encycl. 1: 416. 1791.

*Tournefortia corymbosa* Willd.; Roem. & Schult. Syst. Veg. 1:541. 1819.

Shrub or small tree, 2 to 3 meters high, essentially glabrous throughout; leaves elliptic-lanceolate, up to 25 cm. long, (extremes to 40 cm.), 11 cm. wide, acuminate at apex and base, subdecurrent, the lateral nerves 12 to 15 to a side; inflorescence 2 or 3 times dichotomous, at length pendulous, the ultimate branches usually elongate, very slender, the flowers sessile; calyx lobes linear-lanceolate; 1 to 2 mm. long, 0.4 to 0.5 mm. wide; corolla tube 2.5 to 4 mm. long; about 1.5 mm. in diameter, the lobes oblong-lanceolate; stamens borne just below throat of tube, the anthers about 0.5 mm. long; pistil often persistent on the fruit, the style shorter than the stigma; mature fruit transversely ovoid, about 3 mm. long and 5 mm. wide, glabrous.

Distribution: Mexico, Central America, and the West Indies, Colombia and Peru.

Colombia: Humboldt & Bonpland (B $\bar{H}$ , type of *T. corymbosa*).

Magdalena: Don Diego, H. H. Smith 1863 (B, BM, K, N, Par, Ph, Y).

El Cauca: Rio Timbiquí, Lehmann K 208 (K).

Ecuador.

Manabí: El Recreo, Eggere 15312 (B), 15581 (Z, N).

Guayas: Chimbo, Sodiuro 112/14 (B).

Peru: McLean (K).

San Martín: Pongo de Cainarachi, Klug 2730 (F, N).

Fig. 1 y 2. Reproducción del MSS sobre *Tournefortia* de E. Killip, conservado en Smithsonian Institution (con autorización).

(foetidissima)

These specimens are unquestionably conspecific with material from Mexico, Central America, and the West Indies to which the names T. foetidissima, T. glabra, and T. cymosa have been applied. Recent practice has been to use for this plant the name T. glabra, perhaps in view of the following comment Symb. Ant. 4:523. 1910. by Urban, "T. glabra L. I ed. (1753) p. 141 (certissima) - T. foetidissima L. <sup>lc.</sup> ~~cc.~~ p. 140 (pro parte) et II ed. p. 201 (pro minima parte) - T. cymosa L. Spec. II ed. (1762) p. 202 (pro parte),... in Cuba, Jamaica, Hispaniola, America centrali crescit."

More than a single species is apparently represented by Linnaeus' original description of T. foetidissima, but his first statement, "Folii ovato-lanceolatis, spicis ramosissimis pendulis," may well apply to the species under discussion.

There is no specimen of T. foetidissima or of T. cymosa in the Linnaean Herbarium but there is an excellently preserved one of T. glabra, bearing the notation "6 [i.e., species no. 6 of the Species Plantarum], glabra" in Linnaeus' handwriting. This has thick leathery leaves, up to 9 cm. long, suberect cymes with relatively short branches, and obtusely lobed corollas. I have made careful study of this specimen and am convinced that it can not be confused with the plant with elongate decurrent leaves, a long pendulous inflorescence, and acute corolla lobes. In most herbaria these two elements are represented under one or another of these three names.

Fig. 2

cida por los habitantes de las Antillas. Investigando las posibilidades de tipificación, Ch. Jarvis, BM, buscó a mi pedido, el material correspondiente a la planta cultivada, descrita por Clifford, sin resultado. Tampoco existe material nombrado por Linné, corroborando así las conclusiones de Killip (MSS reproducido en este trabajo). Por consecuencia, y de acuerdo con Ch. Jarvis, debemos tipificar con el Icón de Plumier, ed. Burmann, que Linné vió y citó.

I. foetidissima Linnaeus, Sp. Pl. ed. 1. 140 (4); ed. 2. 201 (4) excl. protol. Pluken., Brown, Morison, Sloane. Candolle, l.c. 518, excl. syn. Jacq. et icon 220 ex errore pro 230. Tipo: Plumier, Pl. Americ. ed. Burmann. 226, tab. 230 copiada de Plumier MSS 6: 56, basado en una planta recogida en la Isla de Santo Domingo, Fond de Baudin.

I. macrophylla Lamarck, Illustr. Genres 1: 416. 1791. Poiret in Lamarck, Encyc. Méthod. 5: 356. 1804. Tipo: Santo Domingo, comm. Dupuis 17...Holót. P-LA.

I. foetida Persoon, Synopsis 1: 165. 1807. Nom. illegit. pro ic. Plumer.

I. corymbosa Willdenow in Roemer et Schultes, Systema 4: 541. 1830. Tipo: Colombia, Humboldt et Bonpland... Holót. B-W. Isót. P.

I. glabra et I. cymosa auct. non L. et I. maculata Jacq. auct. non Jacq.

Este árbol de olor desagradable, compensado, como lo expresa Plumier por el soberbio espectáculo que ofrece con sus infrutescencias péndulas de frutos blancos en doble hilera, como lluvia de perlas (de ahí el nombre de "arbre aux perles"), posee grandes hojas y largas inflorescencias hasta 30 cm y más, multifloras.

OBS. De Candolle cita como sinónimo "I. cymosa Jacq.", Collectanea 1: 96; Ic. Pl. Rariorum 1: tab. 31. 1782. Esta lámina muestra una planta parecida a esta especie pero las flores son rosadas hasta violáceas, y en su descripción Jacquin dice que las flores son "cárneas", los pétalos redondeados y las bayas blancas con puntos negros. Todo esto no conviene a esta especie. Sería I. staminea Gris. ?, pero no tengo informaciones que atestigüen esos colores.

Los dos icones de Plumier, l.c. (fl. y fr.) corresponden a esta especie. El área de distribución es vasta, en el continente desde México hasta Colombia y Venezuela, y en las Grandes Antillas.

Ex. : MEXICO. Bourgeau 2479, P. Hahn 268, 337, P.

GUATEMALA. v. Tuerckheim 437, P.

COSTA RICA. Tonduz 14749, P.

PORTO RICO. Riedlé, P.

CUBA. de la Sagra, P.

JAMAICA. Hooker, P. Philipson 1037 BM.

República DOMINICANA. Dupuis, P-LA, 167 P-LA. Egoers 2437, P, US. Poiteau, P. Schomburgk, P. v. Turckheim 3486, P, US. Riedlé, P.

St. JEAN. Richard, P.

COLOMBIA. Humboldt et Bonpland B-W 3444, P. Smith 1863, COL, P, US. Haught 4246 COL. Philipson et al. 2132 COL. v. Sneidern 1037 COL.

VENEZUELA. Luteyn 9232 NY, P.

5. I. filiflora Grisebach, Fl. Brit. w. Indies 483. 1862. Urban, Symb.

Antil. 4: 522- 523. 1911 excl. syn. I. foetidissima. Tipo: Dominica, Im--ray.

Esta especie ha sido confundida con I. foetidissima siendo bien distinta por sus corolas con tubos muy delgados, densamente adpreso-pubescentes, enangostados en la fauce; los lóbulos cortamente oblongos, obtusos con el nervio medio (adpreso-pubescente dorsalmente) prolongado en cortísimo mucrón. La inflorescencia es una panícula de cincinos, profusamente ramificada, ramas laterales divergente en ángulos casi rectos, relativamente cortas.

En I. foetidissima los tubos corolinos son anchos, los lóbulos ovado-trianguulares, largamente agudos, dado la forma "stellata" a la corola así descrita. Las cimas 2 ó 3 veces 2-3-fidas tienen ramas largas, péndulas.

Vive en las pequeñas Antillas.

Ex. : S.l. herb. Juss 6541 P-JU (v. IDC microfiches).

St. JEAN. Richard, P.

DOMINICA. Eggers 990, P.

GUADELOUPE. Duchassaing P. L'Herminier, P. Quentin 567, P. Questel 4825, P. Questel s. n°, P. Richard, P. Rodríguez 3914, P. Stehlé (Marie Galante), P. Stehlé 2839, 2838, P. Sastre et Fournet 2801, P.

MARTINIQUE. Belenger 332, 639, P. Hahn, P.

6. I. staminea Grisebach, Fl. Brit. W. Indies 484. 1862. Adams, Flowering Pl, Jamaica 620-621. 1972. Tipo: Jamaica.

Especie inconfundible por su cáliz ca.  $\frac{1}{2}$  del largo del tubo de la corola, ancho, con lóbulos oblongos, obtusos o subagudos; corola con tubo ancho, lóbulos suborbiculares o anchamente oblongos; anteras libres, lanceoladas visibles fuera de la fauce. Inflorescencias erguidas, en fruto ± péndulas. Pubescencia muy corta, laxa.

Parece endémica de Jamaica.

Ex. : JAMAICA. Webster et al. 8473 1959 BM. Wilson (ex herb. Hooker), P.

-----

La colaboración del Charlie Jarvis en la verificación de materiales del Museo Británico y el préstamo del valioso material del Herbario de Vahl, por el Instituto Botánico de Copenhague, han facilitado esta difícil investigación. Les quedo muy reconocida.

Muséum National d'Histoire Naturelle, Paris.

NOTES ON A GUAYANAN **DIEFFENBACHIA** (ARACEAE)

George S. Bunting

**Dieffenbachia duidae** (Steayerm.) Bunting, comb. nov. Spathicarpa duidae Steayerm., Fieldiana, Bot. 28: 101. 1951. TYPE: Julian A. Steyermark 57994 (holotype, F). Venezuela. Territorio Federal Amazonas: Depto. Atabapo, Cerro Duida, southeastern-facing slopes along Caño Negro (tributary to Caño Iguapo), 970-1,150 m, 25-26 Aug. 1944.

Dieffenbachia bolivarana Bunting, Bol. Soc. Venez. Ci. Nat. 25: 30. 1963.

Dieffenbachia liesneri Croat, Aroideana 9: 62. 1986.

Though the type specimen has not been seen (it cannot be located), the original description of Spathicarpa duidae leaves little doubt regarding the species represented, and the type locality (Cerro Duida) complements the known distribution of this taxon in T. F. Amazonas from the upper and lower Río Ventuari to Cerro Aratitiope, Sierra Parima, and Cerro de la Neblina. This species also grows in eastern Bólvivar (Uaipán-tepui, Chimantá Massif, and Amaruay-tepui), and in adjacent Guyana (southern Pakaraima Mountains). It has an altitudinal range of 115-1,600 m, reaching the maximum on Chimantá Massif.

While Spathicarpa and Dieffenbachia are only distantly related, it is possible to find certain similarities in the rather small inflorescences common to both Spathicarpa spp. and Dieffenbachia duidae. The spadix of Spathicarpa is entirely adnate to the open spathe and bears pistillate and staminate flowers intermixed. On the other hand, only the lower pistillate part of the spadix of Dieffenbachia is adnate to the spathe, while the upper, staminate part is free. After anthesis, however, the upper, free part quickly dries and is often caducous, leaving only the pistillate part of spadix enclosed in the persistent spathe and bearing female flowers surrounded by several staminodes which might, at least in poorly preserved specimens, be interpreted as intermixed pistillate and staminate flowers. In his original description of this species, Steyermark duly noted that "the flowering part of the specimen is in poor condition". However, the rhizomatous or cormous stem and the reticulate venation of the leaf blade of Spathicarpa are sufficient bases for distinguishing it from the cauline Dieffenbachia with striate leaf venation.

Spathicarpa does not occur in Venezuela, being limited to southern Brazil, Paraguay, and northern Argentina.

I am grateful to Mr. Kevin Swagel, Field Museum of Natural History, Chicago, for supplying pertinent data and illustrations.



## UROSPATHELLA, NEW GENUS OF VENEZUELAN ARACEAE

George S. Bunting

Recent explorations of the Territorio Federal Amazonas of Venezuela have revealed the limited distribution of a singular, diminutive aroid of wet savannas. It has slender, entire, oblong or elliptic leaf blades on elongate petioles, and long attenuate spathes. Because of its unilocular ovary with two, basally fixed ovules, it was originally described in the Asian genus Cyrtosperma (as C. wurdackii Bunting). However, the seeds of Cyrtosperma have endosperm, while those of closely allied American genera lack it. The inclusion of this species in Urospatha has been considered, but that American genus is characterized by an incompletely bilocular ovary with two or more ovules per locule fixed centrally on the partition, and by leaf blades of a very distinctive, sagittate form. [The unilocular and uniovulate condition of the pistils of U. savannarum Steyerem. (Fieldiana, Bot. 28: 102. 1951) has not been verified.] Since this Amazonian species does not conform to either of these genera, a new genus is proposed to accommodate it.

**Urospathella** Bunting, gen. nov. TYPE: Urospathella wurdackii (Bunting) Bunting.

Urospathae Schott affinis, a quo pistillorum ovario uniloculari, loculo biovulato, ovulis prope basim loculi affixis, spatha longissime attenuata nunquam torta, seminis verrucosis ut videtur sine endospermio, et foliorum lamina anguste lineari vel elliptica sine lobis posticis differt.

The form of the ovule also seems to be distinctive, having the funiculus inserted at the center of the ovule, nearly perpendicular to its axis.

**Urospathella wurdackii** (Bunting) Bunting, comb. nov. Cyrtosperma wurdackii Bunting, Acta Bot. Venez. 10: 285. 1975. TYPE: Maguire & Wurdack 36384 (holotype, NY). Venezuela. Amazonas: Río Guainía, "sabanita" along Caño Pimichín on right bank, 1 km above Pimichín, 140 m, 24 Nov. 1953. PARATYPE: Maguire & Cowan 30566 (NY). Venezuela. Amazonas: Cerro Yapacana, río Orinoco, Savanna no. 3, NW base of mountain, 130 m, 1 Jan. 1951.

The spathe of this species is long attenuate but not bifid as stated in the original description. The spathe in vivo is probably not flat and splits as a result of pressure during the drying process, thereby creating the bifid spathe seen in some herbarium specimens.

Distribution: west-central Territorio Federal Amazonas of Venezuela and adjacent Colombia (Vaupés).



Figure 1. *Urospathella wurdackii* (Bunting) Bunting. A, Maguire & Wurdack 36384 (isotype, VEN); B, O. Huber 2637 (VEN).

Two other American species were described in *Cyrtosperma*, viz., *C. americanum* Engl. in Mart., and *C. spruceanum* (Schott) Engl. in Mart. Both have pinnatifid leaf blades more or less sagittate in outline, although their ovary condition is similar to that of *Urospathella wurdackii*. Mr. Alistair Hay has reported (personal communication) the absence of endosperm in the seeds of these species, obliging their removal from *Cyrtosperma*. No publication relative to their transfer has been seen.

## A. Lourteig

Resumen. Durante unos dos siglos se transmiten nombres de Leguminosae que no corresponden a la realidad según el Código Internacional de Nomenclatura Botánica. Sobre la base de documentos auténticos, se trata de corregir esta situación en especies de Canavalia, Clitoria, Lonchocarpus y Senna de Antillas. Una nueva combinación ha sido necesaria: Senna galeqifolia (L.) Barneby et Lourteig

## CAVALIA

Under the species of "Phaseolus" that Plumier described in his Manuscripts, there are two that belong, at present, in the genus Canavalia DC

1. Phaseolus maritimus fructu duro semine variegato, Plumier, Cat. 8; MSS 2, ic. 99; Pl. Americ. Edit. Burmann 216 - 217 s. tab.

Aublet, Fl. Guiane Franç. 2: 765. 1775, brought to this protologue the binomial name Dolichos maritimus Aublet, based solely on the Plumier elements, l.c. Type: Plumier, Icon MSS 2: 99, from a plant originating in the Antilles, frequent on the sea littoral.

This binomial has been cited and described by Lamarck, Encyc. Méthod. 2: 295 - 296 as var. ♂ of his Dolichos obtusifolius, conserving Aublet's citation and type.

2. Phaseolus fructu amplo coccineo et duro, Plumier, Cat. 9; MSS 2: 86; Pl. Americ. Edit. Burmann 216 s. tab.

Lamarck, l.c. described (French translation of Plumier MSS inedit, in Latin) the plant based solely on the elements of Plumier. Type: Plumier, Icon MSS 2: 86, from a plant originating in Sylvae Insulae Sandominicae.

Both binomials have been transferred to the Genus Canavalia by De Candolle and Aubert du Petit Thouars.

Urban, Symb. Antill. 8, and Beihefte of Repert. So. Nov. 5, in 1920, has clearly expressed the situation of both binomials which remains unchanged until now.

Sauer in his Revision of Canavalia, 1964, pretends to typify the binomials (pp. 163-164), considering Lamarck's binomial illegitimate, misunderstanding his publication and ignoring those of Urban. This last author corrects himself, putting his own binomial C. rusiosperma under synonymy of C. obtusifolia Lam. Nevertheless, Sauer considered both species synonyms of C. nitida (Cav.) Piper, of which the basionym is posterior to C. obtusifolia Lam., bringing great confusion into the nomenclature of the genus.

Summarizing:

1. Dolichos maritimus Aublet, Fl. Guiane Franç. 2 : 765. 1775. Type: Plumier MSS 2: ic. 99.

Canavalia maritima (Aublet) Thouars in Desvaux, J. Bot. 1: 80-81. 1913. Urban, Symb. Antil. 8: 308-309; Repert. Sp. Nov. Beihefte 5: 143. 1920.

Syn. : Dolichos obtusifolius Lamarck var.  $\S$  Encyc. Méthod. 2: 295. 1786.

Species widespread on the sea coasts.

2. Dolichos obtusifolius Lamarck, Encyc. Méthod. 2: 295-296 excl. var.  $\S$  1786. Type: Plumier, MSS 2 : 86.

Canavalia obtusifolia (Lam.) Candolle, Prodrum 2: 404. 1825 (excl. syn.). Urban, Symb. Antil. 8: 756. 1921.

Syn. : Canavalia rusiosperma Urban, Ibid. 1: 473. 1900; 8: 308. 1920.

Type: several syntypes from the Antillas .

Canavalia ensiformis auct. (Aublet, l.c. s. Dolichos 764-765 ) quoad syn. Plumer. non Linnaeus

Canavalia nitida (Cav.) Piper, Contr. U.S.Nat. Herb. 20: 562. 1925. Sauer, Brittonia 16: 117-118. 1964.

Clementea nitida Cavonilles, An. Ci. Nat. 7: 64. 1804. Type; Cult. Hort. Matrit. (from Cuba).

#### CLITORIA

Plumier described in MSS 2, ic. 85

Phaseolus magno flore, siliquis tenuioribus falcatis Plumier, Catal. 8; Pl. Americ. Edit. Burmann 214 s. tab.

This protologue was placed in binomial nomenclature as Clitoria falcata Lamarck, Encyc. Méthod. 2: 51. 1786. The description is taken from Plumier translated into French and the species is typified by the Icon inedit, l.c. This name has been misapplied to a species widely distributed in the Neotropics.

The confusion was created by Burmann who synonymized with the protologue of Plumier that of Sloane : Phaseolus erectus major siliqua terete semine rubro, Hist. 1 : tab. 115, fig. 2, etc.; all that disagrees with the descriptions and illustration of Plumier and Lamarck.

In 1807, Clitoria rubiginosa Persoon was published, typified by a specimen from " St. Domingo in Juss. herb. ", and so called for the colour of the legume; Poiret rebaptised it as C. tetragona for the shape of this legume. Keeping in mind that Plumier gave the qualificative of falcata on account of the shape of the fruit which was a ..... "siliquum longum, tenue falcatum et multis veluti articulationibus divisam, quarum singulae semen continent reniforme splendens, candidum, et hilo rubente donatum", it is easy to realise that they are two quite different species.

Persoon kept both species separated but de Candolle did not follow him and misapplied Lamarck's name. Bentham, treating C. falcata in Synopsis of the Genus Clitoria. J. Proceed. Linn. Soc. 2: 39. 1858 in foot note, realised that "Lamarck's description of the fruit does not agree with that of species but de Candolle who saw the original speci-

men in Jussieu's herb. had certainly this plant in view". He did not agree but he was loyal to de Candolle. Urban, Repert. Sp. Nov. 15: 317. 1919 considers this comment of Bentham, but sharp critically minded, having seen the copy of Plumier Icon, insisted on the differences between the species.

Therefore:

1. Clitoria falcata Lamarck, Encyc. Méthod. 2: 51. 1786. Persoon; Synopsis 2: 303. 1807. Urban, Repert. Sp. Nov. 15: 317. 1919; Beihefte 5: 143. 1920 (as Sp. dubia); Symb. Antil. 8: 302. 1920 (botanicis hodiernis ignota). Type: Plumier MSS 2: ic. 85 from a plant collected in Sylvas Insulae Sandominicanæ.

Syn. : Neurocarpum falcatum (Lam.) DC, Prodrômus 2: 236. 1825 (excl. Patria Porto Rico et "legumini valvulae medio nervigeræ et specim. Juss.)

I have not seen material of this species. According to the description it is a high liana that spreads over the trees in the forest. The 3 leaflets, largely oblong, obtuse or subacute, are similar in shape and size. The bracteoles are ovate-acuminate appressed to the calyx, which, gave to Plumier the impression of being another calyx. The legume is long, narrow, incurved. It is different from C. Ternatea in which the lateral leaflets (2 or 3 pairs) are different from the terminal one, the bracteoles are orbicular, very conspicuous, and the legume is shorter and straight.

2. Clitoria rubiginosa Ventenat ex Persoon, Synopsis 2: 303. 1807. Poiret in Lamarck, Encyc. Méthod. Suppl. 2: 301-302. 1811. Adams, Flowering Pl. Jamaica 365. 1972. Type: Santo Domingo, Desportes 18.... P-J 14927.

Although the name of rubiginosa has been attributed to Jussieu (not by Persoon), it is clear on the label of the type specimen l.c., in Herb. Jussieu written by himself, that it was given by Ventenat (see also IDC microfiches).

Syn. : Clitoria tetragona Poiret ex DC, Prodrômus 236. 1825, Nomen in syn. Neurocarpum ellipticum Deaux, J. Botan. 1: 75. 1813. Candolle, l.c. 51. Hamilton, Prodrômus 51. 1825. Type: Santo Domingo ex herb. Deaux, P. Clitoria glycinoides DC, l.c. 234. Type: Guiane Française, Poiteau, ex herb. Delessert G.

Martusia rubiginosa (Juss.) Britton in Britton and Wilson, Sci. Surv. Porto Rico and the Virgin Isl. 5 (3): 411. 1924.

This species grows in Central America, the Antilles and tropical South America. As happens with many species widely dispersed and adapted to different ecologies, the plants show slight differences that would not support infraspecific status.

#### LONCOCARPUS

Although the number of species of this genus occurring in the Antilles is limited, their determination is hazardous on account of the nomenclatural confusion. Within a relatively short period of years at the

beginning of the XIXth. century, the same epithets have been used for different plants. Two binomials are prominent on the scene; unfortunately they cannot be maintained:

- 1) Lonchocarpus latifolius, based on Amerimum latifolius Willdenow, is illegitimate, substituted for A. pinnatum Jacquin,
- 2) Lonchocarpus violaceus is based on Robinia violacea Jacquin, Enum. Pl. Carib. 28 (1). 1760, with an inexpressive protologue without citation of locality or material or reference. In the same paper describing L. sepium, Jacquin uses a protologue similar except for "pedunculis partialibus unifloris" in opposition to "pedunculis partialibus bifloris" (violaceus), and gives no other information. In 1763, in Select. Stirp. americ. p. 210, tab. 178, fig. 49, Jacquin adds as synonym one protologue of Plumier, and "habitat Carthagensi in fruticosis, floret julio & agosto". The small fig. 49 does not justify any species. The description does not give the details necessary to identify any species. Linnaeus, Sp. Pl. ed. 2: 1044 cited Jacquin and also Miller, Dict. ed. 8 (N° 8) 1768, but this last plant, sent by Houston, from Campeche, has "winged leaves" (cf. Miller).

Willdenow, Sp. Pl. 3 (2): 1131-1132 (3). 1803 gives a description and cites the preceding authors together with a reference to Houttuyn, Linn. Syst. 2: 26. No material survives. Humboldt, Bonpland et Kunth, Nova Gen. Sp. Pl. 6: 383. 1823, described the new genus Lonchocarpus, giving in a footnote the new combination based on Dalbergia and Robinia that showed the characters attributed to their genus, but they did not make the combination Robinia violacea Jacq. as De Candolle assumed, because they considered it as a species dubia.

De Candolle, Prodrum 2: 259, taking up "Lonchocarpus violaceus (Jacq.) H.B.K.", based it as binomial on Robinia violacea Jacq., giving the localities Carthagensis and Guadelupe. No material from Cartagena is in his herbarium but there is a specimen from Guadelupe (see IDC microfiches). The description made by de Candolle contains characters that do not exist in Jacquin's description and indeed they are those of L. punctatus H.B.K. No wonder the majority of the specimens from the Caribbean region are truly L. punctatus H.B.K.! There are other species also so named.

The name of Jacquin cannot be applied to the Antillian species for it has been used.

Bentham, Synopsis Dalbergiaceae (1860) p. 95-96 (sub L. violaceus), has interpreted correctly L. punctatus H.B.K.; Pittier created L. Benthamianus for the specimens that Bentham cited l.c. The area of distribution of this species is essentially that recorded by Bentham.

Lonchocarpus punctatus H.B.K., Nova Gen. Sp. Pl. 6: 383. 1823. Type Venezuela, Cumena, Humboldt et Bonpland IX. 18.... Holot. P-HB. Syn. Lonchocarpus Benthamianus Pittier, Contr. U.S.N.H. 20: 86-87. 1917.

Ex.: Antigua: Nicolson, P. Richard, P.

Guadeloupe: Bena 591, 643, P. Fournet 713, 712, 711, 1411 INRA. Duchas - saing, P. Quentin 184, P. Questel 1477, 2436, 5150, P. Sastre 7868, P.

Stehlé 1626, P. Thiebaut, P. Désirade Bena 642. Saintes, Rodriguez 4024, 4056, P. Duss 522, 1010, P. L'Herminier, P. Perrottet 231, P. Martinique: Bélanger 566, 867, P. Hahn 576, 664, 931, 1123, P. Plée 604, P. Sieber 182, P. St. Vincent: Eggers 6627, P. Venezuela: Funck 12, P. Linden 275, P. Mocquerys, P. Stayermark y Manara 110460, P. Isla Santa Margarita: Miller & Johnston 257, P.

Plumier cited in his Catalogue, p. 19. 1703, three protologues that to-day should be considered as Lonchocarpus:

1. Acacia latifolia floribus purpureis, Plumier (corresponds to MSS 7: ic. 144).
2. Pseudo acacia latifolia, flore roseo, Plumier (corresponds to MSS 7: ic. 146).
3. Pseudo acacia fraxini folio floribus violaceis, Plumier. This has only been written in pencil on the page of icon 146, covered with a strip of paper that curiosity moved someone to tear it off in the greater part.... Therefore, only two species are described and illustrated by Plumier, both cited by Burmann without illustration.

1. Acacia latifolia floribus purpureis, Plumier, Catal. 19. 1703. Balbergia heptaphylla Poiret in Lamarck, Encyc. Méthod. Suppl. 4: 445-446. 1811. Type: Santo Domingo, Poiteau 18... Holst. FI (ex herb. Desfontaines). Isot. P.

Lonchocarpus heptaphyllus (Poiret) D.C., l.c. Candolle, l.c. 259-260.

Syn.: Dalbergia pentaphylla Poiret in l.c. 445-446. Type: Porto Rico, Ledru s. 1797 P.

Lonchocarpus pentaphyllus (Poiret) H.B.K., l.c. De Candolle, l.c. 259.

Lonchocarpus latifolius H.B.K. ex DC, l.c. 260 (L. latifolius H.B.K. sine descript.) excl. Amerinum latifolium Willd. et Pterocarpus latifolius latifolius Poiret in Lamarck, l.c. 611. Non Robinia latifolia

Poiret in l.c. 6: 224-225 nec Robinia latifolia Miller, 1768. Type: Porto Rico, Bertero s. 1820 communic. Balbis G-DC (Probably the original specimen of Bertero is in TOR). H.B.K., l.c. p. 283 footnote: ...

"Amerinum latifolium Willd. (teste specim. a Balbisio mecum communic., ad Amerimno pinnato Jacq. tamen longe diverso);..." This specimen is not in B (personnal communic. Dr. Paul Hiepko). Perhaps it was a duplicate of that one seen by De Candolle and extant in his herbarium (see IDC microfiches). The specimen N° 13088 to-day in B-WILL shows the Willdenow's name and "Carthagenaë" on the outside of the folder, the specimen only in fruits and leaves detached within a packet, which was collected by Isert (vid. photog. reprod.). This may be L. heptaphyllus

(Poir.) DC after comparison of the foliole and pubescence by P. Hiepko. Acacia latifolia floribus purpureis Plumier MSS 7: ic. 144 from a plant collected "in partibus orientalibus insulae Martinicanae", but Plumier saw other plants in the Isla of St. Domingo, fl. may and june and even in july bearing "mature silique".

The name L. heptaphyllus has been retained rather than L. penta-

phyllus, because the majority of the specimens have leaves 7-foliolate, the type of pentaphyllus shows some leaves 7-foliolate (there are even some 9-foliolate) and the type collection is conserved in two institutions.

Bentham treated (p. 90) L. latifolius H.B.K. but he did not exclude the illegitimate binomial of Willdenow, and consequently put under synonymy the superseding names of Poirlet; he added to the list L. oxycarpus DC., l.c. 261, of which type is from Guadelupe, Bertero s. 1820 G-DC (see IDC microfiches). Pittier, Contr. U.S.N.H. 20: 69. 1927 and Urban, Symb. Antil. 8: 229. 1920 did not realize the illegitimacy of Willdenow's name but recognized it as the basionym.

Ex. : Cuba : Curtiss 462, P. Eggers 4964, P. Jack 5080, 6017, P. Linden 14, P. Rugel 365, P. de la Sagra, P. Wright 142, 1184, P.

Jamaica : Harris 10812, 12366, P. Hooker, P.

Porto Rico : Ledru 268, P. Eggers 948, P. Plée 582, 718, 977, P. Riedlé, P. Sintenis 940b, 6671, P.

Santo Domingo : Poiteau, P. Bertero, P. Eggers 2523, P. Jacquemont, P. Lio-gier 14774, P. Richard, P.

Brazil : Ducke 11718, P.

Colombia : Isert, B.

Dominica : Eggers 743, P.

Guadeloupe : Bena 579, 626, 627, 628, 644, P. Duchassaing, P. Perrottet 224, P. Questel 2251, 2482, 4899, 5031, P. Richard, P. Rodríguez 2862, P. Steh-161147, P. Thiébaud, P.

Guyane Française : Serv. Forest. 7538, P. Le Mout, P. Melinon s.n., 373 P. Oldeman 1441, P. Sagot s.n., 125, P.

Martinique : Bélanger 301, P. Hahn 851, 1501, P. Mouret 450, P. Plée, P.

Richard, P. Sieber 175, P. Stehlé 2373, P. Fournet 1412, 2159, 3822, INRA.

Panamá : Allen 891, P. Sutton Hayes 374, P. Johnston 775, P.

Trinidad : Philcox et al. 7504, P.

Venezuela : Breteler 5156, P. Funck et Schlim 513, P.

2. Pseudo acacia latifolia flore roseo. Plumier, Cat. 19. 1703.

Robinia latifolia Poirlet in Lamarck, Encyc. Méthod. 6: 224-225. 1804.

Non Miller, nec Lonchocarpus latifolius H.B.K. Type: Antilles, ex herb. Surian in herb. Jussieu 15227 P-JU (see IDC microfiches).

Lonchocarpus roseus De Candolle, Prodrumus 2: 260 (12). 1825 excl. Robinia rosea Miller ed. 8. (N° 4). 1768, Elliot, Sketch. 2: 243. 1822 et Loiseleur in Duhamel, Arb. frut. Nouv. Edit. pl. 17. 1835. Type: the same as Robinia latifolia Poirlet, l.c.

Syn. : Robinia rosea Miller quoad protol. Plumer.

Delbergia domingensis Persoon, Synopsis 2: 276. 1807. Type: Santo Domingo, Turpin 18.... P.

Lonchocarpus domingensis (Persoon) DC., l.c. 259. Urban, Symb. Antil. 8 : 296-297. 1920. Type : the same as l.c. Persoon cited Turpin as collector of the type of his species. However, the only old collection from Porto Rico extant at the time of Persoon's description, and bearing that name as well as Lonchocarpus domingensis, is signed by Poiteau. Since



both, Turpin and Poiteau were at the same time in the Antilles, the attribution of their collections is not always ready.

Lonchocarpus sericeus (Poiret) DC var. glabrescens Benth., l.c. 88. Type: several syntypes.

Poiret gave the details of the plant and the flower taken from Plummer's description (MSSS 7: ic. 146); the type specimen, material cited above, from the herb. Jussieu, bears only immature fruits. The icon was made from a plant collected in Guadeloupe, in blossom.

Robinia rosea Miller described after a plant sent by Houston from Campeche, corresponds to a plant with "... single winged leaves" (cf. Miller) that is not De Candolle's species.

L. sericeus and L. roseus are similar species; pubescence on leaves and rachis of inflorescences varies in both. They have large suborbicular or ± oblong bracteoles, appressed to the calyx, character that separates these species from the supposed "violaceus" Jacq. and others. However, they differ in a subtle ensemble of details.

In L. roseus the folioles are membranaceous, narrowly oblong or narrowly elliptic, acute to long acuminate. Inflorescence loose. Calyx truncate with 4 small teeth of which 1 is usually longer, ± subulate or narrow, acute (Richard in sched. : "Cal. truncatus; denticulis 4 vix manifestis infimo submajore"); pubescence usually whitish or yellow, appressed hairs shorter than in L. sericeus.

Ex.: Santo Domingo: ex herb. Maire, P. Eggers 2430, P. Fuertes 63, P. Liogier 14921, P. Richard, P.

Porto Rico : Plée, P. Sintenis 678, P. 4991, P.

Martinique : Belanger 487, 868, P. Fournet 664, 2191, INRA. Hahn 663, 1023, P. Sastre 6511, 8637, P. Sastre et Fiard 7587, P. Oldeman et Maurice 2, P.

-----

Lonchocarpus sericeus (Poiret) H.B.K., l.c. 283. Candolle, Prodrum 2: 260. 1825 based on Robinia sericea Poiret, Encyc. Méthod. 6: 226. 1804. Type: Montserrat or St. Christopher, Vahl in herb. Jussieu 15229P-JU (see IDC microfiches).

Syn. : Lonchocarpus pyxidarius DC, l.c. Type: Cuba, R. de la Sagra 18.. Holot. G-DC. Isot. P.

Lonchocarpus tomentosus Tulasne, Arch. Mus. Paris. 4: 82-83. 1843. Type: Brasil, Mato Grosso, ex herb. Imper. Brasil 232. 18... Holót. P.

Lonchocarpus lucidus Pittier, Contr. U.S.N.H. 20: 77-78, fig. 27. 1917. Type: Costa Rica, Santo Domingo de Osa, Tonduz 9950 III 1896 Holót. US Isót. P.

The folioles are coriaceous or subcoriaceous (usually larger than in L. roseus); they are largely oblong to largely elliptic, seldom the lower pair is suborbicular, the apex acute or subacute, rarely obtuse or roundish. Inflorescence dense, flowers larger than in L. roseus. The calyx truncate, if some teeth are visible, they are triangular, short.

The pubescence is usually golden yellow, very densely appressed, the hairs longer than in L. roseus.

This species occurs in large continental areas, both in West Africa (Angola, Cameroun, Côte d'Ivoire, Dahomey, Gabon, Guinea, Niger and Togo), and in Central and South America (Brazil, Guianas, Panamá, Venezuela, Trinidad, Costa Rica, Mexico, Nicaragua, etc.). In the Antilles: Jamaica, Cuba, Porto Rico, Santo Domingo.

Ex. : Hundreds of specimens from Africa have been examined by me. They are very uniform.

Cuba: de la Sagra, P. Combs 150, P. v. Hermann 199, P. Jack 4726, 5235, P. Linden 2138, P. Ruge 223, Wright 1185, 1186, P.

Jamaica : Harris 12356, P. Hooker, P.

Mexico : Ruiz et Pavón, P. Thiébaud 1153, P.

Virgin Isl., Crabe Island, Duchassaing, P.

Costa Rica : Tonduz 9950, P.

Nicaragua : Wright , P.

Brazil: Gardner 1275, P. Glaziou 10552, P. Harley et al. 16291, P. Pires 2653, P. Prance et al. 1316, P.

Guadeloupe : Bena 632, P.

Guayana : Archer 2564 cult., P.

Panamá : Sutton Hayea 599, P.

Trinidad : Eggers 1182, P. Fendler 318, P. Sieber 108, P.

Venezuela : Steyermark 86623, P.

#### SENNA

Cassia minor arborescens siliquis planis articulatis, Plumier, Cat. 18. MSS 6: ic. 29.

Barneby and Irwin in Mem. N.Y. Bot. Garden 35 : 56. 1982 maintained Cassia galegifolia L., based on Plumier, edit. Burmann, Pl. Americ. 78, 1, this plate being the type of this species. However, the authors, "are unable to identify this with any confidence"....

After personal observation of the original icon, Rupert Barneby identified this plant with Senna pallida (Vahl) Barneby et Irwin, l.c. 537 et seq. The Linnaean binomial, l.c. has priority over Vahl's name. Therefore, a new combination is necessary :

Senna galegifolia (L.) Barneby et Lourteig n.c.

based on Cassia galegifolia Linnaeus, Syst. Nat. ed. 19: 1017. 1759 Type Plumier, Edit. Burmann Pl. Amer. 69, tab. 78, 1, copied from Plumier MSS 6? ic. 79. after a plant originating in Guadalupe or/ and Martinica.

Syn. : Cassia pallida Vahl, Eclogae Amer. 3: 12. 1807. Type : Colombia, Santa Marta, Rohr ex herb. Vahl, C.

Senna pallida (Vahl) Irwin et Barneby, l.c. 537 incl. **synon**,

Cassia Mari-mari Aublet, Fl. Guiane Franç. 1: 382. 1775 illegitim. based on Plumier, l.c.

The 19 varieties of Senna pallida described by Barneby and Irwin,

l.c. pp. 539 - 559 are to be referred to Senna galegifolia (L.) Barneby et Lourteig

This paper was finally prepared in the midst of the "souvenirs" of pleasant conversations, revisions of materials and fruitful discussions, during the last summer, in New York Botanical Garden, with Rupert Barneby. His intelligent reading of my manuscript is highly appreciated as his agreement upon the need of a new combination in Senna.

I thank Paul Hiepko, from Berlin, for his fine informations about Willdenow's collections, and Claude Sastre, from Paris, for his searching of plants of Lonchocarpus, during the last weeks, in Martinique as well as for his valuable informations from the nature "brought" to me.

Muséum National d'Histoire Naturelle,  
Paris 75005. France.

## Book Reviews

George M. Hocking  
School of Pharmacy, Auburn University  
Auburn, Alabama

### XVI

"ALASKA'S MAGNIFICENT PARKLANDS," by various authors. 200 pp., numerous col. pls. (s.n.): / National Geographic Society, Washington, D.C. 20036. 1984. \$8.50 (regular ed.)

A truly magnificent volume about a magnificent area, this Alaska so rich in its natural beauty of landscape, plant and animal life, skyscape. The introduction treats the state as a whole. The following chapters in succession deal with the following National Parks/Preserves: Glacier Bay National; Wrangell-Saint Elias; Kenai Fjords; Denali; Lake Clark; Katmai; Aniakchak; Yukon-Charley Rivers; Bering Land Bridge; Cape Krusenstern; Kobuk Valley; Noatak; Gates of the Arctic. Much of the excitement and natural beauty and majesty of the far northern State are conveyed in this book. Without question this is one of the most striking and attractive travel books this reviewer has ever looked over.

GMH

"INTRODUCTORY MYCOLOGY", ed. 3, by C.J. Alexopoulos and C.W. Mims. xix + 632 pp., many figs; John Wiley & Sons, New York (etc.) 1980 \$32.95.

This latest edition (ed. 2 was published in 1962), a new and very different format is used (with pages 7 by 10 in. and double-columned). The text as before is interesting and brings the subject alive. Both line drawings and photos embellish the pages. In this edition, the fungi are grouped in Kingdom Myceteae and separated out of the Kingdom Plantae. For a student of mycology and for others, this text supplies all of the necessary information for exploration of all of the phases of this complex subject.

GMH

AMERICAN DRUGGIST BLUE BOOK, 1986-1987 Edition. (Frances H. Lee, Editor). 542 pp. Hearst Corporation, 555 W. 57th St., New York, N.Y. 10019. 1986. \$30.00

In this useful compilation of pharmaceutical proprietaries available on the American market, there is the usual alphabetic listing of products (with information on manufacturer; dispensing forms, sizes, and prices) and also a practical and valuable reference section at the front and end of the folio-size paper-bound volume. Included in this is a section of product information (by generic name), a controlled substances manual, an index of manufacturers (placed before the

product section), manufacturers' catalog section (6 companies), a product identification guide (illustrations of important medicinals), many full page and part page advertisements (with an index to these), etc. The book is naturally of primary importance to the pharmacist and pharmaceutical manufacturer.

GMH

"NATURAL PRODUCTS AS MEDICINAL AGENTS; plenary lectures of the International Research Congress on Medicinal Plant Research, Strasbourg, July, 1980. J.L. Beal and E. Reinhard, (Editors), Hippokrates Verlag, Stuttgart, BRD. 526 pp., figs., tabs.; 1982.

A series of 22 chapters by various persons, arranged under the following headings; Microbial natural products; natural products of higher plants; biologically active natural products; marine natural products; ethnopharmacology; and future biological production of medicinal agents. This is a useful and valuable contribution.

GMH

"APOCYNACEES", par Pierre Boiteau - Flore de la Nouvelle Calédonie et dépendances, v. 10: 303 pp., 53 pls., 80 maps. Muséum National d'Histoire Naturelle, Paris. 1981.

A family description includes a key to the 18 genera found in New Caledonia and descriptions, distribution data, etc., follow for each species. Carissinae Pichon ex Boit. subtrib. nov. under tribe Carisseae is shown with a single gen., Carissa. Catharinthinae Pichon ex Boit. subtrib. nov. under tribe Plumerieae has only one genus, Catharanthus. Ochrosiinae subtrib. nov. under tribe Rauvolfieae has genera Ochrosia and Neisosperma. Ervatamiinae subtrib. nov. under tribe Tabernaemontanoideae has Ervatamia with E. lifuana Boit. et Allorge sp. nov. (similar to E. orientalis (R. Br.) Domin.) Neriinae subtrib. nov. under tribe Nerieae has Nerium. There are also 10 new combinations, 3 new varieties, and one new form.

GMH

"CORPORATE CRIME IN THE PHARMACEUTICAL INDUSTRY," by John Braithwaite. viii + 440 pp., Routledge & Kegan Paul, London, Boston. 1984. \$45.00

In this book, bribery, dumping, negligence of safety testing, fraud, unsafe manufacturing processes, monopolies, and oligopolies are all featured in a text replete with sound literature references. To make the commentary more graphic and more interesting, the author furnishes many cases of actual crime, such as that of the Musica family who invaded McKesson & Robbins; the Revco Medical fraud (retailer), the Abbott affair (large volume parenterals); G.D. Searle (Flagyl), Richardson-Merrell (thalidomide; MER/29); A.H. Robins (Dalkon Shields); Massengill (Elixir Sulfanilamide); Winthrop (aminopyrine (Pyramidon)); anabolic steroids as appetite stimulants; and others. The author, an

Australian, was very thorough in his research, interviewing no less than 131 senior executives of pharmaceutical manufacturing and exporting companies in the USA, UK, Australia, Mexico and Guatemala. This is also attested to by the large bibliography (20 pages). The text of nine chapters is supplemented by detailed notes giving further information and often proof of data. Much of the dumping of inferior, substandard, or excess pharmaceuticals or of products not permitted sale in the home land is done with nations of the Third World, backward nations often without adequate medical supervisory laws. This however is gradually changing as these developing countries become more sophisticated and more demanding. It appears that the larger companies ("transnationals") are much less culpable than the smaller ones in wrong doing in the foreign trade. (pp.157-8).

GMH

"PRESCRIPTION DRUG ENCYCLOPEDIA". new edition, by Gayle Cawood, J.M. Failes, and Frank W. Cawood. 366 pp., paper back. F.C. & A Publishing, Peachtree City, GA. 1987.

This small volume was intended for the layman and is composed principally of an alphabetical listing of drugs sold only on prescription. Thus, category, effects, warnings, etc., are in simple lay language.

GMH

EBERWEIN, B., HELMSTAEDTER, G., REIMANN, J., SCHOENENBERGER, H. and VOGT, CLAUDIA. (Editors). Pharmazeutische Qualitaet von Phytopharmaka. (Pharm. quality of plant medicinals) Deutscher Apotheker Verlag, Birkenwaldstr. 44, 7000 Stuttgart 1, BRD. (W. Germany). 135 pp., 30 figs., 6 tabs.; 1984. Flexible plastic binding. DM. 38,--

In the preparation of the basic materials for plant pharmaceuticals, nature does not "hold to GMP (Good Manufacturing Practices) guidelines" and these present special difficulties for quality protection. In order to maintain phytotherapy as a valid therapeutic trend, one must comply with the wishes of the legislator as well as with a broad segment of the population. Fortunately, the development of a consensus on the matter of quality dependence is well on the way to realization. Appropriate analytical procedures must be adequate for establishing the quality of the plant drug and must also be practicable. In this volume will be found the proceedings of the scientific symposium conducted 24 Jan. 1984 at Bad Godesberg by the Bundesfachverband der Arzneimittel-Hersteller (BHI) (Federal professional union medicinal manufacturers) (cf. Amer. Drug Manufacturers Assn.). This meeting was participated in by professional people from research, industry, and governmental circles, who had as objective the development of meaningful analytical procedures as a prerequisite to the successful introduction and continued use of plant medicinals. Published here are 15 papers authored by 15 professional

people (including 2 of the editors) from industry, universities, and government. There are chapters on the analytical methods of the German Pharmacopeia and German Medicinal Codex; possible contamination of plant materials with pesticides; microbe-reducing measures for plant drugs; requirements of quality in plant medicinals; and so on. One chapter deals with the practical problems coming up in the analysis of Harpagophytum tuber, ginseng, camphor, garlic, hydroxy-benzoic acid esters (as preservatives), & c. This volume will be of interest to pharmacists, natural product manufacturers, research people, and others.

GMH

"A HISTORICAL CATALOGUE OF SCIENTIFIC PERIODICALS, 1665-1900, with a survey of their development" by Robert Mortimer Gascoigne. xii + 205 pp., Garland Publishing Inc., New York, London. 1985. \$29.00.

The essence of this volume lies in the listings of serials under appropriate headings, such as science in general, botany, etc. The order within each group is chronological, starting with the oldest members. Only outstanding journals are included and the choice for these lies in the extent of use and the persistence of the journal. Unlike two preceding lists of scientific journals - Scudder (1879) and Bolton (1897) - which were comprehensive, here only journals with a life of 10 years or more were ordinarily included. The basis for inclusion was determined for the nineteenth century from surveys of two bibliographies, viz., The Royal Society's "Catalogue of Scientific Papers" and the "International Catalogue of Scientific Literature." For the earlier periods, Poggendorff's "Handwoerterbuch" was similarly utilized. A total of 936 titles is listed, of which botany included 72. (However, some of the journals in the section "Natural History" (with 81 numbers) contained more or less botanical subject matter.) The oldest serial in botany was Botanisches Magazin (Zurich, 1787-1800) with The Botanical Magazine, (London, 1787 -date) vying for first place. Following the catalogue proper, several chapters analyze and discuss the listings. Relative sizes of the various periodicals was determined by actual counts in the Royal Society "Catalogue" for the years 1863-64 and by counts with the "International Catalogue" for 1901-05, thus indicating the size (extent of use) for each period. A survey of the history of periodical literature is next put forward, with appended a table of general science periodicals published by institutions throughout the world 1665-1900. Finally, the history of serial literature for each of the 26 fields of science is sketched. A useful bibliography and index complete this valuable study of the world's science serial literature.

GMH

"SURVEY OF DRUG RESEARCH IN IMMUNOLOGIC DISEASE. 5. NONCONDENSED AROMATIC DERIVATIVES". Part IV., by Vassil St. Georgiev. (Editor). X + 606 pp. S. Karger AG., Basel, Muenchen, etc. 1986. sFr. 490.-- US \$293.50 (hard cover).

This series of survey volumes carries out an important function in organizing and consolidating the vast quantities of accumulated drug research pertaining to immunologic disease. Without question, this excellent work is the most comprehensive for this field in the world. With a total of 8 volumes in the series, the first was devoted to aliphatic derivatives; this (Volume 5) is the fourth part of the "Noncondensed aromatic compounds;" there will be a total of 8 volumes. This work will allow access to all the chemical series or compounds known to be immunologically active. Both natural and synthetic compounds are covered. This particular volume includes benzoic, salicylic, anthranilic, and phenylacetic acids and their derivatives and related compounds. Detailed syntheses are furnished with the literature comprehensive for journal, patent, and book literature. Apparently, the original texts and not abstracts were used. Access is mostly through the serial numbers applied to individual compounds. (At first this may lead to some confusion). There are 4 indexes: (1) author (2) chemical index (3) biological subject (4) biological activity cross-index. In this last one, all compounds are arranged by their biological activity. Thus, as an example, there are over 13 pages with well over 100 compounds (in this volume) listed under "analgesic activity." All drugs listed have some form of immune activity even though some were developed with other than this in mind. Included for each compound are: chemical structure (graphic formula); preparation method; biological activities (immune actions and interactions, pharmacokinetics, dose response, toxicology, clinical use). The work facilitates obtaining a fuller knowledge of drug design, synthesis, screening, and evaluation. The author is attached to the research division of Pennwalt Corporation, Rochester, N.Y.

GMH

HAGERS HANDBUCH DER PHARMAZEUTISCHEN PRAXIS. Edited by P.H. List and L. Hoerhammer. 4th completely revised edition. Chemikalien und Drogen. Volumes I to VIII. (listed below). Springer-Verlag, Berlin - Heidelberg - New York. 1967-80 DM. 2194.

This series of volumes constitutes essentially an encyclopedia of pharmacognosy and of pharmaceutical/medicinal chemistry; a very high percentage of the items are plant or animal drugs or derived products, including many compounds. Many authors were involved in writing the many chapters. (Volume VII is really not a part of the general topics, since this deals with dispensing forms and adjuvants). The various volumes are made up as follows:

- Vol. I. - General part, active principle groups. (I) XXXI + 1270 pp.; 1967; DM. 258.--
- Vol. II. - Active principle groups (II). - Chemicals and drugs (A-AL); 1969; DM. 264. --
- Vol. III. - XII + 912 pp. (AM - CH) 1972. DM 206.
- Vol. IV. - XII + 1226 pp., 1973 CI - G. - DM. 295. --



- Vol. V. - XII + 938 pp.; 1976. H - M. DM. 228. --  
 Vol. VI-A - XII + 1024 pp.; 1977. N - Q. DM. 258. --  
 Vol. VI-B - XII + 720 pp., 1979. R,S, DM. 185.--  
 Vol. VI-C - XII + 582 pp.; 1979. T - Z. DM. 160 --  
 Vol. VII. - VII + 628 pp.; 1980. DM. 170. --  
 Vol. VIII. - Sachverzeichnis, III + 628 pp.; 1980.  
 DM. 170.--

Volume 8 is a comprehensive index to the whole series of seven numbered volumes (actually 9 bound volumes). From actual use, this index appeared to be quite complete; not all compounds but all of the essential and important ones are included, as well as all of the plants and animals of origin, both by common name and by scientific name. This work has a great depth of content in the area of analysis, many pages being devoted to these data for the outstanding drugs. For instance, opium (under Papaver) is provided with nearly 50 pages of detailed information mostly on the qualitative and quantitative study of constituents. This is truly a great work on the model of the numerous German handbooks (encyclopedias).

GMH

"TAXONOMISTS' GLOSSARY OF MOSQUITO ANATOMY" by Ralph E. Harbach and Kenneth L. Knight. - xi + 415 pp., 83 pls., with 365 figs., 23 tabs, 1 chart, Plexus Publishing, Inc., Medford, N.J. 08055.-1980. - \$24.95+

The general plan of this work is to cover the anatomy of the mosquito through the various life stages: adult, egg, larva, pupa, with a final chapter on vestiture or covering. Under each of these headings there is a vast number of anatomical terms arranged in alphabetic sequence, accompanied by many line drawings and S.E.M. microphotographs. The valid terms are defined while synonyms are listed, the latter being available through the exhaustive (65 pages) index at the back of the book. The first published reference to each term is indicated and for each accepted term, an abbreviation and reference are given. Because of the widely different usages of terminology for the various parts, several tables are used to indicate the different terms of outstanding entomologists. The book is based on a series of 16 articles which appeared in Mosquito Systematics and other journals. These texts were of course completely revised and updated. The objective of this work was to stabilize the terminology for Culicidae (mosquitoes, order Diptera), a group of insects which have been the cause of indescribable suffering through the ages by transmission of some of the worst diseases from which mankind has suffered - malaria and yellow fever being among the most deadly. This book will be of great importance to entomologists, public health people, and other specialists, as well as to librarians. Without question it furnishes the most complete descriptive terminology for this group of insects.

GMH

"SLEEP, BENZODIAZEPINE AND PERFORMANCE: Experimental Methodologies and Research Prospects" edited by I. Hindmarch, H. Ott, and T. Roth. VIII + 223 pp., 81 figs., 28 tabs. Springer-Verlag Berlin, Heidelberg, New York, Tokyo. 1984. Cloth DM 98,-- (approx. US \$50.00).

In this volume, the 26 authors (including the editors) have demonstrated in 17 chapters (including the terminal resume) how sleep, benzodiazepines, and daytime performance are interrelated. Formerly, barbiturates were the most widely used hypnotics but their place has been taken now by the members of this group, which include Valium and Librium. They have a high degree of safety in inducing sedation and drowsiness and eventually sleep. The importance of this work may be comprehended when it is learned that Valium (Diazepam) is claimed the most widely used drug in history. (Diazepam is known chemically as chloro-dihydro-methyl-phenyl-benzodiazepinone; there are at least 35 proprietary or trade names). As a basis for discussion, there is considerable background information on sleep that is of much interest. For instance, it develops that the age at which sleep is most productive in the way of maximum daytime energy and alertness is the prepubescent period of 10 to 12 years. (May this be related to the fact that the anabolic hormones are dominant during the sleeping period and high levels of these hormones are found in the young?) The complexity of sleep requires an integrated approach to its problems. Recent discoveries are commented on in detail: the existence of benzodiazepine receptors in the gamma-aminobutyric acid (GABA) receptor complex; antagonists; and development of the radioreceptor assay.

The frequent use of abbreviations and acronyms in modern times is a fact of life; however, it would seem essential to furnish a key to such abbreviations as SWS (slow sleep wave), NPSG (nocturnal ? polysomnography) (this latter abbreviation could not be found in any of 12 volumes of abbreviations accumulated by the reviewer).

A useful feature for this volume would have been a table of the approximate 16 compounds making up the series of benzodiazepines to show the generic name and principal proprietary names. This might be inserted in front with the table of contents or at the back near the index.

The editors are English (Hindmarch), German (Ott), and American (Roth). The text is entirely in English, with abundant references. There are both author and subject indexes.

GMH

"A CHECK LIST OF CROSSES IN THE GRAMINEAE," by Irving W. Knoblauch (Michigan State University, E. Lansing, Mich.). 1-170. Published by the Author. S.d. (ca 1980). Price ?

This lists both natural and artificial crosses of taxa of 84 genera of the Gramineae (grasses) (out of some 600 genera known). The data are based on the literature, for which 1131 references are given.  
GMH

La flora de la Española, II. Liogier, A.H., Universidad Central de I Este v. 44: 420 pp., 104 figs.; 1983 (1984). (Serie Cient. XV) (Dominican Rep.)

This is the second volume of a work, the first volume of which was published as *Phytologia Memoirs III* (1981) (*Antillean Studies I*). (Vol. I included Fams. 1-53, covering Gymnospermae, Monocotyledoneae, and Dicotyledoneae from Casuarinaceae to Urticaceae). This volume covers Fams. 54-100 inclusive except for #56, Loranthaceae, and #69, Cactaceae, which remain to be studied in more detail. Keys, descriptions, vernacular names, general distribution data, and references are given. The objective was to furnish a drawing of one species in each genus of the 45 families represented. Scientific and vernacular name indexes are included. (No novelties were noted). (Dr. Liogier was the author of the *Flora de Cuba*, which appeared under his religious name (Franciscan order) of Hermano Alain F.S.C. (E.E. Liogier). (1946-53) (1974)

GMH

PFLANZEN der TROPEN: BLV Bestimmungsbuch, by W. Loetschert, and G. Beese, BLV Verlagsgesellschaft Muenchen, Wien, Zuerich.  
263 pp. 274 col. pls., figs., maps, tabs.; 1981. DM 36,--

This volume is concerned with a large number (323 spp.) of ornamental and economic plants which grow in the tropics. Following an informative introduction, there are sections on ornamental plants (palms, tree ferns, shrubs, vines, herbs) and economic plants (those bearing starches, proteins and fats, stimulants, spices, beverage plants, vegetables, fruit, citrus plants and technical species). The section of colored plants which are exceptionally attractive, occupies a position between the ornamental and economic plants. A supplement furnishes explanations of technical terms, an index of the scientific names, and an index of German and English common names. The text describes the chief characteristics of the plants, their occurrence, distribution and biologically significant details; there is also considerable on the ways in which the economic species are used. The introductory portion gives a climatic characterization of the tropics with distribution maps and brief but generally adequate information. The normal distribution of the various tropical plants is supplemented

with observations on the effect of human activities on their growth. While this is one of the "determination books" of the publisher it is not provided as one would expect with diagnostic keys; determinations must be made on the basis of the illustrations and textual descriptions. This volume represents one of some 30 books in the BLV "determination" book series. The small size of the volume makes it convenient to carry on a field trip.

GMH

"ANGEWANDTE KLINISCHE PHARMAKOLOGIE: Phase-I-Pruefungen," by P.W. Luecker (Mit Beiträgen von W. Rindt u. M. Eldon). x + 148 pp. 19 figs., several tabs. Heidelberger Taschenbuecher Bd. 2 1 4 . Springer-Verlag Berlin, Heidelberg. (flexible cover) DM. 19, 80 1982.

In this "pocket book", an instructional program of applied clinical pharmacology (CP) is carried out by means of selected examples. It presents the daily practice needed in conducting the testing of medicinals in Phase I (first of 4 phases); in this one, the drug substance is applied for the first time to humans (after previous animal trials) to determine the compatibility, non-toxicity, pharmacokinetics (changes of drug concentration in body), and metabolism. Stripped of unnecessary ballast, the methods of CP (and related areas), are presented in a direct fashion and recommendations are made for suitable research programs. Unlike teaching methods now used, this book contains clear directions for conducting researches, complete with blank forms, samples of testing plans, even of a research patient agreement (or contract), check list, etc. Finally, the patient testing models are described (such as for antacids, cardiac drugs, antidepressants,) permitting the measurement and qualification of a small number of cases. - The entire text is in German except for the English text of definitions and symbols prepared by a Committee on Pharmacokinetic Nomenclature of the American College of Clinical Pharmacology (8 pp.).

GMH

"THE MERCK MANUAL OF DIAGNOSIS AND THERAPY". 14th edition, edited by Robert Berkow, M.D. xxviii + 2579 pp., 129 figs., 213 tabs. Merck Sharp & Dohme Research Laboratories, Rahway, N.J. 1982.

As might be expected, "M.M. XIV" is the largest and all-round best edition yet of the well known and most excellent reference work of the prestigious Merck Company. Although in appearance it does not markedly vary from earlier editions, it comprises a surprising 2600 pages and has been greatly increased in textual content (more than 18%) over the previous edition and 32% over the 12th edition, one result of using a thin (but strong) type of Bible paper. All phases of medical diagnosis and treatment are covered except surgery and there are also important sections on toxicology and procedures in practice. The 24 chief sections with 291 chapters were composed and critiqued by more

than 272 medical men (mostly of the USA but also including several Canadians, Englishmen, et al.). These are listed in the early part of the Manual. There are also 30 persons on the editorial staff or as consultants. Disease entities not included are presumably not amenable to internal medical treatment but require surgery or physical therapy of some kind. A new section on "clinical pharmacology", a sort of condensed materia medica with information on bioavailability, drug absorption, elimination, etc., was introduced in the 13th ed. and is here continued.

For the first time, a chapter on geriatric medicine (Ch. 264 in the section on clinical pharmacology) has been introduced. New topics included are Legionnaire's disease and toxic shock syndrome. The treatment of common complaints with such common names as indigestion, biliousness, "nervous legs", and "frozen shoulder" might well have been included. This work is of particular value to the general practitioner as opposed to the specialist, but it has become more valuable than ever to the medical man of all branches.

At its astonishingly low price, the book should be in the library of every practitioner or student of medicine, pharmacy, dentistry, nursing, or other branches dealing with human health.

(Earlier reviews: Ed. XI: Quart. J. Crude Drug Res. 8: 282-3; ed. XII: ibid. 14: 146-7; 1978.)

GMH

"ORCHIDS OF PAPUA NEW GUINEA: AN INTRODUCTION.", by Andrée Millar, University of Washington Press, Seattle, Wash. 98105. X + 102 pp., 6 figs., 1 map, 200 pls. (color) 1 tab.; 1978. \$25.00

The author of this beautiful volume spent many years in Papua New Guinea, visiting many regions, and acquiring a close acquaintance with the orchid flora. The beauty and the variability of the countryside are apparent from many of the colored photographs (taken from Kodachromes). The beauty of habitat and orchid are perpetuated through the photography of Roy and Margaret Mackay. This book represents the first attempt (and a quite successful one) to furnish a pictorial and geographical record of the orchids of this tropical area. During the German occupation of the territory in the teens of our century, the intrinsic beauty and value of the orchid population here were recognized, but following that and up to the present time, there has been a great hiatus in these botanical studies. A return to this interest is therefore greatly overdue. The richness of the orchid flora will come home when one learns that 134 genera have been reported (Dockrill, 1972) for Papua New Guinea. The number of species is of course much greater, thus 569 species from a single genus, Bulbophyllum, have been reported, and 512 species in Dendrobium. In this text, 49 pages are occupied with these two genera alone. And these are only the known species: there are believed to be many many more species which are not yet known to the botanist. The index shows 51 genera with perhaps some 180 species; there are also many cultivars.

Emphasis has been placed in discussions on the potential values of the plant in horticultural plantings. Thus the discussion comes under three headings: habitat; plant; and flowers. Under "habitat", both the kind of environment and the geographical location of the plant are taken up. The book therefore has interest both for the plant taxonomist and for the plant grower.

GMH

"DICTIONNAIRE DES SIGLES & ABBREVIATIONS, TECHNIQUES & SCIENTIFIQUES," by Jean Murith, VI + 458 pp. Lavoisier Technique & Documentation - 11, rue Lavoisier, F-75008 Paris France. 1982. 350,00 Fr. (approx. \$50.00)

This dictionary has been of especial use to the writer of this review since it shows acronyms for many French organizations which are not listed in most of the abbreviation dictionaries available. The compilation is stated to be international, but most abbreviations noted were for France and other parts of Europe and the USA. Some 17,000 entries are included, covering fields of science, medicine, economics, finance, commerce, general information, etc. Not only the names of the organization but also its address and even its phone number (when European) are given. Sample trials showed excellent coverage with many acronyms not found in several other similar dictionaries in our library. Among the acronyms/abbreviations not found were: PI (Protocol Internationale), UNIPEF (Union Pharmaceutique et Financière); UTIP (Union Technique Intersyndicale Pharmaceutique), APDILA (Association des Pharmaciens Directeurs de Laboratoires d'Analyse); FSPF (Fédération des Syndicats Pharmaceutiques de France); UER de Pharmacie (Union Européen de Recherche); BNFSPF (Bureau National de la Fédération des Syndicats Pharmaceutiques de France); AFNIR (Assn. Française de Normalisation); CEZA (Comité Européen de Zoologie Agricole); CILB (Commission Internationale de Lutte Biologique); FNOSS (Fédération Nationale de l'Office de Sécurité Sociale); UTIP (Union Technique Intersyndicale Pharmaceutique); FIAN (Physics Institute of the Academy of Science, USSR); MACT (Master of Arts without language or thesis); UPC (Universal Product Code) (for grocery checkout systems); PIN (postal code index); PMC (pollen mother cell); NFPA (National Fire Protection Assn.); URS (USSR); SAT (Scholastic Aptitude Test); PSAT (Preliminary Scholastic Aptitude Test); APB (All Points Bulletin (police)); MH (Master of Horticulture); CATV (Community Antenna Television); ACA (American College of Apothecaries) ACPE (Amer. Council on Pharmaceutical Education); ADA (Amer. Dental Assn.); ADR (Accepted Dental Remedies); AFPE (Amer. Foundation for Phar. Education); AIHP (Amer. Inst. of the Hist. of Pharm); APHA (Amer. Pharm. Assn.); APA (Alabama Pharm. Assn.); ASHP (Amer. Soc. of Hospital Pharm.); BP (British Pharm.); CHA (Catholic Hospital Assn.); FIP (Fédération Internationale Pharmaceutique); FWDA (Federal Wholesale Drug Assn.); MSC (Medical Service Corps); NABP (Nat. Assn. Bds. Pharm); NACS (Natl. Assn. Chain Drug St.); NARD (Nat. As. Retail Druggists); NWDA (Nat. Wholes. Druggists Assn.); PhI (Pharmacopoea Internationalis). The

acronym "CEDEX" which appears in many French postal addresses was found defined for the first time: "Courrier d'Entreprise a Distribution Exceptionnelle" (mail of a company for special delivery).

GMH

NATIONAL GEOGRAPHIC INDEX 1947-1983. 608 pp., many figs. National Geographic Society, Washington, D.C. 1985. \$13.95.

Without question, the National Geographic Magazine is one of the most attractive and interesting periodicals ever published. This latest collective index covers 37 years of the magazine and more than 2500 articles, as well as books, supplements, maps, and TV programs put out by the Society. It supersedes the index for 1947-76. With alphabetical arrangement of 5,000 subjects and in excess of 25,000 entries, this gives access to many topics in science, natural history, geography, history, biography, etc. It may be considered a primary reference for in-depth information on many subjects. The Magazine goes back to 1888, and there is a previous large collective index covering 1888 to 1946. (there has also been an index for 1899-1946). This index also incorporates articles on exploration, research, etc., with lists of medals and awards and of expeditions. The volume is more attractive because of over 100 pages of colored photos. For a bound hardback book, this is an extraordinary value in this age of inflation.

GMH

"MAPA DE VEGETACIÓ DE LA MUNTANYA DELS MOLLONS (ANOIA), by J. Nuet i Badia. Treballs de l'Inst. Botanic de Barcelona (Catalan) 9: 9 pp., 6 maps; 1984.

This map of the vegetation of the mountain of Els Mollons, in the region of Anoia, with accompanying smaller maps, shows the precise geographical position of the mountain and its present and potential vegetative cover. The climactic vegetation corresponds to the consociation "Quercetum ilicis galloprovincia" dominated by the holm oak (*Quercus ilex*), long since destroyed to make way for vineyards, in turn abandoned at the end of the XIX Century because of phylloxera. Today a large part of the mountain is covered by brushwood (consociation "Rosmarino-Ericion" with *Pinus helepis*).

GMH

"INHALATION ANESTHESIA TODAY AND TOMORROW", edited by K. Peter (Univ. Munich) and F. Jesch (Univ. Munich). - Anaesthesiologie und Intensivmedizin Band 150: XII + 259 pp., 126 figs., 19 tabs. Springer-Verlag Berlin, Heidelberg, New York. 1982. DM. 76, --

This brochure is made up of 28 unnumbered chapters, each with references in a terminal group. There is a subject index at the end. The text is divided into four large parts following an initial chapter on biotransformations. The first part concerns the toxicity of volatile anesthetics (VA) (with 4 chapters) and information on the

mechanisms of action (next 3 chapters). The second part tells considerable on the effects of VA on the cardiovascular system and the microcirculation (6 chap). The third part of the text instructs on the influence of VA on cerebral functions in man (3 chap.), on the hepatic functions (1), renal system (1), and skeletal muscles (1). The 4th part deals with the special clinical aspects of the VA: the effects on the endocrine system (1), on infants and children (pediatrics) (1), on the aged person (geriatrics), (1), patients with heart disease (1), hypotensive effects (1). In this chapter, "controlled" (or deliberate) hypnotism is described, in which the VA are used for reducing blood loss and to facilitate surgery (such as in open heart surgery): in this special usage, extra care must be used. The VA considered chiefly in this work are all halogenated hydrocarbons: chiefly halothane, methoxy-flurane, and enflurane. A final chapter summarizing the text, "Balanced anesthesia", takes up a system of combined anesthesia, in which different sorts of anesthesia are used on a patient simultaneously, an idea first occurring apparently to Geo. Crile (ca. 1910-11). The advantage is thought to lie in reducing the risks of anesthesia. As presently used, the combined anesthesia usually employs muscle relaxants to aid in the efficiency of the anesthetic process. Most of the chapters in this book were written by Germans but there are representatives from 11 other nations (including Northern Ireland), indicating a truly international collaborative effort.

GMH

#### "PHARMAZEUTISCHE STOFFLISTE" (List of Pharmaceutical Substances)

Ed. 4. Edited by Arzneibüro der ABDA (Arbeitsgemeinschaft d e r Berufsvertretungen Deutscher Apotheker). 5 volumes: I, A - B; 1-352; II, C-D. 353-706; III. F-M, 707-1076; IV., N-P, 1077-1388; V., Q-Z, 1389-1696. Publ. by Werbe-und Vertriebsgesellschaft Deutscher Apotheker, m,b,H., Postfach 7708, Beethovenplatz 1-3, 6 Frankfurt/Main, BRD. 1972. Price not known.

This looseleaf dictionary of pharmaceutical products was prepared by the "Society of Professional Representatives of German Pharmacists" (trans.) and includes all medicinally active substances which previously had been distributed on index cards and describe the components of all domestic and foreign medicinal specialties. Included are preparations in 18 pharmacopeias (including the International Pharmacopeia). Materials of both natural and synthetic origin are included. Thus, for example, there is a brief description (with structural formula) of Bacitracin and a listing of proprietary names. Under Bacteria are listed 20 organisms (including some classes). Plant products are taken up generally under the botanical name: thus, *Balsamum peruvianum* is cross-referenced to *Myroxylon*. Synonyms, indications, dosage, etc. are indicated at each main entry. There are a great many cross-referenced terms; for instance, flower pollen (Blütenpollen) is referred to Pollen. Under the letter "L" these natural substances are taken up (omitting cross-references): *Lab*; *Lachesia muta* (bushmaster, snake); lactalbumin; lactates; lactoglobulin;



lactose; Lactuca virosa; lactulose; levulose; Laminaria; Lamium album; lanatoside A, B, C; lanolin; Larix decidua; Lavandula angustifolia; L. latifolia; Lebertran (codliver oil); lecithin (egg); lecithin; Ledum palustre; Leontice thalictroides; Leonurus cardiaca var. villosus; Leptandra virginica; Lespedeza capitata; lespedin; leucine; leucovorin; Levisticum officinale; and 31 others. The work is updated by inserting additional pages as required. A particular advantage of this set of volumes is the recording of numerous trade names. Thus, for instance, under Ascorbic acid, there are given no less than 202 such names. Many abbreviations are used to simplify the text, thus a dagger ( † ) signifies that the product is sold only on prescription in West Germany (including West Berlin). All described substances (not cross entries) are numbered to facilitate identification on data processing equipment. Throughout the work many entries are in Latinized form; thus, wherever this is used in the German Pharmacopeia. Hence, stronger ammonia water is rendered *Liquor Ammonii caustici*. Otherwise, the German names are used. The looseleaf volumes are well made with plastic covers. This work should be a valuable reference tool wherever drugs and pharmaceuticals are studied or manufactured.

GMH

"PHILIPPINE NATIONAL FORMULARY, First Edition," edited by Jesusa A. Concha. 135 pp., 4 col. pls. The National Science Development Board, General Santos Avenue, Bicutan, Taguig, Manila, Philippines. 1980. Price?

In this paperbacked brochure, monographs for 84 vegetable drugs appear in the alphabetic order of their common (Phillippine) names. Many original data resulting from research by scientists at the University of the Philippines and elsewhere have been incorporated into the text. For each drug there are given the scientific and other names (English, Spanish, and various Phillipine dialects), part used, indication and directions for use, constituents, and references. A listing of indications and uses with the names of various drugs under each use represents a kind of cross reference; there is also an index of names other than those used in the arrangement of the monographs, finally a bibliography. This is a useful compilation and is one of the texts whose contents were used in the preparation of the "Inventory" (WHO).

GMH

"TRILLIUMS OF ONTARIO", by J.S. Pringle. Royal Botanical Gardens, Hamilton, Ont.-Tech. Bull. no.5: 27 pp.; 1984. (ed. 3) Canad. \$2.50.

General discussions about the genus are followed by descriptive texts on the four known Ontario species, T. grandiflorum, T. cernuum, T. undulatum, and T. erectum. Variations, uses, cultivation, etc. are discussed.

GMH

"GUIDE TO THE GENERIC NAMES APPEARING IN THE 'INDEX KEWENSIS' and ITS 15 SUPPLEMENTS." by Ernest Rouleau. 511 pp., Les Editions Jules Chatelain, Lac de Brome, Cowansville, Quebec, J2K H1 Canada. 1981. \$141.00 (Canad.)

The two main volumes and the 15 supplements of Index Kewensis (IK) represent valuable listings of the known phanerogam species. However, its use becomes more unhandy with the appearance of each supplemental volume, each with its own alphabetic sequence of genera and species. Not only is it necessary in making a through search to consult the main volumes and the 15 supplements but it is also important to check the corrigenda which appear in the earlier supplements as well as in the main work. Actually one must look in more than 20 places to be sure he has not left out some vital entry. This problem has been obviated in some of the larger American herbaria by using huge scrapbooks in which all entries from all volumes are pasted in strict alphabetic sequence, making the search almost an "instant" one. The cost of some at least of these paste-ups was borne by clerks hired under emergency employment programs carried out under the Roosevelt administration. Unfortunately, most botanists are compelled to use the longer more time-consuming search operation. The work under review will help to lighten the load. The major part of the volume consists of an alphabetic sequence of all the genera found in IK. with indications of all volumes in which the genus appears. Following this, the next largest section, tabulates under the families the component genera found in each, with a on-page terminal listing of genera of uncertain position. (Parentheses are used to indicate tentative assignment). The last section is a schematic placement of families under order, superorder, subclass, class, subdivision, and division, based on various systems currently in vogue.

GMH

"Das AMP-System. Manual zur Dokumentation psychiatrischer Befunde," edited by Ch. Scharfetter. 88 pp. Springer-Verlag Berlin - New York. 1971. DM. 3.50 US \$1.10.

The Arbeitsgemeinschaft fuer Methodik und Dokumentation in der Psychiatrie (AMP) is represented by psychiatric clinics in leading cities of Switzerland, Germany and Austria. The six data forms for use in computer recording and calculations are reproduced: - general anamnesis; disorder anamnesis; psychiatric findings; somatic findings; medication (30 day period); and therapy. These sections are discussed in detail. Bibliography; index.

GMH

"THE ENCHANTED RING: THE UNTOLD STORY OF PENICILLIN," by John C. Sheehan. xvi + 224 pp., 12 figs. The MIT Pres, 28 Carleton St., Cambridge, MA 02142. 1982 \$15.00.

In this attractive and well readable account of the history of our most valuable drug and the first commercially available antibiotic, about one-third of the text concerns the early beginnings and development of penicillin of natural origin, while the last part of the volume gives much detail on efforts at and final success in the laboratory synthesis and commercial manufacture of this useful medicament. In this development, the author himself played an important role especially in the opening of the  $\beta$ -lactam ring (the "enchanted ring" of the book) and other Herculean labors leading to the successful synthesis of the compound. Much of the narrative reads like a story.

GMH

"ETHNIC MEDICINE IN THE SOUTHWEST," Edited by Edward H. Spicer. - ix + 1-291, 1 fig., 2 tabs. The University of Arizona Press, Box 3398, Tuscon, Ariz. 95722. 1977. \$6.95 paper (\$16.50 cloth).

Five authors including the Editor, who wrote the initial chapter developed along general lines, have presented a study of the folk medical practices of the southwestern United States. There is a chapter by a different author for each ethnic group of this part of the country: Blacks; Hispanic Americans; Indians (Yaqui tribe); and "Anglos" (Anglo-Americans). The medical articles and practices of each group are given with some detail, with frequent excerpts or quotations from representatives of the various groups. The Editor is a professor at the University of Arizona and the others are all graduates of that university. Much can be learned from this book not only on medical practices but also of the philosophy, social practices, religion, and general ways of thinking of these peoples of the warm, dry, sandy states represented. Arizona is chiefly spoken of but much also applies to New Mexico and other adjacent states. This is an excellent and inexpensive source of information on the subject.

GMH

FLORA OF SOUTHEASTERN QUEENSLAND. Volume I. Stanley, T.D. and Ross, E.M. Queensland Department of Primary Industries, Misc. Publ. 81020: IV + 545 pp., 80 figs., 8 maps; 1983.

This volume is the first of three and is devoted to approximately half of the dicotyledonous taxa found in title area; the second volume will take up the remaining dicots while the third is to deal with the monocots and gymnosperms. In the 3 volumes there will be an estimated 3,600 species. In contrast, F.M. Bailey's "Queensland Flora" (1902) included for the entire state 4,500 species. It is planned to publish three more regional floras for Queensland in the course of time. A compilation, "The Ferns of Queensland", by S.B. Andrews, was published in 1982. Other cryptogams have not been presented since so many of them are imperfectly known. The region covered, representing the "pastoral districts" of Burnett, Darling Downs, Moreton, and Wide Bay, constitutes some 184,600 sq. km. or about 11% of the total area of the

State. The arrangement of families follows that of Engler ("Syllabus") -- as revised by H. Melchior. This volume includes 79 families less one (Proteaceae, which will be taken up in volume 2). This order runs from Casuarinaceae to Sapindaceae, families sometimes considered the more primitive of the dicots. A general key to all dicot families, including those of vol. II, is presented before the systematic treatment. Under each family there is a generic key and under each genus a species key, wherever applicable, i.e., where there is more than one unit represented. Vernacular names are shown where commonly known or used and those synonyms which are found in the Australian literature; no effort was expended to provide complete synonymies. Descriptions are provided for features visible to the eye or hand lens. The excellent line drawings are very helpful. Exotic naturalized species are indicated by means of an asterisk (\*). The majority of families were the responsibility of E.M. Ross, T.D. Stanley dealt with 10 families, while 8 other families were treated by other specialists. Adequate descriptions are given for families, genera, and species. The volume has an index. - This flora will be an important resource for the flora of Australia.

GMH

"MANUAL OF PHARMACOLOGIC CALCULATIONS WITH COMPUTER PROGRAMS," by Ronald J. Tallarida and Rodney B. Murray. - IX + 150 pp., 28 figs., 27 tabs. Springer-Verlag Berlin, Heidelberg, New York. 1981. DM. 33. (US \$19.--).

The first half of this volume deals with the pharmacologic basis for the calculations (1-33) with appropriate formulas or equations for each. The calculations are easily done with a small calculator and the Appendix tables. The second half is taken up by computer programs (1-33) corresponding to the procedures in the first part.

GMH

A catalog of vascular and wetland plants that grow in Oklahoma. by J. Taylor, Herbarium, Southeastern Oklahoma State Univ., (Durant, Okla.) Publ. No. 1: vi + 1 - 77; 1977.

Preceded by introductory information on the floristic regions of Oklahoma and a classification of habitats, this catalog includes ca 600 taxa. Notations are given as to nature of plant and in which of the 6 floristic regions it has been collected by the writer or by others. This listing is followed by a bibliography and by 5 appendices, which list aquatic and wetland plants of Oklahoma arranged by family, used by wildlife, potential weeds, reported poisonous to livestock, and those reported edible. An index to common names follows.

GMH

"TROPICAL PLANT DISEASES" by H. David Thurston. vii + 208 pp., 60 figs., 5 tabs.; American Phytopathological Society, St. Paul,

Minn. 1984. \$12.00.

This letter page size paperback brochure is rich in information on the various diseases besetting tropical crops, these being arranged in approx. descending order of importance (rice, maize, and so on). Cereals, root crops, beverage crops, tropical fruits and nuts, rubber, fiber crops, drug plants, &c., are included. Most of the diseases taken up are caused by fungi but there are also included attacks by bacteria, viruses, nematodes, &c. An excellent coverage of the nature of the plant itself is included. The emphasis is on identification and control of the various diseases. The pages are replete with references.

GMH

"FOOD PLANTS OF BRITISH COLUMBIA INDIANS", by Nancy J. Turner. Part 1. Coastal peoples. 265 pp., 131 figs., 2 maps. Part 2. Interior peoples. 261 pp., 118 figs., 1 map. British Columbia Provincial Museum, Victoria, Canada. 1975, 1978. \$4.00 each part.

Interesting details are given about hundreds of plants used as foods by the Indians of B.C. The plants are arranged in the order: Thallophyta; Pteridophyta; Gymnospermae; Angiospermae. The food names are detailed. Most of the figures are in color. Very useful volumes.

GMH

"A MONOGRAPH OF CERATOCYSTIS AND CERATOCYTIOPSIS by H.P. Upadhyay. xiii + 1-176, 513 figs., University of Georgia Press, Athens, GA. 30602. 1981. \$27.50.

Fungi of these genera are the cause of numerous diseases of crop plants, forest trees, etc., including the diasastrous Dutch elm disease caused by Ceratocystis ulmi (Buism.) C. Moreau, which has caused great economic losses in the USA. Ceratocystiopsis Upadhyay et Kendrick was split out of Ceratocystis in 1975, and in this volume 13 new combinations are made by transfer from Ceratocystis, leaving a total of 15 spp. including C.minuta Upadhyay et Kendrick, the type. For Ceratocystis, 75 spp. are described, of which seven are new combinations. Ceratocystis is divided into four sections, including sect. Endoconidiophora (Munch) stat. nov. (Endoconidiophora as gen.); sect. Ips sect. nov. (with C. ips (Rumb.) Hunt as type); and sect. Ophiostoma (H. et P. Sydow) stat. nov. (Ophiostoma as gen.) (with O. piliferum (Fr.) C. Moreau as type); as well as the typical sect. Also described is Graphiocladiella clavigerum gen. et sp. nov. to accommodate the conidial stage of Ceratocystis clavigera (Robins. - Jeff. et Davids.) comb. nov. (Europhium clavigerum). The book is well printed and bound. About one-quarter of the pagination is occupied by microphotographs and drawings of the fungal structures.

GMH

"TREES OF CENTRAL TEXAS: A FIELD GUIDE" by R.A. Vines. vii + 405

pp., 266 figs., University Texas Press, Austin, TX. 78713. 1984.  
\$10.95.

This consists primarily of portions of the text of the late R.A. Vines' "Trees, shrubs, and vines of the Southwest" (1960), but with additions and corrections. Covered roughly is the area of the Edwards Plateau as bordered by the Balcones Escarpment (s. and e. of the Pecos River (w.)) and the Texas Plains and the Llano Uplift. Following a brief description of the area, the taxa are arranged in systematic order - first Gymnosperms, then Spermatophytes. Included are 186 tree species. The graphic descriptions and good drawings aid identification of trees in the field.

GMH

"MOSES OF THE SOCIETY ISLANDS" by H.O. Whittier. x + 1-410, 101 figs., 1 tab.; University of Florida Press, Gainesville, Fla. 1976 (recd. 1977). \$17.50.

The introduction describes the Society Islands, made up of nine islands in two groups, which occur in the South Central Pacific. A chapter on the ecology of the mosses is followed by the taxonomic part, consisting of keys and descriptions. 39 fams. are recognized containing ca 175 spp. and vars. Included are Campylopus aoraiensis sp. nov. (Tahiti; the smallest of the gen.); Syrrophodon fissipapillatus sp. nov. (Tahiti); S. mooreae (Bescherelle) comb. nov. (Calymperes m.); Leptostomum millerianum sp. nov. (Tahiti; compared with L. macrocarpum (Hedwig) Pylaie); Macromitrium bescherellei nom.nov. (Dasymitrium nadeaudii Besch.); Macromitrium tahitense Broth.); Entodon solanderi (Aongstrom) Jaeger var. turgidus (Aongstrom) stat. nov. (Cylindrothecium turgidum); and Sematophyllum entodontoides Bescherelle var. moorei (Bartr.) stat. nov. (S.m.). The book is well made with cloth binding, and with bibliography, glossary, and index. It is relatively inexpensive at \$17.50.

GMH

"SELENIUM - A POTENTIAL ENVIRONMENTAL POISON AND A NECESSARY FOOD CONSTITUENT." by Charles G. Wilber. vii + 126 pp., 20 tabs. Charles C. Thomas, Springfield, IL 62717. 1985.

It is paradoxical that selenium (Se) is an element essential to life and health and at the same time one of the toxic substances found in soils and transmitted through various plants (selenium accumulators) to animals, including man. At the same time, Se is an essential element and a poison for plants, some being more sensitive to it than others. This authoritative work by the Professor of Zoology at Colorado State University is made up of 7 chapters, an appendix, and a large literature section. It could well be a starting point for much research work on this sulfur-like element, now so popularly sold by health food stores.

GMH

New York Botanical Garden Library



3 5185 00216 9934

Inasmuch as we do no editing, papers accepted for publication *must* be submitted in *exactly* the form that the author wants to have them published. They will then be photographed and printed by photo-offset in exactly the form as submitted except that we will add page numbers and running-heads.

Typescripts should be prepared single-spaced on clean white heavy bond smooth and opaque paper. Elite type is probably the most space-economical. Typescript text must not exceed a rectangle  $5\frac{5}{8}$  inches wide (horizontal) by  $8\frac{5}{8}$  inches high (vertical), not including the running-head and page number.

The title of the paper should be typed in all uppercase (capital) letters with 2 blank lines above the title and one beneath; then the name of the author in ordinary upper- and lower-case letters, along with his address (if so desired); followed by 2 blank lines; then the first line of text. It is usually best to leave a blank line between paragraphs.

All scientific plant and animal names and group names should be typed either in italic type (if available) or underscored. Any corrections in the text made by the author must be complete and neat as they will be photographed as they are.

The finished typescript as submitted by the author will be reduced from the  $8\frac{5}{8} \times 5\frac{5}{8}$  inch size as submitted to  $6\frac{2}{8} \times 4$  inches by the printer. It is therefore advisable to place a centimeter or millimeter scale on all text figures and plates included.

Use a *new* heavily inked black typewriter ribbon and be sure to *clean* the type on the typewriter after each several pages of typing.

Cost of publication at present is \$12.00 US per page, with no subsequent rebates, but this rate may vary depending on inflation and costs, so it is best to inquire as to current rates. The page charges are due *with* the typescript and no paper will be published before payment is received in full. Each author will receive gratis a proportionate share of the printed copies remaining after paid subscriptions are filled, but if separates (reprints or offprints) are desired, these will be charged extra in accord with the current rate for offprints provided by the printer. The cost of all such separates ordered must also be paid for in advance at the time the typescript is sent. No orders for separates will be accepted later, nor can additions or corrections be accepted.

Authors are asked to indicate in light pencil on the *reverse* side of each page of their typescript the page number so that no mistakes in sequence occur.

All manuscripts accepted will be published in the next issue, so that the size of the numbers may vary greatly. A volume will contain 512 pages. The plan insures prompt publication of all accepted manuscript.

Illustrations will be published according to the desires of the authors. No extra charge is made for line drawings, such as are ordinarily reproduced in zinc, or for diagrams, tables, or charts, provided they conform to certain limitations of size and proportion. An extra charge will be made for halftones, depending on their size, as fixed by the engraver.

Articles dealing with research in all lines of botany and plant ecology, in any reasonable length, biographical sketches, and critical reviews and summaries of literature will be considered for publication.