

A revision of *Rhynchanthera* (Melastomataceae)

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The neotropical genus *Rhynchanthera* (Melastomataceae, Microlicieae) is revised, and 15 of the 84 proposed taxa are recognized; two species are excluded from the genus. The group consists of subshrubs and shrubs with usually purple flowers in thyrsoid inflorescences of uniparous or biparous cymes. It is characterized by androecia with five antepetalous staminodia in addition to the five fertile stamens, and – in most species – dimorphism of the stamens, with one strikingly longer than the other four. The plants always are covered by at least some simple glandular hairs. The majority of the species of *Rhynchanthera* occur in south-central Brazil, however, the range of the genus extends from southern Mexico to Bolivia and Paraguay. All species grow in wet places in open scrub or savanna vegetation. Micromorphological features of the seeds have been investigated and support the traditional placement of *Rhynchanthera* in the Microlicieae where it is closest to *Microlicia*, *Lavoisiera*, and *Trembleya*. Two taxa are illustrated with drawings, and the distribution of all is mapped.

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Introduction and taxonomic history of the genus

Rhynchanthera consists of 15 species of shrubs or subshrubs growing in wet places in open habitats from Mexico to Paraguay. The wide distribution of some of the species combined with their great variability have resulted in the formal naming of many local varieties, and for lack of a reliable modern treatment considerable herbarium material accumulated during the last 20 years and remained unnamed. The study of this material yielded much new information on the geographical distribution of the species and also clearly showed their polymorphism. Fortunately, the taxonomic problems were only intrageneric because the boundaries of the genus have always been clear, as was its tribal placement: *Rhynchanthera* is at the core of the 17 genera making up the neotropical Microlicieae and is characterized by a unique type of androecium. One species originally based on fruiting material and from the start notably different from the rest of the genus has recently been recollected; it is a new genus in the Merianieae (Almeda, pers. comm.).

The genus *Rhynchanthera* was established by A. P. de Candolle (1828a). It accommodated Aublet's (1775) *Melastoma grandiflora* from French Guiana and a new species collected by Sessé and Moçônio in Mexico. De Candolle, who worked with Moçônio on the classification of the material to be treated in the Flora Mexicana (de Candolle 1828b) recognized that the Mexican species was intimately related to the French Guianian one, and besides conferring with Moçônio he also studied an illustration Sessé & Moçônio had drawn from a life specimen in the field and which formed part of a collection of plates he obtained on loan to Geneva to be copied (McVaugh 1982). Unfortunately, the two species have subsequently often been confused (e.g., Cogniaux 1883, 1891; Gleason 1938, 1958).

De Candolle placed two other previously described species in *Rhynchanthera*, Desrousseaux's *Melastoma dichotoma* (1797) and Richard's *Rhexia serrulata* (in Humboldt & Bonpland 1823) and described an additional 12 species in his new genus – all but one based on Martius' material from south-central Brazil. Only two of de Candolle's proposed species are here recognized;

a third has already been excluded from the genus by earlier workers (see Excluded taxa). Martius (1831), who in Brazil had had ample opportunity to observe *Rhynchanthera* in its natural habitat, in his "Nova genera et species plantarum" describes – and thus apparently recognizes – only two of the species de Candolle named from his collections.

Chamisso (1835) described the next known species in the genus, *R. brachyrhyncha* and *R. verbenoides*, from two specimens sent to Berlin by Sellow from southern Brazil. Bentham (1840) and Miquel (1840) redescribed *R. grandiflora*, already known from French Guiana, from Guyana and Surinam, respectively, and Naudin (1849) named another 15 species and three varieties. Three of these actually were new species collected in turn by Claussen in Minas Gerais, by Gardner in Goiás (Brazil), and by Weddell at the border between Goiás and Mato Grosso. Another new species was discovered in the eastern Colombian savannas (Ilanos) by Triana and described by him (1871).

The most recent monographer of the family, Cogniaux (1883, 1891, 1898) named numerous species and varieties (20), only one of which, in my opinion, merits taxonomic recognition. Likewise, the 16 additional species named by Moore (1895), Pilger (1902), Sprague (1905), Ule (1915), Hoehne (1922), Gleason (1925, 1931), and Brade (1959, 1960) are all synonyms of earlier taxa. Gleason (1935b) also transferred a species clearly misplaced in *Tibouchina* to *Rhynchanthera*, and in 1967 Wurdack described a new species from Venezuela, which to this date remains the most poorly collected one.

The genus is treated in several floras, e.g., those of British Guiana (Gleason 1932), Surinam (Gleason 1935a, Görts-van Rijn & Jansen-Jacobs 1988), Panama (Gleason 1958), French Guiana (Lemée 1953), Guatemala (Standley & Williams 1963), Mexico (Standley 1961), Peru (Macbride 1941), Santa Catarina, Brazil (Wurdack 1962), and Venezuela (Wurdack 1973).

Material and methods

This revision is based on the study of 1420 herbarium collections and on field work. I visited the following herbaria to select material, part of which was then usually requested on loan (acronyms according to Holmgren et al. 1981): AAU, B, BR, C, CAS, COL, F, G, G-DC, GB, GOET, HB, HBG, IAN, INPA, LISU, M, MG, MO, NY, P, QCA, R, RB, S, SP, SPF, U, US, VEN, and YU. In addition, material from the following herbaria was examined: BM, BHMH, CM, GH, K, L, LE, PH, UB, W and Z. The lists of selected collections following the descriptions generally cite one specimen per state except in the case of the most poorly collected species. A list of exsiccatae may be obtained upon request from the author; one copy is archived at the Missouri Botanical Garden.

Photographs are cited by negative number, preceded

by the herbarium acronym. Photo citations always follow the herbarium where the specimen shown on the photograph is deposited. Thus "W, F photo neg. ..." refers to a negative from the Field Museum of Natural History, J. F. Macbride type photo collection, showing a type stored in Vienna.

All measurements in the descriptions refer to dried material. For detailed analyses and comparative studies, floral organs were boiled in water for a few minutes and preserved in Hoyer's solution.

I investigated seeds of all species using scanning electron microscopy. The seeds – from mature capsules – were mounted on stubs, carbon-coated and then sputter-coated with gold-palladium and examined with a Hitachi S570.

Field observations on two species were made in Amazonia, Roraima, and Rondônia, Brazil, during 1980–82 and again in 1984 and near Rio de Janeiro and in Minas Gerais in January 1988 and 1989.

Morphology

Vegetative morphology

All species of *Rhynchanthera* are erect subshrubs or shrubs, 0.3–3 m tall. Occasionally they are called "herbs" but they are always woody at the base. Most appear to be short-lived perennials, but some species or populations may be biennial or annual. *Rhynchanthera grandiflora* and *R. hispida* reach maturity within a year after germination (pers. obs.). Branching is sympodial with lateral, more or less steeply ascending branches initiated in the upper half of the stem. This conforms to Rauh's model in the system of growth forms by Hallé et al. (1978; Cremers 1983). Stems and branches are usually obtusely quadrangular or sometimes subterete; however, *R. verbenoides* and *R. serrulata* are characterized by acutely 4-angled stems. The whole plants are typically covered by at least some, often numerous spreading glandular hairs, with the nodes bearing longer hairs than the rest of the branchlets. However, the density and glandulosity of the pubescence (about which more below) is quite variable within species.

Anatomically, the woods of *R. brachyrhyncha*, *R. grandiflora*, and *R. paludicola* have been studied by ter Welle & Koek-Noorman (1981). Average vessel member lengths were 300–510 (176–656) μm (but the genera of Melastomataceae overlap widely in this character), fiber/vessel ratios were 1.29–1.70, and rays were exclusively uniseriate as in most Melastomataceae. A clear tangential arrangement of the vessels could be seen in *R. paludicola*; *R. brachyrhyncha* differed in many characters from the other two species.

ter Welle & Koek-Noorman (1981) investigated two other species of the Microlicieae to which *Rhynchanthera* belongs (see Inter- and intrageneric relationships), representing *Trembleya* and *Bucquetia*. The *Trembleya* species had wood similar to that of *Rhynchanthera*;

Bucquetia differed in lacking parenchyma bands. The polygonal or round-oval pit shape and the absence of parenchyma bands are the only differences between the Microlicieae and their apparent closest relatives in the neotropics, the Tibouchineae. The latter have oblong – but sometimes also round – pits and parenchyma or pseudoparenchyma bands (ter Welle & Koek-Noorman 1981). However, pits of *Rhynchanthera* are described as “round and more often elongate” and the parenchyma as scarce, with paratracheal parenchyma bands scanty. Wood anatomy thus neither supports nor negates the present tribal position of *Rhynchanthera* in the Microlicieae. The unusualness of *R. brachyrhyncha* can not be evaluated in the absence of wood anatomical data for the 12 remaining species of the genus.

Bark in *Rhynchanthera* is usually brown and thin, often exfoliating in fine strips on the older parts of stems. In two species, viz. *R. novemnervia* and (rarely) *R. serrulata*, the base of the stem may be inflated and almost spongy with flaky, whitish or tan bark. This aerenchyma (originating in the pericycle) is likely an adaptation to the permanently water-saturated soils in which these marsh plants grow.

The leaves are always opposite and decussate, regularly spaced along the stem and branches, and often have axillary pairs of smaller leaves developed at each node. They are usually thin and smooth, held horizontally, and dry equally green or brown on both sides. An exception is *R. gardneri* with bullate, downward-bent leaves. Leaf shape varies enough in *Rhynchanthera* to be taxonomically useful; the majority of the 15 species has more or less ovate leaf blades, two have lanceolate or linear blades, the width being correlated with the number of lateral primary veins. The leaves are petiolate or (sub-)sessile; the latter is always true for lanceolate or linear leaves. The primaries arise at the blade base and run more or less longitudinally to the tip of the blade. They are elevated on the lower foliar surfaces and slightly impressed on the upper surfaces. The leaf margins are regularly serrulate or serrate, but this feature may be hidden by a dense hair cover of the upper leaf surface.

The pubescence on both leaf surfaces consists of multicellular, simple glandular hairs (the “long-stalked glands with thin-walled heads” of Wurdack 1986), a type common in the Melastomataceae. The glandular tips may be caducous. The hair covering is denser on the upper surface than on the lower, and in the present treatment it is described as strigulose-hispidulous, sericeous, strigose-hirsute, or lanate. Few species have glabrescent or glabrous leaves. Stomata occur on both foliar surfaces. In spite of initial hopes that the pubescence might be useful in recognizing species it proved to be of little taxonomic value in *Rhynchanthera*.

Small druses of calcium oxalate, few in number, have been reported in the spongy parenchyma and the collenchyma of the midrib in the leaves of the eight species

of *Rhynchanthera* investigated in a comparative leaf anatomical study of the Microlicieae and Tibouchineae (Pflaum 1897: 64–67; unfortunately, in the general part (p. 5) by mistake features observed in two species of *Lavoisiera* are discussed under *Rhynchanthera*. For a summary of Pflaum’s results, see Solereder 1899). Pflaum found that leaf anatomy was homogeneous in these species (“vollständig übereinstimmend”). From the descriptions it is clear that in the leaves anatomically *Rhynchanthera* possesses no features distinguishing it from the related genera *Trembleya* (7 species investigated), *Lavoisiera* (17), and *Microlicia* (40).

Reproductive morphology

In *Rhynchanthera* the major axis does not terminate in a flower at the first node but produces a sequence of four to eight nodes with lateral branches. The lateral branches produce fewer nodes, e.g., three to six in the lower (proximal) branches and one to three in the upper (distal) branchlets, before producing a terminal flower. These monotelic inflorescences are determinate thyrsi with partial inflorescences consisting of uniparous or biparous cymes. The cymes may be once- or twice-compound, with the former being more frequent (terminology following Cremers 1983, who illustrates *R. grandiflora*, *R. latifolia*, *R. verbenoides*, *R. brachyrhyncha*, and *R. ursina*; Sell & Cremers 1987 also discuss *R. brachyrhyncha*). Long proliferous shoots with short side shoots specifically for flowering are sometimes included on herbarium sheets (Ribeiro 1465, Renner 555, both *R. grandiflora*).

Three groups of species are discernible when inflorescence structure is considered: (1) species in which the lateral cymes are usually uniparous and which therefore have solitary axillary flowers, as in *R. hispida*, *R. serrulata*, *R. apurensis*, and *R. novemnervia*; (2) species with usually biparous, once-compound cymes, as in *R. ursina*, *R. gardneri*, and *R. bracteata*; and (3) species with usually biparous, often twice-compound cymes, as in *R. brachyrhyncha*, *R. verbenoides*, and all other species (species are here and in subsequent discussions listed in the order in which they appear in the taxonomic treatment).

In *Rhynchanthera*, the reproductive zone is little differentiated from the vegetative part of the plant, and the inflorescences bear leaves little modified from vegetative leaves. The leaves associated with the flowers become gradually smaller, narrower and subsessile distally, but resemble principal leaves in indument, color, and texture.

Pedicels are short (0.5 to maximally 3 mm long) and bear several pairs of minute bracts and bracteoles. These are membranaceous and caducous and vary greatly in size intra- and interspecifically.

Rhynchanthera flowers are 5-merous, actinomorphic, and borne slightly tilted (Figs 5A, 8A). In all species, the androecium becomes zygomorphic during anthesis

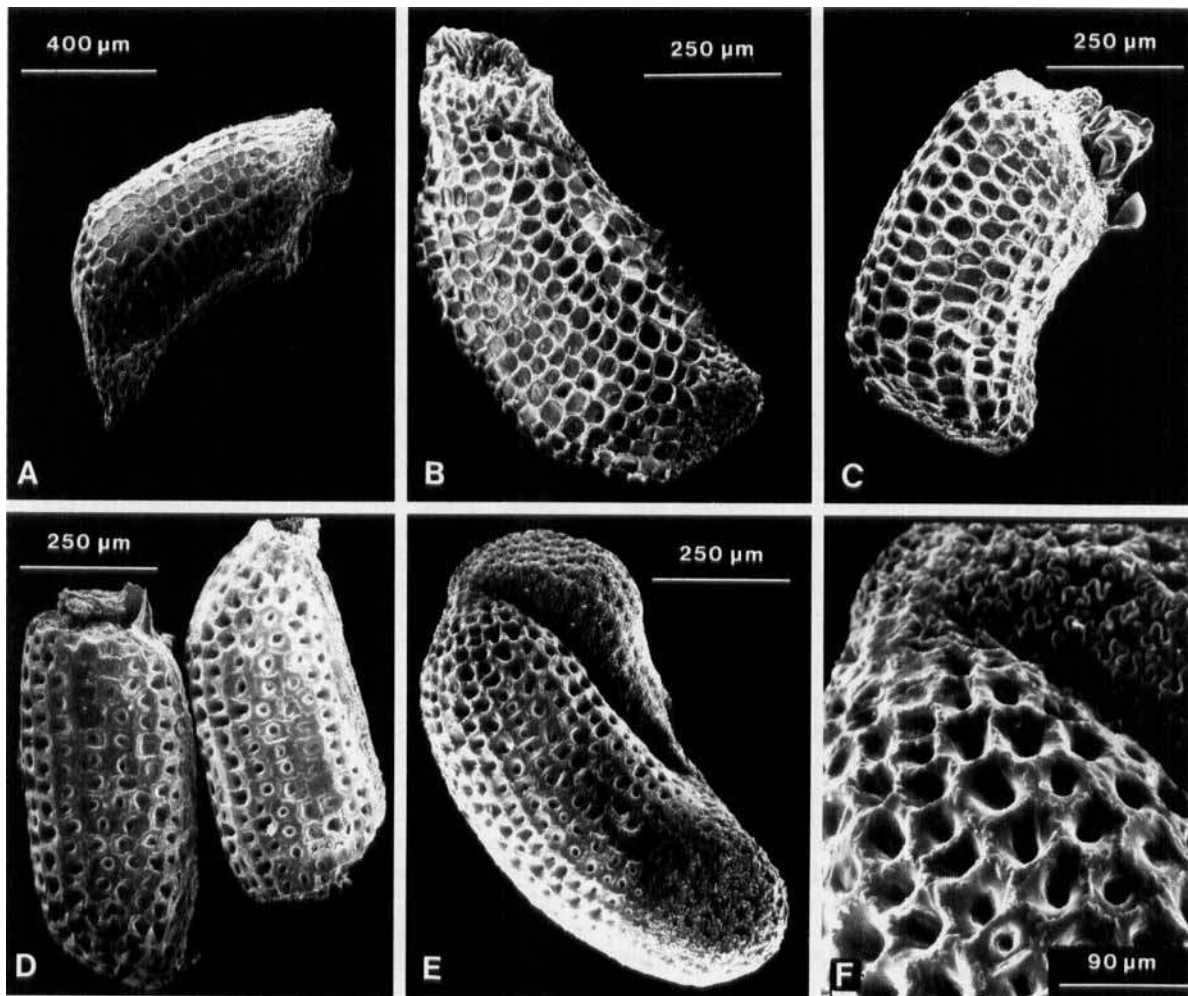


Fig. 1. Seeds (SEM). - A: *Rhynchanthera grandiflora*, Claussen 600 (US). - B: *R. cordata*, Reitz 661 (US). - C: *R. ursina*, Heringer 8535 (US). - D: *R. novemnervia*, Krapovickas & Schinini 31716 (US). - E, F: *R. novemnervia*, P. I. Oliveira 78 (US).

because the stamens and style decline, forming a tight bundle on one side of the flower. In 10 of the 15 species, the androecium is zygomorphic morphologically due to the dimorphism of the fertile stamens of which one is longer than the other four. The flowers are perigynous, with a well-developed campanulate hypanthium which is free from the ovary, but fully envelops it. The hypanthium is covered externally with the same indument as the upper leaf surface of the respective species. In some species the lower half of the hypanthium is glabrous and the upper half bears minute glandular hairs.

The calyx lobes are free or rarely united for a short distance (0.5 mm), triangular or linear-subulate, spreading during anthesis, and persistent. They may be almost as long or considerably longer than the hypanthium, and their length and shape helps to recognize species.

The five petals, convolute in bud, spread horizontally at anthesis. They are glabrous, obovate with a little

pronounced claw, and thin and fugacious, lasting two days (see Phenology, floral biology, and seed dispersal). In the majority of species, the petals are uniformly magenta (= purplish red), deep purple, or lavender. Intraspecific variation in petal color is known from *R. dichotoma*, with white-flowered plants occurring in Guyana.

There are five fertile stamens inserted in front of the sepals and five staminodia, 2–6 mm long, in front of the petals. The pink filaments are terete and glabrous. The connectives are always prolonged below the thecae and expanded ventri-basally into a small, simple or bilobed appendage (Figs 5C, 8C). In species with staminal dimorphism the appendages of the shorter stamens are always larger than the, sometimes almost absent, appendage of the single long stamen.

Rhynchanthera anthers are linear, and the two pollen-sacs terminate in a slender, spoon-shaped beak (rostrum), with a single apical opening. Although the beaks

in different species vary in length from 0.5–5 mm, i.e., by a factor of ten, the thecae are always between 3.5–5 mm long. Possibly this reflects evolutionary constraints on the volume of pollen grains needed to ensure pollination. The length of the anther beak relative to the thecae is a valuable taxonomic character.

The gynoecium consists of an ovoid ovary, which may be glabrous or have some glandular hairs, a sigmoid, thin, terete, glabrous style, and a punctiform stigma. The ovary is 3–4–5-locular, with the number of cells not completely stable in most species. Therefore, it has been accorded much less weight than in previous treatments where species were sometimes defined by the number of locules.

In *Rhynchanthera*, the fruit is a 3.5–8 mm high, dark brown, grey, or rarely purplish-black, semiwoody, campanulate or subglobose capsule, held upright (Figs 5D, 8C). It is enveloped by the hypanthial wall and dehisces loculicidally in the upper section. The capsules persist on the plants for many months after flowering has finished. Fruit color, size, and shape are of some taxonomic usefulness in the genus.

The seeds are numerous, dark brown, and small, 0.75–1 mm long. Seeds of all species were investigated using scanning electron microscopy. Figure 1 shows some of the variation in seed shape and seed coat sculpture encountered within and among species. The seeds are angular (Fig. 1A), subcubical (Fig. 1C), ellipsoidal (Fig. 1E), or straight and truncate at one end (Fig. 1D). The testa cells are regularly foveolate or lacunoso-reticulate; the periclinal walls are sunken whereas the anticlinal walls are thick and more or less strongly undulated in an almost star-shaped pattern (Fig. 1F). The latter is often seen in the oblong terminal hilar region. There is no secondary ornamentation.

The taxonomic value of seed characters in the Melastomataceae has a long tradition and is undisputed (Don 1823, Cogniaux 1891, Whiffin & Tomb 1972, Renner 1989b). In particular, seed and hilum shape are important to distinguish the Microlicieae (to which *Rhynchanthera* belongs) from the related Tibouchineae (which have cochleate seeds and a circular hilum). *Rhynchanthera* has typical microlicioid seeds (for illustrations of additional representatives of this seed type, see Whiffin & Tomb 1972).

Chromosomes

Solt & Wurdack (1980) reported chromosome numbers of $n = 10$, $n = 11$, and $n = (9)10$ for *Rhynchanthera grandiflora* and $n = 9$ for *R. serrulata*. The Central American *R. paludicola* is tetraploid with $n = 20$ (Davidse 1970). To date the chromosome number of only very few microliciean melastomes is known (Solt & Wurdack 1980) and no taxonomic extrapolations are possible yet.

Phenology, floral biology, and seed dispersal

For each species flowering time is given following the species' description. All seem to flower during the drier months, viz. the five species in eastern Colombia and adjacent Venezuela mainly from November to March, the four species in the Guianas and adjacent Brazil from May to October, and the nine south-central Brazilian ones from December to August. Two of the three Central American species have been collected flowering from January to September, that is, also during the rainy season (April–July or August); the third flowers from December to March. Based on label information, it seems that there is some niche partitioning in flowering times. For example, in the Município Laguna, Santa Catarina, Brazil, three quite frequently collected species flower in January–February, February–May, and April, respectively. One of them is known to have a relatively short flowering period of 6–8 weeks over its entire range. However, most species flower for extended periods of about half a year to eight months, and staggering of flowering times in sympatric congeners certainly does not play a large role (see Distribution and habitat). Near Manaus, in central Amazonia, *R. grandiflora* flowers all year round (pers. obs. in three years), with a flowering peak in the relatively drier months. In more seasonal climates, like that of Minas Gerais, the same species flowers for only two months. Single shrubs may flower for three to ten weeks. A medium-sized plant of *R. hispida*, on Maracá island, Roraima, Brazil, in November 1980 had 419 almost ripe capsules and buds for another four or five days of flowering, with 20 flowers per day. It flowered for a total of 21 days.

Flowers of *Rhynchanthera* open late in the morning, between 10 and 11 a.m. (pers. obs. for *R. grandiflora* and *R. hispida*; label data for *R. paludicola*), and close in the early afternoon of the same day. Flowers do not open again but fall off during the following day. They are visited and pollinated mainly by large and medium-sized anthophorid and euglossine bees and the smaller-flowered species also by halictids. Bees visit the flowers to collect pollen which is their only reward. (Scientific names of all captured pollinators are given in notes following the descriptions of *R. hispida*, *R. brachyrhyncha*, and *R. grandiflora*). As usual in Melastomataceae, the bees first land directly on the bundle of stamens and then extract the pollen grains from the tubular anthers using body vibrations. Pollen from all five anthers is deposited on the bee's abdomen which will contact the stigma of the next visited flower. Species with isomorphic stamens and species with dimorphic stamens which occur together are sometimes visited by the same bees (pers. obs.). They are pollinated in the same manner, and the staminal dimorphism thus seems to have no influence on the mechanism of pollination. The anthers of *Rhynchanthera* flowers are often destroyed by pollen-robbing *Trigona* bees (Renner 1983); chewed anthers

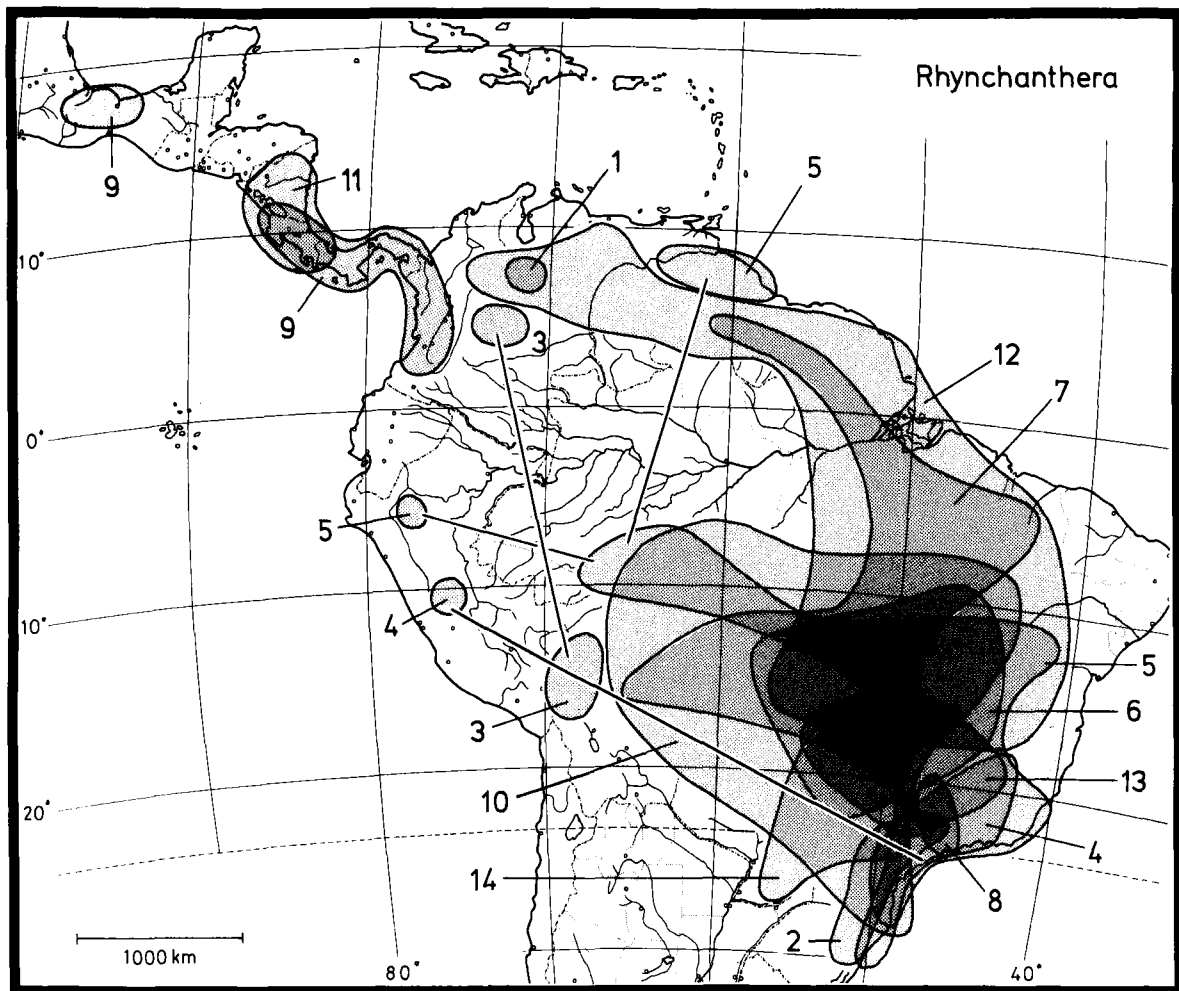


Fig. 2. Distribution of *Rhynchanthera*. The range of the most widespread species, *R. grandiflora* distributed from Mexico to Bolivia, is not included on this map. 1: *R. apurensis*. - 2: *R. brachyrhyncha*. - 3: *R. bracteata*. - 4: *R. cordata*. - 5: *R. dichotoma*. - 6: *R. gardneri*. - 7: *R. hispida*. - 8: *R. latifolia*. - 9: *R. mexicana*. - 10: *R. novemnervia*. - 11: *R. paludicola*. - 12: *R. serrulata*. - 13: *R. ursina*. - 14: *R. verbenoides*.

resulting from these bees' activity are frequently seen in herbarium specimens.

Rhynchanthera grandiflora is self-compatible and incapable of agamospermy (Renner 1984, 1989a). Due to the morphology of the anthers automatic selfing is exceedingly rare in the Melastomataceae and their flowers, even when self-compatible, normally depend on animal vectors for pollination.

The seeds are probably mainly wind-dispersed, but it is possible that they are also spread in mud on birds' feet or that they float at least for some distances (see Distribution and habitat). Fruiting starts while the plant is still flowering; individual capsules mature within a few weeks. The seeds are shaken out gradually, and often there are still some left in one year old capsules.

Distribution and habitat

Rhynchanthera is distributed from the state of Veracruz in Mexico south through Central America to Paraguay and southeast through the Guianas to Bahía and Santa Catarina, Brazil (Fig. 2). This corresponds to a latitudinal distribution from about 20°N to almost 30°S. The genus has not yet been recorded from the intervening countries Guatemala, Honduras, and Belize nor is it known from Ecuador. In the latter country, the moist savanna habitat *Rhynchanthera* species are adapted to is extremely restricted (to parts of the western coastal region), and the savannas in eastern Honduras, Belize and on the border to Guatemala seem to be mostly pine-savannas on stony substrate and thus drier than the ones in southern Mexico, eastern Nicaragua, and south-

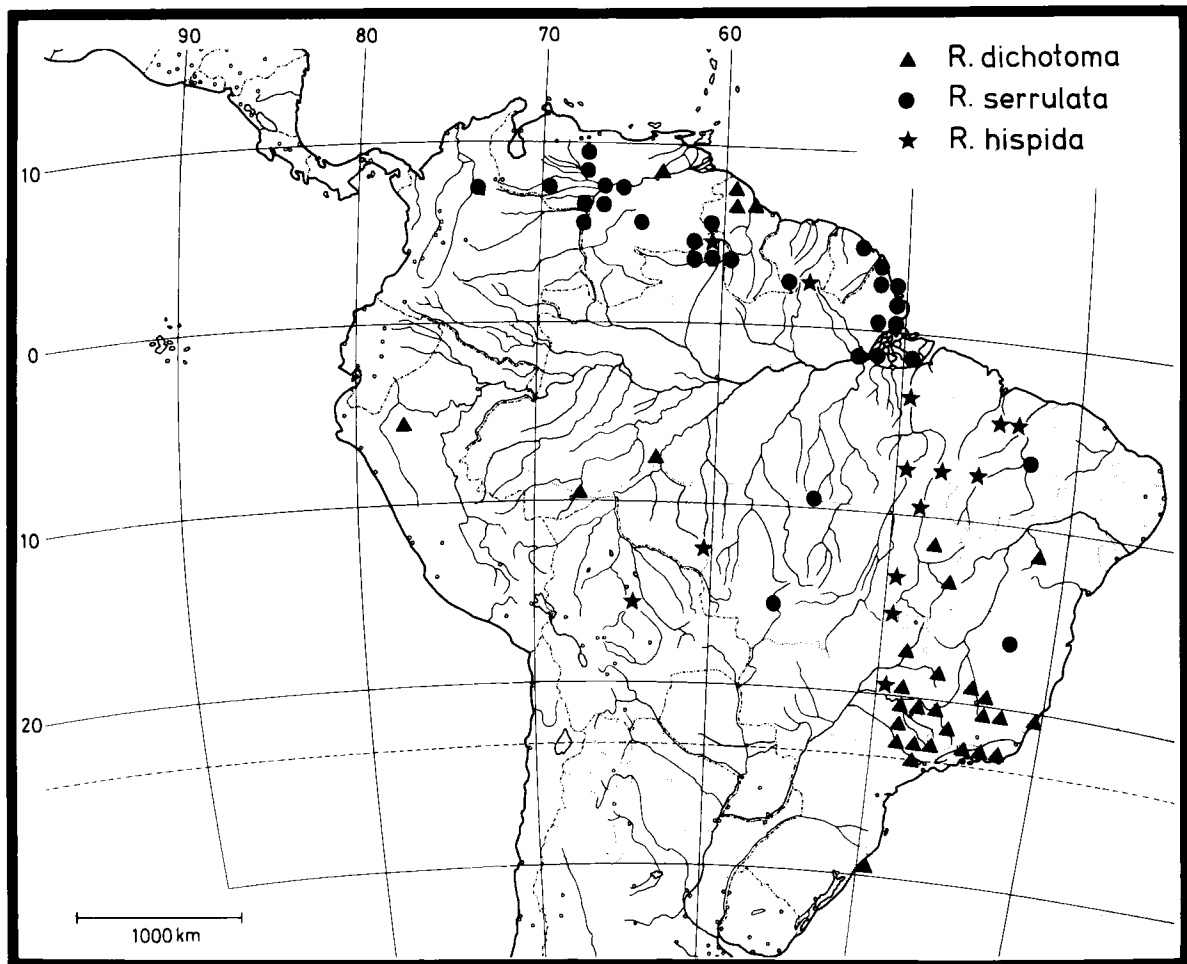


Fig. 3. Distribution of *Rhynchanthera* species.

west Panama where three species of *Rhynchanthera* occur.

Phytosociologically, *Rhynchanthera* belongs to the very widespread generalized tropical American savanna element comprising, e.g., *Curatella americana*, *Xylopia aromatica*, *Byrsonima crassifolia*, and certain grasses (Ducke & Black 1953; Eiten 1972; Huber 1987). It occurs in all of the principal savanna regions of South America as enumerated, for example, by Sarmiento (1984) and Huber (1987): the Brazilian cerrado, the savannas in northern Bolivia (Llanos de Mojos), the Venezuelan llanos of the Orinoco, the savannas of the Guayana region, the Amazonian campos of the Madeira River, and a few others. Whereas most species have wide or very wide ranges (Fig. 2), four species are locally endemic: the central Brazilian *R. ursina*, *R. gardneri*, and *R. latifolia*, and the Venezuelan *R. apurensis*, although the last may be an artefact of unequal collecting.

All species grow in moist places in grass or shrub savannas, for example, in depressions where water ac-

cumulates or along the margins of streamlets or ponds. They often occur in seasonally flooded marshes (wet campos) on clayey soil, with their roots standing in still or flowing water or in permanently water-saturated soil (Lindeman 1953: 109; Janssen 1986; pers. obs.). Frequently, *Rhynchanthera* is found associated with the palm *Mauritia flexuosa* Martius. This habitat undergoes pronounced seasonal changes, which may have preadapted at least some species for habitats disturbed by man. Thus, in Venezuela and central Amazonia, grass areas are commonly burned during the dry season, and *Rhynchanthera grandiflora* and *R. dichotoma* are able to quickly recolonize such areas from seeds (pers. obs. near Manaus and Humaitá, Amazonas, and near Rio Branco, Acre). These species are gregarious and may form large populations with hundreds of individuals growing next to each other.

The greatest diversity of *Rhynchanthera* is found on the Brazilian plateau (Fig. 2) where ten of the 15 species characteristically occur in the cerrado vegetation. Warming (1892), during his detailed study of the flora

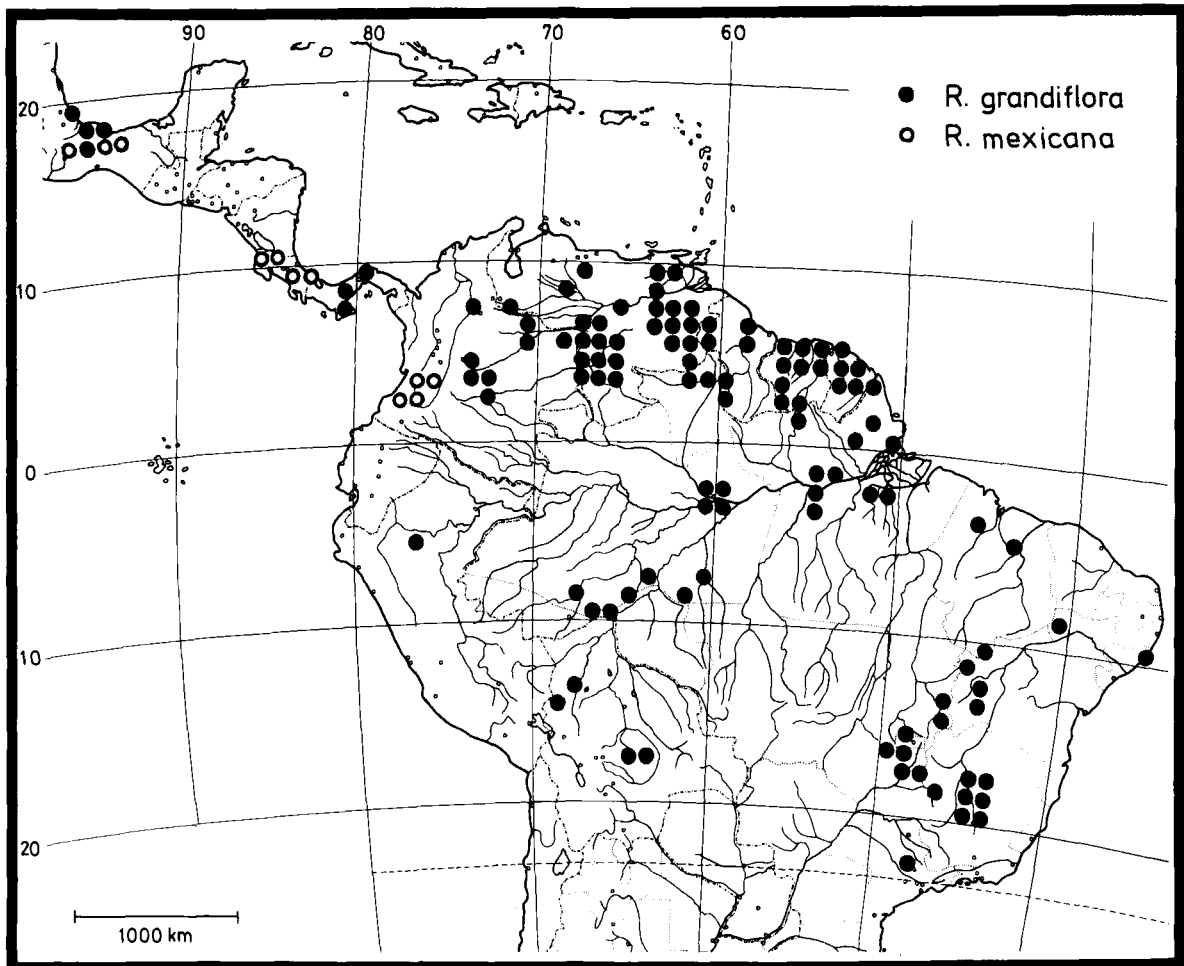


Fig. 4. Distribution of *Rhynchanthera* species.

around Lagoa Santa, observed and collected five *Rhynchanthera* species. Only six of these south-central Brazilian species, namely *R. dichotoma*, *R. cordata*, *R. grandiflora*, *R. hispida*, *R. serrulata*, extend beyond the Brazilian Shield.

Several impressive disjunctions are shown in Fig. 2: the south-eastern Brazilian species *R. cordata* (number 4 on the map) and *R. dichotoma* (5) also occur in Peru, and *R. bracteata* (3), until recently only known from the Colombian llanos, is now known to occur in Bolivia, 2200 km to the south. Often two or even three species are flowering simultaneously in the same savanna: *R. hispida* (number 7 on the map, Fig. 2) and *R. grandiflora* (Fig. 4) (grassy base of Serra Tepequem, Brazil, Maguire & Maguire 40000 and 40002; on Maracá island, Brazil, Renner 30 and 41; Sipaliwini savannas, Surinam, Oldenburger et al. 821 and 929); *R. dichotoma* (5) and *R. grandiflora* (Moyobamba, Peru, Mathews 1276 and 1273); *R. mexicana* (9) and *R. grandiflora* (several collections near Las Minas, Panama and Oaxaca, Mexico); *R. paludicola* (11) and *R. mexicana* (in Nicaragua, Nel-

son 4902 and Atwood & Nelson 4902); *R. serrulata* (12) and *R. grandiflora* (Rupununi River, Guyana, A. C. Smith 2267 and 2310; Surumú, Rio Branco, Brazil, Ule 8246 and 8245; Poponte, Magdalena valley, Colombia, C. Allen 871 and 785); *R. novemnervia* (10) and *R. serrulata* (Serra do Cachimbo, M. N. Silva et al. 85 and 62); *R. dichotoma*, *R. cordata*, and *R. novemnervia* (Mun. Laguna, Brazil, Ule s.n., Smith & Reitz 401, Hatschbach & Guimarães 29388); *R. novemnervia*, *R. ursina* (13) and *R. grandiflora* (several collections near Corumbá, Mato Grosso, Brazil); *R. dichotoma* and *R. ursina* (São Carlos, Brazil, Kuhlmann 3069 and 3069A); and *R. brachyrhyncha* (2) and *R. latifolia* (8) (Moji das Cruzes, Brazil, Glaziou 17517 and 17517b).

Since these species do not differ in their pollination mechanism (see p. 605) and are occasionally visited by the same bees, there appears to be no lack of opportunity for hybridization provided there are no genetic barriers. In herbarium material, I found two putative hybrids, Sucre 829 from Brasília, which is intermediate in leaf pilosity, sepals, and inflorescence branching pattern

between *R. grandiflora* and *R. novemnervia* and Ay-mard & Schargel 6993 from northeastern Venezuela, which is intermediate between the first species and *R. serrulata*.

Inter- and intrageneric relationships

The 15 species of *Rhynchanthera* form a closely-knit natural group which is probably monophyletic. Synapomorphies defining the group are the androecium of five staminodia and five fertile stamens and the thin leaves which often have serrulate margins. Whereas the first trait is unique in the family, the latter character is unique only within the narrower universe of related genera to be discussed presently.

The traditional placement of *Rhynchanthera* is in the Microlicieae (Naudin 1849; Triana 1865, 1871; Baillon 1877; Cogniaux 1891), a neotropical tribe characterized by more or less straight, ovoid or oblong seeds. De Candolle (1828a, b), whose classification of the family was not based on seed characters like the systems of all later workers, thought the genus resembled *Tibouchina* "un peu", and he accordingly placed it just before the tibouchinoid *Macairea*. The two share at least one trait: the usually dense glandular hair cover of the whole plant. However, the Tibouchineae have cochleate seeds and densely pubescent ovaries, and their leaves often possess scale-like emergences (tibouchinoid hairs illustrated, e.g., in Wurdack 1986). None of this is found in *Rhynchanthera*.

Triana (1865, 1871) and, following him, Hooker (1867) and Cogniaux (1891) placed *Rhynchanthera* next to *Lavoisiera*, *Trembleya*, and *Microlicia*. Baillon (1877) accorded mere sectional status to the first three within a broadly defined *Microlicia*. All are central Brazilian and share 5-merous flowers with well-developed calyx lobes, 3–5-loculicidal fruits, antepetalous stamens, which are smaller than the interpetalous ones, connectives which are more or less conspicuously prolonged below the thecae and expanded into ventral lobes, and spoon-shaped anther beaks. *Lavoisiera* (46 spp.) and *Microlicia* (ca. 100 spp.) are very close and much in need of revision; *Trembleya* (11 spp.) is currently an assemblage of species differing greatly in habit and pubescence. In none of these genera are the five antepetalous stamens completely reduced to filiform staminodia as in *Rhynchanthera*.

Furthermore, *Microlicia*, *Lavoisiera*, and *Trembleya* all show xeromorphic features whereas *Rhynchanthera* not only lacks such traits but, on the contrary, shows morphological adaptations to the constantly high ground water supply in its habit. Leaves in *Microlicia*, *Lavoisiera*, and *Trembleya* are much smaller and thicker than those of *Rhynchanthera*, and – different from *Rhynchanthera* – they usually bear few or no glandular hairs and have entire, not serrate or serrulate margins. However, at least one species of *Microlicia*, *M. pabstii*

Brade, has thin leaves like those of *Rhynchanthera* (but it has 10 fertile stamens).

Further differences between *Rhynchanthera* and related genera are merely quantitative, like the smaller ventral appendages on the connectives (compared to *Lavoisiera* and *Microlicia*) and the longer anther beaks in *Rhynchanthera*.

Within the genus, morphology throws little light on interspecific relationships. The most striking character – dividing the genus into two unequally-sized groups – is the dimorphism of the fertile stamens used by Naudin (1849), Triana (1871), and Cogniaux (1891) to recognize the sections *Anisostemon* and *Isostemon*. In the present taxonomic treatment the sequence of species follows the same phenetic classification. I have not accorded the two groups their former formal status (1) because I suspect that this dichotomy does not reflect cladistic branching and (2) because there are two species, *R. ursina* and *R. gardneri*, whose fertile stamens are only slightly dimorphic. In fact, Cogniaux (1891) placed *R. villosissima*, a synonym of *R. ursina*, in sect. *Isostemon*. The ancestral state was probably isomorphic and staminal dimorphism a later development, however, there is no evidence to decide whether dimorphism arose more than once and whether it was traded among species via hybridization. Because isomorphic androecia in my opinion are closer to the ancestral state, the species with this type of androecium are grouped together and treated before those with unequal stamens. Interestingly, and for reasons obscure to me, all earlier authorities (Naudin 1849; Triana 1871; Cogniaux 1891) placed the *Anisostemon* before the *Isostemon*.

There appears to be some correlation between the kind of androecium and geographical distribution. The five species with isomorphic stamens (*R. dichotoma*, *R. hispida*, *R. mexicana*, *R. paludicola*, and *R. serrulata*) occur predominantly in the northern part of the range of the genus. An exception is *R. dichotoma* which occurs in the Guianas and Peru but also in southern Brazil. The 10 species with dimorphic fertile stamens are from southcentral Brazil with the exceptions of *R. apurensis* (Colombia and Venezuela), *R. bracteata* (Bolivia and Colombia), and *R. grandiflora* (Mexico to Bolivia). One possible scenario is that the ancestors of today's species (with isomorphic androecia) had attained a wide distribution, leaving descendants in the Andes and Central America (*R. mexicana*, *R. paludicola*), Peru, Guyana, and French Guiana (*R. dichotoma*) and western Amazonia (*R. serrulata*, *R. hispida*), before the dimorphic androecium evolved in south-central Brazil. However, the seeds are well-suited for dispersal over long distances and relict distributions are impossible to distinguish from recent disjunctions.

Dimorphic stamens may be selectively superior – possibly providing a more convenient platform for the pollinating bees to settle on – or they may be associated with other advantageous characters; today, most species



Fig. 5. *Rhynchanthera paludicola*. - A: Habit. - B: Fruiting branchlet. - C: Dissected petal with two stamens and a staminodium. - D: Mature fruit.

have dimorphic fertile stamens and the most widespread and weediest one, *R. grandiflora*, exhibits the most pronounced heterostemony.

There is a lack of correlation between good andro-

cium characters (whether isomorphic or dimorphic, whether with long anther beaks or with short ones) and ovary, leaf and inflorescence characters: three pairs of vegetatively almost identical species, viz. *R. serrulata* and *R. verbenoides*, *R. mexicana* and *R. grandiflora*, and *R. dichotoma* and *R. cordata* have one member of the pair with equal, the other with unequal stamens. In the absence of criteria that would allow to judge which of these characters are the result of convergence, further speculation on the genealogy seems futile.

Uses

Devez (1932 cited in Lemée 1956: 93) says that Créoles in French Guiana use the flowers of *Rhynchanthera grandiflora* to prepare a syrup against respiratory illnesses, and this has recently been confirmed (Grenand et al. 1987). However, the scarcity of common names indicates that uses are of minor importance.

Taxonomic treatment

Rhynchanthera DC., nom. cons.

De Candolle, Prodr. 3: 106. 1828. - Type: *R. grandiflora* (Aubl.) DC.

Shrubs or subshrubs, 0.30–2(-3) m tall; branchlets subterete, obtusely angular, or slightly or strongly 4(-6) angled, more or less densely hirsute with glandular hairs. Leaves decussate, ovate, broadly ovate, narrowly ovate or lanceolate to linear, petiolate, subsessile, or sessile, thin, margins serrulate, serrate, or (rarely) appearing entire due to a dense hair covering, 3–5–9-nerved, with 1–4 pairs of more or less longitudinal lateral primary veins arising at the base of the blade, both surfaces with glandular hairs or glabrous. Inflorescences terminal and thyrsoid consisting of few- to many-flowered biparous or uniparous cymes. Bracts leaflike and distally gradually reduced in size. Flowers hermaphroditic, 5-merous; hypanthium campanulate; calyx lobes linear-subulate or more or less triangular, spreading, persistent; petals obovate, thin, reddish-pink, purplish red, or magenta, occasionally white; antesepalous stamens 5, fertile, alternating with 5 abortive antepetalous staminodia, the fertile stamens isomorphic or more often dimorphic with one stamen larger than the others; filaments thin, terete, glabrous; anthers subulate with a pronounced beak (rostrum), single-pored, the connective greatly prolonged below the thecae to the filament insertion and with a small anterior simple or bilobed appendage; ovary subglobose, free, perigynous, 3–5-locular, apically setose with glandular hairs or glabrous; style thin, terete, declined or subsigmoid, more or less glabrous; stigma punctiform. Fruit a 3–5-loculicidal, dark brown or grey, subglobose or campanulate capsule; seeds numerous, 0.75–1 mm long, nearly straight, hilum basal, testa regularly reticulate-foveolate.

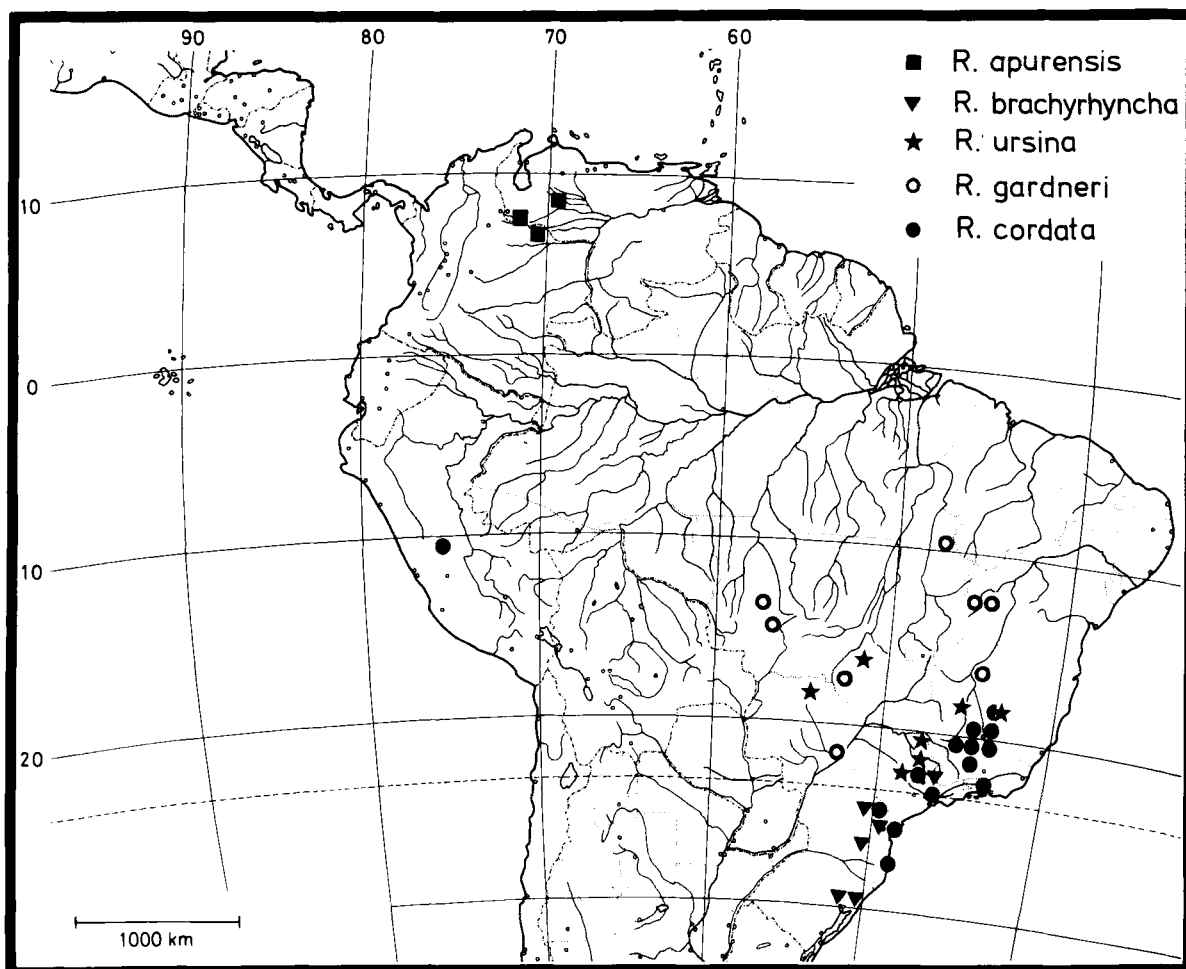


Fig. 6. Distribution of *Rhynchanthera* species.

Nomenclatural note. The generic synonym *Proboscidia* L. C. Rich. ex DC. listed by Cogniaux (1891: 97) was not validly published.

Key to the species

N.B.: Sterile or fruiting material of three species pairs cannot be securely identified (see Inter- and intragenetic relationships).

- 1. The five fertile stamens subisomorphic (Fig. 5c)..... 2
- 1. The five fertile stamens dimorphic with one conspicuously longer than the other four (Fig. 8b) 6
- 2. Leaf blades lanceolate to linear, base acute, subsessile (the petiole to 0.8 cm long) or sessile, with 1(-2) pairs of lateral primary veins..... 2. *R. serrulata*
- 2. Leaf blades ovate or narrowly ovate, base cordate, rounded or subacute, petiolate, with 2-3-4 pairs of lateral primary veins 3
- 3. Cymes distally uniparous with solitary, axillary flowers, anther beaks (1-)2 mm long 1. *R. hispida*
- 3. Cymes distally regular biparous, the flowers usually aggregated at the tips of the branchlets, anther beaks (2-)3(-5) mm long 4

- 4. Upper leaf surface sparsely to densely strigulose with appressed hairs ca. 1 mm long; calyx lobes narrowly triangular, 2-3(-3.5) mm long; thecae (2.2-)3(-4) mm long..... 3. *R. dichotoma*
- 4. Upper leaf surface densely strigulose or strigose-hirsute with curved or patent hairs 1.5-3 mm long; calyx lobes linear-subulate, 5-9 mm long; thecae 4-5(-5.5) mm long 5
- 5. Leaves densely strigulose with curved hairs 1.5-2 mm long, with 3-4 pairs of lateral primary veins, petioles 1-1.5 cm long; ovary 5-celled 4. *R. mexicana*
- 5. Leaves laxly glandular strigose-hirsute with patent hairs 1-3 mm long, with 2-3 pairs of lateral primary veins, petioles 1.8-2.5 cm long; ovary 3(-4)-celled 5. *R. paludicola*
- 6. Stem and branchlets more or less acutely 4-6- angled. 8
- 6. Stem and branchlets subterete or obtusely angular. ... 8
- 7. Leaf blades lanceolate to linear, base acute or obtuse, with 1-2 pairs of lateral primary veins; calyx lobes 6-8 mm long; anther beaks 2-3 mm long, connective below the thecae to the filament insertion in the longest stamen 13-15 mm long; fruit 6-8 mm high..... 12. *R. verbenoides*
- 7. Leaf blades broadly ovate, base rounded or subcordate, with 3(-4) pairs of lateral primary veins; calyx lobes 3-5 mm long; anther beaks 3-4 mm long, connective below the

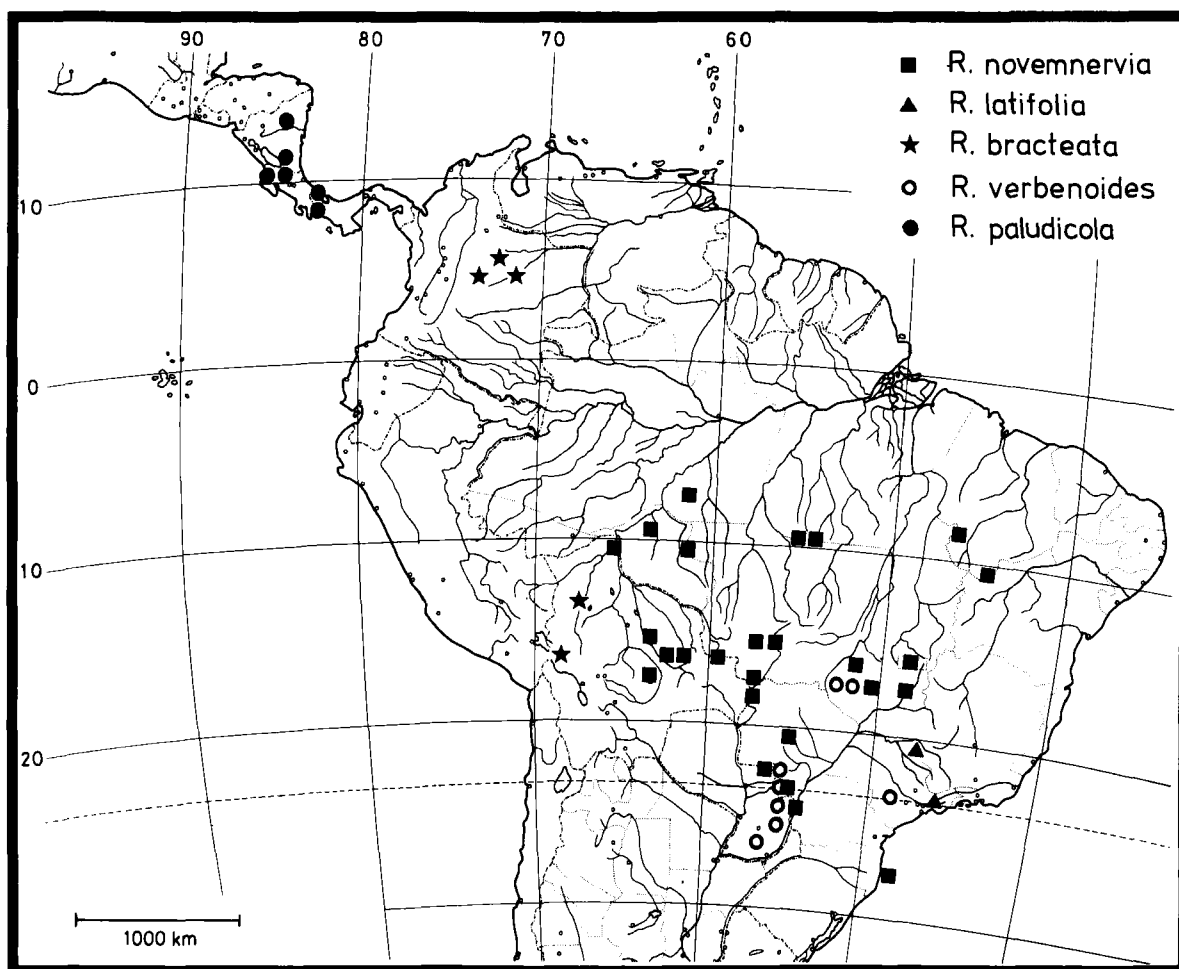


Fig. 7. Distribution of *Rhynchanthera* species.

- thecae to the filament insertion in the longest stamen 8–9 mm long; fruit ca. 5 mm high 13. *R. latifolia*
8. Leaf blades bullate, appressed downward, sessile, moderately to densely lanate with 1–3 mm long soft, whitish or yellowish hairs 7. *R. gardneri*
8. Leaf blades smooth, spreading, petiolate or sessile, densely strigulose-hispidulous to sericeous or laxly pilose with 0.5–1–2–3(-5) mm long brown, brown-red, or reddish-golden hairs, or nearly glabrous 9
9. Anther beaks 0.5–1 mm long 9. *R. brachyrhyncha*
9. Anther beaks 1.5–5 mm long 10
10. Leaves laxly pilose with minute hairs, 0.5–1 mm long, glabrescent, or nearly glabrous 11
10. Leaves densely strigulose-hispidulous or sericeous with hairs 1–3 mm long 13
11. Inflorescence with distally uniparous cymes; flowers subsessile, pedicels 0.5–1 mm long; hypanthium at anthesis 3.5–6 mm long; capsules 7–8 mm high 12
11. Inflorescence with distally regularly biparous cymes; flowers with pedicels 1.5–2 mm long; hypanthium at anthesis 2.8–3.2 mm long; capsules 4–7 mm high .. 8. *R. cordata*
12. Hypanthium at anthesis 3.5–4 mm long; calyx lobes 1.8–2.2 mm long; petals 8–12 mm long; thecae 3–3.5 mm long, anther beaks 1.5–2.2 mm long, connective below the thecae to the filament insertion in the longest stamen ca. 5 mm long 10. *R. apurensis*
12. Hypanthium at anthesis 5–6 mm long; calyx lobes (3-)4–6 mm long; petals (13-)20–25 mm long; thecae (4-)5–6 mm long, anther beaks 3–4 mm long, connective below the thecae to the filament insertion in the longest stamen 7–13 (-15) mm long 11. *R. novemnervia*
13. Leaves sessile or subsessile, petiole to 0.3 cm long 14. *R. bracteata*
13. Leaves petiolate or subsessile, petiole 0.5–3.7 cm long 14
14. Calyx lobes 6–15 mm long; the 5 fertile stamens strongly dimorphic with one much longer than the others, connective below the thecae to the filament insertion in the longest stamen 10–18 mm long 15. *R. grandiflora*
14. Calyx lobes 3–4(-5) mm long; the 5 fertile stamens slightly dimorphic with one somewhat longer than the others, connective below the thecae to the filament insertion in the longest stamen 7–10 mm long 6. *R. ursina*
- 1. *Rhynchanthera hispida* Naudin**
Ann. Sci. Nat. Bot. III, 12: 212. 1849. – Type: Weddell 2213, Brazil, border Goiás/Mato Grosso, banks of Rio Araguaia, Jun/Jul 1844 (P holotype, F frag., G-DC, P isotypes).
Rhynchanthera intermedia Naudin, Ann. Sci. Nat. Bot. III, 12: 211. 1849. – Type: Weddell 2183, Brazil, Goiás/Mato Grosso, May/Jul 1844 (P holotype).
Rhynchanthera virgata Wurdack, Mem. New York Bot.

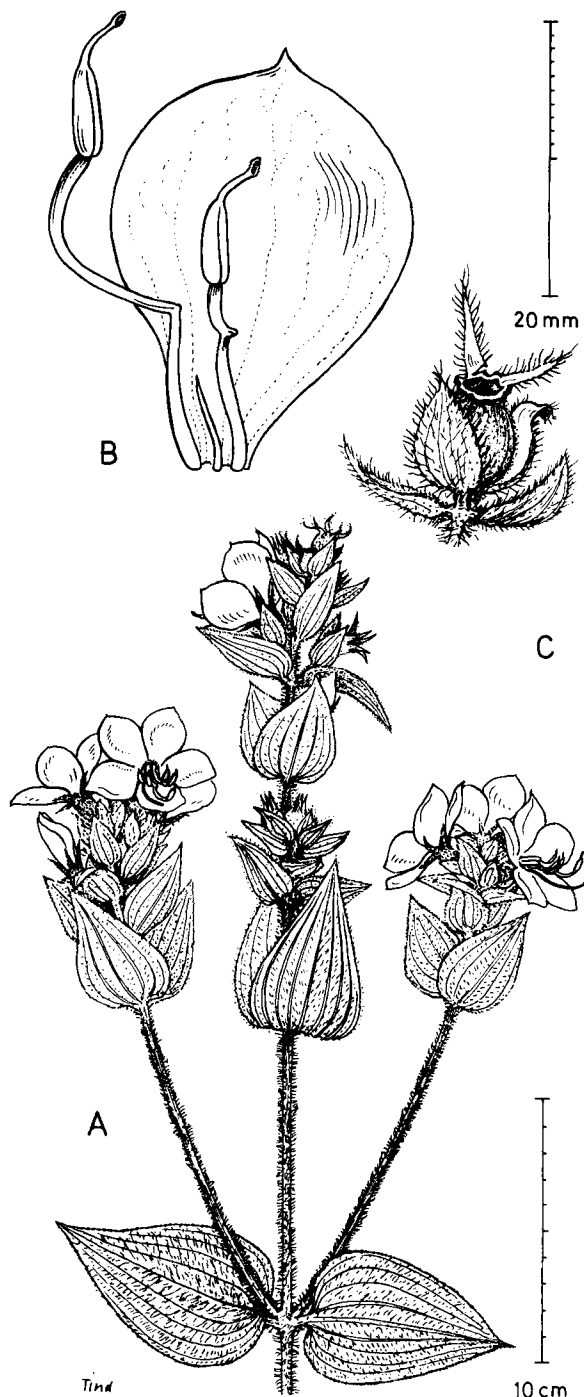


Fig. 8. *Rhynchanthera bracteata*. - A: Habit. - B: Dissected petal with two stamens and a staminodium. - C: Mature fruit.

Gard. 10: 96. 1958. - Type: Maguire & Maguire 40000, Brazil, Roraima, Serra Tepequem, 800 m, 19 Nov 1954 (NY holotype; RB, S, US isotypes).

Subshrub or shrub, 1–1.50 m high, stem obtusely angu-

lar, stem, petioles and inflorescence conspicuously glandular-tomentose with patent hairs 2–5 mm long. Leaves spreading, the petiole (1–)2–5 cm long, blade ovate, 7–9 × 3–7 cm, base cordate, apex acute, with 3–4 pairs of lateral primary veins diverging at the base of the blade, on both surfaces laxly strigose hirsute with patent whitish or tan hairs ca. 2 mm long, margins minutely regularly serrate. Inflorescence thyrsoid with proximally biparous, distally uniparous cymes with solitary axillary flowers. Flowers subsessile, pedicels ca. 1 mm long; floral bracts similar to the principal leaves but much reduced in size upward and becoming subsessile; hypanthium (at anthesis) 3–4 mm long, laxly glandular-pubescent with patent hairs; calyx lobes triangular, 3–5 mm long, with a scattering of glandular hairs and an apical glandular seta; petals magenta, obovate, 12–14 mm long; the five fertile antepetalous stamens subisomorphic, filaments 3.5–4 mm long, thecae 4–5 mm long, beak (1–)2 mm long, connective below the thecae to the filament insertion ca. 3 mm long, inappendiculate, the five antepetalous staminodia ca. 3 mm long; ovary 3(-5)celled, glabrous. Fruit a 6–8 mm high brown capsule.

Distribution and habitat: (Fig. 3) *Rhynchanthera hispida* occurs from southern Surinam through Brazil south to Bolivia. It grows in moist depressions in grass savannas or in gallery forest from sealevel to ca. 200 m altitude. The species is expected in the savannas of southern Venezuela and southwestern Guyana. Collected flowering from the end of May until the beginning of November and with mature fruits from August until January.

Notes: *Rhynchanthera hispida* is shown on a plate in the *Flora brasiliensis* (Cogniaux 1883, pl. 45) but this illustration shows a plant just beginning to flower, and therefore the distally uniparous cymes characteristic of older plants are not yet fully developed.

Triana (1871) synonymized *R. intermedia* under *R. cordata*, but that species has dimorphic fertile stamens. He may have been misled by the protologue of *R. intermedia* which describes one stamen as longer than the others. In the flowers of the type of *R. intermedia*, Weddell 2183, one of the five stamens is indeed slightly longer than the others, but this dimorphism is by no means comparable to the strong heterostemony found in *R. cordata*. In inflorescence branching and overall habit, Weddell 2183 agrees completely with *R. hispida*, and Cogniaux's decision (1883) to synonymize it under that species seems justified. Maguire and Maguire 40000, the type of *R. virgata*, has the lax pubescence and the floral features characteristic of *R. hispida* and belongs to this species.

In northern Brazil (Maracá island, Roraima), *R. hispida* is pollinated by such medium-sized bees as *Xylocopa transitoria* Perez and *Centris fuscata* Lepeletier (Renner 1989a). The anthers are often destroyed by pollen-robbing *Trigona* bees (Renner 1983), and anth-

ers that have been chewed on by *Trigona* can also be seen in the flowers of herbarium specimens.

Selected collections: (27 collections examined). Surinam: Sipaliwini savanna, Jan 1969, Oldenburger et al. 821 (U).

Brazil: Goiás: 2–6 km N of Miracema do Norte, Jul 1964, Prance & Silva 58464 (F, NY, U, UB, US); Corumbá de Goiás, Jun 1976, Heringer 15838 (HB, NY, US); near S. Antônio on Rio Santo Antônio, Pohl 1816 (G, LE, M, NY, W); near Cocães, Pohl 1818 (BR, W); Estr. do Norte or Estr. do Canastra, Aug 1895, Glaziou 21328 (BR, G, LE, P, R, US). – Maranhão: Rio Tocantins, Ilha dos Botos, near Carolina, May 1950, Pires & Black 2019 (IAN, MG, NY, US); SSE of Loreto, at community of Sta. Barbara on Parnaíba river shore, May 1962, Eiten & Eiten 4691 (MO, NY, SP, US); Mun. Caxias, Jun 1972, Sucre 9381 (RB). – Minas Gerais: Ituiutaba, Cachoeira Dourada, Aug 1948, Macedo 1073 (MO, NY, RB, S, SP, US). – Pará: Conceição do Araguaia, along Rio Araguaia, Jun 1953, Fróes 29723 (IAN, US); Tucuruí, Jan 1980, M. G. Silva 5488 (INPA, MG, NY). – Rondônia: Vilhena, near airport, May 1979, Silva & Rosario 4612 (MG, NY); Caminho de Maloca, Buritará to São Luiz, Apr 1948, Scolnik & Luti 750 (US). – Roraima: Maracá island in the Rio Uraricoeira, tributary of Rio Branco, May 1982, Renner 831 (HBG, INPA, US).

Bolivia: Beni: Prov. Marlón, Est. Exp. Perotó, 57 km ESE of Trinidad on rd. to Sta. Cruz, 15°20' S, 64°25' W, Jul 1982, Solomon et al. 8174 (US).

2. *Rhynchanthera serrulata* (L. C. Rich.) DC.

Prodr. 3: 108. 1828. – *Rhexia serrulata* L. C. Richard in Humboldt & Bonpland, Monogr. Melast. 2: 74, tab. 28. 22 Jan [1813] 1823. – Type: Richard s.n., French Guiana, Savannes de Matouty (P holotype, F photo 36116; F frag., L, P, S isotypes).

Rhynchanthera salicifolia De Candolle, Prodr. 3: 109. 1828. – Type: Martius s.n., Brazil, Piauí, Apr. 1819 (M holotype).

Rhynchanthera modesta Naudin, Ann. Sci. Nat. Bot. III, 12: 212. 1849. – Type: Ri. Schomburgk 523 = 817B, Guyana, Roraima, 1842–43 (P holotype, BM, G, G-DC, GH, NY, P, U, W isotypes).

Rhynchanthera parviflora Naudin, Ann. Sci. Nat. Bot. III, 12: 213. 1849. – Type: Le Prieur s.n., French Guiana, sine loc. (P holotype, BM, F, G, L, NY, P, US isotypes; B destroyed, but represented by a photo, F 16648).

Rhynchanthera glazioviana Cogniaux in Martius, Fl. bras. 14 (3): 189. 1883. – Type: Glaziou 9828 (leg. Schwacke), Brazil, Alto Amazonas (C holotype, F photo 21202; K, P, F photo 36113, R, US frag. ex P isotypes).

Subshrub, 0.3–0.8 m tall, stem and branchlets slightly or strongly 4–6-angled, stem, petioles and inflorescence laxly glandular-setose to tomentose with soft, sometimes slightly curved hairs, 0.5–2.5 mm long. Leaves spreading, subsessile or sessile, the petiole to 0.8 cm long, blade lanceolate to linear, (1.7–)5.5(–7) × 0.2–0.9 cm, base and apex acute, with 1(–2) pairs of lateral primary veins diverging at the base of the blade, on both surfaces sparsely appressed pilose with whitish or tan hairs to 2 mm long or nearly glabrous, margins minutely to distinctly irregularly serrulate. Inflorescence thyrsoid, ample, with distally uniparous cymes, the flowers aggregated at the tips of the branchlets. Flowers subsessile, pedicels ca. 1 mm long; floral bracts similar to the principal leaves but much reduced in size upward and becoming subsessile; hypanthium (at anthesis) 3–4 mm long, softly glandular-setulose; calyx lobes linear-

subulate to narrowly triangular, 5–8 mm long, glandular-setulose; petals magenta, obovate, 12–15 mm long; the five fertile antepetalous stamens subsisomorphic, filaments 3–4 mm long, thecae (3–)5(–6.5) mm long, beak 2.5–3(–4) mm long, connective below the thecae to the filament insertion 2.54.5 mm long, anteriorly at the insertion point slightly tuberculate, the five antepetalous staminodia 2–3 mm long; ovary 3(–4)-celled, glabrous or sparsely pilose. Fruit a 4–5 mm high brown capsule.

Distribution and habitat: (Fig. 3) *Rhynchanthera serrulata* occurs in eastern Colombia, through Venezuela and the Guianas to Brazil, with a southern limit of distribution in Minas Gerais and Mato Grosso. It grows in wet places in grass or scrub savannas (cerrado), often in marshes or along the sandy, peaty edges of drying pools; from sealevel to low elevations. Collected flowering in July, August, and October in the Guianas and northernmost Brazil (Amapá), from October to December in Venezuela, and in December in Colombia. In Brazil south of the equator, *R. serrulata* flowers from May to August.

Notes: Humboldt & Bonpland's description of *R. serrulata* is accompanied by an engraving (pl. 28).

Though the label of Glaziou 9828 (the type of *R. glazioviana*) states "Espírito Santo, Itapemirim", the specimen was likely collected by Schwacke in Pará (Wurdack 1970). It has all attributes of typical *R. serrulata*. Naudin's *R. modesta* and de Candolle's *R. salicifolia* were already synonymized by Triana (1871) because their types are clearly typical representatives of *R. serrulata*.

In habit *R. serrulata* resembles *R. verbenoides* except for a less acutely angular stem. However, the latter species has isomorphic fertile stamens. Their ranges do not overlap. The base of the stem in *R. serrulata* sometimes has a curiously whitish, flaky bark, e.g., in Davidse 2927.

Selected collections: (83 collections examined). Guyana. Mt. Roraima, Oct 1927, Tate 142 (NY); Rupununi Distr., Chaakoi-tou, just S of Kanuku Mts., 28 Oct 1979, Maas & Westra 4092 (CAS, NY, U); Rupununi River, Wichabai, 25/26 Oct 1937, A. C. Smith 2276 (F, G, MO, NY, P, S, U, US).

Surinam: Sipaliwini savanna, 295 m, Oct 1968, Oldenburger et al. 367 (NY, U).

French Guiana: Pariacabo, Jul 1914, Benoist 1403 (P); Macouria to Guatemala, km 4, Aug 1961, R. Schnell 11039 (P); Piste de St. Elie, Oct 1984, Prevost 1666 (US).

Colombia: Cesar: Poponte, Dec 1924, C. Allen 871 (MO).

Venezuela: Apure: Mantecal, Oct 1980, Stergios 2396 (MO, US). – Bolívar: 127 km SW of Caicara del Orinoco, Sep 1985, Steyermark et al. 131342 (MO, US); Caicara-Puerto Ayacucho rd., km 154, Werff & Holst 7753 (CAS, MO, US); 1–3 km E of Rio Orinoco between mouth of Rio Horeda and Cerro Gavilan (Cerro Carichana), 100 m, Dec 1955, Wurdack & Monachino 39922 (F, GH, IAN, MO, NY, RB, U, US, W). – Guárico: Calabozo, Feb 1961, Aristeguieta 4511 (NY, US); Nov 1971, Davidse & Pohl 2927 (MO, US); Sta. Rita-Cabruta rd., 20 km from Sta. Rita, Nov 1973, Trujillo 12525 (F).

Brazil: Amapá: Parque Florestal de Amapá, Oct 1979, Austin et al. 6998 (GH, MO, NY, US); Lago Cujubim, Aug 1962, Pires & Cavalcante 52463 (COL, F, IAN, MG, NY, S, US); Oiapoque, Aug. 1981, Rabelo 1314 (MG). – Maranhão: Perizes, Jul 1954, Black et al. 54-16569 (HB, IAN, NY, US); Imperatriz, Aug 1949, Pires & Black 1744a (IAN). – Mato Grosso: Município Cuiabá, S. Jose da Serra, May 1973, Hatschbach 32047 (C, HB, HBG, M, NY, R, SPF, US); 78 km E of Cuiabá, 2 km W of São Vicente, Jul 1984, Mori et al. 16828 (F, NY, US). – Pará: Sta. Cruz dos Martírios, Araguaia river, Jun 1953, Fróes 29767 (IAN, US); between Cristalândia and Gurupí, Belém-Brasília highway, Aug 1963, Maguire et al. 56162 (F, NY, RB, US); Currálinho, Aug 1948, Pires 1253 (GH, IAN, NY, U, US); Serra do Cachimbo, Apr 1983, M. N. Silva et al. 62 (NY, US); Rio Camara, Ilha do Marajó, Jul 1950, Black 50-9913 (IAN, NY, US). – [Piauí: see above, type of the synonymized *R. salicifolia*]. – Roraima: Malacacheta, E of Boa Vista, Dec 1977, Steward et al. 249 (GH, MO, NY, PH, US); Rio Branco, Rio Surumú, Sep 1909, Ule 8246 (G, L, MG, U).

3. *Rhynchanthera dichotoma* (Desr.) DC.

Prodr. 3: 107. 1828. – *Melastoma dichotoma* Desrousseaux in Lamarck, Encycl. 4: 41. 1797. – Type: Dombey s.n., Brazil, Rio de Janeiro (P-JUSS holotype).

Rhynchanthera pentanthera De Candolle, Prodr. 3: 108. 1828. – Type: Martius s.n., Brazil, Minas Gerais, in sylvis udis (G-DC holotype).

Rhynchanthera schrankiana De Candolle, Prodr. 3: 107. 1828. – Type: Brazil, Minas Gerais, Fanado (= Vila Bom Sucesso), Jul 1818, Martius s.n. (M holotype, BM, BR frag., G, G-DC, GH, M, L, MO, P isotypes).

R. schrankiana var. *quadrivalvis* Naudin, Ann. Sci. Nat. Bot. III, 12: 214. 1849. – Type: Blanchet s.n., Brazil, Bahía (P lectotype, selected here, P three isotypes).

Rhynchanthera hookeri Naudin, Ann. Sci. Nat. Bot. III, 12: 212. 1849. – Type: Mathews 1276, Peru, San Martín, Moyobamba (P holotype, BM, F frag., G, F photo 26098, GH, LE, P isotypes).

Rhynchanthera regnellii Cogniaux in Martius, Fl. bras. 14 (3): 184. 1883. – Type: Mosén 371 = 3875, Brazil, São Paulo, Campinas, 5 Jul 1873 (S holotype; BR, P, S isotypes).

Rhynchanthera riedeliana Cogniaux in Martius, Fl. bras. 14 (3): 184. 1883. – Type: Riedel 517, Brazil, Minas Gerais, Aguas Quentes, 10 Sep 1824 (LE lectotype, selected here, GOET, M, P, US, W isotypes; B destroyed but represented by a photo, F 16650).

Rhynchanthera maximowiczii Cogniaux in Martius, Fl. bras. 14(3): 185. 1883. – Type: Riedel 2268, Brazil, Minas Gerais, Batatais, May 1834 (LE holotype, BR, P isotypes).

Rhynchanthera hispida Naudin var. *villosa* Cogniaux in Martius, Fl. bras. 14(3): 187. 1883. – Type: Gardner 4142, Brazil, Goiás, São Domingos, May 1840 (BR holotype, BM, F frag., G, NY, P, W isotypes).

Rhynchanthera williamsii Gleason, Bull. Torrey Bot. Club 58: 216. 1931. – Type: L. Williams 7284, Peru, San Martín, San Roque, 1350–1500 m, Jan/Feb 1930 (NY holotype, F, G isotypes).

Subshrub or shrub, 0.35–1.5 m tall, stems and branchlets obtusely angular or subterete, stem, petioles and inflorescence sparsely to densely glandular-puberulous with hairs 0.5–1 mm long. Leaves spreading, the petiole 1–4 cm long, blade ovate, 5–10 × (2-)4.5–7 cm, base cordate, apex acute, with 3–4 pairs of lateral primary veins diverging at the base of the blade, sparsely to densely appressed strigulose above, sparsely to moderately strigulose-hispidulous beneath with sometimes gland-tipped brown hairs ca. 1 mm long, margins very

finely serrulate to quite conspicuously serrate. Inflorescence thyrsoid, usually ample and much-branched with regularly biparous cymes, the flowers aggregated at the tips of the branchlets. Flowers subsessile, pedicels ca. 1 mm long; floral bracts similar to the principal leaves but gradually reduced in size upward; hypanthium (at anthesis) 3–4(-6) mm long, sparsely to moderately to densely glandular-setulose or hirsute; calyx lobes narrowly triangular, 2–3(-3.5) mm long, glandular-setulose or glabrous; petals magenta or white, obovate, 8–12 mm long; the five fertile antepetalous stamens subsomophic, filaments 3–4 mm long, thecae (2.2-)3(-4) mm long, beak (2-)3(-5) mm long, connective below the thecae to the filament insertion 2–3(-4) mm long, anteriorly at the insertion point slightly tuberculate, the five antepetalous staminodia 3–4 mm long; ovary (3-4-)5celled, glabrous. Fruit a 5–6(-7) mm high brown capsule.

Distribution and habitat: (Fig. 3) *Rhynchanthera dichotoma* is known from Trinidad (but see Notes), Venezuela, French Guiana, Guyana, Brazil, and Peru. The species is to be expected in Brazil in the savannas of Roraima along the border with Venezuela. It grows along the margins of temporary ponds or in marshes near the sea (Portuguese “restinga” or “restinga alagada”); from sealevel to ca. 900 m altitude. In Venezuela and Guyana, flowering August–May, in Brazil, January–September, and in Peru, September–January.

Notes: Illustrations of *R. dichotoma* may be found in Martius (1831), Cogniaux (in Martius 1883, pl. 44, sub *R. regnellii*), and Wurdack (1962 and in prep.). Cogniaux’s plate shows a plant with well-developed accessory leaves in the axils of the older leaves on the stem, a habit often seen in this species.

Rhynchanthera dichotoma is not listed as occurring in Trinidad in the Flora of Trinidad and Tobago (Williams 1928), and I have been unable to trace the collector of the Vienna specimen stated to come from Trinidad. Another doubtful distributional record is an unnumbered Linden specimen in Paris, labeled “Voyage de Funck & Schlim; Truxillo, 1848,” which probably was collected by N. Funck in the state of Monagas in Venezuela.

Rhynchanthera dichotoma is difficult to separate from the following species, *R. mexicana* DC., because some of the characters distinguishing them break down when considered throughout their ranges. In fact, *R. williamsii*, here considered synonymous with *R. dichotoma*, had been placed under *R. mexicana* by Macbride (1941). In general, the two allopatric species differ in flower and fruit dimensions and the length of the calyx lobes, with *R. dichotoma* having smaller flowers and fruits and shorter calyx lobes than *R. mexicana*. However, southern Brazilian specimens of *R. dichotoma*, such as Ule s.n. (HBG) from Sta. Catarina, Bunbury s.n. (BM) from Rio Grande do Sul, and Harley et al.

19381 and Mori et al. 10445 from Bahía, may possess larger flowers than is usual in the species, and from their floral dimensions these might arguably be called *R. mexicana*. I decided against merging the two entities, however, because the vast majority of specimens can be identified as either *R. mexicana* or *R. dichotoma* when leaf shape and indument are taken into consideration: leaves of *R. mexicana* are 2–3 cm broad and covered with hairs 1.5–2 mm long, those of *R. dichotoma* are (2-)4.5–7 cm broad and have minute hairs only ca. 1 mm long.

Rhynchanthera dichotoma specimens from Minas Gerais (often annotated "*R. schrankiana*") have more densely strigulose leaves and narrower thyrsi than those from the coastal area of Rio de Janeiro and from Guyana. Irwin 32526 from Bahía, Yano 1094 and Mimura 502 from São Paulo, and Macedo 1736 from Minas Gerais are transitional between the coastal and the Minas Gerais morphs. The normally purple-flowered *R. dichotoma* appears to have white petals in Guyana.

Selected collections: (206 collections seen). Trinidad: "Hook 807" [? illegible] (W 2 sheets).

Guyana: Pomeroy Distr.: Pomeroy River, Akawini Creek, Jan 1978, Grewal & Persaud 461 (U). – Northwest Distr.: Waini River, Apr 1923, De La Cruz 3655 (F, GH, MO, NY, PH, US); Essequibo River, vic. of Bartica, Sep 1922, De La Cruz 1873 (F, GH, MO, NY, US); Hooroleca, Apr 1887, Jenman 3704 (NY); Maroooc River, Oct 1843, Ri. Schomburgk 1493 (F). Sine loc., 1844, Ri. Schomburgk 808 (BM, G, GH, P, W).

Venezuela: Bolívar: Lower Río Orinoco, Sacupana, Apr. 1896, Rusby & Squires 237 (BM, BR, F, G, GH, M, MO, NY, PH, US, W).

Peru: San Martín: Rioja, Sep 1973, Ferreyra et al. 18249 (US); Zepelacio, near Moyobamba, Dec 1933, Klug 3431 (F, G, GH, MO, NY, S, US); 1600 m, Jun 1947, Woytkowski 35295 (F, G, S).

Brazil: Amazonas: Humaitá, Rio Madeira, Janzen 270a (INPA, US). – Acre: Rio Branco, 28 Aug 1960, Mello Filho 1828 (R). – Bahía: sine loc., 1830, Salzmann 255 (G-DC), Salzmann s.n. (G, LE, P); Cruz de Casina, Feb-Jul 1835, and Cabolla, Aug 1835, Martius "502" (BM, BR, G-DC, GH, L, LE, M, MO, NY, P, W); 19.5 km SE of Morro do Chapéu, on BAO-52 rd. to Mundo Novo, River Ferro Doido, ca. 900 m, Mar 1977, Harley et al. 19381 (AAU, NY, SPF, U, US); Rio Mucuri, BR-101, roadside, Jul 1968, Belém 3877 (IAN, NY, U); 4 km W de Mucuri, Sep 1978, Mori et al. 10445 (NY, RB, US); St. Cruz (de Carma), Feb 1833, Luschnath 6 (BR), Jul 1833, Luschnath 18 (G, US); Jacobina Moritiba, 1842, Blanchet 3624 (BR, GDC, G, LE, MO, P, W). – Espírito Santo: Estr. Vitória – Colatina (BR-101), km 215, roadside, Sep 1977, Shepherd et al. 5840 (F); Lagoa do Macuco, Jul 1969, Sucre 5634 (RB). – Goiás: S. Cruz de Goiás, Pohl 1184 = 2705 (M, W); near Natividade, Pohl 2312 (F, M, W). – Minas Gerais: Padre do Paraíso, Oct 1963, R. S. Santos s.n. = RB 28026 (F, HB, M, NY); Ribeirão Preto, near Rio Novo, Sep 1894, Schwacke 11029 (BR, W); Mun. Tombas, Sítio de J. Bissiato, Pedra Dourada, Jun 1941, J. E. de Oliveira 549 (BHMH). – Rio de Janeiro: Mauá, Jun 1896, Ule 3646 (HBG); Galeão, Ilha do Governador, Jul 1965, N. Santos & Machado 262 (US); Rio de Ouro, Aug 1879, Glaziou 10843 (C, MO, P); sine loc., 1815, Sellow s.n. (BM, BR, G, LE, NY, P, S, US, W). – Santa Catarina: Mun. Araranguá, ca. 29°08'S, 49°36'W, Feb 1952, Smith & Reitz 5881a (US); near Laguna, Jan 1889, Ule s.n. (HBG). – São Paulo: Campinas, May 1900, Novães 626 (US); Mun. Taquaritinga, 10 km S of Taquaritinga, 40 km SE along

Araraquara – S. José do Rio Preto rd., Jun 1961, Eiten et al. 2995 (NY, SP, US); 3.6 km NNW of Padua Sales, Sep 1960, Eiten & Eiten 2285 (F, G, NY, SP).

4. *Rhynchanthera mexicana* De Candolle

Prodr. 3: 108. 1828. – Type: Sessé & Moçño 1211, Mexico, 1787–1803 (MA lectotype, selected here, F, isotype, F photo 47040).

Shrub, 1–2(-3) m tall, stem and branchlets obtusely angular, stem, petioles, and inflorescence densely glandular-puberulous or glandular-tomentose with patent hairs 0.5–4 mm long. Leaves spreading, the petiole 1–1.5 cm long; blade ovate to narrowly ovate, 5–8 cm × 2–3 cm, base cordate, rounded or subacute, apex acute or acuminate, with 3–4 pairs of lateral primary veins diverging at the base of the blade, on both surfaces densely strigulose with curved brownish hairs 1.5–2 mm long, margins minutely serrulate. Inflorescence thyrsoid, usually ample, with regular biparous cymes, the flowers aggregated at the tips of the branchlets. Flowers with pedicels 1–1.8 mm long; floral bracts similar to the principal leaves but reduced in size upward; hypanthium (at anthesis) 4–5 mm long, moderately glandular-setulose; calyx lobes linear-subulate, 5–9 mm long, glandular-setulose or glabrous; petals magenta, obovate, 16–20 mm long; the five fertile antesealous stamens subisomorphic, filaments 5–6 mm long, thecae 4–5 mm long, beak 2.8–3.2 mm long, connective below the thecae to the filament insertion ca. 3 mm long, anteriorly at the insertion point with two minute lobes, ca. 0.5 mm long, the five antepetalous staminodia ca. 5–8 mm long; ovary 5-celled, glabrous. Fruit a 6–7 mm high brown capsule.

Distribution and habitat: (Fig. 4) *Rhynchanthera mexicana* occurs in Mexico, Nicaragua, Costa Rica, and western Colombia. It grows in wet places in savannas, e.g., along streamlets; from sealevel to 1800 m alt. Collected flowering May–November.

Notes: *Rhynchanthera mexicana* DC. is based on a Sessé & Moçño collection from Mexico and is illustrated on a plate prepared for Sessé & Moçño's *Flora Mexicana* (ined.). The illustrations for this work were studied by de Candolle when he was working with Moçño on the classification of the material to be treated in the *Flora* (de Candolle 1828b). The sketches and plate of *Thenardia rosea*, the name de Candolle and Moçño originally had decided to use for *R. mexicana* (de Candolle 1828b), unambiguously show *R. mexicana* (I am much obliged to the Hunt Institute for Botanical Documentation for information and slides). Dr F. Almeda (pers. comm.) has seen the Madrid isotype of *R. mexicana* in 1987 and has confirmed its identity with the type in the Field Museum. A specimen in the British Museum, numbered "150", also belongs to this species and may be another isotype.

In Central America, *Rhynchanthera mexicana* has often been confused with *R. grandiflora* (e.g., by Cogniaux 1891 and by Gleason 1938 and 1958 in the Flora of Panama where Fig. 69 labeled "*R. mexicana*" actually shows *R. grandiflora*). The confusion likely was started by Cogniaux (in Martius 1883) who placed *R. mexicana* in sect. *Anisostemon* and, following his description of the species, cited four specimens all of which in fact were *R. grandiflora* (with dimorphic stamens). Sterile, the two species are undistinguishable, yet they apparently maintain their identity where they are sympatric, for example, in Panama at Las Minas and in Mexico at Oaxaca.

Selected collections: (51 collections examined). Mexico: Tabasco: km 10.4 of Huimanguillo-Rueda rd., Sep 1979, C. Cowan 2513 (CAS, MO, NY, PH). – Veracruz: Minatitlán, 7 Sep 1944, Gilly & Hernández 20 (GH, NY).

Nicaragua: Zelaya: Río Prinzapolca, May 1971, Atwood & Nelson 4902 (YU).

Costa Rica: San José: San Isidro Del General, Aug 1936, Danforth 37 (GH); Oct 1968, Davidse & Pohl 1286 (F); San José, 670 m, Jan 1939, Skutch 4097 (GH, NY, S, US).

Colombia: Cauca: El Tambo, Jun 1933, Sneidern 1453 (S); El Tambo, 1930, Hultén 21 (NY, S); SW of El Tambo, Agua Clara Hacienda, 1100 m, Nov 1946, Haught 5262 (COL, F, NY, US); Popayan, 1800 m, Sep 1961, Uribe 3884 (COL, MO, US), 1500–1700 m, Jul 1922, Pennell & Killip 8235 (GH, NY, PH, US); Cauca valley, Lehmann 5466 (F, GH, NY, PH, S, US); Cauca, 1000 m, 1866, Triana s.n. = 3863 (BM, BR, COL, G-DC, NY, P, W). – El Valle: Pradera, 1000 m, Jul 1930, Dryander 389 (NY, US); Río Cali, Pichinde, 1700 m, Jul 1946, Duque Jaramillo 3940 (COL, NY). – Huila: Vic. La Plata, about 40 km from Hobo, 700 m, Sep 1959, Maguire & Maguire 44190 (COL, GH, NY, US); Cordillera occidental, Nov 1899, Langlassé 47 (F, G, GH, P, US).

5. *Rhynchanthera paludicola* (J. D. Smith) Gleason

Phytologia 1: 136. 1935. – *Tibouchina paludicola* J. D. Smith, Bot. Gaz. (London) 42: 239. 1906. – Type: Pittier 11056, Costa Rica, Puntarenas, Río Cañas Gordas, Feb 1897 (US holotype, F, G, US isotypes).

Shrub, 1–2 m tall, stem and branchlets subterete or obtusely angular, stem, petioles and inflorescence conspicuously glandular-tomentose with patent hairs 3–4 mm long. Leaves spreading, the petiole 1.8–2.5 cm long, blade ovate, 4–7 × 2–4 cm, base cordate, apex acute or acuminate, with (2–)3 pairs of lateral primary veins diverging at the base of the blade, on both surfaces smooth and laxly glandular strigose-hirsute with patent tan hairs 1–3 mm long, margins regularly serrulate, each tooth with a seta ca. 1 mm long. Inflorescence thyrsoid, with regularly biparous cymes, the flowers axillary and solitary or aggregated at the tips of the branchlets. Flowers subsessile, pedicels ca. 1 mm long; floral bracts similar to the principal leaves but gradually reduced in size upward; hypanthium (at anthesis) 4–5 mm long, basally glandular-setulose, apically usually glabrous; calyx lobes linear-subulate, 5–6 mm long, laxly pubescent with an apical glandular seta; petals magenta, obovate, 15–17 mm long; the five fertile ante-

sepalous stamens subisomorphic, filaments ca. 5 mm long, thecae 4–5(–5.5) mm long, beak (2)3 mm long, connective below the thecae to the filament insertion 3(–4) mm long, anteriorly at the insertion point minutely biappendiculate, the five antepetalous staminodia 4–5 mm long; ovary 3(–4)-celled, glabrous. Fruit a 5–6(–8) mm high brown capsule.

Illustration: Fig. 5.

Distribution and habitat: (Fig. 7) *Rhynchanthera paludicola* occurs in Panama, Nicaragua, and Costa Rica at 700 to 1800 m altitude. It is common in wet pastured areas and marshy places in savannas. Collected flowering from January to September and with old fruits in November–December.

Notes: It is unclear why *R. paludicola* was originally placed in *Tibouchina* since the describing author himself pointed out that the presence of five fertile anthers and five staminodia and the glabrous ovary were anomalous in the genus. Gleason (1935b, 1938), who made the necessary transfer, rightly pointed out these characters are perfectly normal in *Rhynchanthera*.

In Nicaragua, *R. paludicola* is sympatric with the similar *R. mexicana*, and both have been collected flowering simultaneously at the same locality. They differ in pubescence, with the glandular hairs in *R. paludicola* being patent and more laxly distributed whereas in *R. mexicana* the pubescence is denser and more appressed. In indument, *R. paludicola* resembles *R. hispida* from South America, another isostemonous species, which, however, has inflorescences with distally uniparous cymes and stamens with short anther beaks, (1–)2 mm long (whereas the inflorescence of *R. paludicola* consists of regularly biparous cymes and the anther beaks are (2–)3 mm long).

Selected collections: (28 collections examined). Panama: Chiriquí: Llanos del Volcan, ca. 1300 m, Jan 1939, P. H. Allen 1549 (F, GH, MO, NY, US); 5 km from Hato de Volcan, rd. to Las Lagunas, Apr 1969, M. D. Corrêa & Lazor 1488 (F, NY); Aug 1982, Hamilton et al. 900 (CAS).

Nicaragua: Zelaya: Río Prinzapolca, Mar 1971, Atwood 4885 (GH); Mar 1971, Nelson 4902 (BM, GH); 0.3–1.9 km N of Limbaikan, Apr 1978, Stevens 8282 (MO).

Costa Rica: Guanacaste: between Guayabo and Guarumo, Oct 1963, Jiménez 1134 (F). – Puntarenas: Cañas Gordas, 1160 m, Sep 1968, Davidse & Pohl 1274 (F); San Vito de Java, 1000 m, Aug 1969, C. E. Schnell 1149 (GH). – Alajuela: vic. Los Chiles, Río Frio, Aug 1949, Holm & Iltis 936 (CAS, F, GH, NY).

6. *Rhynchanthera ursina* Naudin

Ann. Sci. Nat. Bot. III, 12: 207. 1849. – Type: Claussen 601, Brazil, Minas Gerais (P holotype, BM, BR, C, G-DC, GH, L, P, R, S, US isotypes).

Rhynchanthera villosissima Cogniaux in Martius, Fl. bras. 14(3): 187. 1883. – Type: Riedel 2266, Brazil, São Paulo, Batatais (BR holotype, GOET, LE, P, US, W isotypes; B destroyed but represented by a photo, F 16651).

Rhynchanthera spicata Hoehne, *Anexos Mem. Inst. Butantan, Secc. Bot.* 1 (5): 36, pl. 3. 1922. – Type: Hoehne 2462, Brazil, Mato Grosso, St. Luzia, banks of Rio Piquiri, near Coxim, May 1911 (R lectotype, selected here; SP isotype).

Rhynchanthera coxinnensis Hoehne, *Anexos Mem. Inst. Butantan, Secc. Bot.* 1(5): 44, pl. 5. 1922. – Type: Hoehne 2482, Brazil, Mato Grosso, vic. of Coxim and banks of Rio Taquari, May 1911 (SP lectotype, selected here; S isotype).

Subshrub or shrub, 0.3–1.7 m tall, stem and branchlets subterete or obtusely angular, the stem, petioles and inflorescence densely tomentose to lanate with reddish-golden, sometimes gland-tipped hairs 4–6 mm long. Leaves spreading, shortly petiolate, the petiole 0.5 (–1.2) cm long, blade ovate, 2.2–4.5(–5) × 1.8–3.5 cm, base cordate, apex acute or acuminate, with 3(–4) pairs of lateral primary veins diverging at the base of the blade, on both surfaces densely strigulose to sericeous with slightly curved reddish-golden hairs, 1–2(–3) mm long, margins appearing entire due to the dense hair covering. Inflorescence thyrsoid, often narrow, sometimes the lateral branches relatively long and 1–2-branched, with regular biparous cymes, flowers aggregated at the tips of the branchlets. Flowers subsessile, pedicels 0.5–1 mm long; floral bracts similar to the principal leaves but much reduced in size upward and sessile; hypanthium (at anthesis) 4–5(–7) mm long, densely sericeous with reddish hairs; calyx lobes linear-subulate, 3–4(–5) mm long, densely sericeous like the hypanthium; petals pinkish-purple, obovate, (8–)15–20 mm long; the fertile antepetalous stamens dimorphic with one somewhat longer than the other four, filaments 6–8 mm long, thecae 3.5–4(5) mm long, beak (3.5–)4–5 mm long, connective below the thecae to the filament insertion 3–5 mm long in the 4 shorter stamens and 7–10 mm long in the single longer stamen, anteriorly at the insertion point slightly lobed, the five antepetalous staminodia 2–3 mm long; ovary 3(–4)5-celled, basally glabrous, apically minutely setose. Fruit a 5.5–6.5 mm high brown capsule.

Illustration: Fig. 1. C (seed).

Distribution and habitat: (Fig. 6) *Rhynchanthera ursina* occurs in Brazil, in Goiás, Minas Gerais, and São Paulo. It grows in marshy vegetation (Portuguese “brejo”) and along streamlets in the cerrado vegetation of the Brazilian plateau; to 840 m altitude. Collected flowering May–July.

Notes: A typical specimen of *R. ursina* is illustrated in the *Flora Brasiliensis* (Cogniaux 1883: pl. 41, fig. 1).

The dense, dry reddish-golden pubescence of the leaves and peduncles is the most striking feature of this species. The full extent of variation in the glandulosity of the hair cover was not realized initially. Thus, Cogniaux described *R. villosissima* as being glandular pubescent which seemed to distinguish it from *R. ursina*,

thought to have eglandular hairs. However, the hairs may lose their glandular tips when they dry, and this feature is therefore unreliable. The great variability in number of glandular hairs in *R. ursina* was also noted by Hoehne (1922).

Furthermore, Cogniaux thought that *R. ursina* had slightly dimorphic stamens whereas, in his opinion, *R. villosissima* had equal ones. *Rhynchanthera ursina* and the following species, *R. gardneri*, are indeed intermediate in the degree of staminal dimorphism between the preceding five species (with equal stamens) and the remaining ones (with strong heterostemony). In *R. ursina* and *R. gardneri*, invariably, one stamen is only slightly longer than the others; in both species the anther beaks are about as long as the thecae.

Hoehne (1922) described *R. coxinnensis* as having four ovary locules, a trait which supposedly distinguished it from *R. spicata* Hoehne, described as trilocular. Both were collected flowering at the same locality. The more abundant material now available has shown that *R. ursina* may have from 3–5 locules.

Selected collections: (24 collections examined). Brazil: Goiás: Diamantina, Gardner 4609 (G, NY, P, W); ca. 12 km (straight line) S of Caiapônia, ca. 840 m, May 1973, Anderson 9642 (C, COL, F, MO, NY, RB, US). – Minas Gerais: João Pinheiro, Jul 1961, Heringer 8535 (UB, US); Curvello, Jun 1944, Magalhães 2880 (BHMH). – São Paulo: Araracoara, May 1834, Riedel 2267 (BR, C, F, GH, GOET, LE, M, MO, NY, S, US, W); May 1834, Lund s.n. = 2303 in herb. Warming (BR, C, P); Fortaleza, May 1920, Gehrt 4136 (BM, SP); São Simão, May 1957, Handro 691 (HB, SP, US).

7. *Rhynchanthera gardneri* Naudin

Ann. Sci. Nat. Bot. III, 12: 207. 1849. – Type: Gardner 3163, Brazil, Goiás, moist campos, Mission Douro, Sep 1839 (P holotype, BM, F frag., G, G-DC, NY, U, US, W isotypes).

Rhynchanthera gardneri Naudin var. *cuyabensis* Cogniaux in *Martius, Fl. bras.* 14(3): 170. 1883. – Type: Manso 287, Brazil, Mato Grosso, Cuiabá, Serra da Chapada (BR holotype).

Rhynchanthera imbricata Markgraf, *Notizblatt Bot. Gart. Berlin-Dahlem* 10: 47. 1927. – Type: Lützelburg 1828, Brazil, Goiás, Rio das Fêmeas, 6 Aug 1912 (M holotype, HBG, NY isotypes).

Subshrub or shrub, 0.5–1.5 m tall, stem and branchlets obtusely angular, stem and inflorescence laxly tomentose-lanate with soft, yellowish or whitish, wavy, sometimes glandular hairs, 2–3 mm long. Leaves sessile, appressed downward, bullate, blade ovate, 1.5–3.8 × 1.5–2.5 cm, base subcordate, apex acute or acuminate, with 2–3 pairs of lateral primary veins diverging at the base of the blade, on both surfaces moderately to densely lanate with soft yellowish or whitish hairs, 1–3 mm long, margins minutely ciliate-serrulate. Inflorescence thyrsoid, with the lateral branches relatively long and unbranched, with regularly biparous cymes, flowers aggregated at the tips of the branchlets. Flowers subsessile, pedicels ca. 1 mm long; floral bracts similar to the principal leaves but reduced in size upward; hypanthium (at anthesis) 4–9 mm long, softly pilose with yellowish or whitish sometimes glandular hairs, apically

glabrescent; calyx lobes narrowly triangular, 2.5–3.5 mm long, with fewer and slightly longer hairs than the hypanthium; petals deep purple, obovate, 18–22 mm long; the fertile antepetalous stamens dimorphic with one somewhat longer than the other four, filaments 5–7 mm long, thecae 5–6 mm long, beak 3.5–4.2 mm long, connective below the thecae to the filament insertion 7–8 mm long in the 4 shorter stamens and 8–12 mm long in the single longer stamen, anteriorly at the insertion point slightly tuberculate, the five antepetalous staminodia 5–6 mm long; ovary 3(-4)-celled, glabrous, apically with 3–4 small lobes. Fruit a 5–6 mm high brown capsule.

Distribution and habitat: (Fig. 6) *Rhynchanthera gardneri* occurs in Brazil in Bahia, Goiás, Maranhão, and Mato Grosso. It grows along streamlets in the cerrado at 500–750 m altitude; flowering January–September.

Notes: *Rhynchanthera gardneri*, which is illustrated in the Flora Brasiliensis (Cogniaux 1883: pl. 41, fig. 2), is immediately distinguished from all other species by its bullate, sessile, downward-bent leaves with their rather long, wavy, whitish or yellowish hairs. Its stamens resemble those of *R. ursina* with one of the five only slightly longer than the others and the beaks almost as long as the thecae (cf. Notes under that species).

Markgraf (1927) incorrectly described the supposedly distinct *R. imbricata* as “somewhat isolated by its single flowers.” The type of *R. imbricata* has regularly biparous cymes with 2–3 flowers aggregated at the tips of the branchlets just like the other collections of *R. gardneri*.

Selected collections: (14 collections examined). Brazil: Bahia: BR-020, km 122, Mun. Barreiras, Jan 1977, Hatschbach 39462 (US); Espigão Mestre, ca. 100 km WSW of Barreiras, ca. 750 m, Mar 1972, Anderson et al. 36814 (NY, UB, US). – Goiás: Miracema do Norte, Jul 1964, Prance & Silva 58474 (F, GH, MO, NY, S, U, US); Piranhas, Jul 1977, Hatschbach 40096 (C, HB, NY, US). – Maranhão: Mun. São Felix das Balsas, between km 244–245 on rd. from Pastos Bons to São Raimundo das Mangabeiras, 44°52'–56'W, 6°53'–55'S, Aug 1963, Eiten & Eiten 5432 (SP, US). – Mato Grosso: ca. 8 km from Utiariti, Mar 1978, Becker 5 (F, RB); ca. 78 km S of Xavantina, Jun 1966, Irwin et al. 17132 (B, G, GH, IAN, L, M, MO, NY, S, SP, UB, US); Barra dos Garças-Xavantina rd., 77 km from Barra dos Garças, Jun 1966, Hunt & Ramos 6034 (NY, SP, UB, US).

8. *Rhynchanthera cordata* DC.

Prodr. 3: 107. 1828. – Type: Martius s.n., Brazil, Minas Gerais, in campis uliginosis ad Faz. Sta. Barbara et alibi inter Villa da Campanha et Villa Rica, Jan/Feb 1818 (M holotype, G-DC, G, F photo 6402, NY isotypes).

Rhynchanthera latifolia Cogniaux var. *hirsuta* Cogniaux in Martius, Fl. bras. 14(3): 168. 1883. – Type: Lund s.n. = 2297/1 in herb. Warming, Brazil, São Paulo, near Franca (C holotype).

Rhynchanthera cordata DC. var. *genuina* Cogniaux in Martius, Fl. bras. 14(3): 176. 1883. This variety includes the type of *R. cordata* DC. and should be replaced by *R. cordata* var. *cordata*. – Type: Stephan s.n., Brazil, Minas Gerais, Gongonhas do Campo, 1843 (BR lectotype, selected here).

Rhynchanthera cordata DC. var. *brachyrhyncha* Cogniaux in Martius, Fl. bras. 14(3): 176. 1883. – Type: Widgren 966, Brazil, Minas Gerais, 1845 (BR lectotype, selected here).

Rhynchanthera cordata DC. var. *bracteata* Cogniaux in Martius, Fl. bras. 14(3): 176. 1883. Type: Prater s.n., Brazil, São Paulo, Piritura, 1844 (P holotype).

Rhynchanthera laxa Cogniaux in Martius, Fl. bras. 14(3): 176, pl. 42, fig. II, 1883. [The numbers of the two figures on this plate are exchanged, *R. laxa* is actually shown in fig. I]. –

Type: Riedel 1614, Brazil, São Paulo, 1833 (LE holotype).

Shrub, 1–1.5(-2) m tall, stem and branchlets obtusely angular or sometimes basally sulcate, stem, petioles and inflorescence with a sparse scattering of patent, brown hairs or more densely glandular-tomentose with hairs 0.5–6 mm long. Leaves spreading, the petiole 0.5–1.5 cm long, blade ovate, 2–5 × 2–4 cm, base cordate, apex acute, with usually 3 pairs of lateral primary veins diverging at the base of the blade, on both surfaces laxly pilose with more or less appressed minute brown hairs ca. 1 mm long, or nearly glabrous, margins regularly ciliate-serrulate or serrate. Inflorescence thyrsoid, narrow or ample, variously branched, with regularly biparous cymes. Flowers with pedicels 1.5–2 mm long; floral bracts similar to the principal leaves but much reduced in size upward; hypanthium (at anthesis) 2.8–3.2 mm long, minutely glandular-pubescent or glabrous; calyx lobes narrowly triangular, 2.5–4 mm long, sparsely glandular-pubescent; petals pale lavender to deep purple, obovate, 10–12(-14) mm long; the fertile antepetalous stamens dimorphic with one longer than the other four, filaments 5–8 mm long, thecae 4–4.5 mm long, beak 1.5–3 mm long, connective below the thecae to the filament insertion 3–4 mm long in the 4 shorter stamens and 9–10 mm long in the single longer stamen, anteriorly at the insertion point with two minute lobes, 0.5–1 mm long; the five antepetalous staminodia 3–4 mm long; ovary 3(-5)-celled, glabrous. Fruit a 4–7 mm high brown capsule.

Illustration: Fig. 1. B (seed).

Distribution and habitat: (Fig. 6) *Rhynchanthera cordata* occurs in Peru (Pasco) and south-central Brazil (Minas Gerais, São Paulo, Rio de Janeiro, Paraná, and Sta. Catarina); sea-level to 1900 m altitude. It grows in wet places in natural grasslands or pastures. In Brazil, flowering specimens have been collected from January to August, in Peru, in November.

Notes: *Rhynchanthera cordata* is illustrated in the Flora Brasiliensis (Cogniaux 1883: pl. 42, fig. 1 sub *R. laxa*) and in Martius' Nova Genera (1831: pl. 260).

Sterile, *R. cordata* can not always be distinguished from *R. dichotoma* because of an overlap in leaf and pubescence characters in these vegetatively variable species. Cogniaux's three varieties of *R. cordata* are clearly artificial because two of the characters they are based on, namely stem pubescence and floral bract

length, are extremely variable in all species of *Rhynchanthera* and are therefore useless. A third character, the length of the anther beak, is useful in the group but does not vary enough between the types of the three varieties in view of the variation seen in all specimens.

The impressive disjunction in the range of this until recently exclusively southern Brazilian species, now found near Oxapampa in Peru, may be due to man. The Peruvian site, pastures at 1830–1875 m altitude, forms part of an ancient German colony (Pozuzo; D. Smith, pers. comm.), and seeds of *R. cordata* may have come with live stock, grain, or ornamental plants received by the settlers from German friends or relatives in southern Brazil. It is also possible that the species occurs in intermediate savannas and that its range in reality resembles that of *R. dichotoma* with a similar occurrence in south-central Brazil and Peru, but known from Rio Branco (Acre) and Humaitá (Amazonas) in between.

Selected collections: (107 collections examined). Peru: Pasco: Prov. Oxapampa; Chantabamba, 3.5–8 km W of Oxapampa; 75°30'W, 10°35'S, Nov 1982, D. N. Smith 2742 (F, MO, US).

Brazil: Minas Gerais: Caldas, Mar 1867, Regnell III/1 (F, NY, P, S, U, US, W); May 1874, Mosén 1842 (P, S), 4503 (C, S); Uberaba, Aug 1848, Regnell III/3 (S); Serra de Ouro Preto. Mar 1902, Damazio 1820 (G, RB); ca. 10 km SW of Diamantina, 1350 m, Jan 1969, Irwin et al. 22432 (AAU, CAS, MO, NY, US); Diamantina, Aug 1840, Gardner 4606 (BM, NY); Tejuçu, 1833, Vauthier 15 (G-DC, P); Lagoa Santa, Warming 2299/1 and 2299/2 (C); s.n. (BR, P); near São João del Rei, Jun 1824, Riedel 213 (LE); Mun. Nova Lima, Serra da Mutuca, Feb 1945, L. O. Williams 5609 (GH, NY); Belo Horizonte, 1000 m, Mar 1945, L. O. Williams & Assis 6445 (GH). – Paraná: Mun. Arapoti, Rio das Cinzas, Barra do Perdizes, Mar 1960, Hatschbach 6833 (L, NY, US); Mun. Pirai do Sul, Joaquim Murinho, Mar 1966, Hatschbach et al. 14021 (NY, U, US); Serra de Araraquara, Feb 1968, Hatschbach 18656 (B, C, F, GH, HB, HBG, L, M, MO, NY); Jaguariáira, Rio das Mortes, Jun 1980, Hatschbach 43018 (B, HBG, SPF, UB). – Rio de Janeiro: Rio de Janeiro, Jul 1967, Lindeman & Haas 5577 (U). – Santa Catarina: Campo do Maçambú, Palhoça, Mar 1953, Reitz & Klein 401 (M, NY, US); Campo de Una, near Laguna, Apr 1890, Ule 1596 p. p. (HBG). – São Paulo: Jaraguá, Jan 1907, Usteri 2 = 11580 (BR).

9. *Rhynchanthera brachyrhyncha* Chamisso

Linnaea 9: 379. 1834. – Type: Sellow 4588, Brasilia australi (LE lectotype, selected here, BR, P, W isotypes).

Rhynchanthera humilis Cogniaux, Monogr. phan. 7: 98. 1891. – Type: Glaziou 17517, Brazil, São Paulo, Moji das Cruzes, 19 Apr 1889 (BR lectotype, selected here, P, R isotypes). B destroyed but represented by a photo, F 16644).

Rhynchanthera reitzii Brade, Sellowia 12: 135. 1960. – Type: Reitz 4610, Brazil, Sta. Catarina, Mun. Chapecó, Capetinga, Campo Erê, 24 Jan 1952, (HB holotype, M, US isotypes).

Rhynchanthera kleinii Brade, Sellowia 12: 136. 1960. – Type: Reitz & Klein 6445, Brazil, Sta. Catarina, Campo Alegre, Morro do Iquererim, 1300 m, 5 Feb 1958 (HB holotype, US isotypes).

Rhynchanthera brachyrhyncha Chamisso var. *catharinensis* Brade, Sellowia 12: 136. 1960. – Type: Reitz & Klein 6073, Brazil, Sta. Catarina, Campo Alegre, Morro do Iquererim, 1400 m, 9 Jan 1958 (HB holotype, B, US isotypes).

Subshrub or shrub, 0.40–1.20 m tall, stem and branch-

lets obtusely angular or slightly sulcate, the stem and inflorescence laxly pilose with brown-red, patent or sometimes slightly curved, gland-tipped hairs 4–6 mm long. Leaves spreading, sessile or subsessile, the petiole to 0.3 cm long, blade ovate, 1.5–3 cm × 1–5 cm, base rounded, apex acute, with 2(-3) pairs of lateral primary veins diverging at the base of the blade, on both surfaces laxly pilose with brown-red 2–3(-5) mm long hairs, glabrescent, margins regularly ciliate-serrulate. Inflorescence thyrsoid, usually ample and much-branched, with regularly biparous cymes. Flowers subsessile, pedicels 0.5–1 mm long; floral bracts similar to the principal leaves but much reduced in size upward; hypanthium (at anthesis) 2.5–3 mm long, glabrous; calyx lobes narrowly triangular, united at the base for about 0.5 mm, 2.8–3.2 mm long, glabrous except for an apical glandular seta; petals lavender or purple, obovate, 13–19 mm long; the fertile antepetalous stamens dimorphic with one longer than the other four, filaments 35 mm long, thecae 2.5–3.5(-4) mm long, beak 0.5–1 mm long, connective below the thecae to the filament insertion ca. 3 mm long in the 4 shorter stamens and 6–7 mm long in the single longer stamen, anteriorly at the insertion point minutely bilobed, the five antepetalous staminoidea 2–4 mm long; ovary 3(-4)-celled, glabrous. Fruit a ca. 3.5 mm high brown capsule.

Distribution and habitat: (Fig. 6) *Rhynchanthera brachyrhyncha* occurs in Paraguay and Brazil (São Paulo, Paraná, Sta. Catarina, and Rio Grande do Sul). It grows in moist places in savannas and ruderal vegetation from sealevel to 1500 m altitude. The cited specimen collected in the vicinity of S. Leopoldo (51°11'W, 29°45'S) by an unknown botanist is the southernmost record of any *Rhynchanthera*. Flowering for about six to eight weeks from the end of December until the beginning of February.

Notes: *Rhynchanthera brachyrhyncha* is illustrated in the Flora Brasiliensis (Cogniaux in Martius, 1883: pl. 39).

In synonymizing *R. reitzii* and *R. kleinii* under *R. brachyrhyncha*, Wurdack (1962) pointed out that the variability in pubescence exhibited in this species is frequent in savanna plants and therefore is of little use in delimiting species in such groups.

In Paraná, *R. brachyrhyncha* is pollinated by the relatively small (about 10 mm long) bees *Augochloropsis scabrifrons*, *A. sparsilis*, *A. terrestris*, other unnamed species of *Augochloropsis*, and by the common *Pseudaugochloropsis graminea* (Halictidae: Halictinae) (Laroca 1970; the plant is given as *Rhynchanthera* sp., but from the locality, description of the flower, and size of the bees it must be *R. brachyrhyncha*).

Selected collections: (117 collections examined). Brazil: Paraná: Curitiba, Jan 1912, Dusén 13585 (F, GH, NY, S); Feb

1960, Pereira 5190 (B, F, HB, RB); Mun. Castro, Rio São João, 950 m, Jan 1965, L. B. Smith et al. 14486 (GH, NY, R, US). – Rio Grande do Sul: border to Sta. Catarina, Roçinha, between Bom Jesus and Turvo, Dec 1971, Girardi 9380 (U); Canela, Mar 1959, Richter 7866 (HB, NY); vic. of São Leopoldo, 1941, unknown collector 1777 (NY). – Sta. Catarina: Campo de Capivara, Serra Geral, Feb 1891, Ule 1493 (BR, HBG). – São Paulo: Campos do Jordão, Jan 1949, Leite 66 (F); Jan 1890, Moura 342 (BR); Campo Grande, Jan 1915, Brade 5965 (NY, SP).

Paraguay: Misiones, near Alto de la Divisa and Boa Vista, Niederlein s.n. (fide Cogniaux 1891, not seen, probably a unicate destroyed in B).

10. *Rhynchanthera apurensis* Wurdack

Phytologia 14: 264. 1967. – Type: Aristeguieta & Agostini 4130, Venezuela, Apure, Selvas de San Camilo, between Guacas and Guasdualito, Mar 1960 (US holotype, F, MO, NY, VEN isotypes).

Subshrub, 0.7–1 m tall, stem and branchlets subterete, the stem, petioles and inflorescence laxly glandular-setulose with patent hairs 0.5–1 mm long. Leaves spreading, the petiole 1.5–2.0 cm long, blade ovate, 2–4 × 1–2 cm, membranaceous, base rounded, apex acuminate, with 2–3 pairs of lateral primary veins diverging at the base of the blade, on both surfaces laxly pilose with minute tan hairs 0.5–1 mm long, glabrescent, margins regularly serrulate. Inflorescence thyrsoid, with proximally biparous, distally uniparous cymes with solitary, axillary flowers. Flowers subsessile, pedicels 0.5–1 mm long; floral bracts similar to the principal leaves but gradually reduced in size upward; hypanthium (at anthesis) 3.5–4 mm long, laxly glandular-pubescent; calyx lobes narrowly triangular, 1.8–2.2 mm long, glabrous except for marginal and apical glandular setae; petals pink, obovate, 8–12 mm long; the fertile antepetalous stamens dimorphic with one longer than the other four, filaments 3.5–5 mm long, thecae 3–3.5 mm long, beak 1.5–2.2 mm long, connective below the thecae to the filament insertion 2.5–3 mm long in the 4 shorter stamens and ca. 5 mm long in the single longer stamen, anteriorly at the insertion point minutely tuberculate, the five antepetalous staminodia 2–3 mm long; ovary 3-celled, glabrous. Fruit a 7–8 mm high brown capsule.

Distribution and habitat: (Fig. 6) *Rhynchanthera apurensis* is endemic in southwestern Venezuela and adjacent Colombia where it grows in grass savanna; collected flowering November, January, and March.

Notes: There is a drawing of *R. apurensis* in the Flora of Venezuela (Wurdack 1973, Fig. 4).

Perhaps the most distinguishing feature of this species is the combination of small flowers with relatively large fruits. Wurdack (1967) was of the opinion, with which I agree, that *R. apurensis* is most closely related to *R. novemnervia* (he mentioned three synonyms of that species *R. secundiflora*, *R. leucorrhiza*, and *R. cacerensis*), and he drew attention to the fact that the closest affin-

ities of this Venezuelan endemic thus apparently lie with an austro-Amazonian species rather than with the geographically much closer *R. bracteata*, *R. hispida*, or *R. serrulata*.

Collections other than the type: Colombia: Arauca: Arauca – Puente rd., Nov 1972, López-Palacios 2942 (US).

Venezuela: Apure: Sur Bruzual, Nov 1969, Ramia 3388 (VEN). – Barinas: Res. For. de Caparo, N of Ríos Uribante and Apure, S of Caño Anarú, 7 Jan 1972, Marcano-Berti 2815 (MO). – Portuguesa: Dto. Guanare, Mesa de Caracas, Jan 1986, Stergios 8816 (US).

11. *Rhynchanthera novemnervia* DC.

Prodr. 3: 107. 1828. – Type: Herb. Martius 282, Brazil, Mato Grosso, near Cuiabá, 1818 (M holotype, F photo 6404; BM, BR, G-DC, GH, L, LE, MO, NY, P, W isotypes).

Rhynchanthera secundiflora Naudin, Ann. Sci. Nat. Bot. III, 12: 207. 1849. – Type: Weddell 3263, Brazil, Mato Grosso, Rio Paraguay, Apr/May 1845 (P holotype, F photo 36115; F frag., P isotypes).

Rhynchanthera collina Naudin, Ann. Sci. Nat. Bot. III, 12: 208. 1849. – Type: Orbigny 654 = 655, Bolivia, Concepción de Chiquitos, Jul 1850 (P holotype, BR, F, G-DC, F photo 26097, W isotypes).

Rhynchanthera ovalifolia Naudin, Ann. Sci. Nat. Bot. III, 12: 208. 1849. – Type: A. R. Ferreira s.n., Brazil, sine loc. (P holotype).

Rhynchanthera simplicicaulis Naudin, Ann. Sci. Nat. Bot. III, 12: 208. 1849. – Type: A. R. Ferreira s.n., Brazil, sine loc. (P holotype).

Rhynchanthera weddellii Naudin, Ann. Sci. Nat. Bot. III, 12: 213. 1849. – Type: Weddell 2495, Brazil, Maranhão, Sertão de Amaro Leite, Sep–Oct 1844 (P holotype, F photo 36118; F frag., P isotypes).

Rhynchanthera leucorrhiza Moore, Trans. Linn. Soc. London 2, 4: 359. 1895. – Type: Moore 465, Brazil, Mato Grosso, Sta. Cruz, Oct 1891 (BM holotype).

Rhynchanthera riparia Moore, Trans. Linn. Soc. London 2, 4: 360. 1895. – Type: Moore 6, Brazil, Mato Grosso, Faz. on Rio Cuiabá, Aug 1891–92 (BM holotype).

Rhynchanthera parvifolia Cogniaux, Kuntze Revis. gen. pl. 3, 2: 95. 1898. – Type: Kuntze s.n., Bolivia, near Velasco, Jul 1892 (BR holotype, NY isotype; B destroyed but represented by a photo, F 16649).

Rhynchanthera glabrescens Pilger, Bot. Jahrb. Syst. 30: 180. [1901] 1902. – Type: Pilger 636, Brazil, Mato Grosso, Quellgebiet des Ronouro, 27 May 1899 (B holotype, extant!, F photo 16642).

Rhynchanthera corumbaensis Hoehne, Anexas Mem. Inst. Butantan, Secc. Bot. 1(5): 38, pl. 3. 1922. – Type: Hoehne 4864, Brazil, Mato Grosso, Corumbá, Feb 1911 (R lectotype, selected here).

Rhynchanthera cacerensis Hoehne, Anexas Mem. Inst. Butantan, Secc. Bot. 1(5): 40, pl. 4. 1922. – Type: Hoehne 263, Brazil, Mato Grosso, Fazenda do Facão, near Cáceres, Aug 1908 (R holotype).

Rhynchanthera philadelphensis Brade, Arq. Bot. Rio de Janeiro 16: 30. 1959. – Type: Macedo 4031, Brazil, Goiás, Mun. Filadélfia, 10 Aug 1955 (HB holotype, IAN, US isotypes).

Rhynchanthera consimilis Wurdack, Phytologia 29: 137. 1974. – Type: Irwin et al. 15649, Brazil, Distr. Fed., Rio Torto, ca. 10 km NE of Brasília, 975 m, 6 May 1966 (US holotype, F, GH, IAN, MO, NY, S, SP, UB isotypes).

Shrub or subshrub, 0.3–1.8 m tall, the base of the stem sometimes inflated, spongy, and with a whitish-tan, papery and flaky bark, stem and branchlets subterete or obtusely angular, upper part of the stem, petioles and

inflorescence moderately or laxly glandular-setulose with patent hairs 0.5–1.5 mm long, glabrescent. Leaves spreading, shortly petiolate, the petiole (0.2–)1.5–3.2 cm long, blade lanceolate or ovate, 3–8 × 0.5–5 cm, base cordate, rounded or subacute, apex acute or shortly acuminate, with (1–)3–4 pairs of lateral primary veins diverging at the base of the blade, sometimes membranaceous, on both surfaces laxly pilose with minute tan hairs 0.5 mm long, or nearly glabrous, margins regularly ciliate-serrulate. Inflorescence thyrsoid with proximally biparous, distally uniparous cymes with solitary, axillary flowers. Flowers sessile, pedicels ca. 1 mm long; floral bracts similar to the principal leaves but reduced in size upward and lanceolate; hypanthium (at anthesis) 5–6 mm long, densely or sparsely glandular-setulose or basally glandular-setulose and apically glabrous or entirely glabrous; calyx lobes linear-subulate or triangular, (3–)4–6 mm long, pubescent or glabrous like the hypanthium, with marginal and apical setae; petals purple, obovate, (13–)20–25 mm long; the fertile antepetalous stamens strongly dimorphic with one much longer than the other four, filaments 4–9 mm long, thecae (4–)5–6 mm long, beak 3–4 mm long, connective below the thecae to the filament insertion 3–4 mm long in the 4 shorter stamens and 7–13(–15) mm long in the single longer stamen, anteriorly at the insertion point minutely bilobed, more so in the shorter stamens, the five antepetalous staminodia 2–4 mm long; ovary 3-celled, basally glabrous, apically minutely glandular-pubescent. Fruit a 7–8 mm high, usually dark grey capsule.

Illustration: Fig. 1. D–F (seeds).

Distribution and habitat: (Fig. 7) *Rhynchanthera novemnervia* occurs in central Brazil (Amazônia, Pará, Goiás, Piauí, Minas Gerais, Mato Grosso, and Santa Catarina), Paraguay, and Bolivia. It grows in wet or swampy places, often in gallery forests; sea-level to 900 m altitude. In Brazil collected flowering from April to August, in Paraguay from November to February, and in Bolivia from April to June.

Notes: Brade (1959, pl. 2, sub *R. philadelphensis*) drew a fine portrait of *R. novemnervia*.

In describing *R. leucorrhiza*, one of the numerous species here synonymized under *R. novemnervia*, Moore (1895) noted that it was close to *R. secundiflora* Naudin. Cogniaux (1898) likewise noted that a new species he described from Bolivia, *R. parvifolia*, was close to *R. secundiflora*, and, finally, Hoehne (1922) in describing *R. cacerensis* also mentioned *R. secundiflora* as the most similar species. Indeed, *R. secundiflora* and the mentioned synonyms clearly belong to a single species immediately recognized by the solitary, sessile flowers borne in distally uniparous cymes and spaced very regularly along the branchlets, the oblong-campan-

ulate capsules, and the relatively short, triangular calyx lobes. The oldest, unfortunately hitherto little used name for this species is *R. novemnervia* DC.

Leaves of central Brazilian specimens of *R. novemnervia* may resemble those of *R. verbenoides* (glabrous and lanceolate), however, that species has acutely 4-angular stems and branchlets. One such glabrous and narrow-leaved form of the typically slightly more pilose and broad-leaved *R. novemnervia* is the type of *R. consimilis* Wurdack (Irwin et al. 15649) from the vicinity of Brasília. However, its flaky, whitish or tan bark, the somewhat thickened base of the stem, and the oblong, dark grey or almost purplish-black capsules, so characteristic of *R. novemnervia*, convinced me that this is merely an unusual representative of *R. novemnervia*. Moore (1895) and Pilger ([1901] 1902) also noticed the strangely thickened – sometimes almost spongy – base of the stem. This aerenchyma may be an adaptation to the water-saturated clayey soils the plant grows in.

Triana (1871) and Cogniaux (1883) state that *R. weddellii* Naudin is isostemonous; however, a dissection showed that the stamens of the type, Weddell 2495, are strongly dimorphic.

Selected collections: (103 collections examined). Brazil: Amazônia: Transamazônica, Humaitá-Ituituba, km 135 from Humaitá, near km 895, 61°49'W, 8°7'S, Nov 1979, Vieira et al. 111 (US, mixed collection!). – Goiás: Caiapônia, 800 m, May 1973, Anderson 9574 (CAS, MO, NY, UB, US); Jun 1966, Irwin et al. 17755 (F, IAN, M, MO, NY, S, SP, U, UB, US); Jun 1966, Hunt & Ramos 6192 (NY, P, SP, UB, US); Jul 1977, Hatschbach 40072 (US); Rio Doce, Sep 1974, Hatschbach & Kummrow 34980 (US); Sta. Luzia, Apr 1895, Glaziou 21332a (BR, P). – Mato Grosso: Rio Paraguay, Faz. Acurizal, May 1978, Schaller 166 (NY); Jun 1979, Prance et al. 26065 (NY); Corumbá, Jul 1908, Hoehne 102 (BR); Rod. Transpantaneira, Faz. Sta. Catarina, Jul 1976, Maciel et al. 81 (INPA); Rio Paraná, Mun. Bataguáçu, Feb 1970, Hatschbach 23521 (C, MO, NY, US); Cuiabá, Jun 1827, Riedel s.n. = 1082 (BR, LE, NY); May 1927, Dorien Smith 133 (NY); 6 km E of Rondonópolis, en route to Cuiabá, Aug 1963, Maguire et al. 56369 (NY, US); Chapada dos Guimarães, Oct 1973, Prance et al. 19352 (INPA, NY, U, US); Vila Bela, May 1983, Carreira et al. 686 (IAN, INPA, MG, NY); Sararé, Aug 1978, Pires & Santos 16578 (F, MG, NY, US). – Minas Gerais: Mun. Aquidauana, Faz. Sta. Cruz, Jul 1969, Hatschbach & Guimarães 21915 (US). – Pará: Cachimbo air field, Jul 1961, Hemming 1 (K, US); Serra do Cachimbo, Nov 1955, Pereira 1840 (HB, IAN, M, RB, US); Apr 1983, M. N. Silva et al. 85 (F, NY, US); Nov 1977, Prance et al. 25243 (MG, NY); Dec 1956, Pires et al. 6328 (IAN, NY); Jun 1974, Rodrigues 9433 (INPA). – Piauí: Paranaguá, Aug 1839, Gardner 2585 (BM); Sete Cidades, A. B. Sousa 114 (RB). – Rondônia: Mun. Pimenta Buena, Cuiabá-Porto Velho rd., BR-364 km 188, 11°12'S, 61°62'W, Jun 1984, Cid et al. 4651 (MG, US); Guajará-Mirim, 4 May 1976, Cordeiro 979 (IAN). – Sta. Catarina, Mun. Laguna, rd. to Farol Sta. Marta, Apr 1972, Hatschbach & Guimarães 29388 (US)

Bolivia: Sta. Cruz: San José-San Ignacio rd., km 122, Oct 1977, Evrard 8313 (BR); Concepción, Apr 1977, Krapovickas & Schinini 31918 (MO, US); 2 km NW of Robore, 300 m, Apr 1980, Krapovickas & Schinini 36382 (US); Yapacani, 400 m, Jun 1892, Kuntze s.n. (F, NY).

Paraguay: Dept. Amambay, between Ruta 5 and Bella Vista, 5 km S of Río Aquidaban, May 1974, Schinini 8926 (MO, US); Sierra de Amambay, Feb 1913, Hassler 10971 (G,

NY, P, S); upper Apa river, Nov 1901/02, Hassler 8043 (C, G, GH, MO, NY, P, RB, S, US, W).

12. *Rhynchanthera verbenoides* Chamisso

Linnaea 9: 378. 1834. – Type: Anderson 9597, Brazil, Goiás, Caiapônia, 800 m, 1 May 1973 (AAU neotype, here designated; IAN, MO, NY, R, UB, US isotypes).

Rhynchanthera rosea Cogniaux in Martius, Fl. bras. 14(3): 181. 1883. – Type: Balansa 1934, Paraguay, Patiño-Cué, 28 Feb 1875 (BR holotype, BR, G, G-DC, F photo 26099, LE, P, S isotypes).

Rhynchanthera ternata Cogniaux, Monogr. 7: 105. 1891. – Type: Balansa 1934a, Paraguay, Caaguazú, 6 Mar 1876 (BR frag. holotype, P isotype, F photo 36117).

Rhynchanthera linearifolia Hoehne, Anexos Mem. Inst. Butantan, Secc. Bot. 1(5): 42, pl. 4. 1922. – Type: Löfgren 4316, Brazil, São Paulo, Araraquara, Campo do Retiro, 28 Mar 1899 (SP holotype).

Rhynchanthera hassleriana Kränzlin, Vierteljahrsschr. Naturf. Ges. Zürich 76: 147. 1931. – Type: Hassler 11415, Paraguay, Sierra de Amambay, Oct 1912 (B holotype, destroyed, G MO, NY, P, S, W, Z isotypes).

Nomenclatural note: The type of *R. verbenoides* was destroyed in Berlin, and I have chosen as lectotype a particularly fine recent collection. The unambiguous protologue, with exact measurements, states explicitly “Specimen unicum e Brasilia misit Sellowius.” Sellow’s collection was apparently not seen by Naudin (1849) and Triana (1871), who simply quoted some of Chamisso’s information. Cogniaux (1883), however, studied the type and gives the collection number as “592” and the locality as “São Paulo ad S. Carlos.” Herter (1947) has pointed out that the map in the first volume of *Flora brasiliensis* (von Martius 1852) showing Sellow’s itinerary is quite wrong (not, however, the description of the itinerary prepared by Urban and included in the same tome (Urban, 1906)). It is usually not possible to reconstruct where Sellow collected a certain plant because he undertook several trips, each time restarting his number series. Herter (1947) provides an index to Sellow’s hundreds of collecting stations, and this does not include a “São Paulo ad S. Carlos.” Since the specimen is destroyed it will always remain unclear whether Cogniaux made a mistake when copying the name of the locality from Sellow’s label or whether the collecting site of this specimen escaped Herter when he prepared his index (which he did before the fire in Berlin). Though there are several places named either “São Paulo” or “S. Carlos” in south-central Brazil where Sellow collected, I have been unable to combine their locations with Sellow’s itinerary as mapped by Herter (1947). The unique features distinguishing *R. verbenoides* (see Notes below) leave no doubt as to the identity of Chamisso’s species, and Naudin’s (1849), Triana’s (1871), and Cogniaux’s (1891) characterizations all agree with our present concept of the species.

Shrub or subshrub, 0.5–1.5(-2) m tall, stem and branchlets slightly or strongly 4–6-angled, stem, branchlets, and inflorescence laxly glandular-setose with patent

hairs 0.52 mm long, especially on the nodes, glandular tips caducous. Leaves spreading, sometimes ternate, shortly petiolate or sessile, the petiole 0.3–1.2 cm long, blade lanceolate to linear, 5–12 × 0.4–1.7 cm, base acute or obtuse, apex acute, with 1–2 pairs of lateral primary veins diverging at the base of the blade, on both surfaces with a sparse scattering of minute tan or brown hairs 0.5–1 mm long, or glabrous, margins regularly serrulate. Inflorescence thyrsoid, ample, with regularly biparous cymes, the flowers aggregated at the tips of the branchlets. Flowers with pedicels 1–2(-3) mm long; floral bracts similar to the principal leaves but reduced in size upward and subsessile; hypanthium (at anthesis) 4–5(-6) mm long, glabrous; calyx lobes linear-subulate, 6–8 mm long, glabrous; petals magenta, obovate, 12–20 mm long; the fertile antepetalous stamens strongly dimorphic with one much longer than the other four, filaments 4–10 mm long, thecae (3-)4–6 mm long, beak 2–3 mm long, connective below the thecae to the filament insertion ca. 2 mm long in the 4 shorter stamens and 13–15 mm long in the single longer stamen, anteriorly at the insertion point slightly tuberculate, more so in the shorter stamens, the five antepetalous staminodia 1–3 mm long; ovary 3-celled, glabrous. Fruit a 6–8 mm high brown capsule.

Distribution and habitat: (Fig. 7) *Rhynchanthera verbenoides* grows in south-central Brazil (São Paulo, Goiás, Mato Grosso, and Mato Grosso do Sul) and Paraguay. It grows in low-lying, humid places in open vegetation from sea-level to 600 m altitude. In Brazil, collected flowering January to May and in Paraguay in October, November, January, and February.

Notes: There is an excellent illustration of this species in the *Flora Brasiliensis* (Cogniaux 1883, pl. 43).

In habit, the narrow leaves, and the angular stem, it resembles *R. serrulata* but that species has isomorphic stamens. The ranges of the two do not overlap. In describing *R. hassleriana*, Kränzlin (1931) rightly doubted whether his new species was sufficiently distinct from *R. verbenoides*. Kränzlin and also Cogniaux, who named two supposed species in this alliance, tried to use petiole length and pubescence, leaf width, and hypanthium shape to distinguish between *R. verbenoides* and their new species. However, the alleged differences are not convincing in view of the variation seen in modern material. Likewise, the relatively narrow leaves used by Hoehne to distinguish *R. linearifolia* do not hold.

Selected collections: (42 collections examined). Brazil: Goiás: Mun. Jataí, Queixada, Feb 1950, Macedo 2179 (HB, MO, RB); Mun. Mineiros, BR-354, Feb 1974, Hatschbach 34246 (C, HB, HBG, M, MO, US). – Mato Grosso: Ponta Pora, May 1976, Hatschbach 38676 (C, US). – Mato Grosso do Sul: Mun. Amambai, Rio Panduá, Feb 1983, Hatschbach 46185 (AAU, G, NY, US).

Paraguay: Depto. De La Cordillera: Cordillera de los Altos, Jan 1885, Hassler 1777 (BR, G, NY, P); Tucanguá, Jan 1885,

Hassler 3753 (G, GH, MO, NY, P, S, W); Villarrica, Feb 1931, Jørgensen 4223 (CAS, GH, MO, NY, S, US); Serra de Maracaiu, Oct 1900, Hassler 4818 (G), 5090 (G, GH, NY, S, W); Caaguazú, Mar 1905, Hassler 9373 (G). – Misiones, Santiago, Feb 1955, Pedersen 3242 (BR, C, NY, P, US). – San Pedro, Lima, Nov 1969, Pedersen 9409 (C, L, NY, P).

13. *Rhynchanthera latifolia* Cogniaux in Martius

Fl. bras. 14(3): 167. 1883. – Type: Riedel 2265, Brazil, São Paulo, Batataís, May 1834 (BR lectotype, selected here, BM, BR, GH, GOET, LE, M, MO, NY, P, S, W isotypes; B destroyed but represented by a photo, F 16646).

Rhynchanthera stricta Cogniaux, Martius Fl. bras. 14(3): 168, tab. 40. 1883. – Type: Regnell III/2, Brazil, Minas Gerais, between Uberabá and Franca, Feb 1849 (S holotype, C, US isotypes).

Subshrub, 0.3–0.6 m tall, stem and branchlets acutely 4–6-angled, the stem, branchlets and inflorescence minutely glandular-hirsute with hairs 0.5–1 mm long, the glandular tips caducous, or almost glabrous. Leaves spreading, sessile or subsessile, the petiole to 0.3 cm long, blade broadly ovate, 3–4 × 2–5 cm, base rounded or subcordate, apex acute, with 3(–4) pairs of lateral primary veins diverging at the base of the blade, on both surfaces glabrous, margins regularly ciliate-serrulate. Inflorescence thyrsoid, usually narrow, with usually regularly biparous cymes, the flowers aggregated at the tips of the branchlets. Flowers subsessile, pedicels ca. 1 mm long; floral bracts similar to the principal leaves but reduced in size and with longer marginal teeth; hypanthium (at anthesis) 5–6 mm long, laxly setulose or glabrous; calyx lobes linear-subulate, 3–5 mm long, apically sparsely setulose, basally hirsute; petals deep purple or magenta, obovate, 20–25 mm long; the fertile antepetalous stamens strongly dimorphic with one much longer than the other four, filaments 5–11 mm long, thecae 4–6 mm long, beak 3–4 mm long, connective below the thecae to the filament insertion ca. 5 mm long in the 4 shorter stamens and 8–9 mm long in the single longer stamen, anteriorly at the insertion point slightly tuberculate, more so in the four shorter stamens, the five antepetalous staminodia 3–4 mm long; ovary 3-celled, basally glabrous, apically minutely glandular-pubescent. Fruit a ca. 5 mm high brown capsule.

Distribution and habitat: (Fig. 7) *Rhynchanthera latifolia* is only known from the state of São Paulo, Brazil, where it has been collected in the mountain ranges near Franca and Batataís and in the vicinity of São Paulo. It grows in humid places in the cerrado at about 600 m altitude; flowering January–July.

Notes: *Rhynchanthera latifolia* is illustrated in the Flora Brasiliensis (Cogniaux 1883: pl. 40, sub *R. stricta*).

The species is similar to *R. verbenoides* in habit and flowers, but differs in the broadly ovate leaves whereas *R. verbenoides* has lanceolate leaves. The ranges of the two species do not overlap.

Collections other than the types: Brazil: São Paulo: Franca, Jul 1834, Lund s.n. = 2297/2 in herb. Warming (C, P); *ibid.*, Jan 1893, Löfgren & Edwall 2077 (BR, C, SP); Batataís, Jun 1834, Lund s.n. (C 2 sheets); Moji das Cruzes, Apr 1889, Glaziou 17517b (P, R).

14. *Rhynchanthera bracteata* Triana

Trans. Linn. Soc. London 28: 31. 1871. – Type: Triana s.n. = 3864, Colombia, Meta, Llanos de San Martín, Jan 1856 (BM holotype, BR, COL, F frag., G-DC, F photo 26096, LE, NY, P, W isotypes).

Shrub, 1–1.5 m tall, stem and branchlets terete to obtusely angular, the stem, branchlets and inflorescence densely tomentose to lanate with sometimes gland-tipped hairs 4–6 mm long, glandular tips caducous. Leaves spreading, sessile or subsessile, petiole to 0.3 cm long, blade ovate, (4–)6–9 × (2.2–)4(–5) cm, base cordate, apex acute, with (3–)4 pairs of lateral primary veins diverging at the base of the blade, on both surfaces densely sericeous with brown or red-brown hairs 1–2(–3) mm long, margins regularly serrulate. Inflorescence thyrsoid, often narrow, the lateral branches 1–2-branched, with biparous cymes, the flowers densely aggregated at the tips of the branchlets. Flowers subsessile, pedicels ca. 1 mm long; floral bracts similar to the principal leaves but reduced in size and sessile; hypanthium (at anthesis) 5–8 mm long, softly glandular-strigose; calyx lobes narrowly triangular, 9–13 mm long, densely pubescent with slightly wavy, sometimes glandular hairs; petals magenta, obovate, 25–30 mm long; the fertile antepetalous stamens strongly dimorphic with one much longer than the other four, filaments 8–12 mm long, thecae 4–5 mm long, beak 4–5 mm long, connective below the thecae to the filament insertion ca. 5 mm long in the 4 shorter stamens and 13–18 mm long in the single longer stamen, anteriorly at the insertion point slightly tuberculate, more so in the four shorter stamens, the antepetalous staminodia 2–3 mm long; ovary 3(–4)-celled, basally glabrous, apically minutely glandular-papillose. Fruit a 6–7 mm high brown capsule.

Illustration: Fig. 8.

Distribution and habitat: (Fig. 7) *Rhynchanthera bracteata* occurs in eastern Colombia and Bolivia in swampy places in llanos (natural savannas) and pastures; 250–600 m altitude. In Colombia, collected flowering in November–December and June–July and with old fruits in March; in Bolivia, flowering in July–August.

Notes: *Rhynchanthera bracteata* is characterized by relatively large, sessile leaves and few, large flowers in much contracted cymes. Recent collecting in Bolivia has disclosed a disjunction of 2200 km in the species' range.

Collections other than the type: Colombia: Boyacá: 3 km SE of

Tauraumena, Jul 1963, Uribe 4403 (COL, NY). – Meta: Villavicencio, Nov 1938, Cuatrecasas 4775 (F, US); Dec 1950, Idrobo & Schultes 550 (AAU, COL, F, MO, NY, P, U, US). – Vichada: between El Porvenir and Sta. Rosalia, Pinto & Sastre 1213 (COL, GOET, P).

Bolivia: Beni: Prov. Ballivián, San Borja, 19 km from La Paz, Jul 1981, Beck 6954 (US). – La Paz: Iturralde, Luisita, 13°5'S, 67°5'W, Aug 1984, Haase 317A (US).

15. *Rhynchanthera grandiflora* (Aubl.) DC.

Prodr. 3: 107. 1828. – *Melastoma grandiflora* Aublet, Hist. pl. Guiane 1: 414, tab. 160. 1775. – *Osbeckia aubletiana* Sprengel, Syst. veg. 2: 311. 1825. – Type: Aublet s.n., French Guiana (BM holotype).

Rhynchanthera monodynamia De Candolle, Prodr. 3: 107. 1828. – *Rhynchanthera grandiflora* (Aubl.) DC. var. *monodynamia* (De Candolle) Cogniaux, Fl. bras. 14(3): 173. 1883. – Type: Martius s.n., Brazil, Pará, sylvis secus fluv. Amazonum (M holotype, M isotype).

Rhynchanthera haenkeana De Candolle, Prodr. 3: 107. 1828. – Type: Haenke s.n., Peru, Huánuco, before 1794 (M holotype, F photo 6403, BR frag., M isotypes).

Rhynchanthera limosa De Candolle, Prodr. 3: 108. 1828. – Type: Martius s.n., Brazil, Bahía, near Caiteté, Oct (M holotype).

Rhynchanthera rostrata De Candolle, Prodr. 3: 108. 1828. – Type: Martius s.n., Brazil, Minas Gerais, Serra S. Antonio, Aug 1818 (M holotype, F photo 6405).

Rhynchanthera stachydimorpha De Candolle, Prodr. 3: 108. 1828. – Type: Martius s.n., Brazil, Minas Gerais, circa Minas Novas prope Fanado (= Vila Bom Sucesso), Aug 1818 (M holotype).

Rhynchanthera adenophora Miquel, Comm. phytogr.: 73, tab. 10, fig. c. 1840. – Type: Focke 961, Surinam, Pl. Prospérité (U holotype).

Rhynchanthera acuminata Benth., J. Bot. (Hooker) 2: 299. 1840. – *Rhynchanthera cordifolia* Walp., Repert. 2: 120. 1850. – Type: Ri. Schomburgk 82, Guyana, Savannas at Anna-y, 1841 (K holotype, BM, BR, G, G-DC, GH, L, LE, P, U, US frag., W isotypes; B destroyed, but represented by a photo, F neg. 16640).

Rhynchanthera limosa De Candolle var. *depauperata* Naudin, Ann. Sci. Nat. Bot. III, 12: 210. 1849. – Type: Claussen s.n. = 599, Brazil, Minas Gerais, 1842 (P holotype, CAS, G-DC isotypes).

Rhynchanthera grandiflora (Aubl.) DC. var. *microphylla* Naudin, Ann. Sci. Nat. Bot. III, 12: 211. 1849. – Type: Hostmann & Kappler 1300, Surinam, upper Suriname River, Dec 1842 (P holotype, BM, G, GH, GOET, L, LE, M, MO, NY, P, S, U, W isotypes).

Rhynchanthera mathaei Naudin, Ann. Sci. Nat. Bot. III, 12: 209. 1849. – Type: Mathews 1273, Peru, Moyobamba (P holotype, BR, F frag., K, LE isotypes).

Rhynchanthera ambigua Naudin, Ann. Sci. Nat. Bot. III, 12: 210. 1849. – Type: Ri. Schomburgk s.n., Guyana, 1841/42 (P holotype).

Rhynchanthera insignis Naudin, Ann. Sci. Nat. Bot. III, 12: 210. 1849. – Type: Galeotti 2963, Mexico, Vera Cruz (P lectotype, selected here, G, LE, P, W isotypes).

Rhynchanthera acuminata Benth. var. *sublaevis* Cogniaux in Martius, Fl. bras. 14 (3): 171. 1883. – Type: Ri. Schomburgk s.n., Guyana, 1841/42 (BR holotype).

Rhynchanthera betulifolia Cogniaux in Martius, Fl. bras. 14(3): 171, tab. 42, fig. "1". 1883. [The numbers of fig. 1 and 2 were exchanged; *R. betulifolia* is really shown in fig. "2".] – Type: Herb. Ledebour s.n., French Guiana (LE holotype, BR, P isotypes).

Rhynchanthera orinocensis Sprague, Trans. & Proc. Bot. Soc. Edinburgh 22: 431. 1905. – Type: Sprague s.n., Venezuela, Bolívar, Caicara, Orinoco (K holotype).

Rhynchanthera intermedia Ule non Naudin, Notizblatt Bot.

Gart. Berlin-Dahlem 6: 348. 1915. – Type: Ule 8245, Brazil, Roraima, Serra de Pacaraima, upper Rio Branco, Nov 1909 (L lectotype, selected here, G, MG, F photo 45503 isotypes; holotype in B destroyed, but represented by a photo, F 16645). [A homonym of a Naudin species here synonymized under *R. hispida*.]

Rhynchanthera microphylla Gleason, Bull. Torrey Bot. Club 52: 337. 1925. – Type: Hitchcock 16985, Guyana, SE of Georgetown, 27 Nov 1919 (NY holotype, GH, S, US isotypes).

Rhynchanthera cardonae Wurdack, Phytologia 14: 263. 1967. – Type: Cardona 2858, Venezuela, Bolívar, Salto Rio Ichun, Alto Paragua, 1 Mar 1958 (VEN holotype, NY, US isotypes).

Nomenclatural note: Cogniaux (1891) lists three nomina nuda as synonyms: *Melastoma fothersgilloides* Schrank & Martius ex DC. under *R. grandiflora* var. *monodynamia*, *Meriania violacea* Schrank ex DC. under *R. limosa*, and *R. stachyoides* Schrank & Martius ex DC. under *R. rostrata*. Melastomataceae in Martius' herbarium in Munich often bear such diagnosis slips written by Schrank, and de Candolle apparently took notes on them during his visit to Munich in fall 1827 when he saw Martius' melastomes (Wurdack 1958: 106).

Shrub or subshrub, 0.5–1.2(–2) m tall, stem and branchlets subterete or obtusely angular, the stem, petioles and inflorescence more or less densely glandular-puberulous or glandular-tomentose with patent or wavy hairs to 6 mm long, especially on the nodes. Leaves spreading, subsessile or with a petiole (0.5–)2.5–3.7 cm long, blade ovate, narrowly ovate, or (rarely) lanceolate, (3–)4.5–10 × (2–)2.5–4.5 cm, base cordate, rounded or subacute, apex acute or acuminate, with 3–4 pairs of lateral primary veins diverging at the base of the blade, on both surfaces usually densely strigulose-hispidulous with tan or brown-red hairs ca. 1.5 mm long, margins more or less regularly ciliate-serrulate. Inflorescence thyrsoid, narrow or ample, variously branched with biparous or (distally) uniparous cymes, flowers sometimes aggregated at the tips of the branchlets. Flowers subsessile, pedicels ca. 1 mm long; floral bracts similar to the principal leaves but reduced in size upward and sessile; hypanthium (at anthesis) 4–6 mm long, minutely glandular-setulose; calyx lobes linear-subulate, 6–15 mm long, glandular-setulose; petals magenta, obovate, 15–25 mm long; the fertile antepetalous stamens strongly dimorphic with one much longer than the other four, filaments (3–)518 mm long, thecae 4–6.8 mm long, beak (3–)4 mm long, connective below the thecae to the filament insertion 4.5–5 mm long in the shorter stamens and 10–18 mm long in the single longer stamen, anteriorly at the insertion point slightly tuberculate, more so in the four shorter stamens, the antepetalous staminodia 2–6 mm long; ovary 3(–4)- or Scelled, basally glabrous, apically minutely glandular-papillose. Fruit a 6–7 mm high brown capsule.

Illustration: Fig. 1A (seed).

Distribution and habitat: (Fig. 4) *Rhynchanthera gran-*

diflora occurs in southern Mexico, Panama, Colombia, Venezuela, the Guianas, and Brazil and Peru and Bolivia. Common in swampy places in open vegetation; sealevel to 1200 m altitude. In Central America flowering December–March, in Venezuela and the Guianas October–March, in central Amazonia all year round, but with a peak in relatively drier months, and in south-central Brazil in July and August (see Phenology, floral biology, and seed dispersal).

Notes: *Rhynchanthera grandiflora* is illustrated in Aublet (1775), Humboldt & Bonpland (1823 [1813], pl. 11), and Cogniaux (1883, pl. 42, as *R. betulifolia*, shown in the left-hand figure). Miquel's illustration (1840, pl. 10, fig. c) leaves much to be desired.

The variation in certain characters, at first thought to be fixed, was already noted by Triana (1871) and Cogniaux (1891). For example, de Candolle (1828a) described *R. limosa* as 3-locular, Naudin (1849) stated the species was 4-locular (he promptly described a new variety with three locules), and Cogniaux finally called it 3–5-locular. Already Chamisso (1835) suspected that *R. limosa* DC. should be included in de Candolle's *R. haenkeana*, and Cogniaux (1883) included Naudin's *R. matthei* under the latter. *Rhynchanthera acuminata* Benth and *R. ambigua* Naudin are based on the same Schomburgk collections and were accordingly synonymized by Triana (1871), who also synonymized *R. monodynamia* DC. and *Osbeckia aubletiana* Sprengel. Wurdack (1958) synonymized *R. orinocensis* Sprague. Mistakes did occur: *R. insignis* was synonymized under *R. mexicana* by Cogniaux (1883) although it does not have the isomorphic stamens of *R. mexicana*, but dimorphic ones. Dissection of a flower of the type of the allegedly isostemonous *R. microphylla* Gleason, on the other hand, showed that it in fact has strongly dimorphic stamens.

The large material now available has demonstrated the extreme variability in pubescence and leaf shape of the widespread *R. grandiflora*, and this has resulted in further synonymizations. Thus, the apparent distinction between the more narrow-leaved southern *R. rostrata* and the more broad-leaved northern typical *R. grandiflora* has broken down. Rombouts 378 and Oldenburger et al. 391, both from the Sipaliwini savannas in Surinam, and Marcano-Berti 2602 from Bolívar, Venezuela, have narrow leaves like typical "rostrata" from Brasília. Other collections from the Sipaliwini savannas (Oldenburger et al. 755, 929, and 1330) have broad "grandiflora" leaves. On the other hand, specimens such as, e.g., Heringer et al. 524 from the vicinity of Brasília have narrow leaves like those of typical Venezuelan *R. grandiflora*. Ginzberger & Zerry 610 from an intervening locality (Santarém, Pará) indeed is intermediate in leaf shape between the former *R. rostrata* and *R. grandiflora*. Hitchcock 16982 from Guyana, identified by Gleason as *R. acuminata*, is an excellent match in pubescence and flowers for the type of *R. betulifolia*

Cogniaux from French Guiana; both belong undoubtedly to the same species. Finally, the small, thin leaves and relatively short stamens Gleason thought distinguished *R. microphylla* from *R. grandiflora* have now been found in several other specimens from different areas, e.g., Huber & Cerda 1456 from Puerto Ayacucho and Huber 4940 from the Atabapo region, both in Terr. Fed. Amazonas, and Liesner & González 5740 and 11304 from the state of Bolívar.

Rhynchanthera grandiflora is visited and pollinated by medium-sized and large bees, such as *Xylocopa frontalis* (Olivier 1789), *X. tegulata* Friese 1911, *X. muscaria* (Fabricius 1775), *Centris nitens* Lepeletier 1841, *C. flavifrons* (Fabricius 1775) [Anthophoridae: Xylocopinae and Anthophorinae], *Eulaema nigrita* Lepeletier 1841 [Apidae: Euglossinae], and a possibly new species of *Monoeca* [Anthophoridae: Anthophorinae] (observations from Acre, Amazonas, Pará, and Roraima; Renner 1984, 1989a). The species is self-incompatible. *Rhynchanthera grandiflora* co-occurs with several other species (see Distribution and habitat), and on the fluvial island Maracá (Roraima) it was visited by the same bees as *R. hispida*, growing near by. In herbarium material, I have found two putative hybrids (Sucre 829 from Brasília and Aymard & Schargel 6993 from the state of Apure in Venezuela). The first is intermediate in leaf pilosity, sepals, and inflorescence between *R. grandiflora* and *R. novemnervia*, the second is intermediate in sepal shape and size, leaf width, and floral dimensions between *R. grandiflora* and *R. serrulata*.

Selected collections: (607 collections examined). Mexico: Vera Cruz: Isthmus of Tehuantepec, 1895, C. L. Smith 1009 (BM, NY, US); Sierra San Pedro Nolasco, Talea, 1843–44, Jürgensen 607 (G); Sta. Rosa, 15 km E of Coatzacoalcas, Gomez Pompa 4671 (GH).

Panama: Coclé: El Valle, Dec 1936, P. H. Allen 73 (F, GH, MO, NY); Margarita, near El Valle, Jan 1968, Dwyer & Duke 8292 (F); 29 km N of Penonome, Feb 1978, Hammel 1719 (CAS). – Veraguas: 13 km W of Santiago, Mar 1977, D'Arcy 10646A (CAS, MO); outskirts of Santiago, Jan 1971, Wilbur & Teeri 13000 (F, US); along Panamerican Hwy., 270 km W of Panama City, between Santiago and San Felix, Dec 1977, Folsom & Collins 6903 (AAU, BM, CAS, MO, NY, U). – Herrera: 11 mi S of Ocu on Las Minas rd., Dec 1963, Graham 242 (GH).

Colombia: Boyacá: Aguas Claras, Jul 1963, Saravia 2702 (COL). – Casanare: Orocué, Nov 1933, Cuatrecasas 4371 (COL, F, US). – Cesar: Poponte, Nov 1924, C. Allen 785 (MO). – Meta: La Macarena, Jan–Mar 1959, García-Barriga & Mejía 17056 (COL, NY); 20 km W of Puerto Lopez, along rd. to Villavicencio, Jan 1973, Davidse & Llanos 5512 (US); 65 km E of Villavicencio, Jan 1939, Haught 2520 (COL, F, NY, US). – Vichada: Hato Canaima, border between Vichada and Meta, along rd. between El Porvenir and Sta. Rosalia, Mar 1971, Pinto & Sastre 1302 (COL, GOET, P); between Pto. Carreno and Pto. Gaitán, 1971, Pinto & Sastre 1490 (COL, INPA, P, US).

Venezuela: Amazonas: Base of Cerro Paru on Caño Asisa, Feb 1951, R. Cowan & Wurdack 31468 (G, GH, NY); Esmeralda, Oct 1928, Lützelburg 22418 (M, R), Jul 1951, Croizat 218 (F); Puerto Ayacucho, 5°29'N, 67°36'W, Jan 1978, Huber & Cerda 1456 (NY, US, VEN); Base of Cerro Yapacana, 3°38'N, 66°52'W, Dec 1978, Huber & Tillett 3026 (B, CAS,

NY, VEN). – Apure: Distr. Pedro Camejo, between Río Cinaruco near mouth of Caño San Miguel and southern part of the Galeras de Cinaruco, 67°17'W, 6°33'N, Apr 1977, Davidse & González 12313 (MO, US). – Bolívar: Laguna de Canaima, Mar 1969, Hertel & Oberwinkler 15227 (M); between Ciudad Bolívar and Río Pao, Apr 1943, Killip 37211 (F, NY, US). – Guárico: Parq. Nac. Aguaro-Guariquito, ca. 9°48'N, 67°52'W, Dec 1981, Delascio et al. 11523 (MO, US, VEN). – Monagas: La Pica, ca. 15 km from Maturín, Jul 1959, Aristeguieta 3927 (NY, VEN); 70 km S of Maturín on rd. to Ciudad Guyana, Mar 1974, Gentry et al. 10760 (COL, MO).

Guyana: Essequibo county, Orinduik Falls, Ireng River, Jan 1956, Irwin 535 (US); Caupe River, Jul 1884, Jenman 1832 (NY), Hoobaboo Creek, Mar 1897, Jenman 7241 (NY); Arachmere, Dec 1957, Cook 229 (M, NY, U); SE of Georgetown, Nov 1919, Hitchcock 16982 (GH, NY, S, US); upper Mazaruni River, Oct 1951, Maguire & Fanshawe 32233 (NY); Mt. Ayangana, Pakaraima Mts., Feb 1955, Maguire et al. 40679 (F, NY, US).

Surinam: Sikwatra savanna, Apr 1959, Dirven 727 (U); Maratakka River, Apr 1951, Florschütz 2000 (BR, C, NY, U); near Apikollo, Jan 1911, Hulk 57 (U); Dist. Marowijne, Moengo airfield, Oct 1961, Hekking 1039 (GH, U); Kayser Mts., 40 km above confl. with Lucie River, Sep 1963, Irwin et al. 57589 (B, COL, GH, MG, MO, NY, S); along railway near Kabelstation, Feb 1956, Jonker-Verhoef & Jonker 630 (U); French Guiana: Near Cayenne, Jan 1974, Descouings & Luu 20140 (P); Charvein, Oct 1913, Benoist 128 (P); Le Gallion, route N2, Oct 1981, Billiet & Jadin 1031 (BR, NY, U).

Brazil: Alagoas: Mun. de Monte Carmelo, Jun 1940, Oliveira 47 (BHMH, IAN, US). – Amapá: 5 km E of Porto Grande, Oct 1979, Austin et al. 7099 (IAN, INPA, MG, MO, NY); Oiapoque, near airfield, Sep 1949, Black 49-8215 (IAN, NY, P), Egler 1442 (IAN, INPA, MG, NY, UB, US). – Amazonas: Manaus, Aug 1981, Renner 287 (CAS, HBG, INPA), Renner 555 (CAS, HBG, INPA, US); Humaitá, Rio Madeira, Oct 1981, Renner 478 (HBG, INPA, US); Fortaleza Savanna, Rio Puciarí, trib. of Rio Itúxi, 20 km above mouth, 29 Jun 1971, Prance et al. 13799 (F, GH, INPA, MG, NY, RB, S, US). – Bahía: Serra ca. 30 km W of Barreiras, Mar 1972, Anderson et al. 36500 (UB); 12 km N of Correntina, on rd. to Inhaúmas, 44°40'W, 13°15'S, Apr 1980, Harley et al. 21859 (AAU, NY, U, US). – Ceará: Without exact locality and date, Alêmão & Cysneiros 622 (R). – Distrito Federal: Brasília, horto do Guará, Mar 1961, Heringer 8102 (HB, NY, UB, US). Goiás: Cristalina, Apr 1973, Anderson 8143 (F, NY, UB, US); São Domingos, May 1840, Gardner 4145 (BM, BR, W); Anápolis, Oct 1956, L. B. Smith & Macedo 4786 (HB, US). – Maranhão: Banderante to Pinheiro, 3°00'S, 45°10'W, Oct 1980, Daly et al. 672 (F, IAN, MG, MO, NY, US); ca. 20 km NE of Caxias, ca. 4°44'S, 43°11'W, Jan 1970, Eiten & Eiten 10348 (US). – Mato Grosso: Serra O. Nona, Feb 1917, F. C. Hoehne 4253 (SP). – Minas Gerais: Serra de Catiara, Aug 1950, Duarte 2852 (RB, US); Conselheiro Matta, Jun 1934, Brade 13746 (US); Lagoa Santa, Jul 1932, Brade 11901 (GH, R), Jan 1989, Renner 2123 (AAU, CAS, INPA, US); between Rio S. Francisco and Curvelo, Sep 1834, Riedel 2697 (BR, C, GH, GOET, LE, M, NY, P, S, US, W). – Pará: Caucaual Grande, Limpo dos Alemães, Oct 1950, Black & Ledoux 50-10485 (IAN, NY); Rio Parú de Oeste, Missão Tirijo, 2°20'N, 55°45'W, Mar 1970, Cavalcante 2601 (COL, MG, NY, S, US); Rio Calçoene, 11 Nov 1901, Ducke 2507 (BR, MG, R); Santarém, Nov 1849, Spruce 527 (BM, G, G-DC, GH, GOET, LE, M, NY, W). – Pernambuco: Sta. Rosa, banks of Rio Preto, Sep 1893, Gardner 2857 (BM, NY, W). – Piauí: Banks of Rio Gurgea, Aug 1839, Gardner 2584 (BM, US). – Rondônia: Porto Velho, 27 May 1952, Black & Cordeiro 52-14538 (IAN, NY); Rio Guaporé, Faz. Sta. Rosa, Jun 1952, Black & Cordeiro 52-14892 (IAN, NY). – Roraima: Maracá island in the Rio Uraricoera, tributary of the Rio Branco, Nov 1980, Renner 41 (CAS, HBG, INPA); Surumú region, vic. of Perreira village, ca. 150 km from Boa Vista, Oct 1977, Coradin &

Cordeiro 917 (INPA, NY, US); Serra Tepequem, Nov 1954, Maguire & Maguire 40002 (IAN, NY, RB, S, US). – São Paulo: Aguas de São Pedro, 22°30'S, ca. 48°W, Jan 1985, Gentry & Zardini 49263 (US).

Peru: San Martín: 5–6 km from Rioja on rd. to Yurayacu, Apr 1970, Chrostowski 70-129 (AAU, US); Moyobamba, Mar 1952, Noriega s.n. (US); Rioja, Jan 1961, Woytkowski 6117 (GH, MO, R, US), 1947, Woytkowski 35254 (F).

Bolivia: Sta. Cruz, Prov. del Sara, Buena Vista, Mar 1915, J. Steinbach 1123 (NY), Apr 1921, J. Steinbach 5515 (F, G, GH, NY, PH). – La Paz: Near Apolo, Aug 1959, Cardenas 5677 (US); Apolo, Mar 1902, R. S. Williams 40 (BM, NY, US); Iturralde, Luisita, 13°5'S, 67°15'W, Aug 1984, Haase 467 (US).

Excluded taxa

Melastoma saxatilis Vellozo, Fl. Flum.: 181, Ic. 4, tab. 129. 1829 [1825] = probably a species of *Tibouchina*. The synonymization of *Melastoma saxatilis* Vellozo by Cogniaux (1883; and, following him, Wurdack 1962) is incorrect. Vellozo's plate shows a Melastomataceae with 5-nerved leaves and 10 isomorphic fertile stamens, clearly not a *Rhynchanthera*.

Tibouchina meiodon Stapf, Bull. Misc. Inform. 97: 104. 1895. – Type: "Cultivated at Kew from seeds believed to have been sent by Glaziou; 'Pseudopterolepis'-4-merous" (K holotype, n.v.). According to Dr John Wurdack, who has studied the type of this species, it is probably not distinct from *Tibouchina sebastiano-politana* Cogn.

Rhynchanthera fothergillae de Candolle, Prodr. 3: 108. 1828 = *Tibouchina fothergillae* Cogniaux.

Rhynchanthera goyazensis Glaziou, Bull. Soc. Bot. France 54 (1907), Mem. 3c: 257. 1908, nom. nud.

Rhynchanthera gracilis Glaziou, Bull. Soc. Bot. France 54 (1907), Mem. 3c: 256. 1908, nom. nud.

Rhynchanthera gracilis var. *glabrata* Glaziou, Bull. Soc. Bot. France 54 (1907), Mem. 3c: 256. 1908, nom. nud.

Rhynchanthera mollis Glaziou, Bull. Soc. Bot. France 54 (1907), Mem. 3c: 257. 1908, nom. nud.

Rhynchanthera montana Glaziou, Bull. Soc. Bot. France 54 (1907), Mem. 3c: 256. 1908, nom. nud.

Rhynchanthera parviflora Glaziou, Bull. Soc. Bot. France 54 (1907), Mem. 3c: 256. 1908, nom. nud.

Rhynchanthera medialis Standley & Steyermark, Publ. Field Mus. Nat. Hist., Bot. Ser. 23: 137. 1944 = to be included (as comb. nov.) in a new genus being described by Dr Frank Almeda.

From the outset, this taxon, described from fruiting material, did not fit into the genus because of its complete lack of glandular hairs. A seed is illustrated in

Whiffin & Tomb (1972, Fig. 35): it clearly differs from *Rhynchanthera* seeds in size, shape, and testa, not even appearing to be microliticoid.

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Index of scientific names

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<i>fothergilloides</i> Schrank & Martius, nom. nud.	625
<i>gardneri</i> Naudin	618
<i>gardneri</i> var. <i>cuyabensis</i> Cogn.	618
<i>glabrescens</i> Pilger	621
<i>glazioviana</i> Cogn.	614
<i>goyazensis</i> Glaziou, nom. nud.	627
<i>gracilis</i> Glaziou, nom. nud.	627
<i>gracilis</i> var. <i>glabrata</i> Glaziou, nom. nud.	627
<i>grandiflora</i> (Aublet) DC.	625
<i>grandiflora</i> var. <i>microphylla</i> Naudin.	625
<i>grandiflora</i> var. <i>monodynamia</i> (DC.) Cogn.	625
<i>haenkeana</i> DC.	625
<i>hassleriana</i> Kränzlin	623
<i>hispidia</i> Naudin.	612
<i>hispidia</i> var. <i>villosa</i> Cogn.	615
<i>hookeri</i> Naudin	615
<i>humilis</i> Cogn.	620
<i>imbricata</i> Markgraf.	618
<i>insignis</i> Naudin	625
<i>intermedia</i> Naudin	612
<i>intermedia</i> Ule	625
<i>kleinii</i> Brade	620
<i>latifolia</i> Cogn.	624
<i>latifolia</i> var. <i>hirsuta</i> Cogn.	619
<i>laxa</i> Cogn.	619
<i>leucorrhiza</i> S. Moore	621
<i>limosa</i> DC.	625
<i>limosa</i> var. <i>depauperata</i> Naudin	625
<i>linearifolia</i> Hoehne	623
<i>matthaei</i> Naudin	625
<i>maximowiczii</i> Cogn.	615
<i>medialis</i> Standley & Steyerf.	627

mexicana DC.	616	schrankiana var. quadrivalvis Naudin	615
microphylla Gleason.	625	secundiflora Naudin	621
modesta Naudin	614	serrulata (L. C. Rich. in Humb. & Bonpl.) DC.	614
mollis Glaziou, nom. nud.	627	simplicicaulis Naudin	621
monodynamia DC.	625	spicata Hoehne	618
montana Glaziou, nom. nud.	627	stachydimorpha DC.	625
novemnervia DC.	621	stachyoides Schrank & Martius, nom. nud.	625
orinocensis Sprague	625	stricta Cogn.	624
ovalifolia Naudin.	621	ternata Cogn.	623
paludicola (J. D. Smith) Gleason	617	ursina Naudin	617
parviflora Naudin	614	verbenoides Cham.	623
parvifolia Cogn.	621	villosissima Cogn.	617
parviflora Glaziou, nom. nud.	627	virgata Wurd.	612
pentanthera DC.	615	weddellii Naudin.	621
philadelphensis Brade	621	williamsii Gleason.	615
regnellii Cogn.	615	Thenardia	
reitzii Brade.	620	rosea Sessé & Moçônio, nom. nud.	616
riedeliana Cogn.	615	Tibouchina	
riparia S. Moore	621	fothergillae Cogn.	627
rosea Cogn.	623	meiodon Stapf.	627
rostrata DC.	625	paludicola J. D. Smith	617
salicifolia DC.	614	sebastianopolitana Cogn.	627
schrankiana DC.	615		