

STUDIES IN SOUTH AMERICAN AMARANTHACEAE V ¹⁻²TROELS MYNDEL PEDERSEN[†]

Summary

The nomenclature, taxonomy, and synonymy of various South American *Amaranthaceae* are discussed. Two new genera are described, *Hebanthodes* Pedersen with only one new species from Peru, *H. peruviana* Pedersen, and *Lecosia* Pedersen with two new species from NE Brazil, *L. formicarum* Pedersen and *L. oppositifolia* Pedersen. Seven new species, *Alternanthera piptantha* Pedersen, *Gomphrena Hatschbachiana* Pedersen, *G. riparia* Pedersen, *Guilleminea chacoënsis* Pedersen, *G. fragilis* Pedersen, *G. hirsuta* Pedersen and *Pfaffia argyrea* Pedersen, one new subspecies, *Alternanthera Kurtzii* subsp. *sclerosperma* Pedersen, and three varieties, *Alternanthera hirtula* var. *hirtula* Pedersen, *Alternanthera hirtula* var. *nitens* Pedersen and *Pfaffia fruticulosa* var. *diffusa* Pedersen are described. Three new combinations, *Hebanthe eriantha* (Poir.) Pedersen, *Iresine diffusa* forma *Herbstii* (Hook.) Pedersen, and *Pedersenia Hassleriana* (Chodat) Pedersen, are proposed. A key to the species of *Guilleminea* discussed in this paper and a key synthesizing the characters separating *Hebanthodes* from its immediate allies are provided.

Key words: *Amaranthaceae*, South America, taxonomy

Resumen

Se discute la nomenclatura, taxonomía y sinonimias de Amaranáceas Sudamericanas. Se describen dos nuevos géneros, *Hebanthodes* Pedersen, con una sola especie de Perú, *H. peruviana* Pedersen y *Lecosia* Pedersen, con dos especies del NE de Brasil, *L. formicarum* Pedersen y *L. oppositifolia* Pedersen. Además se describen siete especies nuevas, *Alternanthera piptantha* Pedersen, *Gomphrena Hatschbachiana* Pedersen, *G. riparia* Pedersen, *Guilleminea chacoënsis* Pedersen, *G. fragilis* Pedersen, *G. hirsuta* Pedersen y *Pfaffia argyrea* Pedersen, una nueva subespecie, *Alternanthera Kurtzii* subsp. *sclerosperma* Pedersen y tres variedades, *Alternanthera hirtula* var. *hirtula* Pedersen, *A. hirtula* var. *nitens* Pedersen y *Pfaffia fruticulosa* var. *diffusa* Pedersen. Se establecen tres nuevas combinaciones, *Hebanthe eriantha* (Poir.) Pedersen, *Iresine diffusa* forma *Herbstii* (Hook.) Pedersen y *Pedersenia Hassleriana* (Chodat) Pedersen. Se presenta una clave para las especies de *Guilleminea* tratadas y una clave que permite separar *Hebanthodes* de los géneros vecinos.

Palabras clave: *Amaranthaceae*, Sudamérica, taxonomía

¹ When T.M. Pedersen died he left two manuscripts: *Amaranthaceae* for The Flora of Paraguay and Studies in South American *Amaranthaceae* V, which we are publishing here. Most of the illustrations were already completed. Drawings 1, 6, 7, 8 and 13 were prepared later under the supervision of Carmen L. Cristóbal, who made the dissections.

² I should never have been able to finish and publish the two manuscripts left more or less finished when my husband died without the expert help from Ing. Agrón. Antonio Krapovickas and Dra. Carmen L. Cristóbal. I owe them both a very great debt of thankfulness, which I hereby hope to express. Nina Pedersen.

ALTERNANTHERA Forssk.

1. *Alternanthera hirtula* (Mart.) R.E.Fr. in Ark. Bot. 16 (12): 18.1920, non *A. hirtula* Moq. ex Loproire in Bot. Jahrb. Syst., Beiblatt 30: 36. 1901, *nomen nudum*.

1a. *Alternanthera hirtula* var. *hirtula*
Fig. 1, J-K

Mogiphanes hirtula Mart., Beitr. Amarantac.: 135. 1825, nomen; Nov. Gen. sp. pl. 2: 30, tab. 129. 1826. Type: "Crescit in campis ad Porto Feliz et alibi in Provincia S. Pauli. E cisplatina Provincia misit clar. Sellow."

Mogiphanes rosea Morong, Ann. New York Acad. Sci. 7: 206. 1893. Type: PARAGUAY, Cordillère de Péribébuy, *Balansa* 1943 (iso-K).

Alternanthera rosea (Morong) Uline & W.L. Bray, Bot. Gaz. (Crawfordsville) 20: 452, 453. 1895.

Telanthera rosea (Morong) Chodat, Bull. Herb. Boissier, 7, App. 1: 64. 1899.

Telanthera rosea (Morong) Chodat var. *typica* Chodat, l.c., sér. 2, 1: 433. 1901.

Alternanthera hirtula (Mart.) R.E. Fr. var. *rosea* (Morong) Chodat, Bull. Soc. Bot. Genève, sér. 2, 18(2): 277. 1927.

Alternanthera hirtula (Mart.) R.E. Fr. var. *robusta* Chodat, Bull. Soc. Bot. Genève, sér. 2, 18(2): 277. 1927, nomen superfl.

Telanthera rosea (Morong) Chodat var. *cinnabarina* Chodat, Bull. Herb. Boissier, sér. 2, 1: 433. 1901. Type: PARAGUAY, in campo pr. Igatimí, Sept., *Hassler* 4691 (holo-G).

Alternanthera hirtula (Mart.) R.E. Fr. var. *robusta* Chodat subvar. *cinnabarina* (Chodat) Chodat, Bull. Soc. Bot. Genève, sér. 2, 18 (2): 277. 1927.

This species seems restricted to the Argentine province of Corrientes, Central Paraguay, southern Rio Grande do Sul in Brazil, and Uruguay. Martius (1826) reported it from São Paulo, Brazil, and states (1825) that he saw it growing ("v. v."), but apparently did not collect a specimen, and as I have never seen other material from that region, I suspect that this citation is due to some error on his part. In the protologue he further mentions having received a specimen from the "Provincia cisplatina" (= Uruguay) from Sellow. There is a rather poor specimen - two shoots without root, each with one flower-head - in herb. M, without indication of origin. This specimen is the one shown on Plate 129 in the *Nova genera et species*, and is almost certainly the one collected by Sellow. Probably it was the only specimen available for an illustration. In the absence of other material, this specimen - or the plate - must be considered the type of *Mogiphanes hirtula*, and has been accepted as such by Seubert (1875) and Chodat (1926). It agrees well with the general concept of the species.

1b. *Alternanthera hirtula* (Mart.) R.E. Fr. var. *hirsuta* Pedersen var. nov.

Fig. 1, G-I

A varietate hirtula recedit floribus majoribus usque 8 mm longis, foliisque hirsutis nec velutinis. A varietate nitente recedit foliis latioribus indumento diverso.

Type: PARAGUAY, **Canendiyú**: Ñandurokai rumbo 54506/45015. Cerrado, área degradada recientemente quemada 11/10/1996 "Sufrútice de 60 cm, flor amarilla, brácteas florales granate", *B. Jiménez* 1608 & *G. Marín* (holo-CTES). The remark "flor amarilla" must be a misinterpretation of the anthers.

No specimen was mentioned by Chodat in the protologue of his var. *robusta* (*nomen superfl.*), but he refers four previously described varieties: *cinnabarina*, *straminea*, *atropurpurea* and *pallens*, as subvarieties. The subvarieties *straminea* and *pallens* have been referred to *A. malmeana* R.E. Fr. by me in a previous paper (1997), the subvar. *atropurpurea* also in part belongs, and in part is var. *hirtula*. The description of *Telanthera rosea* var. *cinnabarina* could fit this plant, but the type has small flowers and is clearly the var. *hirtula*. In view of the impossibility or inadvisability of using any of the names proposed by Chodat, I have opted for using a new name with a new type for this variety, which in my opinion deserves recognition.

Further material seen: PARAGUAY, **Alto Paraná**: Hernandarias, Itakyry, Reserva Tatí Yupí. Sabana-campo alto 24/9/1980 "Hierba 20-30 cm. Flor color rojizo", *Caballero* 847 (CTES, K, MO). Laguna 8/11/1990 "Decumbente. Haz foliar verde oscuro, envés verde grisáceo; flor pardo-rojiza", *Caballero Marmor* s.n. (CTES). **Alto Paraná** or **Canendiyú**: Laurel, en el contacto de Katinga Sabana /9/1982 "Hierba ... [illegible] ... enana", *B. S. Bertoni* 851, 851a (G). **Canendiyú**: Ipé hú. In campo /10/1898 "Herba 0,3-0,6, flos purpureus", *Hassler* 5170 (K, P). Fruticeto Nanduro kaí 1/11/1978 "Fruticulus radice crassa, pilosus. Folia ovata pilis albis appressis. Capitula sanguineo-purpurea", *Bernardi* 18341 (G, MO).

1c. *Alternanthera hirtula* (Mart.) R.E. Fr. var. *nitens* Pedersen var. nov.

Fig. 1, A-F

A varietate hirtula recedit foliis perangustis sparsim setosis, nitentibus, a varietate hirsuta floribus minoribus, foliorum forma et indumento.

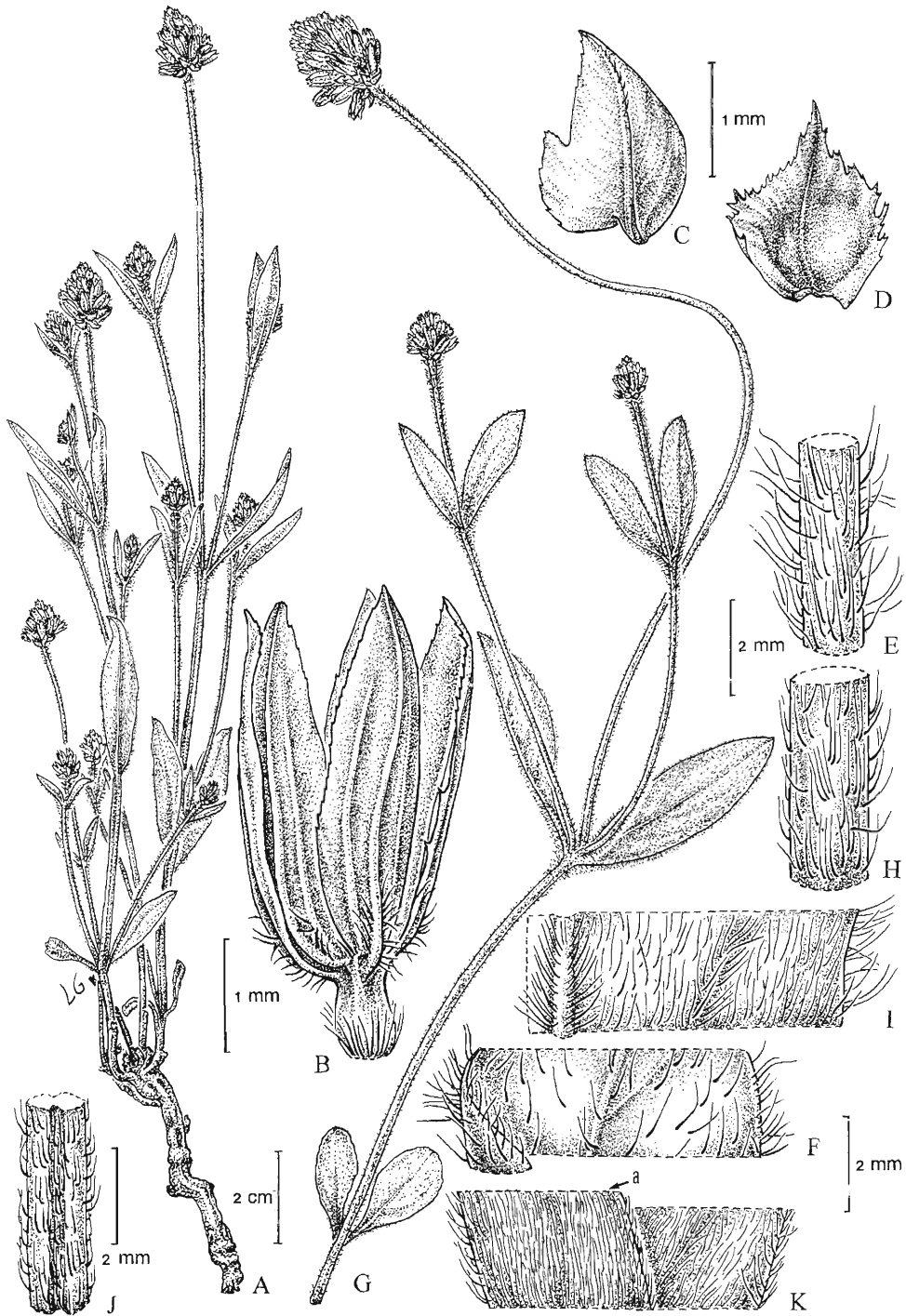


Fig. 1. *Alternanthera hirtula* var. *nitens*: A, habit; B, flower showing the tepals; C, bractlet; D, bract; E, stem indumentum; F, leaf indumentum both sides. (Ferrucci 642 & al.). *Alternanthera hirtula* var. *hirsuta*: G, habit; H, stem indumentum; I, leaf indumentum underside (Jiménez 1608 & Marín). *Alternanthera hirtula* var. *hirtula*: J, stem indumentum; K, leaf indumentum both sides, a, underside. (Bordas 1232, Paraguay, Asunción, CTES).

Type. PARAGUAY, **Amambay**: Parque Nacional Cerro Corá, próx. co. Muralla. En cerrado 14/9/1988 "Inflorescencias purpúreas", *S. Ferrucci* 642, *R. Vanni* & *L. Ferraro* (holo-CTES, iso-K,LIL).

Paratypes. PARAGUAY, **Amambay**: Parque Nacional Cerro Corá. En campo 17/8/1980 "Inflorescencia color rojo-purpúreo", *Schinini* 20257 & *Bordas* (CTES). *Ibidem*, co. Muralla, 1.5 km al N de la administración, 22°38'S, 56°4'W. Vegetación típica del cerrado en la planicie, bosque húmedo y semi-húmedo en el cerro, de hasta 25 m de altura 19/10/1984, "Sufrútice pequeño con xilopodio, rastrero, hasta 0.4 m de largo. Inflorescencia rosada oscura, estaminodios blancos", *Brunner* 970, *Duré* & *Buck* (MO). *Ibidem*, camino al co. Tuya oc. En campo recientemente quemado 1/8/1987 "Hierba de 0.20 m. Flores rojas", *Soria* 1674 (MO). *Ibidem*, frente al co. Muralla. Cerrado 9/1988 "Hierba de flores rojas. Rizomatosa", *Mereles* 1477 (G). *Ibidem*, en cerrado frente al cerro Muralla 11/12/1989 "Inflorescencia morada.", *Vanni* 1312, *Ferraro* & *Ferrucci* (CTES). *Ibidem*, en campo cerrado camino al cerro Muralla. Suelo arenoso 24/10/1994 "Erecta. Tallo simple. Flores purpúreas", *Krapovickas* 45961, *Harley*, *Cristóbal* & *Schinini* (CTES).

All the material seen was collected in the Cerro Corá National Park. Probably the range of this variety extends well beyond the boundaries of the park and into Brazil, but roads in this region are few and bad, and nowadays collectors travel by car and rarely have a horse at their disposal, with the result that distributional maps reflect more the convenient facilities for transport than the actual occurrence of the species treated.

2. *Alternanthera Kurtzii* Pedersen subsp. *Kurtzii*

Pedersen, T.M., *Darwiniana* 14: 435, 1967. Type. ARGENTINE, **Formosa**: Laguna del Riacho, *F. Kurtz* 1941 (holo-Z, iso-CORD).

2. *Alternanthera Kurtzii* Pedersen subsp. *sclerosperma* Pedersen subsp. nov. Fig. 2

Herba verisimiliter annua, erecta, ramosa, ad 30 cm vel ultra alta radice palari caulinis crassitudine ramosissima: caulis 0.1-0.3 cm crassus, juventute rotundato-quadrangularis pilis simplicibus albidis antrorsis parce vestitus, mox glaber, aetate teres. Folia

1.5-6 cm longa 1-3 cm lata, ovata lanceolatae, obtusa, acuta aut raro acuminata, basi in petiolum ad 0.75 cm sensim angustata, penninervia, brevissime mucronata, novella pilosula, mox glabrescentia. Flores in spicastris sessilibus terminalibus gemmis in axillis eorum prophylliorum accrescentibus spurie axillaribus 5-7 mm longis 4-5 mm crassis dispositi: bractea tenacissime scariosa, vel subcoriacea, 3.3-3.5 mm longa, ovata, acuminata, 1-nervia, mucronata, glabra; bracteolae scariosae sub-pellucidae ±3.3 mm longae ovato-lanceolatae, sub-falcatae, acuminatae, naviculares, 1-nerviae, mucronatae, in carina pilosae; tepala diversa: abaxialia duo sub-cartilaginea, interius late membranaceo-marginatum, 4.5-5 mm longa, anguste ovata, acuta, ?-(4)-nervia, vix mucronulata, dorso hirsuta; adaxiale minus, 3-nerviium, haud mucronatum, glabrum: duo interiora scariosa, 3.5-4 mm longa, oblonga, acuta, navicularia, 3-nervia, in carina pilosa. Stamina c. 2.5 mm longa antheris c. 1 mm, filamenta ad tertiam vel duas quintas partes inferiores connata, cum pseudostaminodiis permulto longioribus alternantia. Germen c. 0.5 mm longum et latum, turbinatum, apice truncatum, cum stylo ad 0.4 mm longo stigmatique 0.1 mm lato. Semen testa dura castanea, c. 1 x 1 x 0.6 mm, ovoideum, apice emarginatum.

Type. PARAGUAY, **Alto Paraguay** [ex Chaco]: Pikyrendá-Lagerenza-í, km 50, 20°07'S/61°30'W, 350 m s.m. Zona húmeda 21/6/1988, *L. Ramella* 2340 (holo-G).

Paratypes. PARAGUAY, **Alto Paraguay** [ex Chaco]: Cerro León, 20°06'S/60°15'W. Borde de la laguna Nueva Asunción 2/10/1979 "Abundante. Ramas apoyantes", *Schinini* 17884 & *Bordas* (CTES). Cerro León, borde inundable de la laguna Tarey'í 3/10/1979, *Schinini* 18048 & *Bordas* (CTES). **Boquerón**: ruta Trans-Chaco, 21°30'S/61°15'W. Selva degradada 18/3/1979. "Erecta. Inflorescencias blancas", *Schinini* 16514 & *Bordas* (CTES). **Central**: estero del Ypoá, Villeta-Puerto Guyraté, 10.5 km S of Villeta, W of ayo. Pikyryry, 25°36'S/57°34'W. Inundated savanna on clay 27/11/1992 "Herb 1 m, inflorescence cream-colored", *Zardini* 33931 & *Tillería* (CTES).

This plant I originally intended to describe as a species, but attempting to fit it into a key of the genus, I found that, apart from being probably annual or at the most a short-lived shrub, the upright habit, and the almost complete absence of adventitious roots, there is nothing to distinguish it from *A. Kurtzii* subsp. *Kurtzii*. From the collectors' notes I gather that it grows on temporarily wet ground, e. g. lake

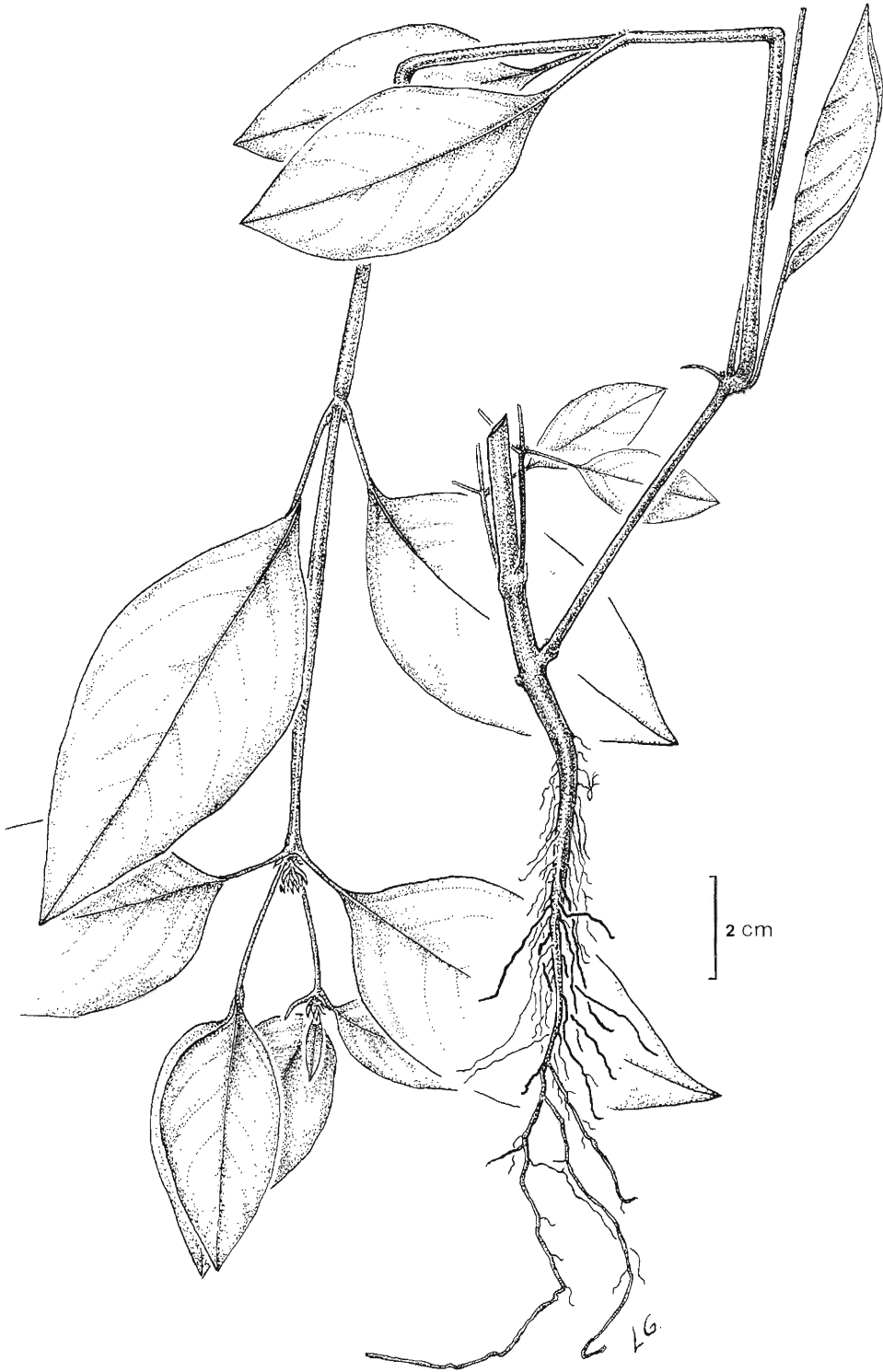


Fig. 2. *Alternanthera Kurtzii* subsp. *sclerosperma*: habit. (Schinini & Bordas 18048).

shores and banks of streams and rivulets formed in years with heavy rainfall, drying out in years of drought. The noticeably hard-shelled seeds suggest that they can lie dormant for prolonged periods in wait of about a year with a favourable rainfall. This peculiar biology, together with the differences described above, should set it well apart from the *A. Kurtzii* subsp. *Kurtzii*.

A. Kurtzii is very closely related to the widely distributed tropical weed *A. ficoidea* (L.) Sm. and with its subspecies could possibly be regarded as varieties of that species. I would not, however, consider this treatment practical, at least not for the present: *A. ficoidea*, as generally understood, varies considerably and may very well comprise forms that merit recognition as separate taxa. Without a critical revision, it will not be possible to arrive at a logical system, taking in account the various levels of relationship found in the complex.

3. *Alternanthera meyeriana* (Regel & Körn.)

Suess.

Lilloa 4: 127, 1939.

Telanthera meyeriana Regel & Körn., Index seminum Horti Petropolitani: 24. 1856. Type: cult. in horto bot. Petropolitano e seminibus Junio 1844 pr. Cochabamba leg. *Cuming* (holo-LE, iso-P).

Sertuenera meridensis Klotzsch, herb. B in scheda.

Pfaffia meridensis Suess., Repert. Spec. Nov. Regni Veg. 35: 334. 1934, nomen, *pro syn.*

Alternanthera meridensis O. Stützer, Repert. Spec. Nov. Regni Veg., Beiheft 88: 44. 1935. Type: Mérida, ad flumen inter arbusta leg. *Moritz 1014* (B,K,W). Mears on his annotation-slip in K considered this specimen the holotype. This may be correct; it certainly has been annotated by Stützer. Unfortunately, I have not seen the Berlin specimen, if still extant, so I can not say whether the words "*Sertuenera meridensis*" on the label were written by Klotzsch. The specimen in herb. W is undoubtedly lost with all the *Amaranthaceae* of that herbarium; should this be the case with the Berlin specimen too, I would consider the Kew specimen a lectotype.

Alternanthera tucumana Lillo, Actas 1a. Reunión Soc. Argentina Cienc. Nat.: 227. 1919. Type: Rep. Argentina, Tucumán, Cuesta de Mala-Mala, alt. 1500 m, *M. Lillo 4373* (lecto-LIL).

Telanthera meyeriana was described from a specimen cultivated in the Botanic Garden of

St. Petersburg from seed collected in Bolivia. I have not seen the holotype, but I have seen the isotype in P. This specimen is of a plant very closely related to *Alternanthera lanceolata* (Benth.) Schinz, from which it seems to differ only in the more complex inflorescence: in *A. lanceolata*, the inflorescence is a terminal, long pedunculate "spike"; usually only in the axil of one of the uppermost pair of leaves a lateral shoot is developed, continuing the growth of the branch, resulting in a succession of uninodal generations of shoots, the leaves not or only slightly reduced in size upwards, with apparently axillary flower-heads. In *A. meyeriana*, the buds in the axils of both the uppermost leaves are developed, the result being a dichotomous cyme with upwards sharply reduced leaves, the ultimate prophylls only appearing as minute, often early-deciduous scales. Usually, the flowers of *A. meyeriana* are larger than those of *A. lanceolata*, but their size varies in both species. An other, less apparent character is the shape of the bractlets, almost orbicular, rounded at apex and long-mucronate in *A. lanceolata*, ovate and often acute, with a short mucro in *A. meyeriana*, though I suspect this character of not being too reliable. The areas of the two species coincide to some extent, but *A. meyeriana* penetrates farther south, and seems to be absent from Central America and Mexico.

I have seen the Kew specimen of *A. meridensis*, and the lectotype of *A. tucumana*. Both agree well with the authentic specimens of *A. meyeriana* seen.

Specimens of *A. meyeriana* from the Galápagos Islands may differ slightly from the plant from continental South America, if not otherwise, then in the colour of the flower, this being described by the collectors as red or pink, but for the present I see no reason for describing them as a distinct taxon.

4. *Alternanthera piptantha* Pedersen *sp. nov.*

Fig. 3

Suffrutex ad 1.5 m altus: caulis striatus, paene angulatus, novellus pilis ad 0.5 mm longis acroscopicis parce vestitus, mox glaber. Folia breviter petiolata, 2-7 cm vel ultra longa, 0.5-3 cm lata, lanceolata, acuminata, penninervia, mutica, utrinque pilis ad 0.5 mm longis simplicibus parce vestita. Flores caduci, in spicastris plus



Fig. 3. *Alternanthera piptantha*: A, habit; B, flower within its bractlets, showing the androecium; C, tepal. (Fortunato & al. 3785).

minusve 10 mm longis, 7 mm latis congesti, hae in dichasio folioso quater-quinquens furcato dispositae: bractea scariosa, 1.5-1.75 mm longa, ovata, acuta, mutica, dorso pilosa, persistens; bracteolae scariosae, inaequales, 1.5-2.3 mm longae, ovatae, acutae, valde concavae, haud mucronatae, dorso hirsutae, persistentes. Perigonium sessile: tepala 3-3.5 mm longa, oblongo-ovata, acuta, trinervia, mutica, dorso pilis ad 0.2 mm longis rigidis patulis usque ad apicem dense vestita; stamina ad 2.5 mm longa antheris 1 mm, filamenta ad tertiam partem inferiorem connata, cum pseudostaminodiis apice dentato-laciniatis staminibus aequilongis alternantia; germen stylo ad 0.2 mm longo stigmatibus capitato. Fructus large 2 mm longus oblongus apice obtusus alis destitutus. Semen non vidi.

Type: PARAGUAY, **Alto Paraguay** [ex Chaco]; Cerro Cabrera, 19°38'S/61°42'W. Sotobosque 5/11/1992 "Flor blanca", *Renée H. Fortunato & al.* 3785 (holo-G).

Paratype: PARAGUAY, **Alto Paraguay**: Cerro León (Lagerenza), 20°19'S/60°42'W. Oeste del cerro. Sotobosque 13/11/1992 "Sufrutice: H = 1-1.5 m. Fl. blanca", *Lorenzo Ramella & al.* 2968 (G).

This more or less shrubby species is very closely related to *A. rufa* Mart., a species as yet not found in Paraguay, but represented by a single collection from Argentine, Misiones. From the notes of the collectors, it seems to be locally common.

GOMPHRENA L.

5. *Gomphrena Hatschbachiana* Pedersen sp. nov. Fig. 4

Herba reptans internodiis 7-11 cm longis: radicem non vidi. Caulis ±0.15 cm crassus, teres, pilis ferrugineis 2-4 mm longis verticillatim ramosis crispulis atque sat implicatis dense vestitus. Folia ad 0.5 cm petiolata, 3.5-6 cm longa, 2-3.5 cm lata, late ovata, obtusa denticulo medio vertice in quo nervus excurrit, penninervia, mucronata, supra subtusque pilis ramosis ad 0.75 mm longis vel ultra longis dense vestita. Flores in spicastris nudis ad 40-50 mm pedunculatis globosis vel ovoideis 13-15 mm diam. dispositi: bractea scariosa, spadicea, ad 2.75 mm longa, anguste ovata, acuta, insignite mucronata, pilis ramosis parce vestita subglabrave; bracteolae bractearum similes, ad 3 mm longae, mucronatae,

densius pilosae. Tepala scariosa, ad 4 mm longa, acuta, trinervia, mucronata, dorso perdense lanata; stamina truncata dente antherifero multo longiore quam lobulis lateralibus vix manifestis; germen superne truncato stylo ad 0.4 mm longo cum stigmatibus bipartito multo crassiore ad 0.6 mm longo ramis oblongo-triangularibus erectis munitum. Fructus deest.

Type. BRAZIL, **Bahia**: mun. Macaubas, estrada para Canatiba, Serra Poções, próximo ao alto, 1100 m s.m. Campo rupestre, solo arenoso 18/1/1997, "Reptante, flor alvescente", *Gert Hatschbach & al.* 65947 (holo-MBM, iso-CTES).

Of this species I have seen only the proposed type specimen and a duplicate, unfortunately both incomplete, but so unlike any other *Gomphrena* that I have ever seen, and not fitting any description that I know of, that I have no compunctions describing it as new. The branched hairs might suggest affinity with *G. elegans* and allies, but the completely different structure of the pistil and androecium seem to preclude this.

6. *Gomphrena riparia* Pedersen sp. nov. Fig. 5

Suffrutex vel herba perennis ramosissima caule decumbenti ad 50 cm vel ultra longo, ramis erectis vel ascendentibus: radix (verisimiliter radices adventitiae tantum adsunt) ad 0.12 cm crassa. Caulis ramisque 0.05-0.3 cm crassi, teretes, juventute pilis 1(-1.5) mm longis simplicibus subdense vestiti, aetate glabri. Folia (0.75-) 2-8 cm longa, 0.25-0.75 cm lata, linearia vel angustissime oblonga, acuta, basin versus in petiolum sensim angustata, parce pilosa. Flores in spicastris pedunculatis, nudis, hemisphaericis, ±0.8 mm diametro congesti: bractea bracteolaeque tenuiter scariosae, 1-5-2 mm longae, hae late ovatae, hirsutae, cum perigonio caducae, illae obovato-orbiculares, pilosae, persistentes. Tepala scariosa, 3-3.5 mm longa, oblonga, acuta, 3-nervia, dorso parte tertia inferiore pilis longis crispulis dense vestita, sursum glabra. Stamina post anthesin tepalis ±aequilonga antheris 0.6 mm longis, filamenta ad medium connata, apice 3-fida, lobulus antherifer lateralibus oblongis, acutis, apicem antherae vix attingentibus multo brevior: germen stylo ad 0.1 mm stigmatibus 2-fido ramis crassis obtusis ad 0.5 mm longo munitum. Fructus ad 1.2 mm longus, ovoideus. Semen testaceum, 1x1x0.8 mm, ovoideum, funiculus latere supra medium insertus. Embryo unciformis foliis quam radícula subduplo longioribus.

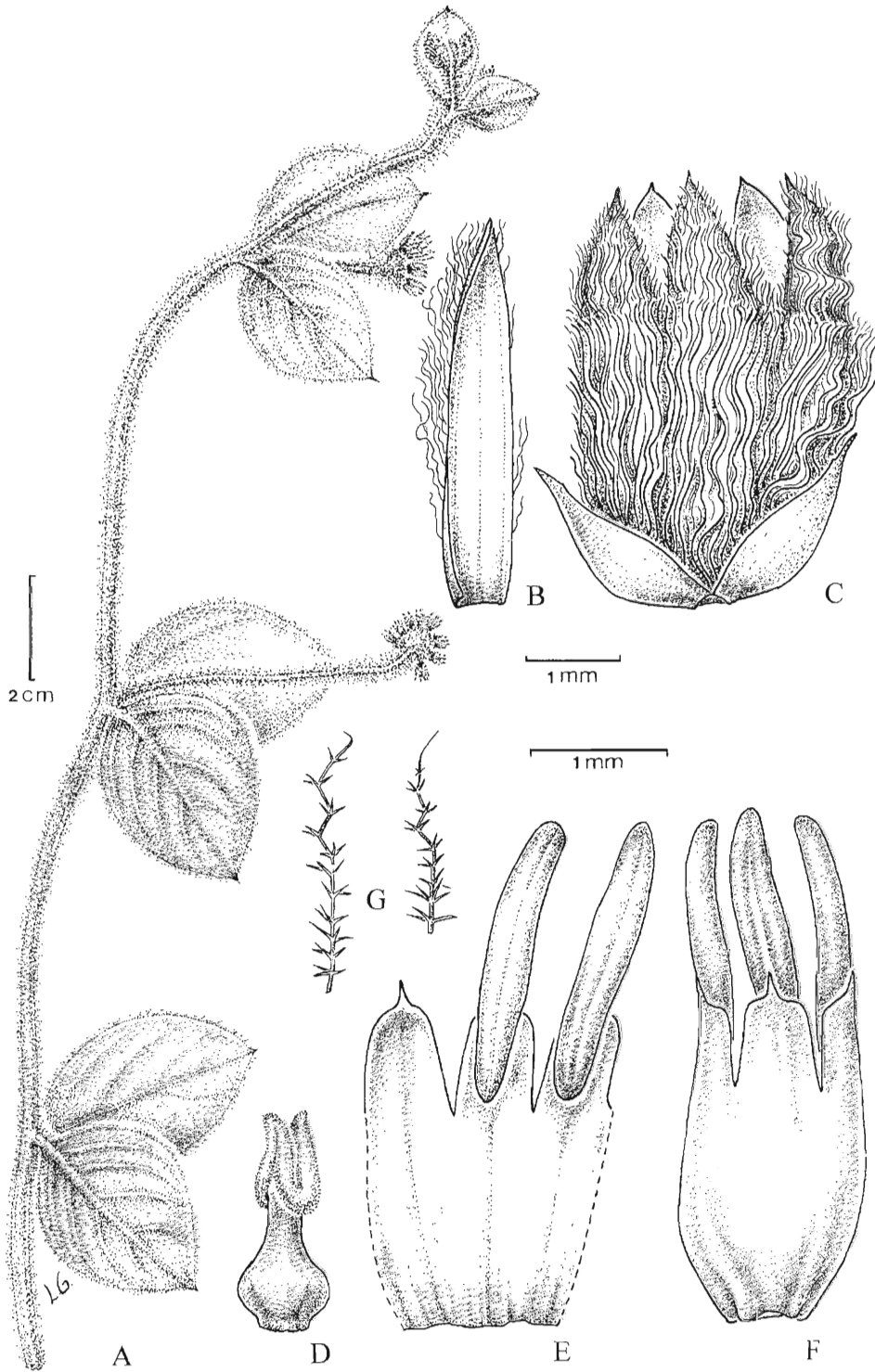


Fig. 4. *Gomphrena Hatschbachiana*: A, habit; B, tepal inside view; C, flower within its bractlets; D, gynoecium; E-F, androecium; G, branched hairs. (Hatschbach & al. 65947).

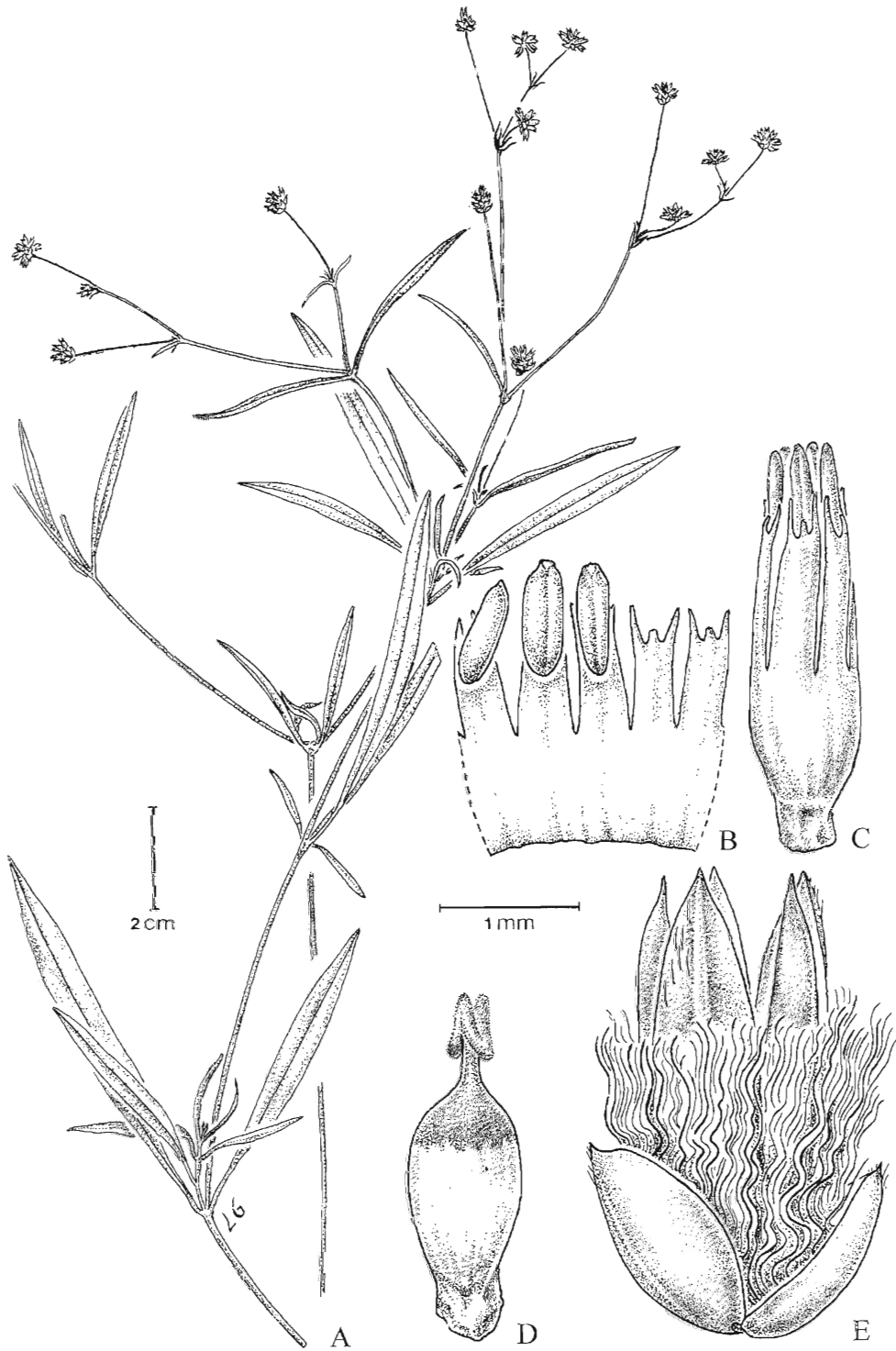


Fig. 5. *Gomphrena riparia*: A, habit; B-C, androecium; D, gynoecium; E, flower within its bractlets. (Poliqesi & Cordero 270).

Type. BRAZIL, **Paraná**: mun. Rio Bonito do Iguaçu: Rio Iguaçu, margem do rio 21/9/1995 "Erva 50 cm, flor alvescente", C. B. Poliquesi & J. Cordeiro 270 (holo-MBM).

Paratype. BRAZIL, **Paraná**: mun. Laranjeiras do Sul, Foz do Chopim, margens pedregosas de Rio Iguaçu 22/9/1968, Hatschbach & Guimarães 19805 (CTES,MBM).

Hatschbach & Guimarães 19805 is a far more slender specimen with longer internodes than the type, in particular the flower-heads in Poliquesi & Cordeiro 270 are 15-30 mm long, in Hatschbach & Guimarães 19805 up to 70 mm long-pedunculate, but the floral characters are essentially the same. At first, the flower-heads are solitary and terminal, but in the course of time a terminal 2-4-times-branched dichasium is developed, its bracts sharply reduced, at the end only 2-4 mm long and almost thread-like.

In general aspect, *Gomphrena riparia* is very similar to *G. serturneroides* Suess. from Bahia, and indeed the two are so closely related that I have had the gravest misgivings about describing it as a distinct species. In the end, my reasons for doing so were the different structures of the androecium and pistil: in *G. serturneroides* - of which unfortunately I have only seen the type and one more specimen - the filaments are truncate, with practically no central lobe and scarcely indicated lateral ones, in contrast to the distinct lateral lobes seen in both collections of *G. riparia*. Also, the style of *G. serturneroides* is slightly longer than that of *G. riparia*, and the branches of the stigma filiform, divergent, and so completely different from those of *G. riparia*. To this may be added the considerable gap separating their geographical areas.

GUILLEMINEA H.B.K.

Guilleminea H.B.K., Nov. gen. sp. 6: 40, 1823. Non *Guilleminia* Neck., Elem. Bot. 2: 132. 1790. *nomen invalidum*.

Brayulinea Small, Fl. S.E. U.S., 394. 1903.

The genus *Guilleminea* was based on Humboldt and Bonpland 2220 from the vicin-

ity of Quito, Ecuador. Previously, Willdenow had described a specimen from the same collection as *Illecebrum densum*, this name being cited in synonymy by Kunth in his description of *Guilleminea illecebroides*, the type species of the genus. The correct combination *Guilleminea densa* was made by Moquin-Tandon (1849: 338). Of later authors who occupied themselves with species belonging here may be mentioned Grisebach (1874), who under *Gossypianthus* Hook. described a new species, and Seubert (1875), who included the genus in his treatment of the *Amaranthaceae* for the Flora brasiliensis. Hooker (1883: 39), redefined the genus, transferring *Gossypianthus lanuginosus* (Poir.) Moq. and *G. australis* Griseb. to *Guilleminea*. Small (1903) mistakenly considered the name *Guilleminea* H. B. K. invalidated by the earlier homonym *Guilleminia* Neck. (*nom. inval.*), and changed the name to *Brayulinea*. This was corrected by Mears (1967), who merged *Gossypianthus* Hook. with *Guilleminea*, a treatment questioned by Eliasson (1987), and rejected by Henrickson (1987).

The only modern treatment of the genus as a whole is the monograph by Mears (1967), where three species and three varieties of *G. densa* are recognized, excluding the species referred to the subgenus *Gossypianthus*. In a previous paper (Pedersen 1976), I had occasion to occupy myself with the genus as it occurs in the Argentine. Since then, in the course of preparing a treatment of the *Amaranthaceae* for the "Flora del Paraguay", I had the opportunity to study abundant material of the genus from hitherto little-explored regions.

In growth-form and general aspect, all species of *Guilleminea* (excl. *Gossypianthus*) are very similar, and could all be referred to one variable species, though I can not see any advantages of such a treatment. They are perennial from a woody taproot, main stem apparently of indeterminate growth, with extremely short internodes and basal leaves therefore forming a rosette, from the axils of which the annual, generally densely branched flowering shoots emerge. The first (sometimes only) internodes of the flowering shoots are vegetative, while the major portion of the shoot seems to be a dichasium, each generation developing a pair of leaves and a terminal, mostly few-flowered

false spike, sometimes reduced to a single flower. In the axils of the two leaves similar lateral shoots are produced, frequently of unequal length, or both with the vegetative internode very short, giving the impression of a flower-head with foliaceous bracts. The spike is usually rather open, the flowers up to 0.5 mm or more distant, subtended by a thinly scarious, enervate bract, at the end of a short stalk, with a pair of similar bractlets, inserted at varying levels on the stalk. The individual flower is scarious, 2-4 mm long, urceolate, split from around the middle into oblong or lanceolate segments. The basal, gamotepalous part may be 5- or 10-nerved. The filaments of the stamens are fused into a cup adnate to the perigon for most of its length. The ovary is free, with a very short style and bifid stigma.

“Good” characters separating the species are few: the number of nerves of the perigon should in theory provide a good character, but the commissural nerves, though possibly al-

ways present, can be very faint to almost invisible under a low-power microscope, and in several species, e. g. *G. densa*, appear to be absent or present, without the specimens presenting other visible differences. Mears stressed the length of the staminal cup in relation to that of the gamotepalous part of the perigon, whether exceeding the bottom of the incisions between the segments or not. I find this character difficult to observe, nor does it always appear to be reliable, and am not using it. In the following, the thickness of the stem of the flowering shoots (a character usually despised), whether the flowers are pedicellate, the presence or absence of the basal leaves at maturity, and the number of flowers in the spike have been found more or less constant, and by the use of these characters, together with others less salient, I believe to have been able to confirm two species previously described by other authors, and discern a further three, apparently distinct taxa.

Key to the species of *Guilleminea* here discussed

- 1a. Spike with 5-12 flowers 2
- 1b. Spike with 1-2(-4) flowers 4
- 2a. Root thickened above, forming a distinct ligneous tuber; basal leaves never present in flowering plants; throughout the range of the genus *G. densa*
- 2b. Root not forming a distinct tuber; basal leaves frequently present 3
- 3a. Flowers distinctly pedicellate; commissural nerves mostly distinct; northern Uruguay *G. elongata*
- 3b. Flowers sessile or almost so; commissural nerves not seen; Chaco region of the Argentine and Paraguay *G. chacoënsis*
- 4a. Leaves densely hairy on both sides; Chaco region, northern Argentine, eastern Bolivia *G. hirsuta*
- 4b. Mature leaves glabrous above 5
- 5a. Flowering shoots ± 0.05 cm thick, rarely much more; segments of perigon lanceolate, acute; Andes of northern Argentine and Bolivia *G. gracilis*
- 5b. Flowering shoots 0.1-0.2 cm thick; northern Paraguay and adjacent Brazil *G. fragilis*

7. *Guilleminea chacoënsis* Pedersen sp. nov.
 Fig. 6

Herba perennis radice palari lignosa foliis basalibus rosulatis ramis florigeris procumbentibus: caulis tenax, 0.1-0.15 cm crassus, teres, juventute tomentosus, aetate glaber. Folia basalia perumque persistentia, ad 4.5 cm longa, 0.5 cm lata, anguste lanceolata oblanceolata, acuta subacutave, penninervia, supra glabra, subtus ± dense tomentosa; caulinarum 0.5-2(-2.5) x 0.25-vix 1 cm, late lanceolata oblanceolata aut spatulata, basin versus

plerumque in petiolum late alatum longe ciliatum angustata, supra plerumque glabra, interdum pilis perpaucis, subtus exiliter tomentosa, aetate glabrescentia. Flores sessiles vel subsessiles, in spicastris terminalibus ex usque ad 10 floribus constantibus axe tenui nodis brevibus piloso: bractea tenuissime scariosa, enervia, ad 3.5 mm longa, anguste obovata, obtusa; bracteolae bractearum similes, 3-3.1 mm longae, ellipticae, subfalcatae, valde concavae; perigonium scariosum, vix 3 mm longum, a medio 5-fissum laciniis obtusiusculis, 5-nerviis nervis prominentibus laciniis percurren-



Fig. 6. *Guilleminea chacoensis*: A, habit; B, young plant showing basal leaves; C, flower within its bractlets; D, flower after partial removal of hairs showing the 1-nerved tepals; E, androecium; F, fruit; G, seed. (Pedersen 12897).

tibus, commissuralibus non visis, pars integra perigonii lanosa laciniis pro magnam partem glabris; stamina in cupulam cum perigonio cohaerentem connata, partes liberae triangulares antheris ad 0.2 mm longis; germen cum stylo ad 0.15 mm longo stigmatique bifido brevissimo ad 1.2 mm longum, oblongo-ovoideum. Fructus ad 1.7 mm longus. Semen spadiceum, ca. 1 x 0.8 x 0.5 mm, compresso-ovoideum, laeve. Embryo hipocrepiformis, paene annularis, folia quam radix vix latiora, multo longiora.

Type. ARGENTINE, **Formosa**: Dpt. Matacos, Ingeniero Juárez, open, scrubby woodland 2/6/1980, T. M. Pedersen 12897 (holo-C, iso-CTES).

Paratypes. PARAGUAY, **Alto Paraguay** [ex Chaco]: Mayor Pedro Lagerenza, 20°S/60°45'W. Cauce seco del río Timane 4/4/1978 "Rastrera. Brácteas blancas", Schinini 14874 & Bordas (CTES). **Boquerón**: Estación Experimental Filadelfia. En campos roturados 1/3/1991, Vanni & al. 2549 (CTES). **Presidente Hayes**: Estancia La Perla 14/10/1986, Pedersen 14618 (C, CTES).

This species should be fairly easy to tell apart from *G. densa*, the root not forming a woody tuber, as is normally the case in the latter, and usually at least some basal leaves are present on the flowering plant, which I have never seen in *G. densa*. Unfortunately, these two characters can only be observed on a complete specimen, and collectors too often do not bother to dig out the root. Further characters separating the two are: flowers in *G. chacoënsis* larger, ± 3 mm long, the perigon distinctly pedicellate, 5-nerved, in *G. densa* 2-2.5 mm, sessile or almost so, often - in the southern part of its range mostly - 10-nerved; filaments in *G. chacoënsis* linear, widened below, in *G. densa* broadly triangular; the ovary of *G. chacoënsis* is more or less acute above, style scarcely distinct, while it is obtuse or truncate in *G. densa*, with a distinct, c. 0.2 mm long style. The fact that it will often be necessary to dissect a flower in order to separate *G. chacoënsis* from *G. densa* might suggest reducing the former to a subspecies or variety of the latter, but I would prefer to leave this decision to somebody taking upon himself the task of monographing the entire genus anew.

As its name implies, *G. chacoënsis* grows in the Chaco, but to judge from the not very nu-

merous collections seen, it does not appear to be very common.

8. *Guilleminea densa* (Willd.) Moq.
DC., Prodr. 13 (2): 338. 1849.

Illecebrum densum Willd. in Roemer & Schultes, Syst. veg. 5: 517. 1819. *Guilleminea illecebroides* H.B.K., Nov. gen. sp. 6: 42. 1823. (*Illecebrum densum* cited in synonymy). *Guilleminea illecebrum* Spreng. in L. Syst. veg., ed. 16, Curae post.: 103. 1827. (*Guilleminea illecebroides* cited in synonymy). Type: Quito, prope urbem, Humboldt & Bonpland 2220 (holo-B, iso-P) 1849.

Guilleminea densa β *alsinaefolia* Moq. in DC., Prodr. 13 (2): 338. 1849. *Illecebrum densum* Pav. msc. in herb. Boissier, Moq. l.c. Type: "Perú" [or Bolivia?] leg. [Ruiz &] Pavón s.n. (holo-G). On the basis of a presumed duplicate in P, I previously (Pedersen 1976) referred this variety to *G. gracilis* R.E.Fr. An inspection of the holotype in G revealed its true identity.

Gossypianthus australis Griseb., Pl. lorentz.: 35, tab. I, fig. 2. 1874. *Guilleminea australis* (Griseb.) Hook. f., in Bentham & Hooker f., Gen. pl. 3: 37. 1883. *Brayulinea australis* (Griseb.) Schinz, in Engler & Prantl., Nat. Pflanzenfam., 2. Aufl., 16c: 65. 1934. Type. Córdoba, frequens in arenosis sterilibus pr. Ascochinga 4. 1871. P. G. Lorentz 384 (holo-GOET, iso-CORD).

Both the type in GOET and the isotype in CORD of *Gossypianthus australis* agree very well with the type collection of *Illecebrum densum* and *Guilleminea illecebroides*, except that only in one specimen from the type collection did I find distinct commissural nerves on the perigon. These are very distinct in the type of *Gossypianthus australis* and were evidently misinterpreted by Grisebach as filaments, as he described it as having 10 stamens. While specimens from the Argentine and the southern part of the area appear always to show nerves on the commissures of the perigon, these are frequently absent or invisible in material from Ecuador and farther north. I have examined a fair number of specimens of *G. densa* from Ecuador, and found commissural nerves in some collections, in others not, without seeing any other significant difference. I am very much disinclined to accept two distinct taxa based on the presence or absence of this character, as

this may very well be due to an error of observation, and shall consider *Gossypianthus australis* synonymous with *Guilleminea densa*.

According to Mears (1967), who presents a map showing the distribution of the recognized taxa of *Guilleminea* [subgenus *Guilleminea*], the only specimens in his opinion referable to *G. australis* seen by him come from the Argentine province of Jujuy and from extreme northern Paraguay, which to me clearly indicates that he never saw the type.

Guilleminea densa is the only widely distributed species of the genus, its area reaching from southern North America to central Argentine. In the Argentine Andes, it is found at elevations of up to 2000 m, descending into the valleys and plains of central Argentine, with isolated stations in the provinces of Corrientes and Santa Fe. It has been found in the port area of Buenos Aires, probably adventitious. As such, it has also been collected in South Africa.

Critical and representative specimens seen: ARGENTINE. **Córdoba:** dpt. Colón, Ascochinga. Häufig auf sandigen, sterilem Boden 4/1871, P. G. Lorentz 384, TYPUS *Gossypianthus australis* Griseb. (holo-GOET, iso-CORD). **Jujuy:** dpt. El Carmen, Camino de Cornisa a Salta 6/3/1967, *Cabrera 18135*, *Añón Suárez, Torres, Crisci & Tur* (C,CTES, LP). **Salta:** dpt. Capital, Cerro San Bernardo 12/11/1942 "Verde-grisácea, pegada al suelo en el camino", *Burkart 13067* (SI). **Tucumán:** dpt. Capital, en las cercanías del pueblo de Tucumán 6-22/12/1872, *Paul Günther Lorentz & Georg Hieronymus 1142* (C,CORD,G, *Gossypianthus tomentosus* Griseb. [duplum det. August Grisebach?]). BOLIVIA OR PERÚ. leg. [Ruiz &] *Pavón*, TYPUS *Guilleminea densa* β *alsinaefolia* Moq. (G,holo-, *Illecebrum alsinaefolium* N.E. scrips. *José Pavón*; *Gossypianthus lanuginosus* Moq. var. *alsinaefolius* scrips. A. Moquin-Tandon; *Guilleminea densa* (Willd.) Moq. det. James A. Mears 1/1976; P, iso-, *Illecebrum densum* β *alsinaefolium* scrips. ?). ECUADOR. Quito, prope urbem, alt. 1490 hex. item in valle S. Iago. floret *Januario Humboldt & Bonpland 2220* TYPUS (holo-B ex W-5066, iso-P: commissural nerves not seen, except on one specimen, where they are very faint, almost vestigial). **Azuay:** km 107 S of Cuenca on Panamerican Highway, 3°27'S/79°9'W, 2250 m s.m. Steep rocks with debris, very dry, dominated by *Tillandsia medusa* a. o. at roadside 4/5/1973 "Flat on the ground", *Holm-Nielsen 5013*, *Jeppesen, Løjtnant & Øllgaard* (AAU, *Guilleminea densa* (Willd.) Moq.! v. Uno Eliassen: commissural nerves present). **Cotopaxi:** road

Salcedo-Ambato, km 2 from Salcedo, 1°3'S/78°36'W, c 2600 m s.m. Seminatural xerophytic vegetation 2/3/1984 "Herb with taproot, creeping, 3 cm high. Flower white", *J. Madsen 50366* (AAU, *Guilleminea densa* (Willd.) Moq. det. Uno Eliassen 1989: commissural nerves present, nearly invisible). **Pichincha:** camino al hospital, entre Mauca Quito y El Sinchologua, entre La Caldera del Pululagua y La Ventana, 0°5'N/78°30'W, 2400-2740 m s.m. Bosque premontano húmedo 21/5/1988 "Rastrera; flores axilares blanquecinas", *Cerón 3781 & Cerón* (AAU, commissural nerves not seen). PERÚ. **La Libertad:** prov. Huamachuco, Huamachuco, 3245 m s.m. Puna 17/8/1959, *Infantes 6052* (P: commissural nerves not seen).

9. *Guilleminea elongata* Mears

Sida 3: 145, 1967.

Type. R.O. del URUGUAY, **Tacuarembó.** Tambores, 300 m s.m., in campo sax/arg. subsicc. ill. 2/1937, herb. *Herter* N° 98299, Pl. Urug. 1891 (holo-M, iso-CTES, herb. AELLEN).

This very distinct species, characterized by its large, long-pedicellate flowers, is confined to northern Uruguay; as yet, no other species of the genus has been found in that country. It is easily recognized by its small size and generally persistent basal leaves. The staminal cup exceeds the rim of the gamotepalous part of the perigon, a character to which Mears attributes considerable importance. Apart from the type, I have seen the following collections:

R.O. del URUGUAY. **Durazno:** arroyo Chileno Chico 20/3/1971 *Ziliani, Colero, Bragioni 10655* (MVFA), **Salto:** Cuchilla de Arerunguá, ROU-31, almost where the road to Paso de Piedras turns off. Rocky flats with a thin cover of soil, grassland with very short and not very dense grass 18/1/1995, *Pedersen 16202* (C,CTES,MBM). **Tacuarembó:** Cuchilla de Peralta, km 102 camino de Durazno, sobre la carretera 10/3/1945 "Paquirriza a tuberosa, frecuente en laderas pedregosas", *Rosengurtt 4718* (MVFA).

10. *Guilleminea fragilis* Pedersen *sp. nov.*

Fig. 7

Herba perennis radice palari lignosa e qua rami florigeri annui oriuntur: caulis 0.1-0.2 cm crassus, teres vel subquadrangularis, in nodis perfragilis, novellus tomentosus, mox glabrescens. Folia basalia ut videtur

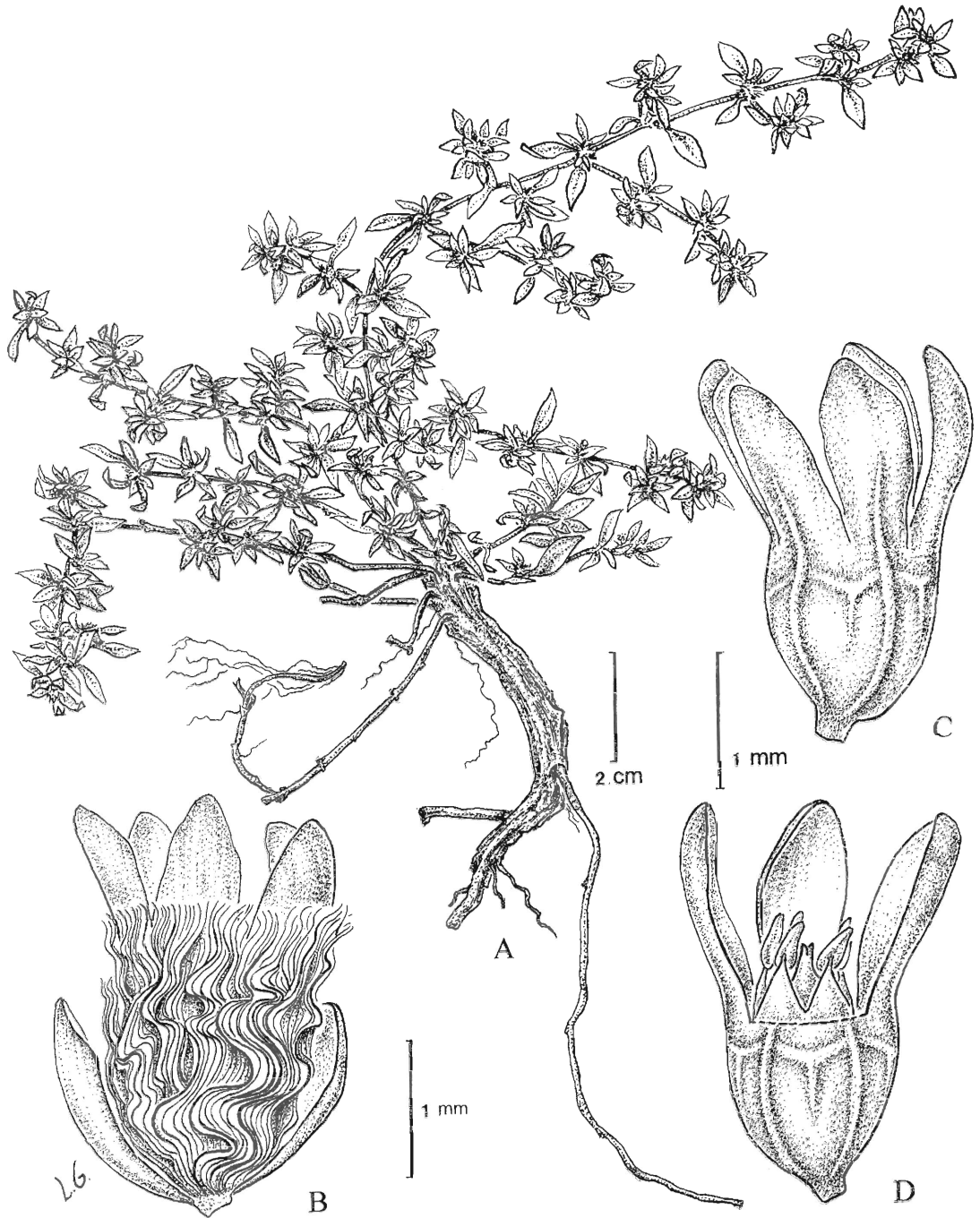


Fig. 7. *Guilleminea fragilis*: A, habit; B, flower within its bractlets; C, tepals after removal of hairs showing the nerves; D, flower showing androecium and gynoecium. (Krapovickas 45050 & Cristóbal).

fugacia; *caulina* vix ad 1 cm longa, 0.1-0.2 cm lata, anguste lanceolata, acuta vel acutiuscula, petiolo aequilato amplexicauli, supra glabra, subtus tomentosa. Flores in spicastris terminalibus 1-2(-3)-floris axe tenui ad nodos piloso dispositi: bractea bracteeaeque tenuissime scariosae, ad 2-2.5 mm longae, hae quam illa longiores, ellipticae aut oblongo-obovatae, obtusissimae, saepe fissae, enerviae, glabrae; perigonium 2.5-3 mm longum, a medio 5-partitum laciniis tenuiter scariosis, pars integra 10-nervia, nervis primariis prominentibus, commissuralibus evanescentibus infra incisuras inter lacinias furcatis, totum perigonium usque ad medium laciniarum lana obtectum; staminum cupula inferne perigonio adhaerens parte ejus integra paullo longior, filamenta libera anguste triangularia antheris ad 0.5 mm longis; germen ad 1 mm longum stylo crasso stigmata bifido. Fructus ± 1.5 mm longus, ovoideus. Semen testaceum ca. 1 x 0.9 x 0.7 mm, funiculo apice inserto. Embryo hippocrepiformis foliis latissimis radice duplo longioribus.

Type. PARAGUAY, **Amambay**: in regione cursus superioris fluminis Apa 2.1902, *Emil Hassler* 8461 (holo-G).

Paratypes. BRAZIL, **Mato Grosso do Sul**: mun. Murtinho, Rio Capibara, 44 km E de Porto Murtinho. En suevo modificado a orillas del camino 29/6/1977, *Krapovickas* 32801 & *Schinini* (CTES). PARAGUAY, **Amambay**: a pocos km de Bella Vista en direcci3n a San Carlos. Prados con rodales de bosque, abundante ganado 12/2/1982, *Fernández Casas* 6229 & *Molero* (MA). Bella Vista, Estancia Apamí, a orillas del río Apa 16/5/1987. "Hierba palustre, flores amarillo-cremosas", *Mereles* 621 & *Ramella* (CTES). 5 km N de ruta 5, camino a Bella Vista. Bosque abierto con bromeliáceas, suelo claro, arenoso 26/2/1994 "Postrada", *Krapovickas* 45050 & *Crist3bal* (CTES). **Concepci3n**: Belén, 10 km S de Concepci3n. En suelos arenosos 16/5/1974 "Rastrera", *Schinini* 9183 (CTES).

The type specimen was misidentified by the collector as *Guilleminea australis* (Griseb.) Hook. f. = *G. densa* (Willd.) Moq. It differs from that species in the tap-root not forming a tuber, the very brittle annual shoots, narrow cauline leaves, few-flowered inflorescence, and larger flowers, the staminal cup prolonged beyond the bottoms of the incisions between the lobes of the perigon.

Both this species and *G. chacoensis*, described above, were perhaps better treated as varieties of *G. densa*, from which they only differ on

minor points, but in the absence of a revision of the genus as a whole, their exact status must remain doubtful.

11. *Guilleminea gracilis* R.E.Fr.

Nova Acta Regiae Soc. Sci. Upsal., ser. 4, 1: 151, 1905. Type. ARGENTINE, **Jujuy**: Dpt. Cochinoca: Abra Pampa, ca. 3500 m s.m. 30/12/1901, *Rob. E. Fries* 972 (holo-S).

Brayulinea gracilis (R.E.Fr.) Schinz in Engler & Prantl, Nat. Pflanzenfam., 2. Aufl., 16c: 65. 1934.

Guilleminea densa (Willd.) Moq. var. *gracilis* (R.E.Fr.) Mears, Sida 3: 143, 1967.

Mears (1967) reduced *Guilleminea gracilis* to a variety of *G. densa*. In a previous paper (Pedersen, 1976), I found that Mears probably never saw authentic material, and restored its specific rank. From his map it appears that Mears referred practically all South American material of *G. densa* except the type and a specimen from Bolivia to his var. *gracilis*, distinguishing the two by the position of the lobes of the perigon at maturity: divergent in the var. *densa*, erect in var. *gracilis*. He does not state having seen any specimen from the type collection of *Illecebrum densum*, and may not have seen any; in at least one specimen presumably from the type collection, the nerve extends to the tip of the lobes of the perigon, a character attributed by Mears to the var. *gracilis*. As he does not cite material, I can not form any opinion on the importance of this character or the identity of the specimen from Bolivia that he has referred to var. *densa*, but I am fairly confident that none of the material which on the map appears as *G. densa* var. *gracilis* really belongs to *G. gracilis* as described by R. E. Fries.

12. *Guilleminea hirsuta* Pedersen sp. nov.

Fig. 8

Herba perennis radice palari deorsum sat incrassata, caule internodiis perbrevibus foliis mox caducis, e quorum axillis rami floriferi ramosi prostrati oriuntur: radix in collo ad 0.35 cm crassa, 1-1.5 cm sub eo ad 0.6-0.7 cm incrassata, deorsum attenuata. Caulis (rami floriferi) vix 0.1 cm crassus, teres, pilis crispis 0.3-0.5 mm longis sat dense vestitus. Folia basalia non vidi, caulinarum petiolo incluso 0.4-0.8 longa, 0.15-0.3 cm lata, ovata, acuta, basi in petiolum angustata, utrinque pilis ad 1 mm longis, crispulis, albidis vestita, subtus densius. Flores

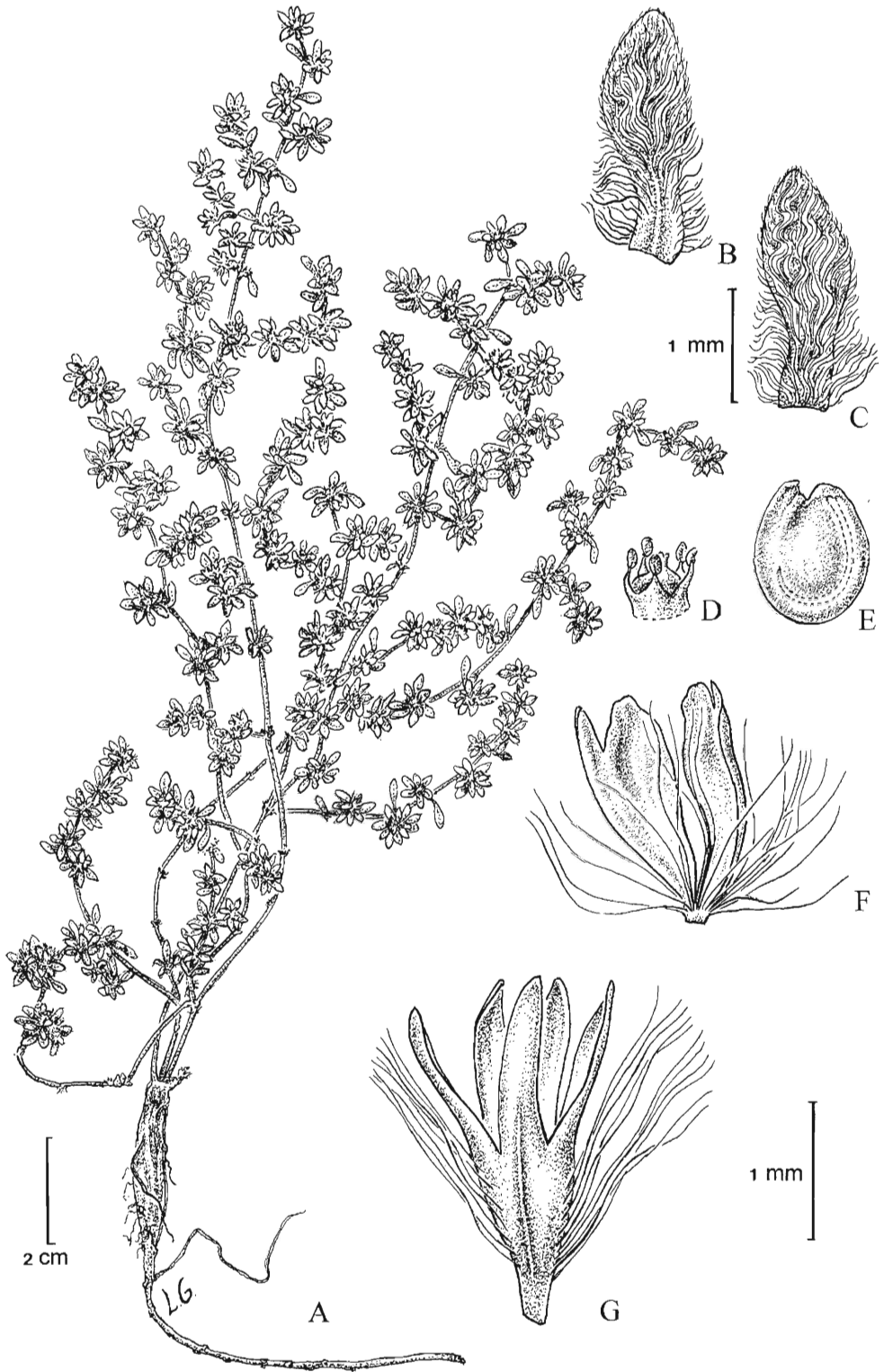


Fig. 8. *Guilleminea hirsuta*: A, habit; B, leaf inner side; C, leaf outer side; D, androecium and gynoecium; E, seed; F, bractlets; G, flower after partial removal of hairs showing the 1-nerved tepals. (*Krapovickas 45370 & al.*).

Flores in spicasteris solitaris terminalibus 1(-3)-floris dispositi: bractea tenuiter scariosa, ad 1.5 mm longa, elliptica, utrinque acuta, saepe fissa, enervia, glabra, persistens; bracteolae bractee similes, ellipticae vel oblongo-obovatae, obtusae, plerumque fissae; perigonium sessile, scariosum, ad 2.5 mm longum, a medio 5-partitum laciniis linearibus lineari-lanceolatisve acutis, 5-nerviis, nervis commissuralibus ut videtur destitutum, pars gamotepala pilis rectis albidis apices laciniarum paene attingentibus vestita; stamina ad 2 mm longa antheris ad 0.2 mm, filamentis in cupulam perigonium adhaerentem, partibus liberis late triangularibus; germen stylo gracili ad 0.2 mm longo stigmatibus bipartito ramis divergentibus. Fructus tenuiter membranaceus ovoideus indehiscens. Semen helvum ca. 1 x 0.8 x 0.5-0.6 mm, late ovoideum, apice profunde emarginatum ubi funiculus insertus est.

Type: PARAGUAY. **Boquerón:** Ruta Trans-Chaco 25 km SE de Nueva Asunción. Bosque bajo con quebracho. Suelo arenoso 13/5/1994 "Postrada, casi enterrada en la arena." A. Krapovickas 45370, C. L. Cristóbal & A. Schunini (holo-CTES, iso-C).

Paratypes: ARGENTINE, **Salta:** dpt. Orán, Campo Blanco, 500 m s.m. 11/2/1925 "Planta rastrera" Schreiter 3549 (CTES). BOLIVIA, **Chuquisaca:** prov. L. Calvo: 1-2 km S del Centro El Salvador-Cimboc, 20°37'S/63°16'W, 820 m s.m. Suelo arenoso, bosque de transición-quebrachal 3/4/1993, Saravia Toledo 11417, Joaquín, Ezcurra & Schinin (CTES). PARAGUAY, **Boquerón:** Gral. Eugenio A. Garay, ca. 1 km W del Cuartel, ca. 310 m s.m. Monte 8/5/1988, Charpin 24619bis & Ramella (G; probably belongs here). Fortín Nueva Asunción, 20°43'S/61°56'W. Bosque al término norte del aeropuerto militar y alrededores. Bosque xerofítico espinoso muy abierto de hasta 10 m de altura. Suelo muy arenoso 24/3/1986 "Hierba perenne formando densas 'alfombras', común en lugares abiertos entre arbustos. Inflorescencia blanquecina", Brunner 1652 (CTES, G). 7 km NW de Nueva Asunción, 20°38'S/62°05'W. En lomada con suelo arenoso 12/12/1987, Schunini 25691 & Palacios (CTES, G).

This species, easily recognized by its leaves, densely hairy on both sides, extends from SE Bolivia and N Argentine over the northern part of the Chaco region. It seems closely related to *G. fragilis*, with which it has the few-flowered inflorescence in common, differing by the characters mentioned in the key.

HEBANTHE Mart.

13. *Hebanthe eriantha* (Poir.) Pedersen comb. nov.

Basionym: *Iresine erianthos* Poir. in Lamarck Encycl., suppl. 3: 180. 1813. Lamarck, Tabl. encycl. pl. 813. 1799. Poir., Tabl. encycl.: 406. 1823. *Gomphrena eriantha* (Poir.) Moq. in DC., Prod. 13(2): 386. 1849. *Pfaffia eriantha* (Poir.) Kuntze, Revis. gen. pl. 2: 543. 1891. Lectotype (designated here): *Iresine erianthos*... Bresil, Commerc., herb. Poir. ex Herbier Moquin-Tandon (P!).

Hebanthe paniculata Mart., Beitr. Amarantac.: 96. 1825 & Nov. Gen. sp. pl. 2: 43. 1826. *Iresine paniculata* (Mart.) Spreng., Syst. veg., ed. 16(4), Curae post.: 103. 1827. *Gomphrena paniculata* (Mart.) Moq. in DC., Prod. 13(2): 385. 1849. *Pfaffia paniculata* (Mart.) Kuntze, Revis. gen. pl. 2: 543. 1891. Holotype: Brasil, Prov. Rio de Janeiro, Martius s.n. (M!).

Hebanthe virgata Mart., Beitr. Amarantac.: 97. 1825 & Nov. Gen. sp. pl. 2: 45. 1826. *Iresine virgata* (Mart.) Spreng., Syst. veg., ed. 16(4), Curae post.: 103. 1827. Holotype: Brasil, crescit in umbrosis ad fluvium Ypanema, in Provincia S. Pauli, Martius (M!).

Gomphrena paniculata (Mart.) Moq. var. *glabrata* Seub. In Mart., Fl. bras. 5(1): 192. 1875. *Pfaffia paniculata* (Mart.) Kuntze var. *glabrata* (Seub.) O. Stützer, Repert. Spec. Nov. Regni Veg. Beih. 88: 15. 1935. Lectotype (designated here): Brasil, Rio de Janeiro, 1867, Glaziou 27 (BR!). As no specimen was designated as holotype a lectotypification is necessary; the specimen chosen as lectotype bears a handwritten label by Seubert.

Pfaffia paniculata (Mart.) Kuntze f. *lanceolata* R.E.Fr., Ark. Bot. 16(2): 6. 1920. Syntypes: [Brasil], Minas Geraes, Caldas, Regnell 1: 452; [Brasil], Minas Geraes, Lagoa Santa, 12.9.1863, Warming (C!); Lagoa Santa, 18.8.1864, Warming (C!); Lagoa Santa 24.7.1865, Warming (C!); [Brasil], São Paulo: Campinas, Severin 13; São Paulo: Campinas, Hainer s.n. Lectotype (designated here): Brasil, ad Lagoa Santa, 18.8.1864, Warming 324 (C!).

Pfaffia paraguayensis Chodat, Bull. Soc. Bot. Genève 18: 286. 1927. Holotype: Paraguay, Reg. fluminis Yhù, Caaguazu, Hassler 9459 (G!).

Pfaffia laurifolia Chodat, Bull. Soc. Bot. Genève 18: 287. 1927. Holotype: Paraguay, Amambay, in alta planitie, jul., Hassler 11280 (G!).

Pfaffia reticulata Seub. var. *strigulosa* Suess., Repert. Spec. Nov. Regni Veg. 35: 333. 1934.

The selection of the type of *Iresine erianthos* Poir. has motivated long researches. In the original diagnosis Poiret cites the tab. 213 [typographical error for 813] and clearly designates 2 specimens: "*Celosia erianthos* Vahl, in herb. Juss." and "Cette plante a été recueillie au Brésil par Commerson (V.s.)".

The name *Iresine erianthos* does not figure in the herbarium Lamarck.

There is a folder with 3 specimens in the herbarium Jussieu:

1: 4375 [*lapsus calami* 4575] A, *Celosia eriantha*, Americ. merid., (scripsit Vahl), missit Vahl [scripsit A.L.Jussieu]. On another label is written *Iresine eriantha* J. [scripsit A.L. Jussieu]. This specimen was elected type of *Iresine erianthos* Poir. (Borsch & Pedersen, 1997:18) and as it has deformed and sterile flowers it was proposed to reject this name. A later analysis shows this specimen to be *Trommsdorffia aurata* Mart. (Borsch in sched.) synonymous with *Pedersenia argentata* (Mart.) Holub.

2: 4575 B "Rio de Janeiro, herb. Commerson - sans nom", this is *Gomphrena vaga* Mart.

3: 4575 B "Rio de Janeiro, herb. Commerson - sans nom", which is *Hebanthe paniculata* Mart. Of the 3 specimens this is the one that is most like Planche 813.

There is in the general herbarium (P) a specimen on whose label is written "*Iresine erianthos* / Lam. ill. t. 813, fig. 1 / *Celosia eriantha* Vahl m. h. Juss. / Bresil, Commerson Herb. Poiret". On another label is written "Herbier Moquin-Tandon". In one of the envelopes there are schematic drawings of the floral parts made by Moquin-Tandon. This has been identified as *Hebanthe paniculata* Mart. (Borsch in sched.).

The last mentioned specimen (P) has got all the information that figures in the protologue to *Iresine erianthos*. Furthermore it was used by Moquin-Tandon in his revision of the *Amaranthaceae* for the De Candolle Prodrumus who placed *Gomphrena eriantha* in the section *Hebanthe* of the genus *Gomphrena*. I prefer to elect this specimen as the lectotype, because: it has belonged to the Poiret herbarium, it has been used by Moquin-Tandon in his definition of this species, and it is fertile, as is shown in the pencil drawings of the floral parts accompanying it.

13a. *Hebanthe eriantha* f. *ovatifolia*
(Heimerl) Pedersen *comb. nov.*

Basionym: *Gomphrena paniculata* (Mart.) Moq. f. *ovatifolia* Heimerl, Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. 79:230. 1908.

Pfaffia paniculata (Mart.) Kuntze f. *ovatifolia* (Heimerl) R.E.Fr., Ark. Bot. 16(12): 6.1920. Type: [Brasil], prope S. Bernardo in circuito urbis São Paulo, *Wachsmund s.n.* (W lost). Neotype (designated here): Brasil, *Glaziou* 11433 (C!).

HEBANTHODES Pedersen
genus amaranthacearum novum

Ut videtur frutex scandens: caulis quoad suppetit 0.1-0.22 cm crassus, juventute rotundato-quadrangularis, acetate teres, ad nodos vix incrassatus, plus-minusve dense pilis 0.75-1 mm longis, 7-8-articulatis, simplicibus vestitus. Folia 3-5.5 cm longa petiolo ad 0.7 cm inclusivo, 0.8-1.5 cm lata, elliptica, utrinque acuta, penninervia nervorum secundi ordinis paribus 5-8, mutica, supra in nervis breviter dilute pilosa, subtus pilis illis caulibus similibus vestita. Flores in spicastris paene sessilibus congesti, hae in inflorescentia 1-2-articulata pauciramosa axe producto hypsophyllis scariosis dispositae: bractea floralis 1.4-1.5 x 1.05-1.25 mm late ovato-triangularis, obtusa emarginatave, uninervia, haud mucronata, dorso sat dense hirsuta, persistens; bracteolae bractee similes, sed plus-minusve 2 x 2-2.5 mm, superna quam infera latior, reniformes, uninerviae, rotundatae dente parvulo obliquo in quem nervus excurrit, dorso secus nervum densius pilosae hirsutave, cum perigonio deciduae; tepala scariosa in sicco brunneola, statura inaequalia, 3.5-4 x 1-1.8 mm, sed forma vix dissimilia, oblongo-ovata oblongave, acuta, trinervia, mutica, basi pilis longis simplicibus ad medium dorsi attingentibus vestita, praeterea glabra; stamina vix 2.5 mm longa antheris ca. 7 mm longis ovalibus filamentis subliberis a medio trilobatis lobis lateralibus linearibus acutissimis vix lobo antherifero aequilongis. Germen ad 0.75 mm longum, ovoideum, stigmatibus sessilibus profunde emarginato sublobatave. Fructus ignotus.

Only one species known, which is the type.

14. *Hebanthodes peruviana* Pedersen sp. nov.
Fig. 9

Characters of the genus.

TYPE: PERU, **Pasco**: prov. Pasco, Cerro de Pasco, Oxopampa, 1800 m s.m., 12/9/1949, leg. *Juana Infantes* 3707 (holo-LIL).

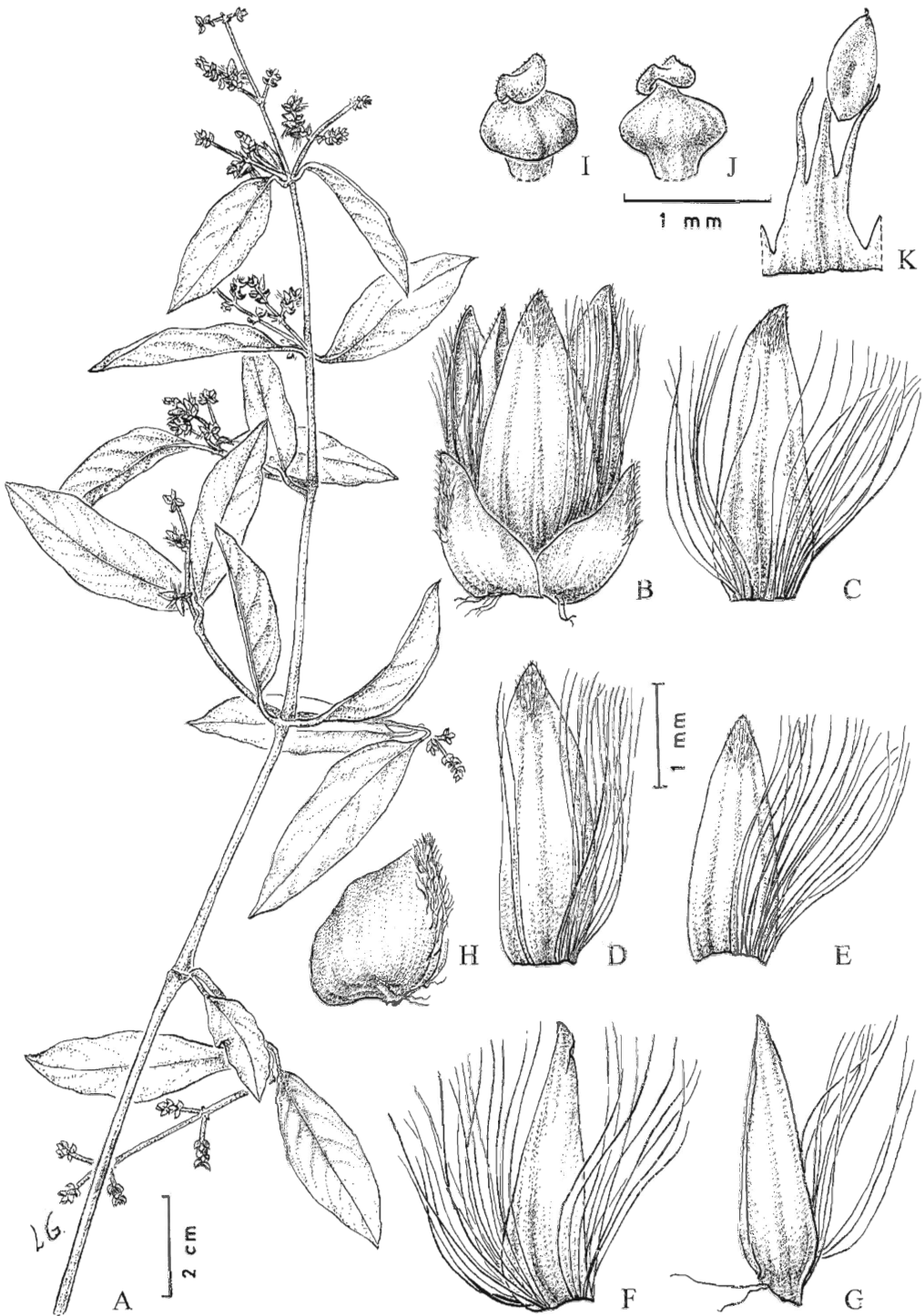


Fig. 9. *Hebanthodes peruviana*: A, habit; B, flower within its bractlets; C-G, tepals; H, bract; I-J, gynoecium; K, part of androecium, antheriferous and lateral lobes. (*Infantes* 3707).

This new species is obviously related to *Gomphrena*, *Hebanthe*, *Pfaffia*, and *Pseudogomphrena*, with all of which it shares important characters, without coinciding in all respects with any of them: the androecium and perigon agree well with *Gomphrena*, but the climbing habit, the inflorescence, and the pistil, with a broadly extended, only slightly lobed stigma, set it well apart from that genus; also, though of less importance, the bractlets are of a shape not seen in other species of *Gomphrena*. With *Hebanthe* it shares the climbing habit, apparently also the inflorescence, which seems to develop a prolonged, multinodal main axis; the pistil and androecium also agree well with several species of *Hebanthe*, as do the bractlets, but the perigon differs markedly, the tepals being almost equal in shape and indument, only differing in size; to include *Hebanthodes* with *Hebanthe* would require the re-definition of the latter genus. The perigon of *Hebanthodes* would agree well with *Pfaffia*, and the pistil, though not typical for that genus because of the presence of a short but distinct style, might preclude placing

it here, while on the other hand the climbing habit, the inflorescence, the shape of the bractlets, and the entire margin of the filaments, which in *Pfaffia* (excluding *Hebanthe*) are invariably fimbriate, make it impossible to merge the two. With *Pseudogomphrena*, the only characters shared seem to be the climbing habit and the perigon; the pistil and especially the androecium are very different, the filaments in *Hebanthodes* almost free to the base and the antheriferous lobe as long as or longer than the lateral lobes, while in *Pseudogomphrena* they are connate beyond the insertion of the sessile anthers (Fries interpreted the connate lateral lobes as pseudostaminodia, the presence of such he considered a distinctive character of his new genus).

Mr. Thomas Borsch, Frankfurt am Main, Germany, with whom I have discussed the systematic position of this novelty, has extracted samples of pollen for study, the result of which presumably will be published independently.

The following key synthesizes the characters separating *Hebanthodes* from its immediate allies:

- A. Upright or decumbent herbs or shrubs, rarely subscandent
 - B. Filaments of stamens fimbriate
 - C. Stigma sessile, more or less emarginate; flowers pentamerous *Pfaffia* Mart.
 - CC. Stigma at the end of a distinct style, bilobed; flowers tetra- or pentamerous
..... *Quaternella* Pedersen
 - BB. Margins of filaments entire; stigma at the end of a distinct style, bilobed; flowers pentamerous .
..... *Gomphrena* L.
- AA. Climbing shrubs
 - B. Tepals very unequal, the outer broad, pubescent or glabrous, inner narrower, densely tomentose
..... *Hebanthe* Mart.
 - BB. Tepals all more or less alike
 - C. Flower-heads globular, borne in a dichasium, the main axis ending in a single head; filaments connate beyond insertion of anthers; stigma bilobed, with tapering branches
..... *Pseudogomphrena* R.E.Fr.
 - CC. Flowers in elongate spikes grouped in a panicle with plurinodal main axis; filaments connate at base only; stigma broadly extended, emarginate *Hebanthodes* Pedersen

IREFINE P. Browne

15. *Iresine diffusa* H. & B. ex Willd. Sp. pl., ed. 4, 4 (2): 765. 1806.

15a. *Iresine diffusa* H. & B. ex Willd. f. *Herbstii* (Hook.) Pedersen nov. comb. *Iresine Herbstii* Hook., Gard. Chron. 1864: 654. 1864.

This commonly cultivated plant was described as a species, and seems to have been treated as such by all later authors. It has to my knowledge never been found in the wild, and appears to be incapable of reproducing sexually, as in all specimens seen, only staminate flowers appear to be present. It almost certainly originated in cultivation as a sport of

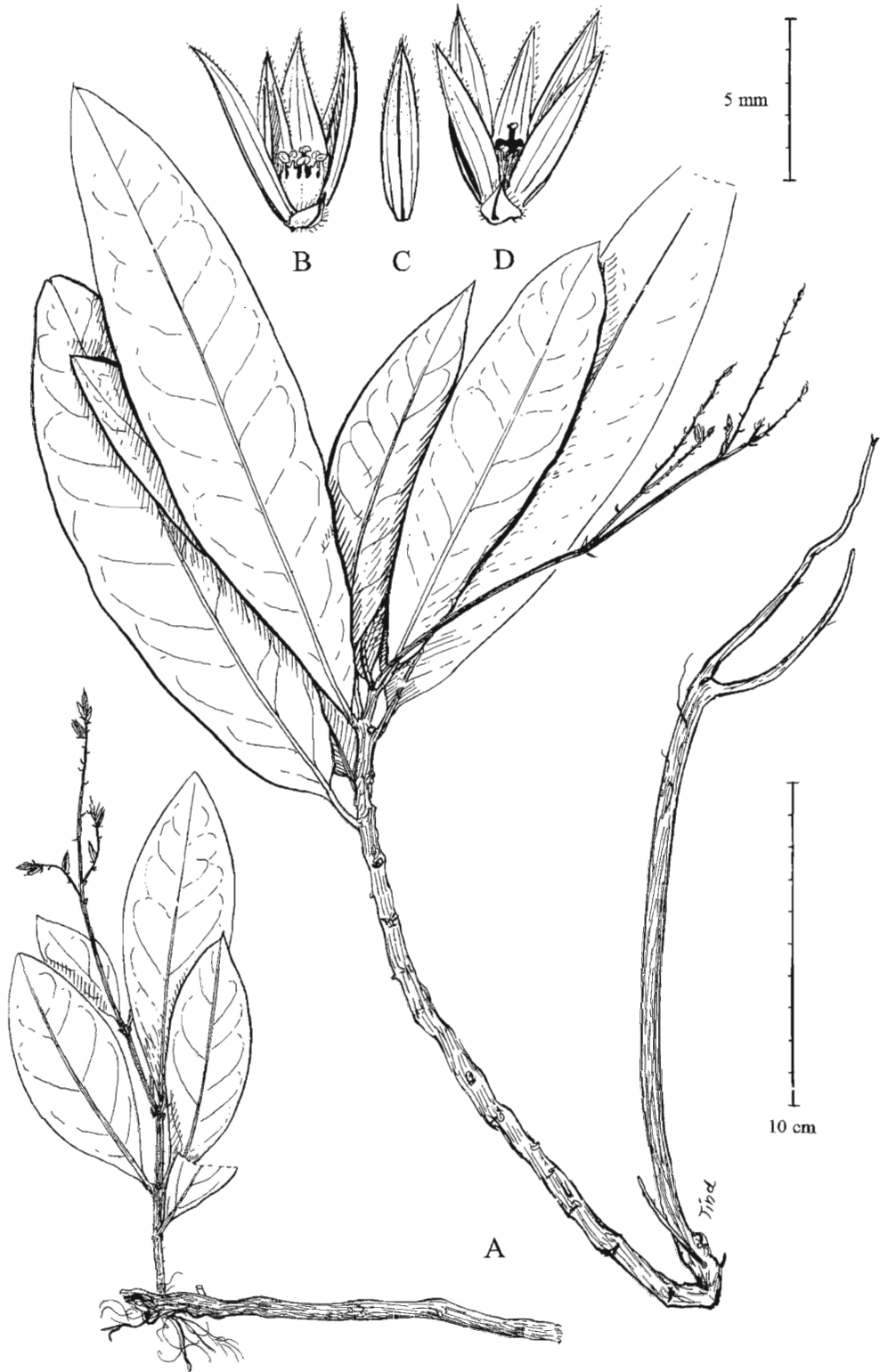


Fig. 10. *Lecosia formicarum*: A, habit; B, flower showing bractlets and androecium; C, tepal; D, mature flower. (Kallunki 539 & al.).

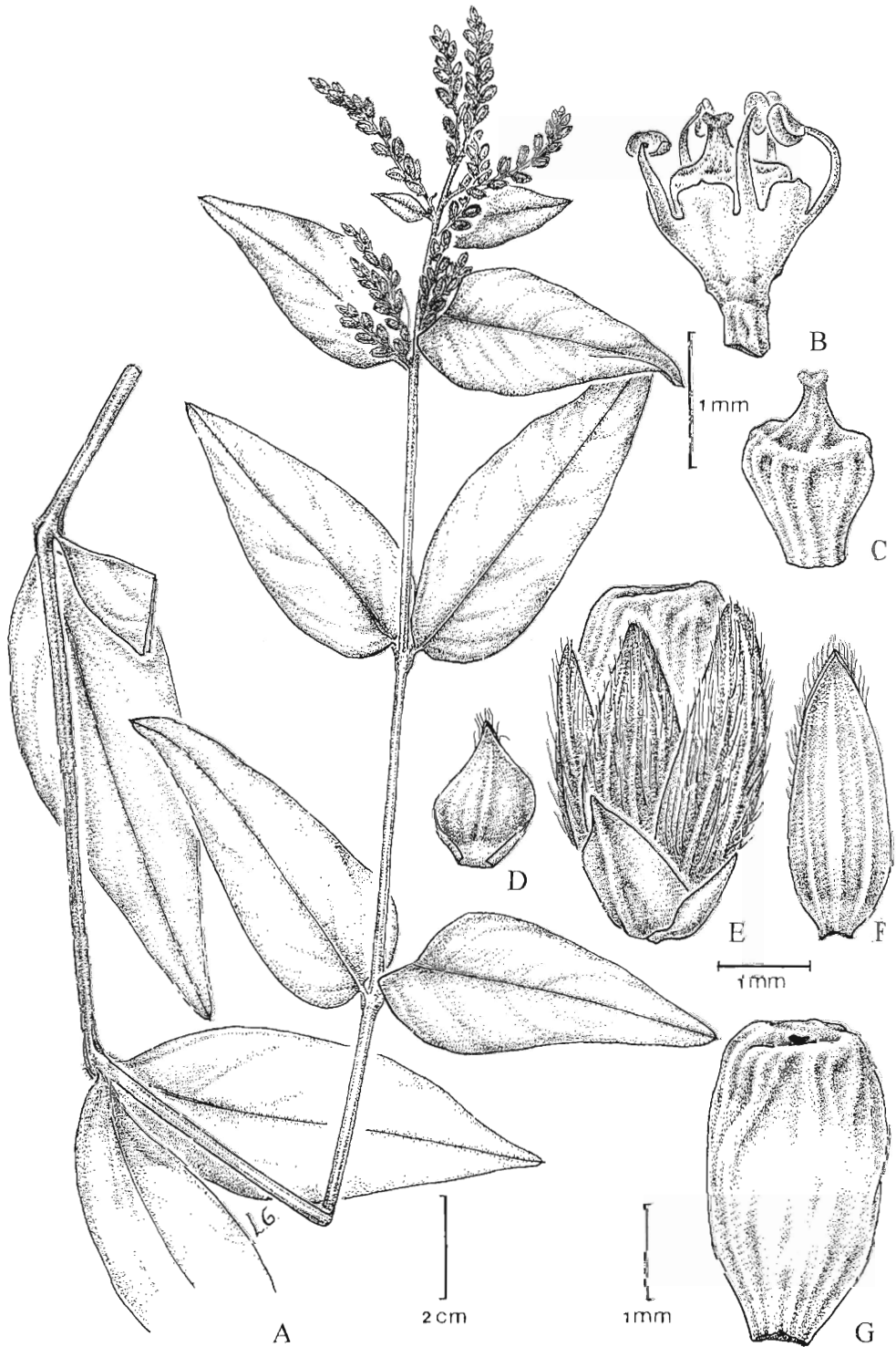


Fig. 11. *Lecosia oppositifolia*: A, habit; B, androecium and gynoecium; C, gynoecium; D, bractlet; E, fruit within tepals and bractlets; F, tepal inner side; G, fruit. (Hatschbach & Cervi 51339).

I. diffusa. This in my opinion does not justify maintaining it at specific rank, and I will suggest demoting it to a form of *I. diffusa*.

LECOSIA Pedersen
genus *amaranthacearum novum*

Flores hermaphroditi in dichasiis unifloris dispositi, ea laxe spicata in inflorescentiis compositis ramosis axillaribus collocata: bracteae bracteolaeque scariosae, illae persistentes, hae cum perigonio maturitate fructus caducae: tepala 5, stamina epitepala antheris quadrilobularibus, filamenta linearia inferne connata cum pseudostaminodiis alternantia; germen stylo indiviso stigmatem emarginato vel leviter 2-lobato; ovulum unicum in funiculo basifixo insertum.

Herbae vel suffrutices humiles pauciramiosi foliis oppositis aut alternis, ut videtur rarissime in silvis spissis pluviis abundis madidis reperti.

Typus generis: Lecosia oppositifolia Pedersen.

In appearance, the two known species of this genus are not unlike certain species of *Celosia*, but the presence of well-developed pseudostaminodia definitely excludes it from that genus, nor do the floral characters seem to fit any other amaranthaceous genus, for which reason I consider it best described as new, despite the fact that owing to the scarcity of available material it must be imperfectly known and of doubtful affinity, the fruit only seen in the type species.

16. *Lecosia formicarum* Pedersen sp. nov.

Fig. 10

Suffrutex humilis parce ramosus ramis sursum dense foliatis: radix ad 0.5 cm crassus, valde ramosus. Caulis 0.1-0.5 cm crassus, hornotinus pilis ±1 mm longis multarticulatis simplicibus patentibus dense vestitus, annotinus glaber. Folia chartacea, 8-21.5 cm longa petiolo 0.5-1 cm incluso, 2.5-6 cm lata, oblongo-elliptica, utrinque acuta subacutave, penninervia paribus nervorum secundi ordinis 9-10, mutica, in nervis pilosiuscula, paginae juventute tenuiter puberulae. Flores laxae in spicis (re vera spicastris) ramosis inflorescentiam compositam axillarem efficientibus dispositi: rhachides spicarum glabrae, rami inflorescentiae pilosi bracteis scariosis acutis 2-3 mm longis suffultis: bractea floralis scariosa 1.2-1.4 mm longa, ovato-triangularis, acuta acuminatave, uninervia, mucronulata, praeter cilia pauca glabra, persistens; bracteolae scariosae, 1.5-2 mm longae, ovatae, acutae

acuminatae, uninerviae, haud mucronatae, densissime ciliatae, cum perigonio deciduae; tepala subchartacea valde maequalia, 4.5-6.5 mm longa, exteriora longiora, lanceolata ovato-lanceolatae, acuta, trinervia, mutica, dorso sursum pilosiuscula; stamina ad 2 mm longa antheris annumeratis juventute incurvatis, post anthesin porrectis, filamenta ad medium vel ultra connata, cum pseudostaminodiis rotundatis vix aequilongis alternantia; germen large 1.5 mm longum obovatum apice truncatum stylo ca. 0.5 mm longo stigmatem emarginato subbilobato. Fructus ignotus.

Type. BRAZIL, Bahia: mun. Itacaré, Fazenda das Almas, 18 km from BR-101 on road to Itacaré, ca. 14°20'-14°22'S/39°10'-39°17'W. Southern Bahian Wet Forest. Forest behind main buildings of fazenda, in understory, growing in ant nest, 13/2/1994. "Subshrub, with fungal hyphae on most stems. Calyx green. Some leaves tinged with red on lower surface". J. Kallunki 539, J. Pirani, J. Cordeiro, P.L.R. de Moraes & L. Clark (holo-C).

Only known from the type collection.

17. *Lecosia oppositifolia* Pedersen sp. nov.

Fig. 11

Herba ramosa teste collectoris ad 70 cm alta: radix non suppetit. Caulis 0.15-0.275 cm crassus, teres juventute sat dense pilis ferrugineis simplicibus ±0.5 mm longis crispulis vestitus, aetate giabrescens. Folia opposita, membranacea, 4.5-11.5 cm longa petiolo 0.3-1 cm longo annumerato, 1.4-3.8 cm lata, ovata lanceolatae, utrinque acuta vel plerumque basi rotundata, penninervia paribus nervorum secundi ordinis 8-9, vix vel brevissime mucronata, parce pilosa, praecipue in nervis. Flores in spicastris 20-30-floris 20-45 mm longis rhachide densissime pilosa bracteis scariosis 1.5-2 mm longis suffultis dispositi, spicastrae in panicula 50-70 mm longa; bractea floralis tenaciter scariosa, ca. 1 mm longa, acuta, uninervia, mutica, dorso pilosa, persistens; bracteolae bractee similes scariosae, ±2 mm longae, ovatae, acutae, uninerviae, dorso pilosae, cum perigonio deciduae, tepala subchartacea, margine scariosa, 2.7-3.6 mm longa, oblongo-ovata vel ovato-lanceolata, acuta, trinervia, mutica, dorso hirta; stamina 1.5-2 mm longa, antheris ca. 0.3 mm longis, post anthesin deciduis annumeratis, juventute incurvata, maturitate porrecta, filamenta linearia inferne connata, cum staminodiis ca. 0.25 mm longis latisque repandis alternantia; germen ca. 0.7 mm longum, turbinatum, stylo ad 0.2 mm stigmatem 0.1 mm bilobato. Fructus quam perigonium aequilongus apice cupula stylum persistentem involucenti eumque occultanti coronatus.

Semen (immaturum) ad 1.2 mm longum obovoideum funiculo latere inserto.

Type. BRAZIL, **Espírito Santo**: mun. Conceição do Castelo, Providencia. Erva alta 70 cm. Mata pluvial, 20/8/1988, G.Hatschbach & A.C.Cervi 51339 (holo-MBM, iso-CTES).

Only known from the type collection.

In aspect, the species of this new genus are not unlike certain species of *Celosia*, for which reason I have chosen for its name an anagram of that word. They differ in the presence of well developed pseudostaminodia, and from most species of *Celosia* by the uniovulate ovary. On the whole, the systematic position of *Lecosia* is uncertain, but probably it should be placed near *Celosia*.

The two species are easily told apart, *L. oppositifolia* having opposite, *L. formicarum* alternate leaves.

PEDERSENIA Holub

18. *Pedersenian Hassleriana* (Chodat)

Pedersen *comb. nov.*

Basionym: *Iresine Hassleriana* Chodat, Bull. Herb. Boiss., sér. 2, 5: 390. 1903.

Type. PARAGUAY, **Cordillera**: Caraguatay. In silva, Nov., E. Hassler 3429 (holo-G, iso-P,S).

PFAFFIA Mart.

19. *Pfaffia argyrea* Pedersen *sp. nov.*

Fig. 12

Herba perennis radice palari, caule annorum praeteritorum procumbenti ut videtur humo oblecto, hornotino brevi erecto dense foliato flores gerenti: radix ad collum circa 0.7 cm crassa, deorsum sensim tenuescens. Caulis annotinus 0.2-0.3 cm crassus, glaber, hornotinus gracilior dense pilis simplicibus 3-4 mm longis crispulis nitentibus griseo-argenteis vestitus. Folia subsessilia, 1.2-1.8 x 0.6-1 cm, elliptica ovatae, acuta acutiusculave, basi obtusa rotundatae, breviter mucronata, perdense pilis caulis similia vestita. Flores in spicastro 40-50 mm longe pedunculatis 12-13 mm diametro congesti: bractea scariosa, spadicea, vix 1 mm longa, suborbicularis, glabra, persistens; bracteolae tenuiter scariosae, ad 2.5 cm longae, late ovatae, obtusae acutiusculave, mucronatae, cum perigonio deciduae;

tepala scariosa, ±5 mm longa, oblonga, acuta, 3-nervia, dorso appresso-tomentosa, ad basin pilis longioribus, intus pilis caespitosis longis undulatis munita; stamina ad 4 mm longa antheris ad 0.75 mm, filamentis ad medium vel ultra connatis, fimbriatis, lobulus antherifer 0, laterales acuti apicem antherarum non attingentes. Germen large 1 mm longum, claviforme, stigmatate sessili profunde emarginato. Fructum non vidi.

Type. BRAZIL, **Minas Gerais**: mun. Grão Mogol, 10 km NW of Grão Mogol. Solo arenoso 22/11/1978 "Flor creme", G. Hatschbach & A. Kasper 41635 (holo-MBM, iso-CTES).

In aspect this species, of which I have seen only the type collection, is somewhat similar to *Pfaffia sericantha* (Mart.) Pedersen, differing mainly in the structure of the flower, in particular the presence of a tuft of long hairs on the inside of the tepals near the base, which seems to preclude any close affinity with that species, and suggests that its allies should be sought among such species as *P. acutifolia*, *elata*, or *fruticulosa*, which all share this character.

20. *Pfaffia fruticulosa* Suess.

Repert. Spec. Nov. Regni Veg. 35: 330, 1934.

Type. BOLIVIA, **Santa Cruz**: Serranías de Incahuasi, Lagunillas, 2200 m s.m., "Matten", XI.1927, C. Troll, iter andinum 160 (holo-B).

To this species I have referred a plant widely distributed over the Paraguayan Chaco and northern Paraguay. With additional material referable here, I have come to the conclusion that the plant from the uplands west of Santa Cruz de la Sierra and the plant growing in the Chaco plain and northern Paraguay are not completely identical, though the floral characters are more or less the same. While typical *fruticulosa* is truly woody, the Paraguayan plant is herbaceous, possibly slightly woody at base, and the flower-heads are arranged in a freely branching dichasium, towards the end subtended by much-reduced leaves, appearing leafless; in typical *P. fruticulosa*, the long-stalked flower-heads are placed in the axils of normal, or possibly slightly reduced leaves. The differences seem to justify separating the Paraguayan plant as a distinct variety:

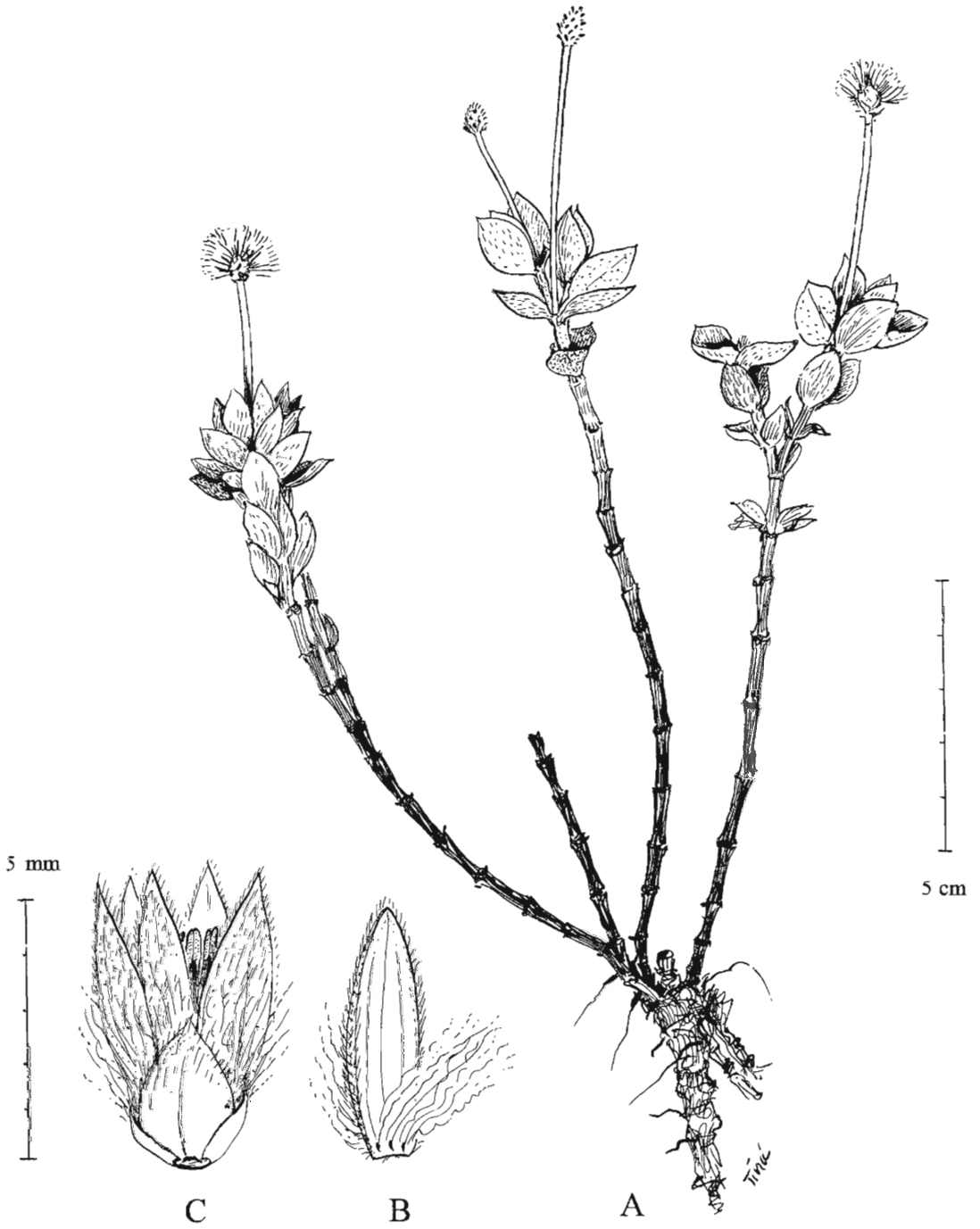


Fig. 12. *Pfaffia argyrea*: A, habit; B, tepal inner side; C, flower and bractlets. (Hatschbach & Kasper 41635).

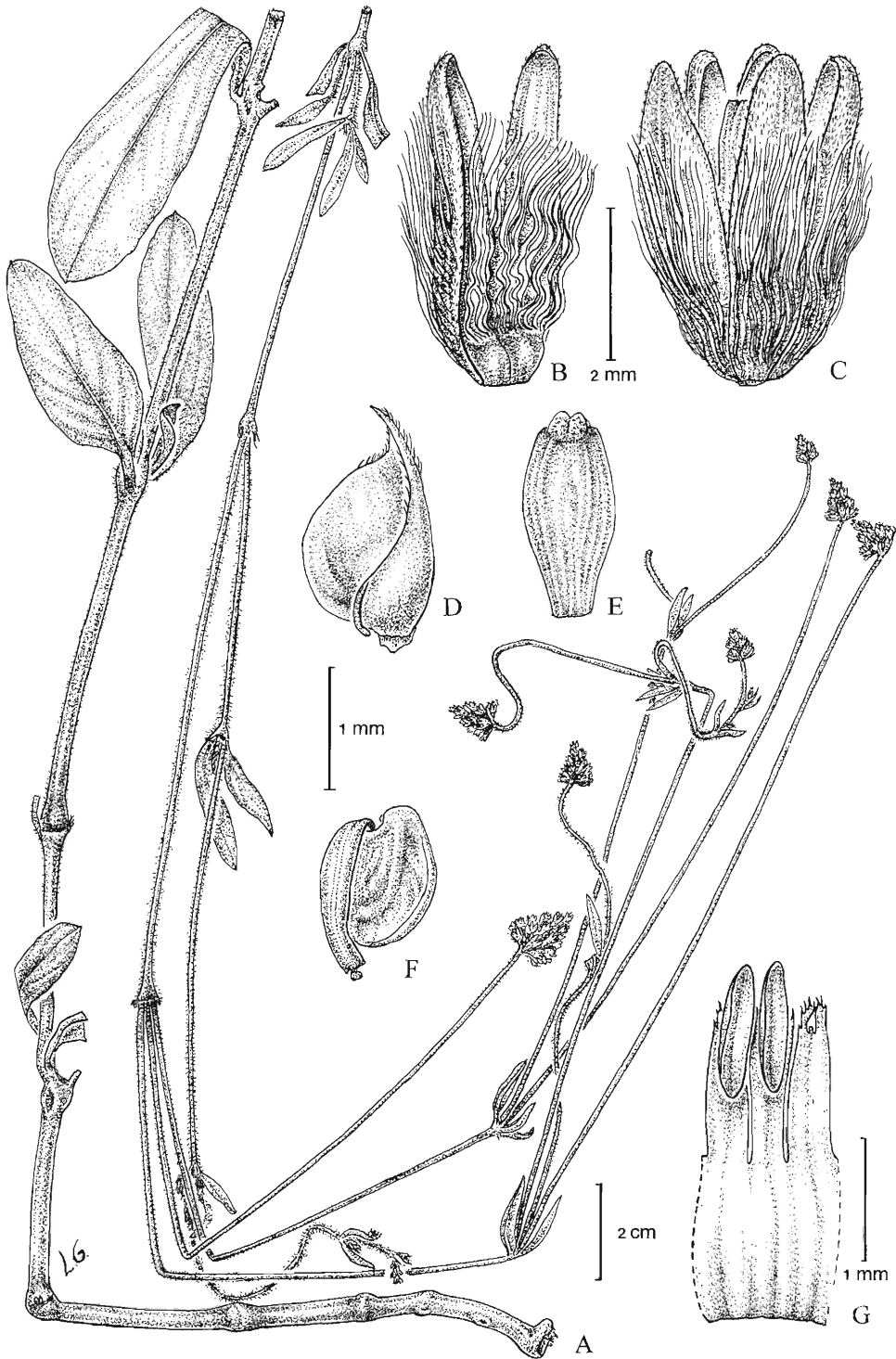


Fig. 13. *Pfaffia fruticulosa* var. *diffusa*: A, habit; B, tepals inside view; C, flower; D, bractlet seen from side; E, gynoecium; F, immature seed showing the funicle; G, part of androecium. (Krapovickas 14177 & al.).

20a. *Pfaffia fruticulosa* Suess. var. *diffusa*

Pedersen var. nov.

Fig. 13

A varietate fruticulosa recedit caule herbaceo vix ad basin lignoso spicastro in dichasio saepe multiramato hypsophyllis reductis aspectu aphylo dispositis. Partes florales hujus varietatis fruticulosae haud diversae.

Type. PARAGUAY, **Amambay**: highroad PY-5, where the road to Cerro Corá branches off. Roadside, sandy soil 15/2/1975, "Herbaceous or slightly shrubby at base, upright or more or less leaning, diffusely branched." T. M. Pedersen 11062 (holo-C, iso-CTES,G,MBM).

Paratypes: BOLIVIA, **Chuquisaca**: prov. L. Calvo, El Salvador-CIMBOC, Zona El Pante, 20°34'S/63°08'W, 700 m s.m. Suelo arenoso. Pastizales abiertos, abundantes 7/4/1993, *Saravia Toledo* 11469, *Joaquín, Ezcurra & Schinini* (CTES). **Santa Cruz**: A. d'Orbigny 570 (P). Dpt. Santa Cruz, prov. Andrés Bañez: On W side of the city of Santa Cruz, 17°47'S/63°12'W, 420 m s.m. In vacant sandy lot 4/12/1988. "Erect or ascending herb. Heads white", *Nee* 37017 (CTES). PARAGUAY, **Alto Paraguay**: [ex Chaco], trayecto 4 de Mayo-Lagerenza. Sobre dunas arenosas 15/5/1996. "Hierba. Flores blancas", *Mereles* 6293 & *Degen* (CTES). Mayor Pedro Lagerenza, 20°5'S/60°45'W. En selva ribereña del río Timane 5/4/1978 "1 m de altura, apoyante, inflorescencias blancas", *Schinini* 14887 & *Bordas* (CTES). Parque Nacional Defensores del Chaco Madrejón, 20°40'S/59°50'W. Thorn forest and disturbed area near airstrip 15/8/1983 "Forb to 2 m tall. Flowers white", *Hahn* 1607 (CTES). Cerro León (Cap. Pablo Lagerenza) 20°20'S/60°20'W, 500-600 m s.m. Sabana de *Tabebuia caraiba*. Pastizal 14/4/1989. "H = 0.15-0.25 m, fl. blancas", *Ramella* 2167 (C). **Amambay**: Ayo. Aceite, 40 km de P. J. Caballero. En campo, en la barranca del arroyo 24/2/1968, *Krapovickas* 14177, *Cristóbal & Ahumada* (CTES). Cerro Guazú versus Capitán Bado, circa 18 km, in savanna per viam 16/12/1978 "Herba suffruticosa magne foliis ovatis velutinis; glomeruli albi in paniculis vastissimis 1", *Bernardi* 19224 (CTES). Cordillera de Amambay, 13-15 km S de ruta 5, Cerro Corá, Colonia Picada Lorito. En cerrado arbustivo con suelo arenoso 11/12/1997. "Erecta", *Schinini* 33720 & *Dematteis* (CTES). Parque Nacional Cerro Corá, 22°39'S/56°03'W; elev. 300 m. Many isolated, flattopped sandstone hills, 100-150 m tall, with level areas of sandy soil between. Vegetation of open campos often shrubby and 15-25 m forest, lightly to heavily disturbed. Open sandy campo with low

shrubs and palms, NE of park headquarters 8/2/1982. "Stem erect, brittle, heads white", *Solomon* 6812, *Vavrec, Pérez, González & Duré* (CTES). Same, 200 m s.m. Cerrado vegetation 18/3/1983 "Flowers (greenish) white, anthers yellow", *Simonis* 92B, *Pérez, Hahn & Duré* (MO). Same. Cerrado, camino al lugar histórico, lugares secos 5/1/1988. "Hierba; flores blancas", *Soria* 1911 & *Zardini* (FCQ,MO). Same, 22°45'S/57°58'W. Cerrado, camino a co. Muralla 4/5/1989 "Hierba; flores blancas", *Soria* 3586 (MO). About 30 km S of P. J. Caballero, on road to Concepción. Roadside 18/10/1986, *Pedersen* 14657 (C, CTES). **Boquerón**: Ruta Trans-Chaco, 12 km NW de Nueva Asunción. Dunas consolidadas 14.5.1994. "Erecta, glomérulos blancos. Raiz pivotante, profunda", *Krapovickas* 45442, *Cristóbal & Schinini* (CTES). 25 km SE de Nueva Asunción. En duna consolidada con espartillo 15/5/1994. "Erecta, con 3-4 ramas basales hasta 1.80 m alt., ramificadas en la porción florífera apical. Hojas acartuchadas", *Krapovickas* 45477, *Cristóbal & Schinini* (CTES). Gral. Eugenio A. Garay, 13 km hacia Mariscal Estigarribia, 410 m s.m. Arenales con bosque arbustivo y gramíneas 5/10/1983. "Arbusto 1.2 m., flores ...", *Beck* 9439 & *Lieberman* (CTES). Gral. Eugenio A. Garay, 1-2 km al Este de Puesto Guaraní, Savana de gramíneas, arenas 330 m s.m. 8/5/1988, *Charpin* 21454 & *Ramella* (CTES,G). Parque Cué 20°13'S/61°48'W, 350 m s.m., picada a Nueva Asunción, 20 km al sur. Arenales 21/6/1988. "H = 0.4 m. Fl.", *Ramella* 2328 (G). Ruta Transchaco km 690, 260 m s.m. En suelos arenosos 7/5/1988, *Charpin* 21386 & *Ramella* (CTES,G). Km 695 de la Ruta Trans-chaco. 20°48'S/61°54'W. Sabana abierta sobre dunas de arena estabilizadas, árboles esparcidos de hasta 8 m de altura. Suelo muy arenoso 26/3/1986. "Hierba subarborescente de 1 m de altura, creciendo entre pastos altos. Inflorescencias blancas", *Brunner* 1672 (G). **Concepción**: some 20 km S of Yby-Yaú, on the road to Cnel. Oviedo. Scrub 22/2/1975 "Perennial, possibly slightly suffruticose at base", *Pedersen* 11143 (C,CTES,MBM,SI). **San Pedro**: road from Capitán Bado to Colonia Río Verde, Ea. San Carlos. Rough grassland & open scrub, sandy soil 21/10/1986, *Pedersen* 14793 (C,CTES). Trinidad, Río Verde, Yerbales, campo arenoso 5/1921, *Rojas* 3786 (SI).

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