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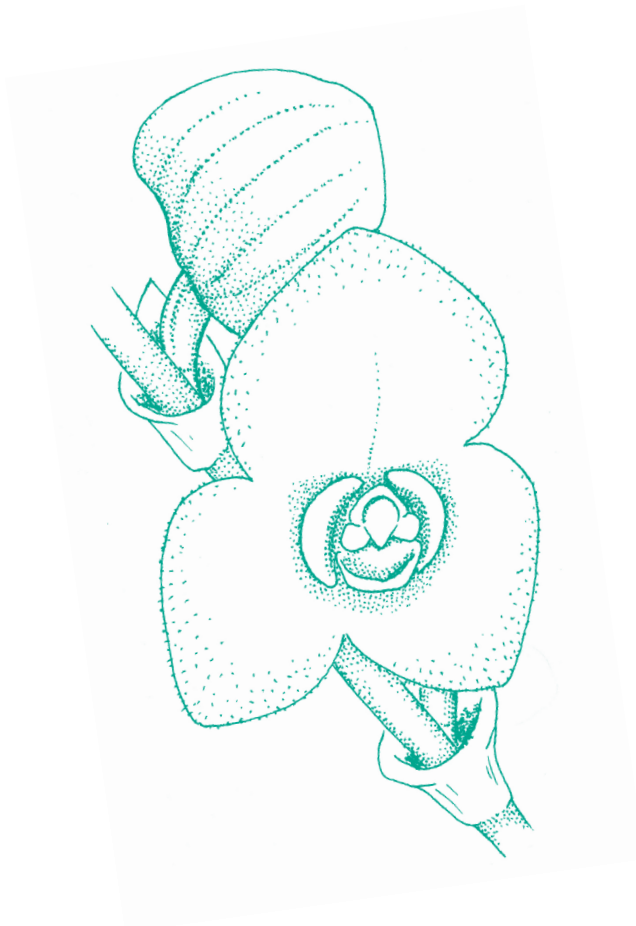
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(see page 52, Figure 41). Drawing by C. A. Luer, inked by S. Dalström.

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Ihsan A. Al-Shehbaz

Bengt-jonsellia (Brassicaceae), a new genus from Madagascar 1

Leonardo Biral and Julio Antonio Lombardi

The first record of *Zinowiewia* in the Brazilian flora
and a short account of its history 5

Xavier Cornejo

Randia tafallana (Rubiaceae): A new name for *Mussaenda parvifolia* Tafalla ex Estrella,
a tree from the dry forests of coastal Ecuador 9

Xavier Cornejo

Odontonema guayaquilense (Acanthaceae),
a new species from the deciduous dry forest of coastal Ecuador 13

Laurence J. Dorr, Fred W. Stauffer, and Leyda Rodríguez

Albert Mocquerys in Venezuela (1893–1894):
A commercial collector of plants, birds, and insects 17

Carlyle A. Luer

Icones Stelidarum (Orchidaceae) Colombiae III 27

Pedro Luís Rodrigues de Moraes and Matheus Carvalho Vergne

Ocotea Batata (Lauraceae), a new species from Brazil 61

Saman A. Ahmad, Azad Rastegar, and Farideh Attar

Cousinia Azmarensis (Asteraceae, Cardusae),
a new species from Kurdistan, Iraq 71

Index to New Names and Combinations 75

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BENGT-JONSELLIA (BRASSICACEAE), A NEW GENUS FROM MADAGASCAR

IHSAN A. AL-SHEHBAZ¹

Abstract. *Bengt-jonsellia* Al-Shehbaz is described as a new genus endemic to Madagascar, and the new combinations *B. laurentii* (Jonsell) Al-Shehbaz and *B. tsaratananae* (Jonsell) Al-Shehbaz are proposed. The characters distinguishing *Bengt-jonsellia* from *Nasturtium* and *Rorippa* are discussed, and detailed descriptions of the genus and a key to its two species are provided.

Keywords: *Bengt-jonsellia*, Brassicaceae, *Ceriosperma*, Cruciferae, *Nasturtium*, *Rorippa*.

Rorippa Scop. (Brassicaceae or Cruciferae) includes ca. 80 species represented by native taxa on all continents but Antarctica (Al-Shehbaz, 1988). Although the genus has long been assigned to the tribe Arabideae (Schulz, 1936), extensive molecular phylogenetic studies, summarized by Al-Shehbaz et al. (2006) and Al-Shehbaz (2012), place it in tribe Cardamineae. Previous authors (e.g., Schulz, 1936; Jonsell, 1968, 1974, 1982; Al-Shehbaz, 1988; Al-Shehbaz and Rollins, 1988; Rollins, 1993; Jalas and Suominen, 1994) broadly circumscribed *Rorippa* and united it with *Nasturtium* W. T. Aiton. However, both genera are currently maintained (e.g., Stuckey, 1972; Appel and Al-Shehbaz, 2003; Mabblerley, 2008; Al-Shehbaz, 2010, 2012), and the substantial morphological differences (see Al-Shehbaz and Price, 1998) and family-wide phylogenetic studies (German et al., 2009; Couvreur et al., 2010) support that distinction.

Jonsell (1979) described *Rorippa laurentii* Jonsell as endemic to Madagascar with two subspecies restricted to a few humid cliffs and cleared forests. Except for the herbarium at the Muséum National d'Histoire Naturelle (P), almost all other collections have poor representations of the species. During a visit in 2016 to P, I had the chance to examine substantial collections of this species, as well as fewer specimens in other herbaria, including most of the type material cited below.

Rorippa laurentii differs from the remaining species of the genus by having non-auriculate (vs. almost always auriculate) cauline leaves, stems rooting (vs. almost always not rooting) from lower nodes, lowest fruiting pedicels 1–2.3 cm (vs. <1 cm), gynophore 1–3 mm (vs. obsolete), latiseptate (vs. terete) fruit, uniseriate (vs. biseriate) seeds 2.8–4.5 mm (vs. 0.4–1(–2) mm), and 4–10 (vs. 18(–25)–300) ovules per ovary. Although the seed sculpture in *Rorippa* ranges from papillate, reticulate, colliculate, to foveolate (Murley, 1951; Vaughan and Whitehouse, 1971; Jonsell, 1974; Al-Shehbaz, 2010), none of its species has concentrically striate seeds as do the two subspecies of *R. laurentii* that were described by Jonsell (1979) to have ridged seed coat.

Despite its wide distribution and diversity, *Rorippa* was not previously included in a genus-wide molecular

phylogenetic study. However, Nakayama et al. (submitted) have recently studied the chloroplast phylogeny of about 45 species of the genus, and their data show that *R. laurentii* was placed outside of *Rorippa*. As indicated by Jonsell (1979), *R. laurentii* is not related morphologically to any African species, though he associated it with the Australian and Southwest Asian species that Schulz (1933, 1936) placed in the highly heterogeneous *Nasturtium* sect. *Ceriosperma* O.E.Schulz. The section was raised to a monospecific genus by Greuter and Burdet (Greuter and Raus, 1983) to include only the Lebanese-endemic *C. macrocarpum* (Boiss.) Greuter & Burdet. However, as shown by Al-Shehbaz and Jacquemoud (2000) and German (2016), the latter species is perfectly at home in *Barbarea* W. T. Aiton, and it is morphologically, geographically, and molecularly unrelated to *R. laurentii*. Both *Nasturtium* and *R. laurentii* have white flowers, hollow stems rooting from lowermost leaves, ebracteate racemes, smooth or slightly torulose and glabrous fruit, and non-mucilaginous seeds. However, *Nasturtium* differs by having strongly reticulate (vs. striate) seeds, slender (vs. strongly dilated) filament bases, absence (vs. presence) of median nectar glands, 25–50 (vs. 4–10) ovules per ovary, obsolete or to 2 mm (vs. 2.5–6 mm) styles, and obsolete (vs. 1–3 mm) gynophore. Because of the above molecular and morphological differences between *R. laurentii*, the rest of *Rorippa*, and *Nasturtium*, it is clear that the species cannot be maintained in both genera, nor placed in *Ceriosperma* or *Barbarea*. Therefore, the two subspecies of *R. laurentii* are treated as distinct species of a new genus hereafter called *Bengt-jonsellia*.

Bengt-Jonsellia Al-Shehbaz, *gen. nov.* TYPE: *B. laurentii* (Jonsell) Al-Shehbaz.

Herbs perennial or sometimes annual. *Trichomes* absent. *Multicellular glands* absent. *Stems* erect, rooting from lower nodes, branched above or sometimes also from base, leafy, unarmed. *Basal leaves* not rosulate, soon withered; cauline leaves petiolate, not auriculate at base, simple and pinnatifid to pinnatisect, or pinnately compound, dentate. *Racemes* many-flowered, ebracteate, lax, elongated considerably

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¹ Missouri Botanical Garden, 2345 Tower Grove Avenue, St. Louis, Missouri 63110, U.S.A.; P.O. Box 299, St. Louis, Missouri, 63166-0299, U.S.A.; ihsan.al-shehbaz@mobot.org

in fruit; rachis straight; fruiting pedicels divaricate to horizontal, straight or curved upwards, persistent. *Sepals* oblong, free, deciduous, ascending to spreading, equal, base of lateral pair not saccate; petals white, erect at base with flaring blade, longer than sepals; blade broadly obovate to suborbicular, apex obtuse to rounded; claw slightly differentiated from blade, much shorter than sepals, glabrous, unappendaged, entire; stamens 6, slightly exerted, erect, slightly tetradynamous; filaments wingless, unappendaged, glabrous, strongly dilated at base, free; anthers oblong, not apiculate; nectar glands confluent, subtending bases of all stamens; median nectaries present; ovules 4–10 per ovary; placentation parietal. *Fruit* dehiscent capsular siliques, linear to ellipsoid, latiseptate, not or slightly inflated, unsegmented; valves papery, with a distinct midvein and obscure or prominent lateral veins, glabrous, not keeled, smooth or slightly torulose, wingless, unappendaged;

gynophore 1–3 mm; replum rounded, visible; septum complete, membranous, veinless; style 2.5–6 mm, attenuate to apex, persistent; stigma capitate, entire, unappendaged. *Seeds* uniseriate, wingless, broadly oblong, plump; seed coat concentrically striate, not mucilaginous when wetted; cotyledons accumbent.

Eponymy: The genus is named in honor of Dr. Bengt Jonsell (June 11 1936–), professor emeritus, Swedish Academy member, world authority on *Rorippa*, *Diceratella* Boiss., and *Farsetia* Turra, author of *Flora Nordica*, and expert on the Brassicaceae floras of Eretria, Ethiopia, Madagascar, Somalia, Tropical East Africa, and New Caledonia.

A genus of two species endemic to Madagascar and treated as subspecies of *Rorippa laurentii* by Jonsell (1979). However, the substantial morphological differences (see key) strongly support German (2016) in treating them as distinct species, though he maintained them in *Rorippa*.

KEY TO THE MORPHOLOGICAL DIFFERENCES IN *B. LAURENTII* AND *B. TSARATANANAE*

- 1a. Fruit linear, slightly torulose, not inflated, 2–3 mm wide; cauline leaves pinnatisect to pinnatifid, with sessile, decurrent lobes; fruiting pedicels 1–2 mm; style 2.5–4(–4.5) mm. *B. laurentii*
 1b. Fruit ellipsoid, not torulose, slightly inflated, 5–6 mm; cauline leaves pinnately compound; with petiolulate leaflets; fruiting pedicels 1.5–3 mm; style 4–6 mm. *B. tsaratananae*

Bengt-jonsellia laurentii (Jonsell) Al-Shehbaz, *comb. nov.*

Basionym: *Rorippa laurentii* Jonsell, Bot. Notiser 132: 532. 1979. Described from: “Madagascar, prov. Fianarantsoa, massif Andringitra, Antanifotsy, NE slope of Andranotily, c. 1900 m, 29.IV.1978, L. Jonsson 1090.” TYPE: “FLORA MADAGASCARIENSIS. PROV. FIANARANTSOA: Massif Andringitra, Antanifotsy, NE slope of Andranotily, (S22°07', E46°52'I. Alt. c. 1900 m. Large colonies on burnt areas in the Ericaceous-zone (1 year after burning),” 29 Apr 1978, Lars Jonsson 1090 (holotype: UPS [*n.v.*]; isotypes, BR-000008887115, ETH-000000006, FT-001106, P-00783438, TAN [*n.v.*]).

Stems 15–120 cm tall, hollow. *Lowermost cauline leaves* petiolate, 3–18.5 × 1.5–10 cm, pinnatifid to pinnatisect, 5- or 7-lobed; lobes sessile, decurrent, dentate, terminal lobe ovate to broadly lanceolate, to 7 × 3 cm, lateral lobes to 5 × 2 cm; upper leaves smaller, 3-lobed; uppermost leaves not lobed, entire or with few teeth. *Racemes* 8–70-flowered; fruiting pedicels 1–2 cm, straight or slightly curved. *Sepals* yellow-green, 3–4 mm, with hyaline margin; petals white with yellow-green veins and claw, suborbicular to broadly obovate, 5–6 × 3–5 mm; claw to 1 mm; filaments 2.5–4 mm; anthers 1.5–2 mm; ovules 6–10 per ovary. *Fruit* linear 2–3.5 cm × 2–2.8(–3) mm, latiseptate, slightly torulose, not inflated; gynophore 1–1.5 mm; style 2.5–4(–4.5) mm. *Seeds* broadly oblong, 2.8–4 × 2–3.8 mm. $2n = 48$.

Bengt-jonsellia tsaratananae (Jonsell) Al-Shehbaz, *comb. et stat. nov.*

Basionym: *Rorippa laurentii* subsp. *tsaratananae* Jonsell, Bot. Notiser 132: 535. 1979. Described from: “Madagascar, massif of Tsaratanana, Amboabory–Antsianongalata, 2600–2700 m, XI/XII. 1937, Humbert 18471.” TYPE: “Mission H. Humbert—Plantes du MADAGASCAR (5° voyage)—1937-1938 N° 18471 MASSIF DU TSARATANANA (RÉSERVE NATURELLE N° 4) PLATEAUX SUPÉRIEURS ET HAUTS SOMMETS DE L'AMBOABORY A L'ANTSIANONGALATA: flane S. de l'Antsianongalata. Ravins humides dans la sylvie à Lichens et brousse éricoïde Altitude: 2600-2700 m. Date de la récolte: Novembre-Décembre 1937. Fl. Blanches LEG. H[ENRI]. HUMBERT” (holotype: P-00047925; isotypes: BR-000008886439, G-00007018, G-00007020, MO-3400229, MO-3741038, K-000230683, K-000230684, P-00047926, P-00047927, P-00047928).

Stems 50–90 cm tall, hollow. *Lowermost cauline leaves* petiolate, 3–7 × 1.7–3 cm, pinnately compound, 5- or 7-foliolate; leaflets with petiolule 1–3 mm, dentate, terminal leaflet ovate to lanceolate, 7–20 × 4–6 mm, dentate or incised, lateral leaflets slightly smaller, usually oblique at base; uppermost leaves smaller, 3-foliolate, entire or dentate. *Racemes* 10–35-flowered; fruiting pedicels 1.5–3 cm, strongly curved upwards. *Sepals* yellow-green, 2.8–3.8 mm, with hyaline margin; petals white, broadly obovate, 4.5–6 × 3–4 mm; claw to 1 mm; filaments 2–3 mm; anthers 1.8–2.2 mm; ovules 4–6 per ovary. *Fruit* ellipsoid 2–3 cm × 5–6 mm, subterete, not torulose, slightly inflated; gynophore 2–3 mm; style 4–6 mm. *Seeds* broadly oblong, 4–4.5 × 3.3–3.8 mm.

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THE FIRST RECORD OF *ZINOWIEWIA* IN THE BRAZILIAN FLORA AND A SHORT ACCOUNT OF ITS HISTORY

LEONARDO BIRAL¹⁻³ AND JULIO ANTONIO LOMBARDI¹

Abstract. We report here the first record of *Zinowiewia* (Celastraceae) for the Brazilian flora, based on a specimen of *Z. australis* collected in Serra do Surucutus, at 1000–1400 m, Roraima state, in the basin of the Rio Branco and subsequently the Rio Negro, the latter being the largest tributary of the Amazon River. This novelty will be added to the Brazilian Flora 2020 project. With this addition, the family is now represented in Brazil by 20 genera and 142 species. An account of the history of *Zinowiewia* is also provided.

Keywords: Brazil, Celastraceae, Celastroideae, Lundell, *Wimmeria*

Zinowiewia Turcz. (Celastraceae) has been recognized as an endemic genus of the Neotropics where it is represented by 17 species distributed in South and Central America and Mexico (Simmons et al., 2012) and found at altitudes of 250–3,150 m (Ulloa and Jørgensen, 1994). The number of species was recently reduced to 10–12 after new synonyms were proposed for Mesoamerican species (Barrie, 2015).

Plants in the genus can be glabrous trees or shrubs, the leaves opposite, decussate, with entire margins, the inflorescences axillary cymes forked one to several times, the flowers bisexual, 5-merous, ovary 2-locular, fruits a samara with one apical wing, and one (rare two) linear-oblong seed (Simmons, 2004; Ulloa and Jørgensen, 1994). Another particular character of this taxon is that the branches are slightly expanded and compressed at the nodes, a helpful character to identify sterile collections at generic level. From some morphologically related genera, especially those from the Neotropics the plants of which bear samaras, *Zinowiewia* is easily distinguishable from *Plenckia* Reissek and *Wimmeria* Schlttdl. & Cham. by the opposite leaves (vs. alternate leaves). It can also be differentiated from *Wimmeria* by flowers 5-merous and samaras with a single terminal wing (vs. flowers 4-merous and samaras with 3–4 longitudinal wings). Another taxon with plants bearing samaras is *Rzedoswskia* Medrano, a monotypic genus endemic to montane areas from Mexico that includes shrubs with denticulate leaves and flowers 4-merous.

Zinowiewia was proposed by Turczaninow (1859) to allocate a new combination for *Wimmeria integerrima* Turcz., published by him a year before, but with questions remaining about its generic position (Turczaninow, 1858). Based on the winged fruits with one or two seeds without aril (Simmons et al., 2012), Loesener (1942)

placed it in subfamily Tripterygioideae. Simmons et al. (2012) provided a phylogeny for Tripterygioideae based on morphological and molecular characters and showed that *Zinowiewia* is the sister clade of *Microtropis* + *Quetzalia*, sharing with those opposite leaves, ovary two carpelate, and molecular synapomorphies in the ITS region. Currently, Tripterygioideae has been recognized as a highly polyphyletic clade (Simmons et al., 2012) and *Zinowiewia* is nested in Celastroideae (Simmons, 2004).

Of 17 species names for *Zinowiewia*, 13 were proposed by Cyrus Lundell between 1938 and 1987, several of them being reduced to *Z. integerrima* (Turcz.) Turcz. and *Z. rubra* Lundell after Barrie's treatment (2015) for Mesoamerica. Barrie (2015) cited three species in Mesoamerica (the former two and *Z. pallida* Lundell). Moreover, we have two additional species cited for Mexico: *Z. concinna* Lundell and *Z. pauciflora* Lundell. In South America, four species have been recorded: *Zinowiewia madsenii* C. Ulloa & P.M. Jørgensen, endemic to Ecuador, *Z. sulphurea* Lundell, endemic to Colombia, *Z. aymardii* Steyermark, endemic to Venezuela, and *Z. australis* Lundell, present in various countries, accounting for the nine species recognized in the genus.

After Turczaninow's delimitation in 1859, it took almost 80 years for additional species to be described in the genus. Then, six new species for Central America and Mexico were published at once by Lundell (1938). In the following years, two more taxa were described by him (Lundell, 1939b, 1940), as well as the unique revision for the genus completed until currently (Lundell, 1939a). A few new taxa were published in the following decades (Williams, 1964; Lundell, 1970, 1981, 1985, 1987; Steyermark, 1988). The last species described was *Z. madsenii* (Ulloa and Jørgensen, 1994) published also with a short comment about the genus,

This contribution is derived from the doctoral dissertation of the senior author entitled "Systematics and phylogeny of *Maytenus* Molina (Celastraceae) from Neotropics," supported by FAPESP – Fundação de Amparo à Pesquisa do Estado de São Paulo (fellowship grant #2011/21879-5). We are grateful to the curators of all herbaria for specimen loans and/or allowing us to check the material deposited in their institutions: M, MG, and U, and John Carlos Karpinski for editing the originally submitted English version.

¹ Universidade Estadual Paulista "Júlio de Mesquita Filho" – UNESP, Instituto de Biotecnologia de Rio Claro, Departamento de Botânica, Av. 24 A, 1515, Bela Vista, 13506-900, Caixa Postal 199, Rio Claro, São Paulo, Brazil.

² Author for correspondence: leobiral@hotmail.com

³ Current address: Universidade Tecnológica Federal do Paraná – UTFPR, Campus Santa Helena, prolongamento da Rua das Cerejeiras, s/n, CEP 85892-000, Bairro São Luiz, Santa Helena, Paraná, Brazil.

and details about the two species that occur in Ecuador.

According to Standley and Steyermark (1949), the genus remained monotypic for a long time, and then had several species described in a short time. They considered all the species to be closely related and had doubts about the differentiation amongst many of them. The revision supplied by Lundell (1939a) is outdated and was based almost exclusively on specimens deposited in American herbaria, where the genus does not occur. However, he provided a relatively complete morphological description of the genus. At that time, he recognized seven species, presented a key, and provided individual descriptions, a short list

of material examined, and plates for four taxa. The main characters he used to differentiate the species in the key are based on the shape of leaves and fruits, and the length of petals (Lundell, 1939a). All those characters are questionable when a large number of specimens are examined and thus justify the new synonymy proposed by Barrie (2015).

When checking Celastraceae collections in several herbaria, the authors came across the first record of *Zinowiewia australis* for the Brazilian flora. Here we document this new record as well as the expansion of its known distribution to the Brazilian Amazon region.

TAXONOMY

Zinowiewia australis Lundell, Bull. Torrey Bot. Club 65(7): 469. 1938. TYPE: VENEZUELA. Selvas nubladas [entre] Agua Negra y El Junquito, at alt. of 1,800 m, 29 December 1936, H. Pittier 13826 (Holotype: F [894843]; Isotypes: LL, MICH, NY, US, VEN).

This species is known from Venezuela, Colombia, Ecuador, Peru, and Bolivia. The following collection represents the first record from Brazil:

Specimen examined: BRAZIL. Roraima: Serra do Surucutus, 2°42–47'N, 63°33–36'W, NE of Mission station, 1000–1400 m.s.n.m., forest at foot at red sandstone cliff, 17 February 1969 (fl), G.T. Prance 10015 (F [1772295], INPA [27148], K [001137341], M [s.n.], MG [41717], P [05493140], U [260544]).

The images for the specimens deposited in F and U can be accessed on their websites. For images of the material in INPA, check the database SpeciesLink (<http://splink.cria.org.br/>), and for those in K and P, visit the database REFLOA (<http://reflora.jbrj.gov.br/>).

The new record presented here will be added to the monograph of Celastraceae for the Brazilian Flora 2020 project (Brazilian Flora, 2020), a project currently in progress the goal of which is to catalogue all the species of plants, algae, and fungi that occur in Brazil: the authors are responsible for the Monograph of Celastraceae.

With this addition, 20 genera of Celastraceae are represented in Brazil, eight of them from the Celastroideae subfamily, which is the case of *Zinowiewia*, and 142 widely distributed species. Of these, two genera have samaras: *Zinowiewia* and *Plenckia*.

We support Standley and Steyermark's view that several taxa, especially those that Lundell described from Central

America, are very closely related and that the actual number of species is uncertain (Standley and Steyermark, 1949). The characters usually cited to distinguish species (see Lundell, 1939a; Standley and Steyermark, 1949; Barrie, 2015) show overlap amongst species, which complicates the identification of herbarium specimens. Even after the synonyms proposed by Barrie (2015), we believe that species circumscriptions are not clear and that a detailed taxonomic study is still required.

Zinowiewia australis and *Z. aymardii*, and *Z. concinna*, *Z. integerrima* and *Z. sulphurea* are all difficult to be distinguished based only on their morphological characters. For example, the differences cited by Steyermark (1988) to identify *Z. aymardii* from *Z. australis* are based on the number of flowers, length of primary and secondary axes of inflorescences, seed body and fruits wing; notwithstanding, any metrics for these characters are cited for *Z. australis* and *Z. aymardii* are based on just three collections.

Given that most of the *Zinowiewia* species have been described based on a few specimens (especially Lundell's taxa), we predict that the distinction of some taxa will become questionable when more collections are studied, and that additional new synonymy will be proposed in the genus.

Several genera of Neotropical Celastroideae, especially those with a small number of species, e.g. *Crossopetalum* P. Browne, *Gyminda* Sarg., *Haydenoxylon* M.P. Simmons, *Quetzalia* Lundell, *Schaefferia* Jacq., *Wimmeria*, and *Zinowiewia* have not been the subject of consistent taxonomic studies or these studies have become outdated throughout recent decades. Probably new records of occurrence, and even undescribed species, will be registered when more taxonomic studies are carried out for them.

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RANDIA TAFALLANA (RUBIACEAE): A NEW NAME FOR MUSSAENDA PARVIFOLIA TAFALLA EX ESTRELLA, A TREE FROM THE DRY FORESTS OF COASTAL ECUADOR

XAVIER CORNEJO¹

Abstract. *Randia tafallana* is here proposed as a new name for *Mussaenda parvifolia* Tafalla ex Estrella, a species published in *Flora Huayaquilensis* (1989) and a later homonymous of *Mussaenda parvifolia* Miq. (1867). The present status of the populations of *Randia tafallana* is unknown.

Resumen. Se propone *Randia tafallana* como un nombre nuevo para *Mussaenda parvifolia* Tafalla ex Estrella, una especie publicada en *Flora Huayaquilensis* (1989) y homónimo de *Mussaenda parvifolia* Miq. (1867). El estado actual de las poblaciones de *Randia tafallana* es desconocido.

Keywords: Ecuador, Guayaquil, *Mussaenda parvifolia*, *Randia tafallana*, Rubiaceae, Juan Tafalla.

During the colonial period, after working in Peru as a field assistant for Hipólito Ruiz and José Pavón in the *Virreinato del Perú y Chile* expedition (1777–1788), Juan Tafalla was assigned to move and settle northwards to lead the first team established in Ecuador for botanical research. His main goal was to prepare an inventory of timber woods from the coastal region and document the Cinchonas in the southern Andes of the country. From 1799 to 1803, Tafalla and his team gathered specimens and elaborated descriptions in Latin and plant size plates *in situ* for more than five hundred species of vascular plants from the region of Guayaquil in the present coastal Ecuador. Some of those species were regarded as new to science and names were handwritten by Tafalla himself. During those years, collections, descriptions, plates and letters were shipped from Guayaquil by Tafalla to Hipólito Ruiz, assigned since 1789 to the “Oficina Botánica de la Flora Peruana y Chilense” in Madrid, Spain. Unfortunately, Ruiz and Pavón were mostly occupied on the study of plants from Peru and Chile and on the edition of the forthcoming volumes of *Flora Peruviana et Chilensis*, a historical and pioneer masterpiece that has partially remained unpublished to the present. Therefore, Tafalla’s botanical work from the region of Guayaquil was neglected. His specimens of plants from Ecuador were recorded on the labels as gathered by Ruiz or Pavón, from a country that they neither visited nor explored (Tafalla, 1989). Subsequently, ca. 60 of those historical collections from Guayaquil were sold by Pavón to Aylmer Bourke Lambert, a British botanist who was mostly interested in building a herbarium by gathering types and important specimens cited in publications. Unfortunately, after Lambert died, his herbarium was dismembered and the specimens purchased from Pavón were dispersed among several herbaria in Europe (Steele, 1964; Miller, 1970). That

would explain why some common species of plants from the city of Guayaquil and surrounding areas are missing in *Flora Huayaquilensis* (Tafalla, 1989). Moreover, botanical studies in a number of taxonomic revisions and monographs unfairly credited Tafalla’s collections as gathered by Ruiz or Pavón (e.g., De Candolle in Prodrômus, 1824). Some species known to the present as strictly endemic to coastal Ecuador and originally collected by Tafalla were even named after them (e.g., *Erythroxylum ruizii* Peyr., *Thalia Pavonii* Korn) or named after Peru, contributing also to some phytogeographical confusion as if it were collected or occur in the latter country (e.g., *Duguetia peruviana* (R. E. Fr.) J. F. Macbr.). Furthermore, several of the handwritten names Tafalla assigned to the new species were scratched and replaced by Ruiz, who wrote his own names without consulting Tafalla. Regrettably, Tafalla’s botanical work remained unpublished and forgotten in Real Jardín Botánico (MA) for approximately 180 years.

In the twentieth century, Eduardo Estrella, an Ecuadorian doctor in medicine, found at MA the forgotten collections, letters and plates elaborated by Tafalla and his team in Ecuador. The discovered material was edited and finally published as *Flora Huayaquilensis* (Tafalla, 1989), a classic publication of great historical value in which the aforementioned practices of Ruiz and Pavón were brought to light and supported by irrefutable and detailed evidence. Estrella credited Tafalla and made his work known. However, although many of Tafalla’s new names were formally described in Latin with the respective cited collections and illustrations, those names rather unintentionally became, in accordance to the principle of priority (see Arts. 11 and 29 of the ICBN: McNeill et al., 2012), synonyms of names previously published by other authors (e.g., Humboldt et al., 1815–1825).

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¹Herbario GUAY, Facultad de Ciencias Naturales, Universidad de Guayaquil, Av. Raúl Gómez Lince s.n. y Av. Juan Tanca Marengo (Campus Mapasingue), P.O. Box 09-01-10634, Guayaquil, Ecuador; xcornejoquay@gmail.com

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FIGURE 1. *Randia tafallana* Cornejo. Holotype from the Ruiz & Pavón herbarium at MA. The label reads: F.H. D. 366 L. 597, meaning *Flora Huayaquilensis*, description 366, plate 597. Photograph courtesy of Herbario del Real Jardín Botánico, CSIC, Madrid, ©RJB-CSIC.

There was a tree among the new species documented in *Flora Huayaquilensis*, *Mussaenda parviflora* Tafalla ex Estrella (Rubiaceae) that Juan Tafalla collected in Guayaquil in 1802, of which there is a specimen at MA in the Ruiz and Pavón herbarium and a description and plate published in Tafalla (1989: 80–81, description 366, plate 597).

Mussaenda parviflora sensu Tafalla present brachyblasts armed with short apical spines, small flowers and small baccate fruits. *Mussaenda parviflora* sensu Tafalla is a perfect match for the genus *Randia* L. (Rubiaceae) and not the “unarmed” *Mussaenda* L. Furthermore, the fully reflexed sepals and the small, yellow corollas, ca. 1 cm long, of *Mussaenda parviflora* sensu Tafalla do not fit any known species of *Randia*. In the meantime, Tafalla’s work was not published until 1989, and a morphologically different species of Rubiaceae was formally proposed in 1867 in *Proflusio Florae Japonicae*, having the same generic name and epithet (as *Mussaenda parviflora* Miq.). Consequently, *Mussaenda parviflora* Tafalla ex Estrella

in *Flora Huayaquilensis* is a later homonym and, in accordance to the principle of priority ruled by Art. 11 of ICBN (McNeill, 2012), a new name is needed for Tafalla’s species, that is formally proposed here as:

***Randia tafallana* Cornejo, nom. nov.**

Replaced synonym: *Mussaenda parviflora* Tafalla ex Estrella, *Flora Huayaquilensis* 80–81, description 366, plate 597 (1989), non *Mussaenda parviflora* Miq., Ann. Mus. Bot. Lugduno-Batavi 3:110 (1867). TYPE: ECUADOR. Guayaquil: 1802 (fl, y fr), *Juan Tafalla s.n.* (holotype: MA-815635, in Ruiz and Pavón herbarium). Fig. 1.

Etymology: The epithet of this historical species honors Juan José Tafalla Navascués, the author of the first flora of Guayaquil, in coastal Ecuador.

Randia tafallana is known only from the type collection gathered in 1802 by Juan Tafalla in the area of Guayaquil. The present status of its populations is unknown.

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Page 12 intentionally left blank.

**ODONTONEMA GUAYAQUILENSE (ACANTHACEAE),
A NEW SPECIES FROM THE DECIDUOUS
DRY FOREST OF COASTAL ECUADOR**

XAVIER CORNEJO¹

Abstract. *Odontonema guayaquilense*, a new species of subshrub of Acanthaceae from the remnant deciduous dry forests of Guayaquil, in coastal Ecuador, is here described and illustrated. The new species is assessed as Endangered EN B1ab(iii).

Resumen. Se describe e ilustra *Odontonema guayaquilense*, una nueva especie de subarbusto de Acanthaceae de los bosques secos deciduos remanentes del área de Guayaquil, en la costa de Ecuador. A esta nueva especie se asigna el estatus En Peligro, EN B1ab(iii).

Keywords: Acanthaceae, Ecuador, dry forest, endemic, Guayaquil, *Odontonema guayaquilense*.

During fieldwork for the forthcoming Flora of Guayaquil (X. Cornejo, in prep.), the author explored the city's vegetation remnants and found a new species of *Odontonema* Nees (Acanthaceae, a family recently monographed for Ecuador; Wasshausen, 2013). It was surprising to find such a taxonomic novelty, never before gathered, in a coastal city that has been largely visited and collected by naturalists and botanists since the XVIII century (Humboldt et al., 1821; Tafalla, 1989; Valverde et al., 1991; C. Dodson and A.H. Gentry, unpubl. manuscript). *Odontonema* is a Neotropical genus currently comprising 30 species, only two of which have been recorded for Ecuador: *Odontonema cuspidatum* (Nees) Kuntze is a native of Mexico but frequently cultivated as an ornamental in tropical gardens where, in coastal Ecuador, it is occasionally visited by hummingbirds such as *Amazilia amazilia* Lesson (1827), and *O. laxum* V. M. Baum, endemic to the southern Andes of Ecuador, is known only from the type collection gathered in Azuay (Wasshausen, 2013). In this contribution, a third species of *Odontonema*, also of ornamental potential, is formally described and illustrated.

Odontonema guayaquilense X. Cornejo, *sp. nov.* TYPE: ECUADOR. Guayas: Guayaquil, ESPOL, Campus Prosperina en las faldas de Cerro Azul, secondary deciduous dry forest, 2°09'S, 79°58'W, ca. 300 m, 11 August 2016 (fl), X. Cornejo & J. F. Cornejo 8832 (Holotype: GUAY; Isotypes: NY, QCA, US). Fig. 1.

Species nova affinis *Odontonema coccineum* Leonard, *a qua folia elliptica* (vs. *oblongo-elliptica*), *cum base atenuata* (vs. *angusta et rotundata*), *costa pilosa* (vs. *glabra*), *corolla subactinomorpha* (vs. *2-labelada*), *et antherae glabrae* (vs. *puberulae*) *differt*.

Subshrub to 1.5 m tall. Stem subcylindric, somewhat flattened at apex, smooth, glabrous. *Leaves* subsessile, the blades elliptic, 15–22.5 × 5–9 cm, abundantly pilose when young, glabrescent with age, primary and secondary veins sulcate above, the blade with punctate cystoliths and pilose

on main veins beneath; 10–13 pairs of lateral veins; the base attenuate, the apex acuminate. *Inflorescence* terminal, a narrow panicle, the lateral racemes bearing 2–4 flowers, the rachis 9–23 cm long, scattered short-pilose, the hairs uniseriate, pluricellular; bracts linear-lanceolate, ca. 2.5–3 mm long, appressed-pilose, the margin entire and ciliate. *Flowers* pedicellate, the pedicels 3–4 mm long, shortly-pilose. Sepals 5, the lobes lineal-lanceolate, ca. 3 mm long, equal in length, free to base. Corolla infundibuliform, 5-lobed, red, shortly-pilose outside, the tube distantly expanded, 15–20 mm long, the limb subactinomorphic, the lobes ovate to shortly-lanceolate, the larger ones 4 × 2.5–3 mm, the margins ciliolate, papillose without. Ovary oblongoid, ca. 2 × 0.8 mm, glabrous, on a fleshy nectary. Style, ca. 20 mm long, barely exceeding the corolla. Stamens 2, adnate to corolla, the free part ca. 5 mm long, the anthers oblong, ca. 2 mm long. *Fruit* capsule, ca. 18 mm long, narrow at base, swollen at distal third, the apex acuminate.

Etymology: The epithet of this taxonomic novelty refers to the city of Guayaquil, from where the new species is known to occur as an endemic.

Habitat and distribution: *Odontonema guayaquilense* is known only from the type collection. The habitat is a secondary deciduous dry forest located at the campus Prosperina, a private property owned by the Escuela Superior Politécnica del Litoral (ESPOL), that is located on the slopes of Cerro Azul at the outskirts of Guayaquil. Cerro Azul is part of the southern tip of the cordillera Chongón-Colonche, an isolated coastal mountain range west from the Andes (Bonifaz & Cornejo, 2004).

Conservation status: At present, the native vegetation of the area where *Odontonema guayaquilense* occurs is apparently conserved. However, as fires of anthropogenic origin and urban pressure on the small forest remnants in Guayaquil are the main threats, the preliminary status of Endangered EN B1ab(iii) (IUCN, 2012), is assigned to this species.

The author is grateful to Dieter C. Wasshausen for his useful comments on *Odontonema* and to an anonymous reviewer for his constructive suggestions.

¹Herbario GUAY, Facultad de Ciencias Naturales, Universidad de Guayaquil, Av. Raúl Gómez Lince s.n. y Av. Juan Tanca Marengo (Campus Mapasingue), P.O. Box 09-01-10634, Guayaquil, Ecuador; xcornejoquay@gmail.com



FIGURE 1. *Odontonema guayaquilense*. **A**, terminal branch bearing leaves and inflorescence (fresh); **B**, terminal branch bearing leaves and inflorescence (dry); **C**, raceme bearing flowers (fresh); **D**, raceme bearing flowers and a mature open fruit (dry); **E**, detached and longitudinally sectioned corolla displaying two stamens, flower buds, calyx with a superior ovary, an elongate style, and a fruit; **F**, terminal branch with decussate leaf blades of attenuate bases. Based on the holotype.

Based on leaf size, the structure and size of inflorescences, and floral size, *Odontonema guayaquilense* resembles *O. coccineum* Leonard from Colombia, in the departments of Antioquia and Santander, but the new species mainly differs from the later by the elliptic (vs. oblong-elliptic) leaf shape, the bases strictly attenuate (versus narrowed to rounded), main leaf vein pilose (vs. glabrous) beneath, corolla subactinomorphic (vs. 2-lipped), and lateral surface of anthers glabrous (vs. puberulous). *Odontonema guayaquilense* also may resemble *O. auriculatum* (Rose) T.

F. Daniel from western Mexico, in the states of Guerrero, Michoacan, Colima and Nayarit, but the former species mainly differs from the later by the terminal branches subcylindric and somewhat flattened at apex (vs. sharply quadrangular), larger leaf shape 15–22.5 cm long (vs. 8–15 cm long), the leaf base strictly attenuate (vs. attenuate and often somewhat auriculate), the main veins pilose (vs. glabrous) beneath, and the corolla subactinomorphic (vs. 2-lipped). Table 1 presents the differences between these three species.

TABLE 1. Comparison of *Odontomema guayaquilense* Cornejo with similar species.

	<i>O. GUAYAQUILENSE</i>	<i>O. COCCINEUM</i>	<i>O. AURICULATUM</i>
Branches	subcylindric, somewhat flattened at apex	subquadrangular	sharply quadrangular
Leaf shape and length	elliptic, 15–22.5 cm long	oblong-elliptic, to 24 cm long	ovate-elliptic to obovate-elliptic, 8–15 cm long
Leaf base	strictly attenuate	narrowed to rounded	attenuate and often somewhat auriculate
Leaf blades beneath	pilose on main veins	glabrous	glabrous
Corolla	subactinomorphic	2-lipped	2-lipped
Stamens insertion	at base of the corolla tube		at top of the corolla tube
Anthers, lateral surface	glabrous	puberulous	unknown
Fruit	ca. 18 mm long	ca. 25 mm long	ca. 25 mm long
Distribution	deciduous dry forests of coastal Ecuador (Guayas)	Colombia (Antioquia, Santander)	Mexico (Guerrero, Michoacan, Colima and Nayarit)

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Page 16 intentionally left blank.

ALBERT MOCQUERYS IN VENEZUELA (1893–1894): A COMMERCIAL COLLECTOR OF PLANTS, BIRDS, AND INSECTS

LAURENCE J. DORR,¹ FRED W. STAUFFER,² AND LEYDA RODRÍGUEZ³

Abstract. Albert Mocquerys, a commercial collector of natural history specimens, visited Venezuela from September 1893 through May 1894 and collected a wide range of organisms; plants, birds, insects, fishes, mammals, and fossil shells. Walter Rothschild evidently was his principal zoological patron and Emmanuel Drake del Castillo his botanical one. In Venezuela, Mocquerys established himself at Puerto Cabello and made three trips inland. The first was to localities near Barquisimeto; the second to the cave of the “guácharo” near Caripe; and the third was to the Venezuelan Andes near Mérida. Details concerning his collections and their present-day whereabouts are presented as is a gazetteer of localities associated with his collecting trips. Biographical data also clarify that Mocquerys was the third generation of a family of French dental surgeons, all of whom were accomplished naturalists with a special interest in entomology.

Resumen. Albert Mocquerys, colector comercial de especímenes de historia natural (collector of natural history specimens), visitó Venezuela desde septiembre de 1893 hasta mayo de 1894 y colectó una amplia gama de organismos; plantas, aves, insectos, peces, mamíferos y conchas fósiles. Walter Rothschild era evidentemente su principal cliente zoológico y Emmanuel Drake del Castillo su correspondiente botánico. En Venezuela, Mocquerys se estableció en Puerto Cabello y realizó tres viajes al interior. El primero fue a localidades cerca de Barquisimeto; el segundo a la cueva del “guácharo” cerca de Caripe; y el tercero fue a los Andes venezolanos cerca de Mérida. Se presentan los detalles sobre sus colecciones y su paradero actual, como un diccionario de localidades asociadas con los viajes de recolección. Los datos biográficos también aclaran que Mocquerys fue la tercera generación de una familia de cirujanos dentales franceses, todos ellos notables naturalistas con especial interés en la Entomología.

Keywords: Albert Mocquerys, Venezuela, commercial natural history collecting

Detailed information regarding the identity and activities of Albert Mocquerys (1860–1926) proved to be somewhat elusive until recently even though he was a prolific and well-traveled natural history collector with prominent patrons and clients. In late 1893 and early 1894 Mocquerys spent roughly eight months in Venezuela and collected a wide range of natural history specimens including plants. The Swiss botanist Henri Pittier (1931) speculated that Mocquerys’ focus in Venezuela was ornithological rather than botanical, but we suspect it may have originally been entomological. In addition to birds, plants, and insects, Mocquerys also collected other small vertebrate animals (including bats, rabbits, rodents, amphibians, and fish), insect nests, and fossil shells (NHM: TM 1/3/11).

The vascular plant collection, made in diverse localities in northern and western Venezuela, is a substantial one and even though these specimens are regularly cited in revisions, monographs, and floras, Mocquerys’ contribution to Neotropical and Venezuelan botany invariably is mentioned only in passing if mentioned at all (Bureau, 1904; Pittier, 1931; Arnal, 1943; Wurdack, 1972; Vegter, 1976; Pérez-Vila, 1988; Dorr, 1997, 2004, 2014; Huber et al., 1998; Espinoza and Rodríguez, 2007; Lindorf, 2008; JSTOR Global Plants, 2017). Sufficient details concerning Mocquerys and his Venezuelan collecting trip have been found such that we now can sketch his career, identify several of the patrons of this particular sojourn, discuss where he collected, and describe the subsequent fate of most of his collections.

PRELUDE

It is not surprising that Albert Mocquerys developed an interest in natural history. His father Émile Mocquerys (1825–1916) and paternal grandfather Simon Mocquerys (1792–1879) collected insects and participated in local natural history societies. His grandfather especially was fascinated by Coleoptera and amassed a world-wide collection with an emphasis on teratological specimens (Anonymous,

1879; Fauvel, 1880; Horn and Kahle, 1936). Both his father and grandfather concentrated their own collecting activities in Normandy and especially Seine-Inférieure. However, his father Émile, a member of the French Entomological Society for over 60 years (Anonymous, 1916), eventually retired to Sfax, Tunisia where he died. We have not established where Albert was born, but suspect it was

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¹ Department of Botany, National Museum of Natural History, MRC-166, Smithsonian Institution, P.O. Box 37012, Washington, D.C. 20013–7012, U.S.A.; dorr1@si.edu

² Conservatoire et Jardin botaniques de la Ville de Genève, Université de Genève, laboratoire de systématique végétale et biodiversité, CP 60, CH-1292 Chambésy, Switzerland; fred.stauffer@cjb.ville-ge.ch

³ Instituto Experimental Jardín Botánico Dr. Tobías Lasser, Herbario Nacional de Venezuela, Universidad Central de Venezuela, Apartado 2156, Caracas 1010-A, Venezuela; leyda.rodriguez@ucv.ve

either Rouen or Évreux in Normandy. His brother Georges (1865–1948) was born in the latter city where their father who had lived in both cities became established as a dental surgeon; a profession shared also by Simon and later by Albert and Georges.

Albert Mocquerys began his career as a commercial natural history collector when he visited French possessions in West Africa from 1889 to 1891. He collected primarily insects (see e.g., André, 1889, 1890; Jordan, 1894; Régimbart, 1895), but also plants (see e.g., Hua, 1893) and he acquired ethnographic objects (Koenig, 1900). His expedition or series of expeditions allowed him to collect in present-day Gabon, The Gambia, The Republic of the Congo, Senegal, and Sierra Leone. Details of his activities during this period remain somewhat obscure and are being

reconstructed from his collections, correspondence, and other indirect pieces of evidence (Dorr, in prep.).

We assume that Mocquerys returned to France after leaving West Africa. What made him then select South America for his second major collecting expedition is unclear. In the 1840s his father had visited Brazil and collected wasps (Carpenter, 1999: 13, 20, 23), at least, and recorded the use by Amerindians of biting ants to suture wounds (Mocquerys, 1844; Middleton, 1896). Whether or not stories of this trip influenced Albert is unknown. In any case, Albert's Venezuelan trip provides us some insight into how a commercial natural history collector operated in northern South America at the end of the 19th century and the networks that then existed in Europe for acquiring, shipping, and distributing specimens.

VENEZUELAN ITINERARIES, SEPTEMBER 1893–MAY 1894

Mocquerys arrived in Venezuela in September 1893 and spent the next eight months collecting there. A letter (NHM: TM 1/3/11) written in early October 1893 to Walter Rothschild (1868–1957) suggests that Mocquerys may have originally visited Venezuela to collect insects and only switched his focus to birds, another group that fascinated Rothschild, because as Mocquerys explained to his patron he had arrived in the dry season and insects would not be abundant until the rainy season began the following March. The nature of the financial relationship between Rothschild, who was building a large collection of insects and birds at Tring in Hertfordshire, England (Rothschild, 1983; Birkhead et al., 2014), and Mocquerys is not altogether clear. It appears that Rothschild extended him a line of credit (NHM: TM 1/8/20), but there also is evidence that Mocquerys was paid by the specimen (NHM: TM 1/2/23). Rothschild had several methods for compensating his collectors; he sometimes temporarily employed them at a flat rate and/or with a salary, or he defrayed expenses, or he paid his collectors or their dealer(s) by the specimen (Rothschild, 1983). In the October 1893 letter, Mocquerys also mentioned recently receiving a letter from Ernst Hartert (1859–1933), Rothschild's newly-appointed curator of birds.

We do not know precisely what Hartert wrote Mocquerys, but we do know that Hartert was keen on Venezuelan birds because in May 1892 he had set out on his own ornithological expedition to that country. Political instability, however, made visiting Venezuela impractical and Hartert and his wife instead visited and collected birds in St. Thomas, Puerto Rico, and the Dutch islands of Curaçao, Aruba, and Bonaire. Venezuela's "Revolución Legalista," a challenge to presidential succession that devolved into civil war (Rondón Márquez, 1973), made the country unsafe from March 1892 until a new constitution was adopted in June 1893. Despite his unanticipated change in plans Hartert nonetheless profited from his rerouted trip and in September 1892, ten months after his return to England and after becoming Rothschild's curator of birds, he published an account of the birds (Hartert, 1893) found on the three Dutch islands off the coast of Venezuela.

Zimmer and Phelps (1954) wrote that the center of operations for most of Mocquerys' work in Venezuela was

Puerto Cabello and this appears to be confirmed by the correspondence that survives; several of Mocquerys' letters are signed "Naturaliste à Puerto Cabello" ("a naturalist at Puerto Cabello"). In September 1893, Mocquerys collected birds and plants in the dense lowland forests of San Esteban in the Cordillera de la Costa just south of this port. By early October 1893, Mocquerys wrote (NHM: TM 1/3/11) Rothschild from San Esteban to relate that he had just sent him his first shipment of specimens, which included birds, butterflies, wasp nests, a bat, a spider's nest, a crab, a chameleon with a very long tale, fish, a salamander, and two squirrels. He also promised to send beetles to Rothschild the following month.

Mocquerys then ventured inland collecting at Duaca, Barquisimeto, El Tocuyo, and Bucarito in Lara state (Fig. 1A). Exact dates for this excursion are not known but it took place between October and the end of the year. Likewise, the precise sequence of localities visited is not known but we assume that Mocquerys availed himself of the existing rail line that ran from Puerto Cabello to Tucacas and then into the interior via the copper mines at Aroa and the village of Duaca before terminating in Barquisimeto. The Venezuelan botanist José Saer D'Héguert (1904–1976), born slightly more than a decade after Mocquerys visited, reported that "Alberto Mocquerys" was friendly with his parents while collecting birds and plants in Duaca (Saer D'Héguert in Hurtado León, 1999). Mocquerys went into some detail when he described to Rothschild (NHM: TM 1/3/11) the personal inconveniences associated with collecting on a mountain that terminated the "savanne de Bucarito" ("savanna of Bucarito"), a day's horseback ride from El Tocuyo. It is unclear as to whether or not Mocquerys returned to the coast during this excursion into Lara state. We do know from his correspondence that he visited Valencia on the western shore of the Lago de Valencia before 6 November 1893, but he may have visited at other times as well between October and December 1893.

Mocquerys wrote letters to Rothschild from Puerto Cabello in early November and early December 1893, and also in early January 1894. Whether or not Mocquerys was in Puerto Cabello continuously during these months is unclear. In early December he wrote Rothschild

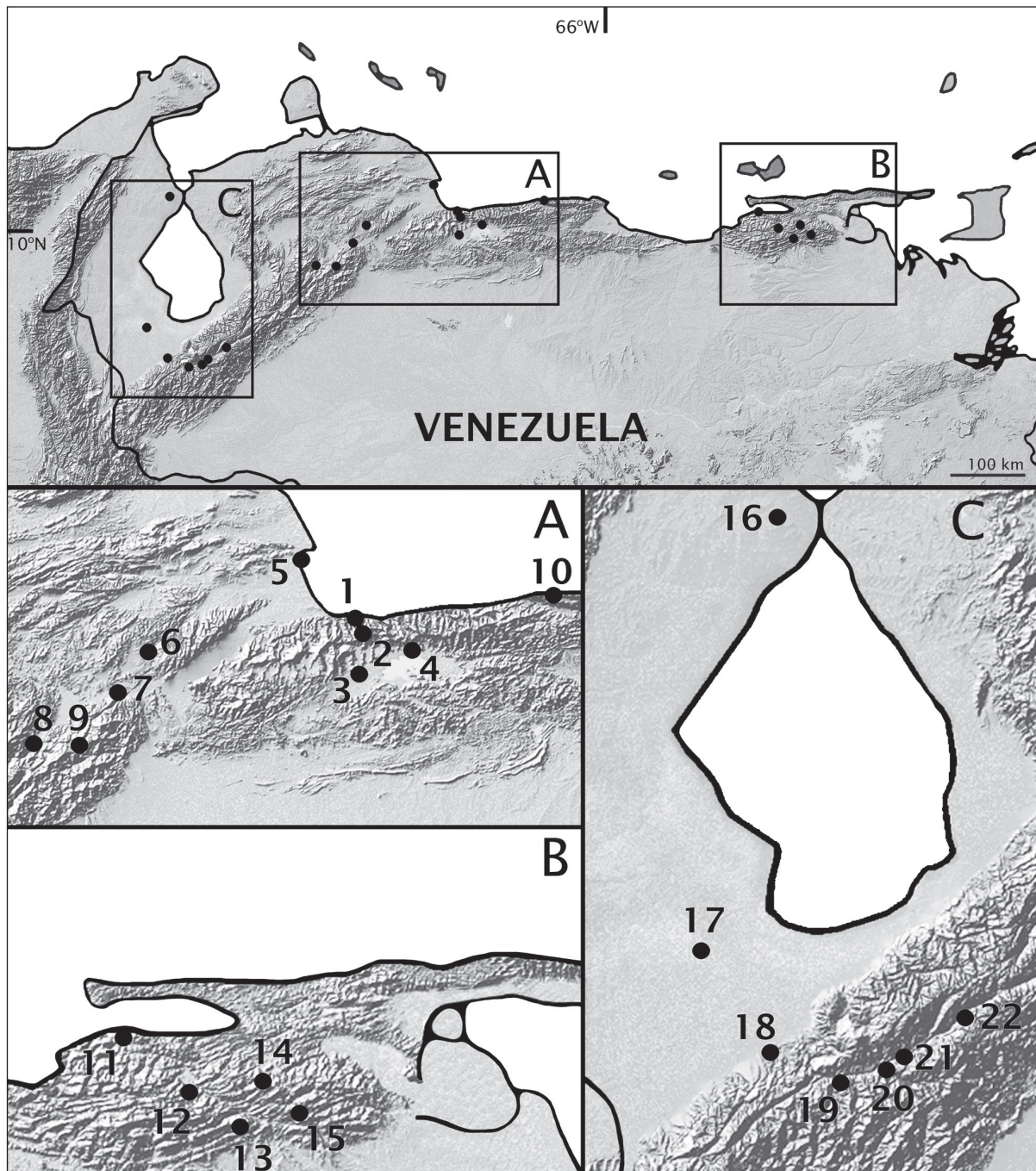


FIGURE 1. Localities associated with the 1893–1894 collecting trip to Venezuela undertaken by Albert Mocquerys. 1, Puerto Cabello. 2, San Esteban. 3, Valencia. 4, Mariara. 5, Tucacas. 6, Duaca. 7, Barquisimeto. 8, Tocuyo. 9, Bucarito. 10, La Guaira. 11, Cumaná. 12, Cumanacoa. 13, San Antonio de Maturín. 14, El Caripe. 15, El Guácharo. 16, Maracaibo. 17, Santa Bárbara de Zulia. 18, El Vigía. 19, Lagunillas. 20, Ejido. 21, Mérida. 22, Mucuchies.

(NHM: TM 1/3/11) that the box he said that he had shipped the previous month, presumably the one he discussed in his early October letter, had not been sent because the person he had entrusted with this task had forgotten to do it. Mocquerys also mentioned that he had received letters from Hartert who spoke of the “cavernes de Caripé” (“caves of Caripe”) and that Mocquerys thought of going there later in December. Asking for a renewal of his credit he also

told Rothschild that he intended to head to the Andes but that such a trip would be expensive; at the very least he would have to purchase a mule for himself and one for his “muchacho” (assistant).

In the early January 1894 letter Mocquerys continued to plead his straitened circumstances to Rothschild (NHM: TM 1/8/20). The Andes trip and the trip to Caripe were both on hold until he had additional funds. Outlining what

would be a long and very expensive trip to collect the “guácharo” (the oil bird, *Steatornis caripensis* Humboldt, 1817, Steatornithidae) Mocquerys wrote Rothschild that it would require three days travel by steamer to Carúpano, another five days by horse to Caripe, and then he would still have to travel an additional three leagues to get to the caves.

Shortly after writing Rothschild, Mocquerys made a hurried trip to Monagas state, visiting Caripe, El Guácharo (Cueva del Guácharo), and San Antonio de Maturín (Fig. 1B). He did not follow exactly the route that he had outlined to Rothschild. It appears that he sailed from Puerto Cabello to Cumaná (not Carúpano) and we know that he then traveled by land south to Caripe and El Guácharo where he presumably was intent on collecting the cave-dwelling oilbird or “guácharo.” This bird had been described by Alexander von Humboldt (Humboldt, 1817) who had visited these caves almost a century earlier in 1799. Plants were collected by Mocquerys in and around Cumaná, but not further south in Monagas state. Several years later in a letter to Hartert (NHM: TM 1/2/23), Mocquerys mentioned this trip again and complained that not only had he spent ten days on horseback and three days in a steamer, but also that the trip had cost him approximately “quatre cents francs!” (four hundred French Francs, ca. US\$2,000 today). Interestingly in the margin of this letter Hartert wrote “Why was he so foolish, if it is true.”

After his hurried excursion in search of the “guácharo,” Mocquerys shifted his attention again to the west of Venezuela. In March and April 1894 plants and birds were gathered from Maracaibo and San Carlos de Zulia. During these same months Mocquerys made natural history collections in Ejido, Lagunillas, Mérida, and Mucuchies (Fig. 1C). Typically travelers from Maracaibo to Mérida would sail or take a steamer across the Lago de Maracaibo

to the river port of Santa Bárbara (i.e., Santa Bárbara de Zulia) near the southwestern end of the lake and then travel by mule to El Vigía and from there to Mérida by way of Lagunillas; at least five days of rough travel. Mocquerys’ work in the Venezuelan Andes ended abruptly when a strong earthquake struck Mérida on 28 April 1894. Several years later Mocquerys complained to Hartert (NHM: TM 1/2/23) that he had lost everything in that unexpected and locally devastating event.

On this last excursion Mocquerys was almost certainly assisted by “Salomón Briceño Gabaldón é hijos.” Salomón Briceño-Gabaldón (1826–1912), based in Mérida, had been engaged in commercial collecting of natural history specimens since the early 1870s (Phelps, 1944) and he and his sons supplied bird skins to Rothschild among other clients. Mocquerys’ father Émile obliquely confirmed that Albert had a connection to Briceño when he wrote the following year to Rothschild or one of Rothschild’s curators and stated that he would contact Briceño’s agent in Paris or Briceño himself about a missing parcel shipped from Venezuela (NHM: TM 1/14/22).

We also know that Mocquerys collected plants at the Hacienda “Mariara,” either when he visited Valencia or sometime in 1894. Evidence for the latter date is from a photograph taken at Hacienda “Mariara” showing Mocquerys and other members of what appears to be a shooting party (Zimmer and Phelps, 1954, Fig. 1). Interestingly there are no bird or small animal collections labeled with this locality, only plants. The other persons in this photograph are identified, but we do not know what interest, if any, they had in natural history.

Finally, Mocquerys visited Curaçao in May 1894 (fide AMNH skin 472482, as “Curacao I.”). This may have been a stop while en route home, but details as to how Mocquerys returned from Venezuela to Europe are wanting.

SPECIMENS COLLECTED IN VENEZUELA

Birds: Mocquerys did not collect birds on his earlier trip to West Africa and somehow in the relatively brief period between concluding that expedition and heading to South America he learned how to collect and prepare them. We can only speculate that Rothschild or Hartert taught him these specialized skills, which are not trivial, and certainly for Mocquerys expanding the range of natural history objects that he could collect and sell was advantageous financially.

Mocquerys’ Venezuelan bird collections have proved, in part, to be controversial. Almost from the moment they were first critically examined questions arose about the provenance of some of the skins (Cory and Hellmayr, 1924: 295; Hartert, 1927: 29; Phelps and Phelps, 1940; Zimmer and Phelps, 1954; Fitzpatrick and Stotz, 1997: 42). Cory and Hellmayr (1924: 295) questioned the type locality of the Venezuelan Rufous-tailed Antthrush (now known as Schwartz’s Antthrush) (*Chamaeza turdina* (Cabanis & Heine, 1859), Formicariidae) and thought the locality “El Guácharo” was confused with “San Esteban.” Hartert (1927: 29) speculated that some of the birds collected by Mocquerys may have been purchased live because he was

aware that some of the taxa were “sold in cages alive, for food and for aviaries.” Zimmer and Phelps (1954) listed at least 14 taxa collected by Mocquerys where the label data are suspect and wrote, “We find it incredible that Mocquerys, who made a brief and hurried excursion to Caripe for the express purpose of collecting the ‘Guácharo’ (*Steatornis caripensis*), should have obtained as many unique records as his labels would indicate, especially since he obtained only one ‘Guácharo’!”

The Venezuelan bird collections made by Mocquerys were sent to Europe in the 1890s and added to Rothschild’s collection in Tring. In early 1932, however, they were transferred to the American Museum of Natural History in New York City. In late 1931 Rothschild, facing financial hardships because of a scandal, reluctantly decided to offer for sale the greater part of his ornithological collection and it was purchased for the American Museum by one of its patrons (Murphy, 1932; Phelps, 1944; Snow, 1973; Rothschild, 1983; Birkhead et al., 2014).

Fishes: In a letter dated 3 October 1893 (NHM: TM1/3/11), Mocquerys informed Rothschild that the first

package that he planned to send from Venezuela to England would include eleven fishes that he found living under rocks in a torrent on top of the mountains. These freshwater fishes were collected in the small rivers flowing north from the Cordillera de la Costa near San Esteban into the Caribbean. Rothschild, whose interests did not encompass ichthyology, donated the specimens to the British Museum (Natural History) (now Natural History Museum, London) where they were accessioned on 9 November 1904 (<http://data.nhm.ac.uk/dataset/collection-specimens/resource/05ff2255-c38a-40c9-b657-4ccb55ab2feb/record/2218085>). Regan (1905) based one new species of armored catfish on this collection. It is doubtful that Charles Regan (1878–1943), a British ichthyologist who joined the British Museum (Natural History) in 1901 (Burne and Norman, 1943), would have had direct contact with Mocquerys.

Insects: Inasmuch as insects had been the primary focus of Mocquerys' collecting in West Africa it is somewhat surprising that his Venezuelan insect collections ultimately proved to be less important than his bird and plant collections. In the surviving correspondence with Rothschild, Mocquerys mentioned several different times that he had collected and shipped Lepidoptera (including microlepidoptera and sphingids) and Coleoptera (NHM TM1/3/11) to his patron. As noted above, we strongly suspect that Mocquerys' original connection to Rothschild had formed around insect rather than bird collections. Rothschild had previously acquired West African Coleoptera collected by Mocquerys (see e.g., Jordan, 1894). In 1893, Rothschild hired Karl Jordan (1861–1959) to curate Coleoptera at the Tring Museum (Rothschild, 1955) and Mocquerys must have been aware of this when he set off for Venezuela. In 1894, Rothschild switched the focus of his entomological pursuits from Coleoptera to Lepidoptera and this meant that his curator Jordan changed his focus, too (Rothschild, 1955). Some of the Lepidoptera collected by Mocquerys in Venezuela were cited in monographs published by Rothschild (see e.g., Rothschild and Jordan, 1903: 422; Rothschild, 1919: 6).

There is some evidence that Mocquerys used the network of dealers interested in buying entomological specimens that his family and he had established over the years although we are left to wonder how extensively he exploited these contacts while in South America. Maurice Régimbert (1852–1907), a specialist on aquatic beetles (Dytiscidae, Gyrinidae, and Hydrophilidae), received some collections made by Mocquerys in Venezuela (Régimbert, 1902, 1903) via Rothschild. When Mocquerys asked Rothschild to communicate these specimens to Régimbert he explained (NHM TM1/3/11) that the two were friends from secondary school in Évreux. Régimbert's collection is now at the Muséum national d'Histoire naturelle, Paris. Other Venezuelan Coleoptera collected by Mocquerys are in the collection of René Oberthür (1852–1944) (Casari, 2002: 289); whether or not these were acquired through Rothschild as opposed to being sold directly to Oberthür is unknown. Likewise, Coleoptera collected in Venezuela by Mocquerys are in the Museum für Naturkunde in Berlin (Joly and

Escalona G., 2010), which suggests that Mocquerys may have sold beetles to the German entomologist and natural history dealer Otto Staudinger (1830–1900). Mocquerys earlier sold African Coleoptera to Staudinger whose personal collection eventually went to the Museum für Naturkunde in Berlin in 1907.

Rothschild apparently did not expect an exclusive relationship with Mocquerys although he may have expected to have the right of first refusal for specimens collected with his financial assistance. Several years after leaving Venezuela, Mocquerys asked Rothschild (NHM TM1/14/22) to help arrange for a natural history dealer in London to purchase the duplicates that Rothschild did not want; Mocquerys even mentioned a dealer who was mute (unidentified by us) who Rothschild had recommended that Mocquerys contact before his departure for Venezuela.

Mammals: Mocquerys trapped or netted small mammals at diverse locations in Venezuela and M. R. Oldfield Thomas (1858–1929), mammalogist in the Zoology Department of the British Museum (Natural History), based several novelties (species and subspecies) on these specimens (see e.g., Thomas, 1894: 351, 1897: 553, 1898: 274, 1903: 382). Among the novelties are a species of shrew from Mérida, a species of bat from Valencia, a species of rabbit from Cumaná, and a subspecies of agouti from Caripe. It is interesting to speculate that Oldfield paid Mocquerys for these specimens. Oldfield certainly had the capacity to do this because his wife, whom he married in 1890, was heiress to a small fortune and he often hired mammal collectors and then presented their specimens to the British Museum (Natural History) (Hinton, 1929).

Plants: Emmanuel Drake del Castillo (1855–1904) almost certainly was Mocquerys' botanical patron. We know that Drake, before Mocquerys began his Venezuelan adventure, had acquired vascular plant specimens that Mocquerys had collected in West Africa (see e.g., Hua, 1893) and it is easy to imagine that Mocquerys, knowing that he was on his way to South America, entered into a commercial relationship with Drake who was in the process of amassing a world-wide herbarium in excess of 500,000 specimens (Bureau, 1904: cxxiii). Whether or not this was the case, we do know that before April 1895 Émile Mocquerys received in Évreux on his son's behalf a shipment of Venezuelan plants (NHM: TM 1/14/22) and it is possible that Émile, not Albert, was the intermediary with Drake. In any case, all of the Mocquerys plant collections from Venezuela by virtue of labeling are associated with the "Herbier E. Drake." In a number of instances "MOCQUERYS, VENEZUÉLA" is stamped in purple ink on the original ticket provided by Mocquerys (see e.g., *Lockhartia acuta* (Lindl.) Rehb. f., P barcode P00456054) or stamped on a separate label on these specimens. According to Bureau (1904: cxxiii), Drake and his curator were in the habit of placing on the left of a sheet the original label or ticket of the collector and on the right, the label of the botanist who provided the determination.

Many, but not all, of the Mocquerys specimens are numbered. The numbered collections are not ordered in a way that reflects the known chronology of Mocquerys'

itineraries and, as with his bird collections, the implication is that the specimens were processed out of chronological sequence (Zimmer and Phelps, 1954). It is unclear as to whether or not the numbers have corresponding field books or any other particular significance; field books and notes have not been found. We have seen or are aware of herbarium specimens with numbers between 1 and 1263, but in organizing our data we see large gaps in the number sequence. As a rule, locality data are sparse and imprecise by current standards (Fig. 2).

Interestingly, Mocquerys collected almost exclusively herbaceous and shrubby material and rarely, if ever, trees. This suggests a certain degree of opportunism or even a mercenary attitude toward this endeavor. He left us some clues as to his plant collecting practices and compensation when after his trip to Venezuela he wrote Casimir de Candolle (1836–1918) soliciting the latter's patronage for a proposed collecting trip to Madagascar (CJBG: 22 May 1896). Mocquerys mentioned that he had sent from Venezuela to Paris approximately 20,000 herbarium specimens for which he received 50 centimes (cents) each. As part of his sales pitch to de Candolle, Mocquerys described his plant collecting habits: each dried specimen is provided with a label that indicates whether the plant is an herb, shrub or

tree; also whether it is crawling, climbing or erect; and each label states the habitat, altitude, and locality where the plant was found. Also, as best as possible each specimen consists of flowers and seeds or fruits. If the latter are plentiful (and can be dried) they are set apart and numbered with the same number as the dried specimen. In addition, Mocquerys described how he tried to spend a month in each locality, leaving only when he had determined that he had exhausted the collection of interesting specimens.

In 1913, the Drake herbarium was acquired by the Muséum national d'Histoire naturelle, Paris (Bureau, 1904; Stafleu and Cowan, 1976) and as a consequence the primary set of Venezuelan plants collected by Mocquerys is now in the herbarium of that museum (P). After acquiring the Drake herbarium, Paris (P) distributed duplicate specimens to other herbaria and these duplicates are now found in A, AMES, B, BR, COL, CTES, F, G, K, LIL, MO, NY, RB, S, SI, TEX, U, US, VEN, and W, at least (Vegter, 1976; Espinoza and Rodríguez, 2007; JSTOR Global Plants, 2017; Dorr, unpubl.; acronyms follow Thiers, 2017). Most of the data on the labels of specimens outside of Paris, and a good number within, are copied data; duplicate labels handwritten by one or more technicians or assistants working in the herbarium in Paris. Almost without exception the



FIGURE 2. Labels used on Venezuelan plant specimens collected by Mocquerys and distributed by Paris. A, Printed label with hand-written data. B, Label with data copied by hand. C, Label with Mocquerys' handwriting. D, Label accompanying the preceding and associating the specimen with Drake del Castillo and the herbarium in Paris. (All labels courtesy of US).

material distributed by Paris indicates that the specimens were part of the “HERBIER E. DRAKE” (Fig. 2B, D) or “Ex HERBIER E. DRAKE” (Fig. 2A). Occasionally specimens also have a printed label “MOCQUERYS.—PLANTES DE VENEZUELA (1893–94),” but invariably hand-lettered locality data (Fig. 2A). One also sometimes finds specimens that have labels with field notes handwritten by Mocquerys (see e.g., Fig. 2C).

A handwritten label on one of the orchids collected by Mocquerys, “*Oncidium ampliatum* Lindl.” (= *Chelyorchis pardoi* Carnevali & G.A. Romero; see Carnevali et al. 2009; P barcode P00437010), tells us that he also collected living material in Venezuela for Alexandre Godefroy-Lebeuf (1852–1903). The label on this specimen reads “Fleurs jaune; d’une orchidée à bulbe aplati, dont j’envoie une

certaine quantité par ce même courrier, pour M^r Godefroy-Lebeuf.” As with Drake, Mocquerys had established prior to his South American expedition a relationship with this French horticulturist who was one of the principal French importers of exotic orchids (Dorr, 1997; Dorr and Nicolson, 2009). It was only a few years earlier that Mocquerys had sent Godefroy-Lebeuf living material of orchids from West Africa (Godefroy-Lebeuf, 1892).

Fossil shells: In early November 1893 Mocquerys wrote Rothschild that among other items he was about to send from Puerto Cabello (NHM: TM 1/3/11) were two boxes of fossils. The fossils had been found at Lago de Valencia and were later (NHM: TM 1/3/11) described as fossil shells. The contents of these two boxes have not been traced.

EPILOGUE

After leaving Venezuela, Mocquerys continued his itinerant lifestyle. From December 1894 to February 1895 he collected birds and insects on and near the southwestern coast of the Caspian Sea (Roselaar and Aliabadian, 2007; NHM: TM 1/14/22). He was not, however, done with Venezuela. He wrote Rothschild from Bakou (i.e., Baku, Azerbaijan) that his father had written him from Évreux to let him know that another box from Venezuela had arrived after his departure for Persia. He thought that this box would have specimens of interest for Rothschild, but his father Émile wrote Hartert that all that he had received from Venezuela since his son’s departure was a box of plants and that he hoped the box intended for Rothschild was not lost (NHM: TM 1/14/22).

Following his quick trip to Persia, Mocquerys settled briefly in Bône (now Annaba), Algeria to practice dentistry, but having secured new (and some old) patrons he explored Madagascar from 1897 to 1898 where he collected birds, small vertebrates, crustacea, insects, and plants on the East coast and adjacent Île Ste Marie (Dorr, 1997, 2004, 2014). Subsequently Mocquerys collected birds, insects, and plants off the coast of West Africa in São Tomé from 1899 to 1900 (Dorr, 2014). There is evidence that he collected birds, at least, as late as 1904 in Angola, Príncipe, and the

Cape Verde Islands; whether or not this was a continuation of his São Tomé trip or a separate trip or trips is unclear. A final collecting trip from late 1908 until early 1910 focused on birds of the Pantanal in southern Brazil (Simon, 1912; Menegaux, 1917). We suspect that Mocquerys ultimately settled in Tunisia where his father and brother resided and we assume this is where he died in 1926.

There were no dramatic discoveries or consequences emanating from Mocquerys’ collecting activities in Venezuela. Although a number of animals were described as new, we know of only two species of plant described from his Venezuelan collection; *Andropogon mocquerysii* Benoist (Poaceae) and *Miconia mocquerysii* Wurdack (Melastomataceae). The number of plant specimens sent to France, however, was remarkable and represents a different type of botanical legacy. The specimens (along with his zoological collections) are part of the slow but important accretion of new records that eventually lead to a better understanding of species distributions and morphology. Certainly the commercial aspect of Mocquerys’ collecting influenced what he gathered; when one is paid by the piece then any piece will suffice. A sharper focus on plants and an effort to collect trees might have produced more interesting results for the botanist.

VENEZUELAN LOCALITIES ON MOCQUERYS SPECIMENS

Mocquerys used relatively few Venezuelan place names on his specimens. The following list accounts for all the names of localities that we have encountered. In this gazetteer the locality used on a specimen is first given in bold letters. It is then followed in brackets by the state and first order subdivision (“municipio”), geographical coordinates, a brief description, dates (when known but invariably imprecise), and the nature of the material collected. If no source is cited after the coordinates then we have inferred the latitude and longitude from maps of the relevant state.

Barquisimeto [Lara: Iribarren]: 10°04'N, 069°19'W (Paynter, 1982); now largest city and capital of Lara state; no precise date, probably October and November 1893; plants. Note: Barquisimeto was connected by railroad with Puerto Cabello (Filsinger, 1922; Yarrington, 1997: 78) and

we assume this is how Mocquerys traveled to this city from the coast.

Bucarito [Lara: Morán]: ca. 09°47'N, 069°48'W; a mountainous ridge terminating the “savanne de Bucarito” south of El Tocuyo (see below), a locality that is not found on present-day maps; October and November 1893 (Hartert, 1894: 674, as “hills near Bucarito, in the state of Tocuyo,” 1922: 365, as “Mt. Bucarito, Tucuyo;” Hellmayr, 1903: 530, as “ad mons Bucarito, Tucuyo;” 1908: 19, as “Mount Bucarito, state of Tocuyo;” Phelps, 1944: 331, as “Cerro Bucarito;” Zimmer and Phelps, 1944: 3, as “Mt. Bucarito;” birds and plants. Note: Paynter (1982) placed Bucarito 50 km northwest of Barquisimeto, but Mocquerys clearly indicated in a letter to Rothschild (NHM: TM 1/3/11) that it was south of El Tocuyo. Also, with bird specimens, at least, the many

variations of this place name are invariably associated with El Tocuyo (see below). One herbarium specimen (*Pleurophora anomala* (A. St.-Hil.) Koehne, *Mocquerys 15*, VEN) is labeled "Sanare, Bucarito". Sanare is a village ca. 15 km south southeast of El Tocuyo. Paynter's (1982) mistake is understandable because there are many localities in Venezuela named "Bucarito".

Bucarito, Cerro (see Bucarito).

Bucarito, Sanare (see Bucarito).

Bucarito, Savane de (see Bucarito).

Caripe [Monagas: Caripe]: 10°12'N, 063°29'W (Paynter, 1982); near the head of the Río Caripe, 46 km west of Caripito and 23 km east of San Antonio de Maturín near Cueva del Guácharo; January 1894 (Phelps, 1944: 331; Zimmer and Phelps, 1954: 3); birds, insects, mammals, and plants. Note: There is a suspicion that some of the birds that are labeled Caripe were actually collected elsewhere (see text).

Cumaná [Sucre: Sucre]: 10°28'N, 064°10'W (Paynter, 1982); largest city and capital of Sucre state, it is a Caribbean port 70 km northeast of Barcelona; January and May 1894 (Hartert, 1927: 29; Phelps, 1944: 331; AMNH skin 472557); birds, mammals, and plants. Note: The May record is based on label data transcribed from birds skins at the AMNH.

Cumanacoa [Sucre: Montes]: 10°15'N, 063°55'W (Paynter, 1982); upper valley of Río Manzanares, 40 km southeast of Cumaná; no precise date, but probably January 1894; birds and plants.

Duaca [Lara: Crespo]: 10°18'N, 069°10'W (Paynter, 1982); village between the Sierra de Bobare and the Sierra de Aroa, 30 km northeast of Barquisimeto; October to December 1893 (Phelps, 1944: 331); birds and plants. Note: When Mocquerys visited Duaca, the village was connected by railroad with Barquisimeto and Puerto Cabello (Filsinger, 1922; Yarrington, 1997: 78) and we assume this is how Mocquerys traveled there from the coast.

Ejido [Mérida: Campo Elías]: 08°33'N, 071°14'W (Paynter, 1982); 10 km southwest of Mérida on the Río Chama; March and April 1894 (Hartert, 1897: v, as "April 1897"; Phelps, 1944: 331); birds and plants.

Guácharo, El [Monagas: Caripe]: 10°09'N, 063°32'W (Paynter, 1982); the cave of the "Guácharo," 5 km southwest of Caripe and 19 km east of San Antonio de Maturín; January 1894 (Hartert, 1922: 396; Hellmayr, 1906: 91; Phelps, 1944: 331); birds.

Guaira, La [Vargas: Vargas]: 10°36'N, 066°56'W (Paynter, 1982); a Caribbean port 10 km north of Caracas; no precise date; plants.

Lagunillas [Mérida: Sucre]: 08°31'N, 071°24'W (Paynter, 1982); 28 km southwest of Mérida on the Río Chama; March 1894 (Phelps, 1944: 331, without precise date); birds.

Maracaibo [Zulia: Maracaibo]: 10°40'N, 071°37'W (Paynter, 1982); city on west side of the strait that connects the Lago de Maracaibo and the Golfo de Venezuela; March and April 1894 (Phelps, 1944: 331); birds, insects, and plants. Note: Régimbart (1902: 191) cited a Mocquerys insect collection made here under electric street lamps in November but that month seems implausible.

Mariara [Carabobo: Diego Ibarra]: 10°18'N, 067°43'W; ca. 15 km west of the city of Maracay (Aragua state) on the railroad and the north shore of Lago de Valencia; 1894 without month(s); plants. Note: This is undoubtedly the Hacienda "Mariara" mentioned by Zimmer and Phelps (1954, Fig. 1). It is unclear as to whether or not it was a stop on the "Gran Ferrocarril de Venezuela" when Mocquerys visited; construction of this railroad connecting Caracas and Valencia was completed in February 1894.

Mérida [Mérida: Libertador]: 08°36'N, 071°08'W (Paynter, 1982); largest city and capital of Mérida state, it is located in the valley of the Río Chama between the Sierra del Norte and the Sierra Nevada de Mérida; April 1894 (Hartert, 1897: v, as "April 1897"; Phelps, 1944: 331); birds, mammals, and plants. Note: Some plants were collected "Près Mérida" at 2000 m or in "páramo" at 2700 m and clearly were gathered from the surrounding mountains rather than the city proper. In a letter to Rothschild (NHM: TM 1/14/22), Mocquerys mentions visiting the Páramo de Zumbador (ca. 08°00'N, 072°05'W; Paynter, 1982), but no individual collection or collections can now be tied to this locality in Táchira state southwest of the city of Mérida. One bird skin (AMNH skin 731040) is said to be from "Río Marregas," which undoubtedly is a transcription error for the Río Albarregas that runs through the city.

Mucuchíes [Mérida: Rangel]: 08°45'N, 070°55'W (Paynter, 1982); 29 km northeast of Mérida in the upper valley of the Río Chama; March and April 1894 (Phelps, 1944: 331); birds.

Puerto Cabello [Carabobo: Puerto Cabello]: 10°28'N, 68°01'W (Paynter, 1982); a Caribbean port 33 km north of Valencia; November and December 1893, January 1894 (correspondence); fishes, insects, and plants.

San Antonio de Maturín [Monagas: Acosta]: 10°07'N, 063°43'W (Paynter, 1982); 25 km southeast of Cumanacoa (Sucre state); January 1894 (Phelps, 1944: 331, as "San Antonio"); birds. Note: Also known as San Antonio de Capayacuar or San Antonio del Río Colorado.

San Carlos del Zulia [Zulia: Colón]: 09°40'N, 071°55'W (Paynter, 1982); on the Río Escalante 20 km from the southwest coast of Lago de Maracaibo; March 1894 (Phelps, 1944: 331, as "San Carlos, Zulia"); birds.

San Esteban [Carabobo: Puerto Cabello]: 10°26'N, 068°01'W (Paynter, 1982); a small cocoa-producing village in a valley on the north slope of the Cordillera de la Costa 5 km south of Puerto Cabello; September and October 1893 (Phelps, 1944: 331; correspondence); birds, fishes, and plants.

Tocuyo, El [Lara: Morán]: 09°47'N, 069°48'W (Paynter, 1982); 60 km southwest of Barquisimeto near the head of the Río Tocuyo; October and November 1893; birds. Note: This locality is invariably cited as "Tucuyo" and is clearly the city of Tocuyo (or El Tocuyo) and not a former district in Lara state with the same name (see also NHM: TM 1/3/11). This name is also associated with "Cerro Bucarito" (see above).

Valencia [Carabobo: Valencia]: 10°11'N, 068°00'W (Paynter, 1982); largest city and capital of Carabobo state, it is located 10 km west of Lago de Valencia and 30 km

inland from Puerto Cabello; October to December 1893 (Thomas, 1903: 383; Phelps, 1944: 331; correspondence); birds, mammals, and fossil shells. Note: At least one bird skin (AMNH skin 500731) is said to be from the “Laguna de Valencia”. Similarly, fossils collected before 6 November 1893 (NHM: TM 1/3/11) are from the “lagune de Valencia”.

Valencia, Lago de (see Valencia).

Valencia, Laguna de (see Valencia).

Vigía, El [Mérida: Alberto Adriani]: 08°38'N, 071°39'W (Paynter, 1982); on the Río Chama 55 km west of Mérida; no precise date, probably March and April 1894; plants.

Zulia: A Venezuelan state that almost entirely surrounds Lago de Maracaibo and also borders Colombia on the west and the Venezuelan states of Táchira, Mérida, Trujillo, Lara, and Falcón on the east; no precise date, probably March and April 1894; plants.

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CJBG = Archives des Conservatoire et Jardins botaniques, Genève.

NHM = Library and Archives, Natural History Museum, London. [<http://www.nhm.ac.uk/our-science/departments-and-staff/library-and-archives/collections.html>].

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ICONES STELIDARUM (ORCHIDACEAE) COLOMBIAE III¹

CARLYLE A. LUER²

Abstract. An additional fifty new species of *Stelis* from Colombia are described and illustrated in this the third of a series that includes those not identified when compared with any of the previously known species.

Keywords: Colombia, Orchidaceae, Pleurothallidinae, *Stelis*

While continuing to revise the genus *Stelis* Sw. for Colombia, an additional 50 new species are described and illustrated in the third part of this series.

Stelis adinfinatum Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia?: without collection data, fl. in cult. by Marta and Oscar Robledo at La Ceja, Jan. 1978, C. Luer 2871 (Holotype: SEL). Fig. 1.

This long-scandent, prolific species is characterized by each ramicaul bearing another ramicaul; an elongated, flexuous, successively flowered raceme of flowers with obtuse, long-pubescent sepals, single-veined petals, and a subquadrate lip.

Plant medium in size, epiphytic, prolific, long-scandent; roots slender. Ramicauls slender, ascending, 6–9 cm long, enclosed by a tubular sheath from below the middle and another at the base, arising from the apex of a ramicaul, with a spathe 1–1.5 cm long. *Leaf* erect, coriaceous, elliptical, subacute to obtuse, 5–7 cm long including a petiole 1–2 cm long, the blade 1.5–1.8 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* solitary; to 25 cm long, the raceme erect, arching, flexuous, distichous, many-flowered; floral bracts oblique, acute, 2 mm long; pedicel 1.5 mm long; ovary 2 mm long; the peduncle 7–10 cm long, from the apex of a ramicaul with a spathe 1.5 cm long; flowers light yellow; *sepals* long-pubescent within, ovate, obtuse, 3-veined, the dorsal sepal 3 mm long, 3 mm wide, the lateral sepals, 2 mm long, 2.7 mm wide; *petals* transversely ovate, the apical margin obtuse, thickened, 0.6 mm long, 1 mm wide, 1-veined; *lip* subquadrate, 0.5 mm long, 0.7 mm wide, 0.7 mm deep, shallowly concave below a bitumid bar with a shallow notch, the apex broadly obtuse with the margin thickened, the dorsum featureless, the base truncate, hinged to the column-foot; *column* stout, 0.6 mm long and wide, the anther and confluent stigmatic lobes apical.

Etymology: From the Latin *adinfinatum*, “without end,” referring to the continuous production of superposed ramicauls.

This medium-sized species is distinguished by a long-scandent chain of end-to-end ramicauls, a petiolate leaf, and an elongating, flexuous raceme with several flowers

persisting at the summit. A ramicaul emerges together with the spathe and an inflorescence at the apex of each ramicaul. The sepals are 3-veined long-pubescent, the petals are single-veined, and the lip is a simple type A.

Stelis amaliae Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Cauca: Valle de Popayán, cultivated in Popayán by Amalia Lehmann de Sarria, 16 November 1982, C. Luer 8447 (Holotype: SEL). Fig. 2.

This medium-sized, caespitose species is characterized by acute, elliptical leaves surpassed by two twice-longer, many-flowered, strict, distichous racemes with small, 3-veined sepals; minute, thick, 3-veined petals; and a minute, rounded lip with a broad bar.

Plant medium in size, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 4–6 cm long, with a tubular sheath on the middle third and another 1–2 sheaths about the base. *Leaf* erect, coriaceous, elliptical, acute, 5–8 cm long including a petiole 1.5–2 cm long, the blade 0.7–1 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* 1–2; 10–16 cm long, erect, strict, distichous, many flowered; floral bracts oblique, acute, 1.5–2 mm long; pedicel 1 mm long; ovary 1 mm long; the peduncle ca. 2 cm long, from near the apex of the ramicaul, subtended by a spathe 11–12 mm long; *sepals* yellow-green, lightly suffused with purple, microscopically pubescent, broadly ovate, obtuse, connate below the middle, 3-veined, 2 mm long, 2 mm wide; *petals* yellow-green, ovate, concave, 0.5 mm long, 0.6 mm wide, the apex obtuse with a thick margin, concave below a transverse carina, 3-veined; *lip* subquadrate, 0.5 long, 0.6 mm wide, 0.4 mm deep, shallowly concave below a thick, shallowly bar, apex rounded and minimally thickened, the dorsum featureless, the base truncate, hinged to the base of the column; *column* stout, ca. 0.5 mm long and wide, the anther and stigmatic lobes apical.

Eponymy: Named for Amalia Lehmann de Sarria, daughter of F.C. Lehmann, who collected and cultivated this species at their old home in Popayán.

This species from the southern Central Cordillera has no single feature to distinguish it from dozens of other species, except for the combination of the features: numerous, small

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²3222 Old Oak Drive, Sarasota, Florida 34239-5019, U.S.A.; cluer@juno.com

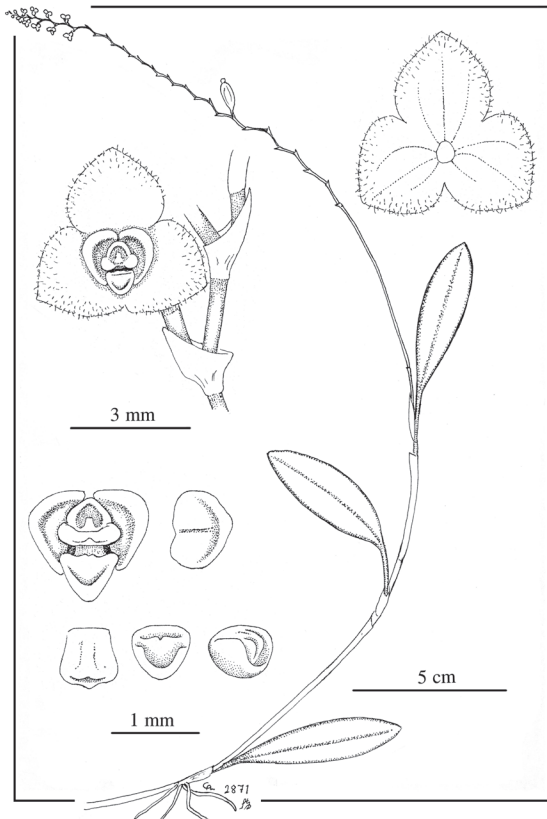


FIGURE 1. *Stelis adinfinatum* Luer & R.Escobar

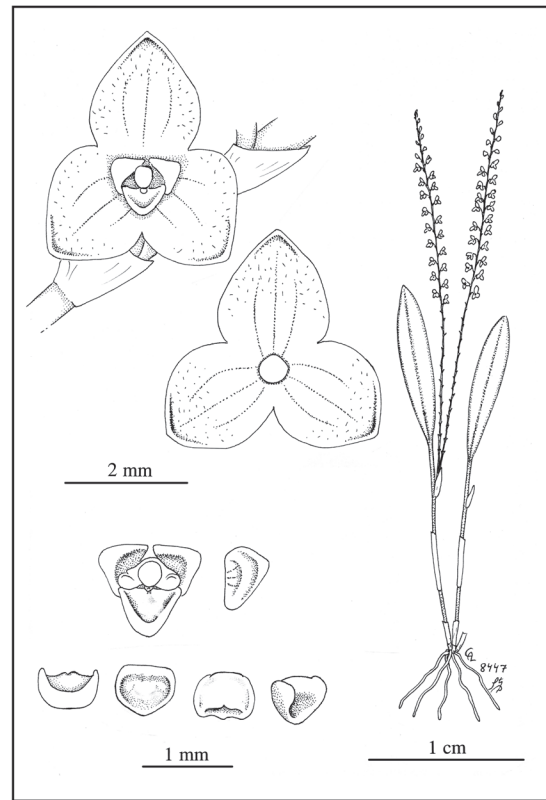


FIGURE 2. *Stelis amaliae* Luer & R.Escobar

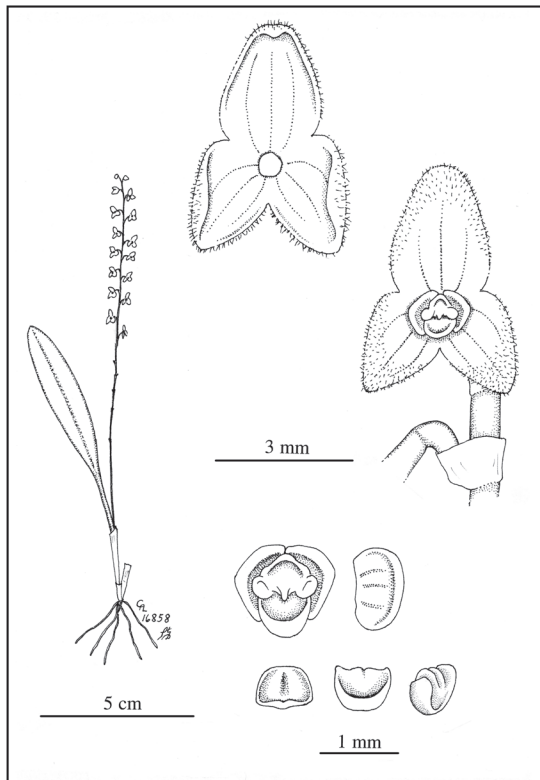


FIGURE 3. *Stelis baudoënsis* Luer & R.Escobar

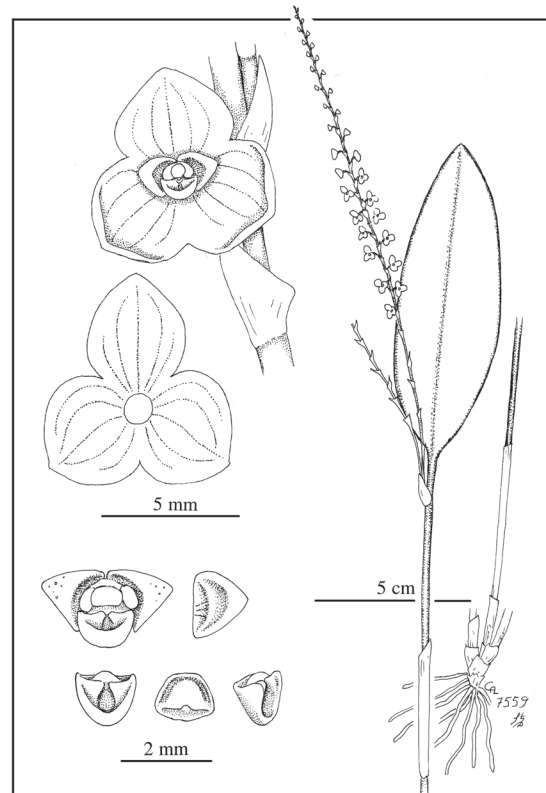


FIGURE 4. *Stelis boyacensis* Luer & R.Escobar

flowers in a crowded, two-sided racemes twice longer than acute, elliptical leaves. The sepals and petals are not distinctive except for their small size about a half millimeter long and wide.

Stelis baudoënsis Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Chocó: Alto de Baudo, 400 m, fl. in cult. by A. de Wilde above Pereira, 15 May 1993, *A. de Wilde 3939* (Holotype: SEL), C. Luer illustr. 16858. Fig. 3.

This medium-sized, caespitose species is characterized by a secund raceme twice as long as an elliptical leaf; convex, shortly pubescent, 3-veined sepals; 3-veined petals; and a rounded lip with a sulcate bar.

Plant medium in size, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 2.5–3 cm long, enclosed by a loose, tubular sheath from below the middle, and 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute, 8–9 cm long including a petiole ca. 2 cm long, the blade 1–1.5 cm wide in dry state, cuneate below into the petiole. *Inflorescence* single; 12 cm long, the raceme erect, strict, subclax, many-flowered; floral bracts tubular, obtuse, 1 mm long, 1.5 mm wide; pedicels 1.5 mm long; ovary 1.5 mm long; the peduncle ca. 3 cm long, from a node below the abscission layer; flowers light green; *sepals* short-pubescent, ovate with the margins recurved, subacute, 3-veined, connate in lower quarter, the dorsal sepal 3 mm long, 2 mm wide, the lateral sepals 2 mm long, 1.75 mm wide; *petals* transversely elliptical, concave, the broadly rounded apex thickened, 0.6 mm long, 1.25 mm wide, 3-veined; *lip* subovoid, with apex broadly rounded, 0.6 mm long, 0.8 mm wide, 0.6 mm deep, shallowly concave below a broad, smooth, shallowly sulcate bar, the dorsum shallowly sulcate, the base truncate, hinged to the base of the column; *column* clavate, ca. 0.8 mm wide and long, the anther and stigmatic lobes apical.

Etymology: Named for the department of Baudo, where the species was collected.

This medium-sized, densely caespitose species occurs at a low altitude in western, coastal Colombia. It is characterized by a ramicaul shorter than an acute, elliptical leaf surpassed by a subclax, many-flowered raceme. The sepals are pubescent with the margins recurved, and the petals are 3-veined. The lip is a simple type A with a thick, smooth, shallowly sulcate bar.

Vegetatively, the plant of this collection (*de Wilde 3939*) is similar to (*de Wilde 4500*, *Stelis divergens*), described herein, both having been collected in Baudo and cultivated near Pereira, but the petals and lip differ drastically. Whether they represent a taxon with extremely variable petals and lip, or a hybrid, is impossible to determine without examination of many more specimens, an improbability at this time. In order to identify one from the other, they are given names.

Stelis boyacensis Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Boyacá: between Arcabuco and Moniquirá, 2500 m, 25 April 1982, C. Luer, J. Luer & R. Escobar 7559 (Holotype: SEL). Fig. 4.

This large, robust, caespitose species is characterized by ovate, subacute leaves; much longer, stout ramicauls; one or

two many-flowered racemes; sensitive flowers with ovate, 5-veined sepals; 3-veined petals with a subacute apex; and a lip with a rounded apex, a concave glenion, and a semiorbicular callus on the dorsum.

Plant large, robust, epiphytic, densely caespitose; roots slender. Ramicauls erect, stout, 10–21 cm long, with a tubular sheath above the middle, and another 1–2 sheaths below and about the base; *Leaf* erect, thickly coriaceous, ovate, subacute, 12–18 cm long including a petiole ca. 1.5 cm long, the blade 2.5–4 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* 1–2; 12–18 cm tall, the raceme erect, strict, distichous, subcongested, with many flowers that mature simultaneously; floral bracts oblique, acute, 5 mm long below to 3 mm long above; pedicels 5 mm long below, shorter above; ovary 2 mm long; the peduncle ca. 2 cm long, subtended by a slender spathe 10–12 mm long, from a node below the apex of the ramicaul; flowers green, sensitive, closing readily, but opening quickly in pickling solution; *sepals* glabrous, the sepals broadly ovate, obtuse, 5-veined, the dorsal sepal 4 mm long, 3.5 mm wide, the lateral sepals 3.5 mm long, 4 mm wide, connate below the middle; *petals* triangular, subacute, 1.3 mm long and wide, concave and 3-veined below a transverse carina, the apical margin thickened; *lip* subquadrate, type A, 1.25 mm long, 1.5 mm wide, 1 mm deep, concave below a cleft bar with a concave glenion, the apex rounded, the margins thick, the dorsum with a low, suborbicular callus; the base truncate, hinged to the base of the column; *column* ca. 1 mm broad and long, the anther and stigmatic lobes apical.

Etymology: Named for the department of Boyacá, where this species was collected.

This large, robust species is similar to other large species with medium-sized flowers with 5-veined sepals, i.e. *Stelis colossus* Luer & R.Escobar but is best distinguished from all of them by petals with a subacute apex, and floral bracts are not large and imbricating. The flowers are sensitive, closing with disturbance, but opening in pickling solution. The lip is type A with a deep glenion.

Stelis calopsis Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia: El Retiro, above Colomborquídeas, La Horqueta, 2500 m, coll. by F. Lopez, fl. in cult. at Colomborquídeas, 27 December 1992, R. Escobar 5130 (Holotype: SEL), C. Luer illustr. 21909. Fig. 5–6.

Among the small, caespitose species, this species is distinguished by a distichous raceme of purple flowers with subcircular sepals, 3-veined petals, and a round to subquadrate lip shallowly concave below a low, central callus descending from the dorsum.

Plant small, epiphytic, densely caespitose; roots slender. Ramicauls erect, 3–10 mm long, enclosed by 1–2 tubular sheaths. *Leaf* erect, coriaceous, elliptical, acute to subacute, 10–30 mm long including a petiole 2–7 mm long, 3–5 mm wide when dry, cuneate below into the petiole. *Inflorescence* single; 3–6 cm tall, the raceme erect, subcongested, several- to many-flowered, distichous; floral bracts tubular, acute, 1–1.5 mm long, pedicels 1 mm long; ovary 1 mm long; the peduncle 2–4 cm long, from a node at the apex of the ramicaul; flowers purple; *sepals* glabrous,

expanded, 3-veined, connate below the middle, the dorsal sepal broadly ovate, subacute to obtuse, 2–2.25 mm long, 2 mm wide, the lateral sepals broadly ovate to subcircular, obtuse to rounded at the apex, 2 mm long, 2 mm wide; *petals* transversely elliptical, concave, broadly rounded at the apex, with the margin minimally thickened, without a transverse callus, 0.75–1 mm long, 1–1.25 mm wide, 3-veined; *lip* subquadrate, 0.75–1 mm long, 0.9–1.25 mm wide, 0.5 mm deep, shallowly concave below a low, central callus that extends from the base to the middle of the lip, the apex rounded to subtruncate; the base broadly truncate, hinged to the base of the column; *column* ca. 0.9 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Greek *Kalopsix*, “a pretty bit,” or “morsel,” referring to the flowering plant.

Paratypes: COLOMBIA. Antioquia: collector unknown, fl. in cult. at Colomborquídeas, 6 July 1996, C. Luer 17975 (SEL); scrub forest above the home of Rodrigo Escobar north of Bello, 9 March 1989, 1600 m, collected by S. Dalström 1258 (SEL), C. Luer illustr. 14114; forest remnant, E of Santo Domingo, 1820 m, 12 May 1985, C. Luer, J. Luer & R. Escobar 11358 (SEL).

This species is closely allied to *Stelis obovata* C. Schweinf., from eastern and Amazonian Venezuela. *Stelis caloptrix* is distinguished by a dark purple-flowered raceme about twice longer than elliptical leaves; broadly ovate to subcircular, 3-veined sepals; and thin, 3-veined petals. The lip is subquadrate and shallowly concave around a low callus that extends from the base to near the middle of the lip.

Stelis calopsix from the Western Cordillera of Colombia differs from *S. obovata* by proportionately narrower, elliptical, subacute to obtuse leaves, and dark purple flowers, while the leaves of *S. obovata* are spatulate or oblanceolate, and broadly obtuse or rounded at the tip, and all the flowers of reported collections are pale yellow.

Stelis caudex Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Cauca: Páramo de Puracé, terrestrial on the road cut, 3200 m, 14 November 1982, C. Luer & R. Escobar 8387 (Holotype: SEL). Fig. 7–8.

This small, repent species is distinguished by numerous roots produced by a thick rhizome; erect ramicauls and elliptical leaf; pubescent sepals; 3-veined petals; and an obovoid, obtuse lip with thin margins and a large, erect callus bearing on top a low, horseshoe-shaped, marginal callus.

Plant small, terrestrial, long-repent, the rhizome stout, ca. 4 mm thick, roots fleshy, ramicauls adjacent to 1 cm apart. Ramicauls erect, slender, 1.5–3 cm long, enclosed by a loose, tubular sheath and 1–2 below at the base. *Leaf* erect, coriaceous, elliptical, obtuse, 3–4.5 cm long including the petiole 0.5–0.8 cm long, 0.7–1 cm wide dry, cuneate below into the petiole. *Inflorescence* single; 8–14 cm. tall, the raceme erect, congested, distichous, many-flowered, with many flowers open simultaneously, 5–10 cm long, the peduncle ca. 4 cm long, from a node below the apex of the ramicaul; floral bracts tubular, acute, 2.5 mm long; pedicels 1.5 mm long; ovary 1.5 mm long; *sepals* yellow with a

short, brown pubescence, broadly ovate, connate in lower quarter, 3-veined, the dorsal sepal subacute, 4 mm long, 3.5 mm wide, the lateral sepals obtuse, 3.5 mm long, 3.5 mm wide; *petals* yellow, transversely ovate, the apex broadly obtuse with a thickened margin, 1.5 mm long, 2 mm wide, 3-veined, with an indistinct transverse carina; *lip* thick, obovoid, 1.8 mm long, 1.3 mm wide, 1 mm deep, the apex broadly obtuse between erect, rounded sides, and concave surrounding an erect callus that extends from the base to slightly above the middle, the dorsum of the callus with a low, horseshoe-shaped, marginal callus, the base hinged to the base of the column; *column* stout, 1 mm long and wide, with the rostellum elongated, the anther and the bilobed stigma apical.

Etymology: From the Latin *caudex*, “a trunk, a stem.” referring to the thick rhizome.

Paratypes: COLOMBIA. Nariño: Pasto, Volcán Galeras, 3200–3500 m, 4 June 1946, R.E. Schultes 7979 (AMES); Putumayo: Santiago, Santiago del Bellavista, Páramo del Bordoncillo, 3249 m, 19 March 1999, S.M. Pasmíño & M.R. Posso 027 (PSO, MO), C. Luer illustr. 21940.

This small species is distinguished by a thick, creeping rhizome wrapped by the numerous roots it produces. Erect ramicauls with an obtuse, elliptical leaf produce a single, crowded raceme of relatively large flowers. The pubescent sepals and the lips are 3-veined. Upon the large, erect callus of the lip, a low, horseshoe-shaped callus defines the margins of the loop.

Stelis cladophora Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Santander: Bucaramanga, between Bucaramanga and Berlin, 2800 m, 27 Apr. 1982, C. Luer, J. Luer & R. Escobar 7585 (Holotype: SEL). Fig. 9.

This medium-sized species is distinguished by an ascending-caespitose habit with stout, prolific ramicauls; racemes to twice longer than the leaf; multiveined, dark purple dorsal sepal and synsepal; thick petals with twice greater dimensions than those of the lip; and a subquadrate lip with three calli on the dorsum.

Plant medium in size to large, epiphytic, ascending-caespitose, roots slender. Ramicauls erect, stout, 3–4 mm thick, 3–7 cm long, with a loose, tubular sheath from below the middle, and 1–2 other sheaths about the base. *Leaf* erect, coriaceous, ovate, acute, 4–6.5 cm long, including a petiole 1–1.5 cm long, the blade 1–1.8 cm wide in dry state, cuneate below into the petiole. *Inflorescence* single; 12–17 cm long, the raceme erect, distichous, simultaneously many-flowered; floral bracts oblique, acute, acuminate, 8–10 mm long low in the raceme, 6–7 mm long near the apex; pedicels 2–4 mm long; ovary 2 mm long; the peduncle 2–5 cm long, from a spathe 10–12 mm long near the apex of the ramicaul; flowers dark purple; *sepals* glabrous, the dorsal sepal ovate, acute, 5 mm long, 6 mm wide, 5- or weakly 7-veined, connate 2 mm to the lateral sepals, the lateral sepals, ovate, subacute, 8 mm long, each 5 mm wide, connate 4 mm, in apposition, forming a deeply concave synsepal; *petals* semilunate, the apex broadly rounded with a broad, thick margin with minute crystals, concave, with a transverse carina, 1.6 mm long, 2.3 mm wide, 3-veined;

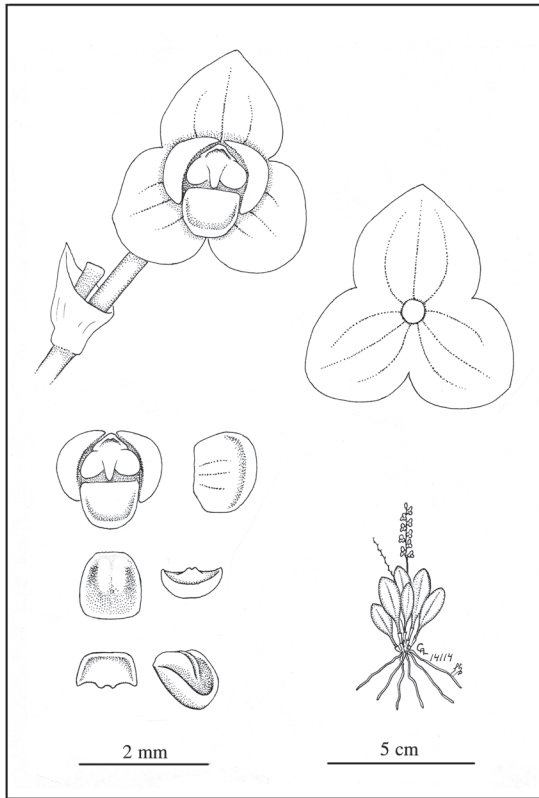


FIGURE 5. *Stelis calopsis* Luer & R. Escobar

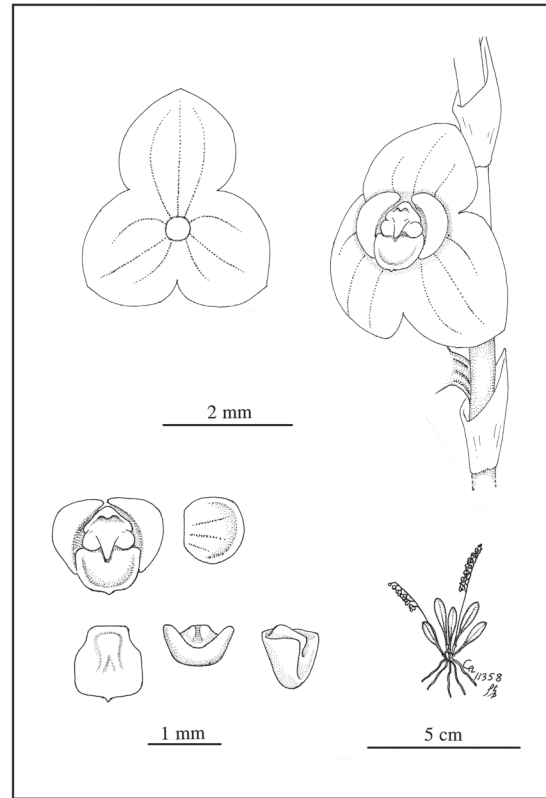


FIGURE 6. *Stelis calopsis* Luer & R. Escobar

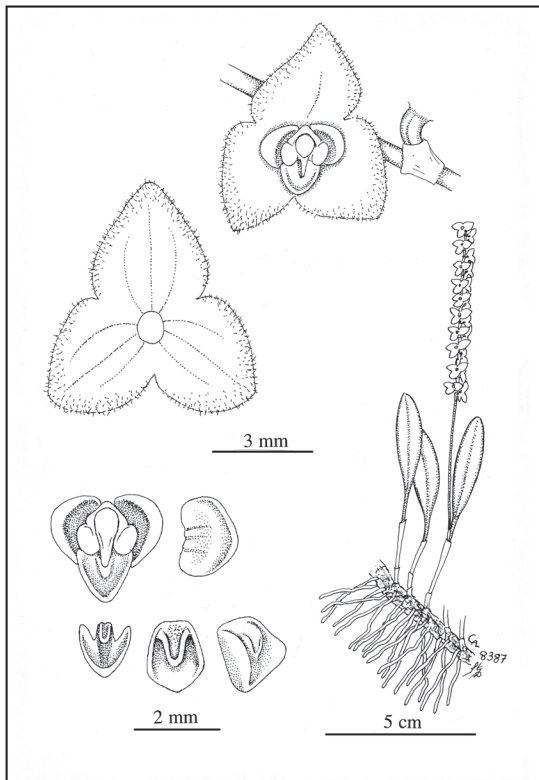


FIGURE 7. *Stelis caudex* Luer & R. Escobar

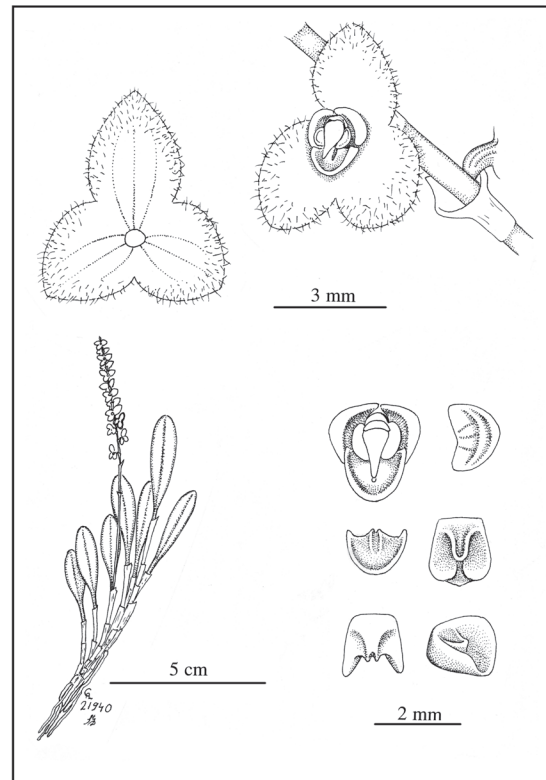


FIGURE 8. *Stelis caudex* Luer & R. Escobar

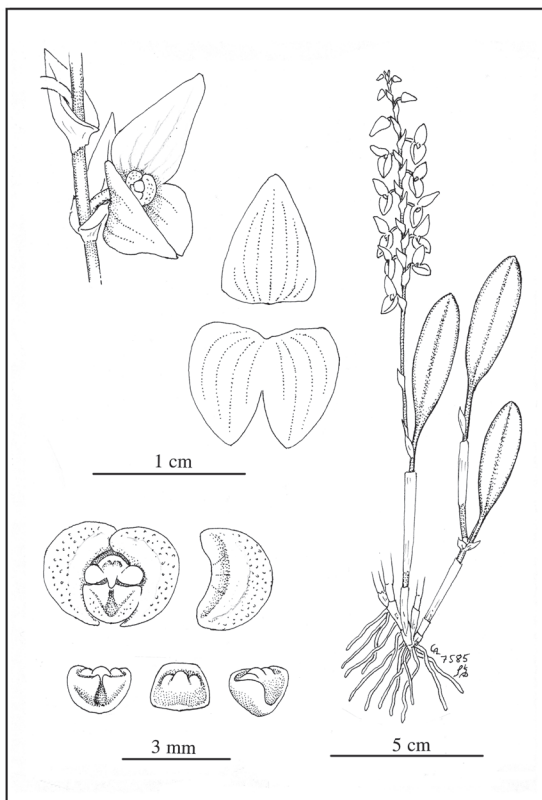


FIGURE 9. *Stelis cladophora* Luer & R. Escobar

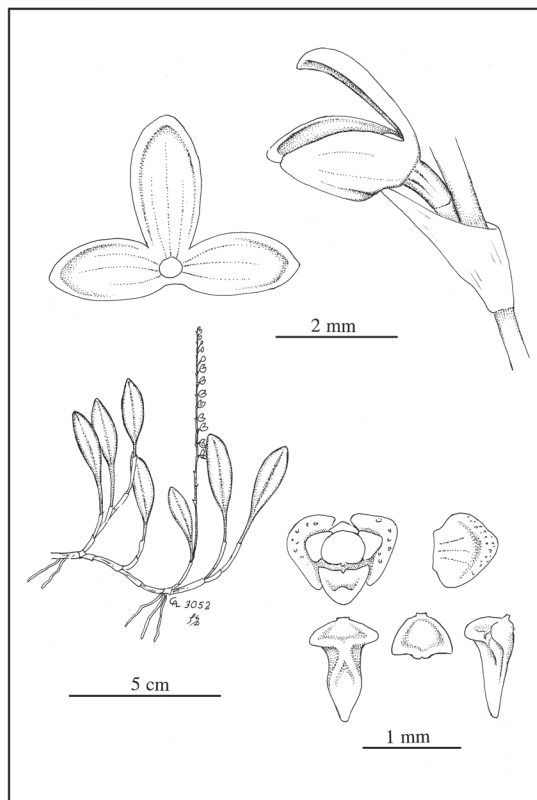


FIGURE 10. *Stelis crassisejala* Luer & R. Escobar

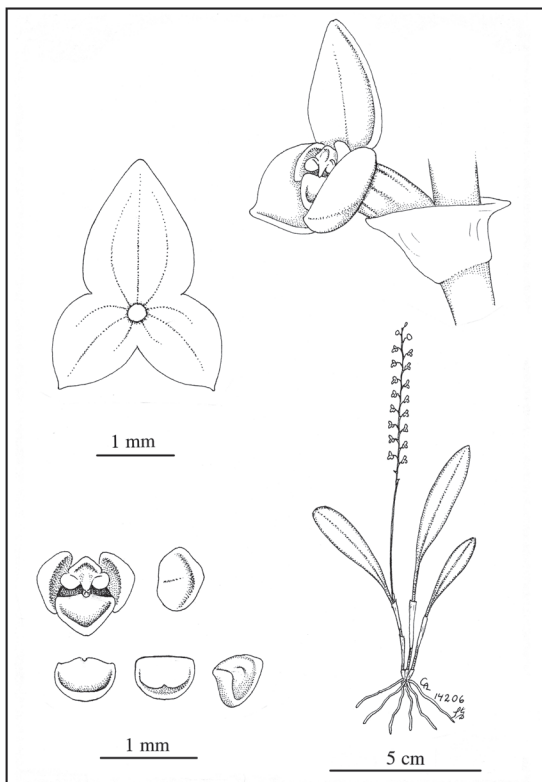


FIGURE 11. *Stelis craticula* Luer & R. Escobar

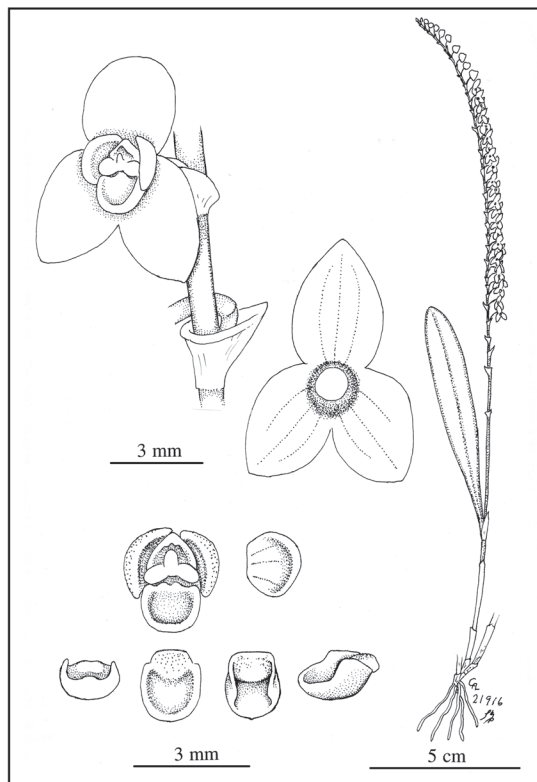


FIGURE 12. *Stelis cupreata* Luer & R. Escobar

lip thick, subquadrate, 0.75 mm long, 1.3 mm wide, 1 mm deep, shallowly concave below a thick bar with a glenion, the apex broadly obtuse with a broad margin, the dorsum with 3 low, rounded calli, the base truncate, hinged to the base of the column; column clavate, ca 1 mm wide and long, the anther and the bilobed stigma apical.

Etymology: From the Greek *kladophora* “branch-bearing,” referring to the prolific habit.

This strong species is characterized by an ascending-caespitose habit with thick, prolific ramicauls. A simultaneously many-flowered raceme of large, dark purple flowers with a deeply concave synsepal surpasses the leaf about thrice the length. The lateral sepals are held in apposition, although only semiconnate. The thick, semilunate petals are proportionately large. A row of three, low, rounded calli occupy the dorsum of the lip.

Stelis crassisejala Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Cauca: Popayán, Páramo de Barbillas, SE of Popayán, 3070 m, 27 July 1978, C. Luer, J. Luer & R. Escobar 3052 (Holotype: SEL). Fig. 10.

This small, ascending-repent species with a trilobed lip is similar to *Stelis elongata* Kunth, but differs with a habit less than half the size, and with thick, concave sepals.

Plant small, epiphytic, scandent, long-repent, the rhizome stout, branching, ascending, 1–1.5 cm long between ramicauls; roots slender. Ramicauls ascending, relatively stout, 1–1.5 cm long, enclosed by a loose, tubular sheath and another sheath below and at the base. *Leaf* erect, coriaceous, elliptical, acute, 3–5 cm long including the petiole 1–1.5 cm long, the blade 0.6–1.2 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* single; 6–8 cm long, the raceme erect, strict, secund, loose to congested above, many-flowered; floral bracts oblique, acute, 2–3 mm long; pedicels 1 mm long; ovary 0.5 mm long; the peduncle ca. 1 cm long, from a node below the apex of the ramicaul; *sepals* yellow, mottled with purple, glabrous, thick, especially at the apices, elliptical, subacute, concave, connate basally, 2–2.5 mm long, 1–1.25 mm wide, 3-veined, the lateral sepals, antrorse; *petals* yellow-white, transversely ovate, 0.75 mm long, 0.75 mm wide, 3-veined, the apex broadly obtuse with a thickened margin, without an obvious transverse carina; *lip* yellow-white, trilobed, 1.5 mm long, 1 mm wide across basal lobes, 0.5 mm deep, the basal lobes formed by incurved margins above the base, then meet medially and descend onto the ovate, acute middle lobe, the base hinged to the column-foot; *column* stout, ca. 1.5 mm long, 2 mm wide, the anther and the bilobed stigma apical.

Etymology: From the Latin *crassisejalus*, “with thick sepals,” for obvious reasons.

This small, scandent species is characterized by a stout, branching rhizome with short, ascending ramicauls with elliptical leaves and an erect inflorescence about twice as long. The three sepals are concave and markedly thickened, especially toward the apices, and with the lateral sepals antrorse. The petals are 3-veined. The trilobed lip is similar to that of the frequent, widely distributed *Stelis elongata* Kunth.

Stelis crassisejala differs from *S. elongata* by a smaller habit with proportionately shorter ramicauls, and third smaller, thick, more or less concave sepals mottled with purple.

Stelis craticula Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia: Yarumal, near Estadero Ventanas, 2000 m, 16 March 1989, C. Luer, J. Luer, S. Dalström & W. Teague 14206 (Holotype: SEL). Fig. 11.

This small, caespitose species is characterized by small, white flowers evenly spaced in a distichous raceme about twice longer than an elliptical leaf; acute, 3-veined sepals with the lateral sepals antrorse; single-veined petals; and a lip with a bigibbous callus.

Plant small, epiphytic, densely caespitose. Ramicauls erect, very slender, 2–3.5 cm long, with a tubular sheath from below the middle, and 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, subacute to obtuse, elliptical, 4–6 cm long including a petiole, ca. 1.5 cm long, the blade 0.7–0.9 cm wide in the dry state, narrowly cuneate below to the petiole. *Inflorescence* single; 6–9 cm long, the raceme erect, subcongested, distichous, many-flowered with most flowers open simultaneously; floral bracts oblique, obtuse, dilated, 1 mm long, 2 mm wide; pedicels 0.5 mm long; ovary 0.8 mm long; the peduncle ca. 3 cm long, subtended by a spathe 6–7 cm long, from a node at the apex of the ramicaul; *sepals* white, glabrous, ovate, acute to subacute, 3-veined, connate in lower fourth, the dorsal sepal 1.75 mm long, 1.3 mm wide, the lateral sepals antrorse, oblique, 1.25 mm long, 1 mm wide; *petals* white, transversely ovate, 0.5 mm long, 0.6 mm wide, 1-veined, concave, the apex broadly obtuse, with the margin minimally thickened, without a transverse carina; flowers white; *Sepals* more or less suffused with red-brown, ovoid, 0.4 mm long, 0.6 mm wide, 0.3 mm deep, type A, the apex rounded with thickened margin, concave below a shallowly sulcate, thick bar, the dorsum smooth, convex, the base truncate, hinged to the base of the column; *column* stout, ca. 0.8 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *craticulus*, “latticed,” referring to the delicate racemes.

This small species is superficially similar to many others with an erect inflorescence twice longer than an elliptical leaf, but it differs by a distichous raceme with tiny, white, spaced evenly flowers, imparting a distinctive appearance. The sepals are ovate and 3-veined, the petals are single-veined, and the bar of the lip is thick, smooth and shallowly sulcate.

Stelis cupreata Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Boyacá: Chiquinquirá. 5 km W of village, 3000 m, fl. in cult. 2 January 1993, by A. de Wilde 4435 (Holotype: SEL), C. Luer illustr. 21916. Fig. 12.

This caespitose species is characterized by a secund, many-flowered raceme that far surpasses an oblong, subacute leaf; shorter ramicauls; glabrous, 3-veined, ovate, sepals; 3-veined petals; and a spoon-shaped lip half-filled with a large callus at the base.

Plant medium in size, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 4–6 cm long, with a loose, tubular sheath from below the middle, another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, oblong, subacute to obtuse, 7–9 cm long including a petiole 1–1.5 cm long, the blade 1–1.5 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* single; 17–20 cm tall, the raceme erect, congested, secund, many-flowered with most flowers open simultaneously; floral bracts oblique, acute, 2.5 mm long; pedicels 1.5 mm long; ovary 2 mm long; the peduncle ca. 8 cm long, subtended by a spathe 10–11 mm long, from a node near the apex of the ramicaul; flowers yellow; *sepals* expanded, glabrous, ovate, subacute to obtuse, 3-veined, connate to near the base, the dorsal sepal 4 mm long, 3 mm wide, the lateral sepals 3 mm long, 3 mm wide; *petals* transversely obovate, obtuse, concave, 3-veined, 1 mm long, 1 mm wide, without a transverse carina; *lip* scaphoid, 2 mm long, 2 mm wide, 0.9 mm deep, concave within the rounded apex with a slightly thickened margin, and concave below a large, rounded, microscopically pubescent callus from the base; attached to the base of the column; *column* stout, ca. 2 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *cupreatus*, “coppery,” referring to the “bronze glow” of the yellow flowers.

This caespitose species is characterized by a long, secund raceme of yellow flowers with a coppery suffusion. The sepals are ovate and three-lobed; the petals are nearly circular and 3-veined; and the lip is spoon-shaped with a round, slightly thickened margin. The basal half of the lip is occupied by a rounded callus that protrudes from overlying the basal margin to near the middle.

The lip of *Stelis cupreata* is very similar to that of *Stelis cyathochila* Luer & R.Escobar described herein, but the plant differs by a larger habit, ramicauls much longer than the leaves, and especially the lateral sepals that are antrorse and connate to the dorsal sepal for about a third of their length.

Stelis dendrophila Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Santander: Bucaramanga, forest between Bucaramanga and Berlin, 2600 m, 28 April 1982, *C. Luer & R. Escobar 7619* (Holotype: SEL). Fig. 13.

This medium-sized, repent species is characterized by a slender rhizome, slender ramicauls and narrow, elliptical leaves and two or three racemes about as long; minutely pubescent, obtuse sepals; 3-veined petals; and a minute, rounded lip with an indistinct glenion.

Plant medium in size, epiphytic, repent, the rhizome slender, 1–1.5 cm between ramicauls. Ramicauls erect, slender, 5–6 cm long, with a tubular sheath from below the middle, and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, narrowly elliptical, acute, 5–6 cm long including a petiole ca. 1 cm long, the blade 0.7–1 cm wide in the dry state, cuneate below to the petiole. *Inflorescence* 2–3; 4–5 cm long, the racemes erect, distichous, successively many-flowered; floral bracts oblique, acute, 3 mm long; pedicels 1 mm long; ovary less than 1 mm long; the peduncle 1–2 cm long, subtended by a spathe 7–8 mm

long, from a node below the apex of the ramicaul; flowers purple; *sepals* glabrous, expanded, broadly ovate, obtuse, 3-veined, connate below the middle, the dorsal sepal 2.5 mm long, 2.75 mm wide, the lateral sepals oblique, 2 mm long, 2 mm wide; *petals* transversely semilunate, concave within a narrowly, thickened, apical margin, with a transverse carina, 3-veined, 0.6 mm long, 1 mm wide; *lip* subquadrate, 0.6 long, 0.6 mm wide, 0.5 mm deep, concave within the rounded apex, concave below a thick bar with an ill-defined glenion, the dorsum slightly convex, the base truncate, attached to the base of the column; *column* stout, ca. 0.8 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Greek *dendrophilus*, “tree-loving,” referring to an epiphytic habit.

This medium-sized, repent species is characterized by a combination of a slender rhizome, slender ramicauls with narrow, elliptical leaves, and two or three racemes about as long; minutely pubescent, obtuse sepals; 3-veined petals; and a minute, rounded lip with an indistinct glenion.

Stelis dewildei Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Risaralda: Pereira, Santa Rosa de Cabral, Ucumarí, Regional Nature Reserva, 2150 m, fl. in cult. April 1992, by *A. de Wilde 03* (Holotype: SEL), *C. Luer* illustr. 21917. Fig. 14.

This caespitose species is distinguished by a congested raceme about half as long as an ovate leaf; a transversely ovate, 5-veined dorsal sepal; thick, shortly pubescent petals; and a subquadrate lip with a large glenion and a solitary, round callus on the dorsum.

Plant medium in size, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 6–9 cm long, with a tubular sheath on the middle third, another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, ovate, acute, 5–7.5 cm long including a petiole 1.5 cm long, the blade 1.5–2 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* single; 3–4 cm long, the raceme erect, congested, distichous, many-flowered with most flowers open simultaneously, floral bracts oblique, acute, 2 mm long; pedicels 1.5 mm long; ovary 1 mm long; the peduncle less than 1 cm long, subtended by a slender spathe 1 cm long, from a node near the apex of the ramicaul; flowers yellow; *sepals* glabrous, expanded, transversely ovate, obtuse, connate to near the middle, the dorsal sepal 3 mm long, 4 mm wide, 5-veined, the lateral sepals oblique, 2.5 mm long, 3.25 mm wide, 4-veined; *petals* thick, transversely semilunate, with a broad, shortly pubescent margin, concave below a transverse carina, 3-veined, 1 mm long, 1.75 mm wide; *lip* type A, subquadrate, 0.6 long, 1 mm wide, 0.75 mm deep, concave within the rounded apex, the bar cleft with a large, deep glenion, the dorsum with a semiorbicular callus, the base truncate, attached to the base of the column; *column* stout, ca. 1 mm long and wide, the anther and the stigmatic lobes apical.

Eponymy: Named for Ahrend de Wilde, ecologist, collector of this species.

This caespitose species is characterized by a congested raceme about half the length of an ovate leaf. The flowers are broadly expanded with transversely ovate, 5-veined

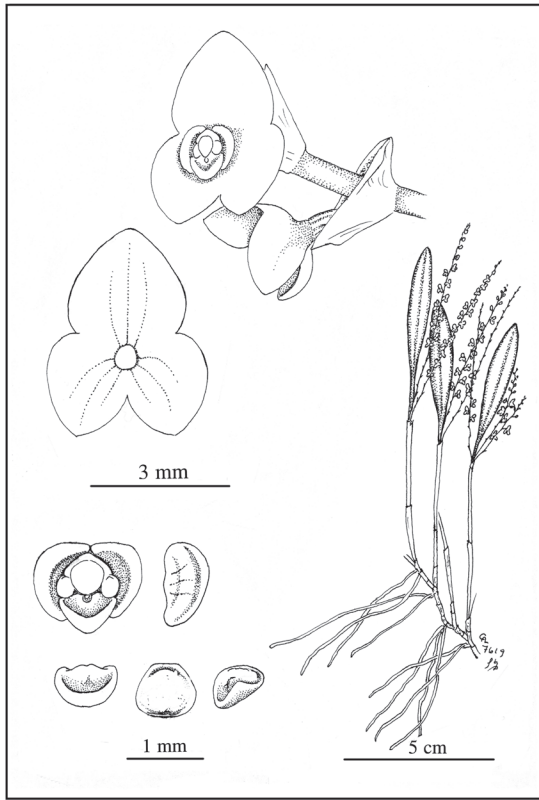


FIGURE 13. *Stelis dendrophila* Luer & R. Escobar

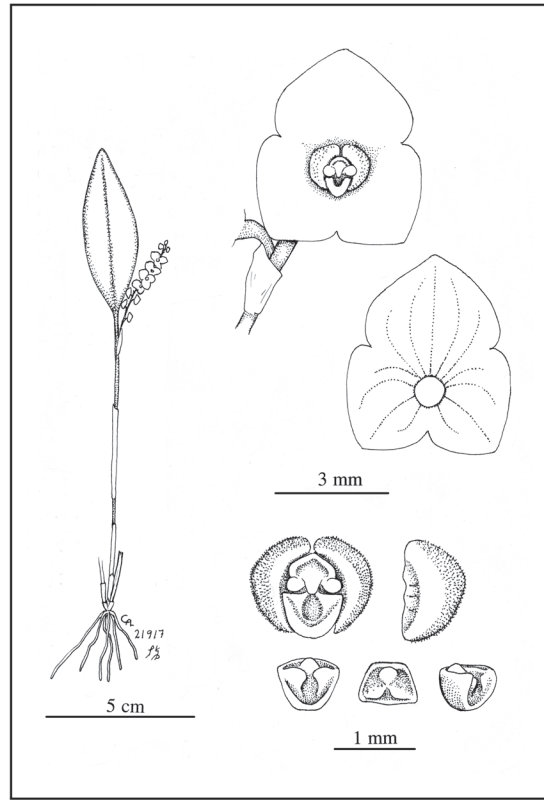


FIGURE 14. *Stelis dewildei* Luer & R. Escobar

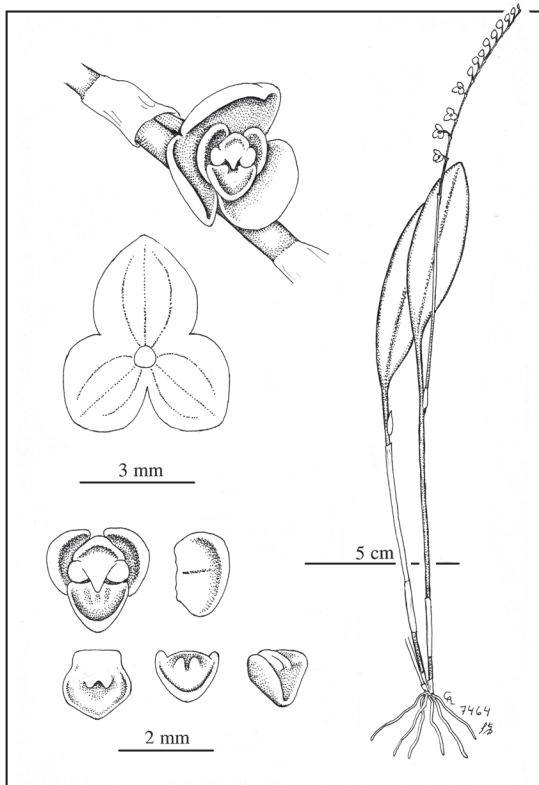


FIGURE 15. *Stelis dithele* Luer & R. Escobar

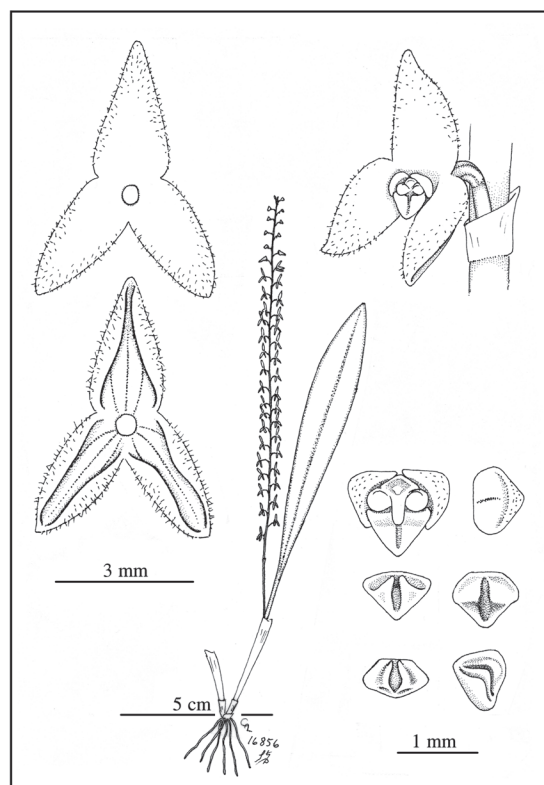


FIGURE 16. *Stelis divergens* Luer & R. Escobar

sepals that are connate to about the middle. The petals are thick, semilunate and minutely pubescent. The lip is type A with a large glenion and a round callus on the dorsum.

Stelis dithele Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Risaralda: near San Clemente, 2200 m, 20 April 1982, C. Luer, J. Luer & R. Escobar 7464 (Holotype: SEL). Fig. 15.

This large species is characterized by acute, elliptical leaves that are exceeded by a long-pedunculate inflorescence; fleshy, obtuse, 3-veined sepals; single-veined petals; and an obtuse lip with a central pair of small, conical calli.

Plant large, epiphytic, densely caespitose. Ramicauls erect, slender, 7–10 cm long, with a tubular sheath from below the middle, and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, acute, elliptical, 8–11 cm long including a petiole 1.5–2 cm long, the blade 1–1.6 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* single; 13–14 cm long, the racemes erect, strict, subclax, secund, many-flowered with many flowers open simultaneously; floral bracts tubular, obtuse, 1.5 mm long; pedicels 2 mm long; ovary 2 mm long; the peduncle 7–8 cm long, subtended by a slender spathe ca. 8 mm long, from a node below the apex of the ramicaul; flowers purple; *sepals* fleshy, glabrous, slightly concave, broadly ovate, obtuse, 3-veined, connate to near the middle, the dorsal sepal 2.5 mm long, 2.5 mm wide, the lateral sepals 2.25 mm long, 2.25 mm wide; *petals* transversely elliptical, 1.2 mm long, 2 mm wide, 1-veined, the apex broadly rounded, thickened on the rounded margin, concave without a transverse carina; *lip* subquadrate, obtuse, 1.5 mm long, 1.4 mm wide, 1 mm deep, concave below the bar modified into a pair a low, obtuse, conical calli, the dorsum slightly convex, the base truncate, hinged to the base of the column; *column* stout, ca. 1 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Greek *dithele*, “two-nippled,” referring to the pair of small, nipple-like calli in the center of the lip.

This large, caespitose species is distinguished by a pair of low, conical, nipple-like calli in the center of the lip, similar to the forked callus of *Stelis major* Rchb.f. Otherwise, the species is characterized by an inflorescence with a peduncle as long as an acute, elliptical, long-petiolate leaf; fleshy, glabrous 3-veined sepals; and thin, single-veined petals.

Stelis divergens Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Chocó: Alto de Baudo, 400 m, fl. in cult. by A. de Wilde above Pereira, 15 May 1993, A. de Wilde 4500 (Holotype: SEL), C. Luer illustr. 16856. Fig. 16.

This medium-sized, caespitose species is characterized by a ramicaul much shorter than a narrowly elliptical leaf; a congested, distichous raceme that exceeds the leaf; pubescent, ovate sepals with recurved sides; single-veined petals; and a lip with a bar cleft from the base to apex.

Plant medium in size, epiphytic, densely caespitose; roots slender. Ramicauls erect, stout, 2.5–3 cm long, enclosed by a loose, tubular sheath from below the middle, and another

1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute, 7–12 cm long including a petiole 1.5–2.5 cm long, the blade 1–1.5 cm wide in dry state, cuneate below into the petiole. *Inflorescence* single; 9–16 cm long, the raceme erect, strict, distichous, subcongested, simultaneously many-flowered; floral bracts tubular, obtuse, 1.5 mm long; pedicels 1.5 mm long; ovary 1 mm long; the peduncle ca. 2 cm long, from a node below the abscission layer; *sepals* light yellow, pubescent, ovate with sides recurved, acute, 3-veined, connate basally, the dorsal sepal 3.5 mm long, 1.5 mm wide unexpanded, the lateral sepals 2.5 mm long, 1.5 mm wide unexpanded; *petals* transversely ovate, concave, the broadly obtuse apex thickened, 0.8 mm long, 1.2 mm wide, 1-veined; *lip* subovoid, with apex subacute, 0.75 mm long, 1.25 mm wide, 0.6 mm deep, shallowly concave below a broad bar with a cleft that extends from the base to the apex via a glenion, the base truncate, hinged to the base of the column; *column* clavate, ca. 1 mm wide and long, the anther and stigmatic lobes apical.

Etymology: From the Latin *divergens*, “of two kinds,” referring to the similarity.

This medium sized, densely caespitose species occurs at a low altitude in western, coastal Colombia. It is characterized by a ramicaul shorter than an acute, narrowly elliptical leaf surpassed by a many-flowered raceme. The sepals are pubescent with markedly recurved sides, and the petals are single-veined. The lip is remarkable with a shallow, longitudinal cleft that divides the dorsum from the base, then forward across the divided bar, and descending as a wide glenion to the apex.

Vegetatively, the plant of this collection (*de Wilde 4500*) is similar to (*de Wilde 3939*, *Stelis baudoënsis*), described herein, both having been collected in Baudo and cultivated near Pereira, but the petals and lip differ drastically. Whether they represent a taxon with extremely variable petals and lip, or a hybrid, is impossible to say without examination of many more specimens, an improbability at this time. In order to identify one from the other, they are given names.

Stelis dinamica Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Risaralda: near San Clemente, 2200 m, 20 April 1982, C. Luer, J. Luer & R. Escobar 7466 (Holotype: SEL). Fig. 17.

This robust, medium-sized species is characterized by stout ramicauls; obtuse, elliptical leaves far surpassed by a congested, many-flowered raceme; floral bracts much longer than the flower; acute, 5-veined, broadly ovate sepals; 3-veined petals; and a lip with a minutely sulcate bar and a round apex.

Plant medium in size, epiphytic, densely caespitose. Ramicauls erect, stout, 4–5 cm long, with a loose tubular sheath from below the middle, another 2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, obtuse to rounded at the tip, 6–8 cm long including a petiole less than 1 cm long, the blade 1.5–2 cm wide in the dry state, cuneate below to the petiole. *Inflorescence* single; 20–26 cm tall, the raceme erect, congested, distichous, many-flowered; floral bracts imbricating, oblique, acute, 9 mm long below to 6

mm long above; pedicels 3 mm long; ovary 1 mm long; the peduncle 6–8 cm long, subtended by a spathe 1.5 cm long, from a node below the apex of the ramicaul; *sepals* fleshy, yellow, glabrous, the sepals similar, broadly ovate, obtuse, 2.5 mm long, 3 mm wide, 5-veined, connate to near the middle; *petals* brown, transversely semilunate, 1 mm long, 1.5 mm wide, 3-veined, concave below a thick, rounded apical margin, and concave below a transverse carina; *lip* brown, type A, subquadrate, 1 mm long, 1.5 mm wide, 1 mm deep, concave below a minutely sulcate bar, the apex rounded, the dorsum slightly convex, the base truncate, hinged to the base of the column; *column* stout, ca. 1 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Greek *dynamikos*, “strong, powerful” in reference to the robust habit, albeit not large.

This robust, caespitose species is characterized by thick ramicauls with thick, elliptical leaves, and a long, congested raceme with floral bracts longer than small flowers. The sepals are broadly ovate and 5-veined. The lip is type A with broadly rounded apex.

Stelis ejuncida Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Santander: W of Velez, road to Landázuri, 2150 m, 5 May. 1984, C. Luer, J. Luer & R. Escobar 10111 (Holotype: SEL). Fig. 18.

This small, scandent species is characterized by very slender, proliferating ramicauls, narrow leaves, and multiflowered inflorescences nearly as long; medium-sized, obtuse, 3-veined sepals; and an obtuse lip with a thick subacute apex.

Plant small, epiphytic, shortly ascending, with some caespitose components, the rhizome slender; roots slender. Ramicauls erect, very slender, 2–6 cm long, enclosed by a tubular sheath below the middle and another sheath at the base, often produced from the apex of another ramicaul. *Leaf* erect, coriaceous, narrowly elliptical, subacute to acute, petiolate, 5–7 cm long including a petiole 2 cm long, 0.7–1 cm wide in the dry state, contracted below the petiole. *Inflorescence* single; 5–7 cm long, the raceme erect to more or less arching, congested, many-flowered with many flowers open simultaneously; floral bracts conspicuous, broadly infundibular, oblique, acute, 3 mm long, 2 mm wide; pedicels 1.5 mm long; ovary 1.5 mm long; peduncle 2–3 cm long, subtended by a fugacious spathe, from a node at the apex of the ramicaul; flowers purple; *sepals* glabrous, ovate, obtuse, 3-veined, the dorsal sepal 3.5 mm long, 2.5 mm wide, the lateral sepals oblique, 2.5 mm long, 2.5 mm wide; *petals* semilunate, 1 mm long, 1.4 mm wide, 3-veined, the apex rounded with a broad, thick, crystal-studded margin, concave, with a transverse carina; *lip* subtriangular, 0.75 mm long, 0.9 mm wide, 0.5 mm deep, shallowly concave below a bar with a small glenion, and concave within the broad margin of the subacute, triangular apex, the dorsum with a subspherical callus above the base, the base truncate, hinged to the base of the column; *column* semiterete, ca. 1 mm long and wide, the anther and the bilobed stigma apical.

Etymology: From the Latin *ejuncidus*, “slender, rushlike,” referring to the habit.

Although prolific by definition, apparently only one or two ramicauls are produced from the apex of a very slender ramicaul. The primary ramicauls are produced from a short, ascending rhizome, with some caespitose components. Middle-sized flowers are borne in congested racemes about as long as the leaf; the sepals are obtuse and 3-veined; the petals are semilunate with a thick margin; and the lip is type A, also with a broad margin.

Stelis ellipsophylla Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Chocó: north of the pass between Urrao and Carmen de Atrato, 2680 m, 31 May 1995, C. Luer, J. Luer & R. Escobar 17689 (Holotype: MO). Fig. 19.

This species is characterized by a large, elliptical leaf, stout ramicauls, and two elongated, many-flowered racemes; 5-veined, subacute sepals; thick, 3-veined petals; and a lip concave above the middle and broadly subquadrate below the middle.

Plant large, epiphytic. Ramicauls erect, stout, 5 mm thick, more than 25 cm tall, with a short, tubular sheath above the middle, and others unknown below the middle, where it has been broken away. *Leaf* erect, coriaceous, elliptical, acute, 20 cm long including a petiole 3 cm long, the blade 5.5 cm wide in the dry state, cuneate below to the petiole. *Inflorescence* 2; 25 cm long, the racemes erect to arching, lax below to congested above, distichous, many-flowered; floral bracts oblique, acute, 5 mm long below to 3 mm long above; pedicels 3 mm long; ovary 2 mm long; the peduncle ca. 5 cm long, subtended by a spathe 12 mm long, from a node below the apex of the ramicaul; *sepals* dark purple externally, greenish purple within, glabrous, ovate, subacute to obtuse, 5-veined, connate below the middle, the dorsal sepal 7 mm long, 6 mm wide, the lateral sepals 6 mm long, 6 mm wide; *petals* green, transversely semilunate, 0.6 mm long, 1.2 mm wide, 3-veined, concave below a thick, rounded apical margin, with a transverse carina; *lip* green, subquadrate, 1 mm long, 0.8 mm wide, 0.5 mm deep, concave below the sulcate, apical margin (the bar) of the subquadrate, basal two-thirds, then contracted into a narrower, concave, apical third, with the apex rounded, the dorsum low, convex, the base truncate, firmly attached to the base of the column; *column* stout, ca. 1 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Greek *elleipsophyllus*, “elliptical-leaved,” referring to the leaf.

The ramicaul of this large, robust species was broken away from the plant, and a search failed in discovering the missing base, or another plant. The single ramicaul is 5 mm thick, 25 cm long, and bears a large elliptical leaf and a pair of long, many-flowered inflorescences. The flowers are large with 6-veined sepals, and the petals are thick and 3-veined. The lip is thick and subquadrate below the middle, then narrowed into a concave, rounded apex.

Stelis enormis Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia: Alijandra, La Planta, 1200 m, coll. by M. Zapata, July 1993, fl. in cult. at Colomborquídeas, 23 May 1995, C. Luer 17563 (MO). Fig. 20.

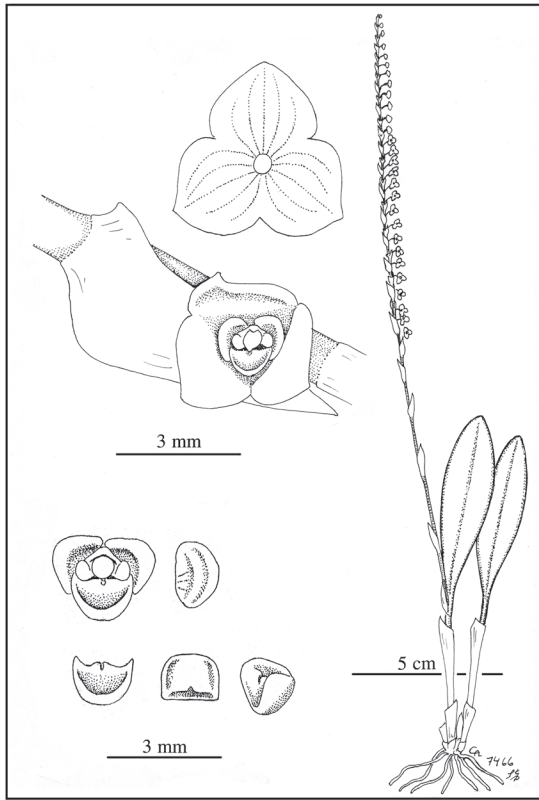


FIGURE 17. *Stelis dynamica* Luer & R. Escobar

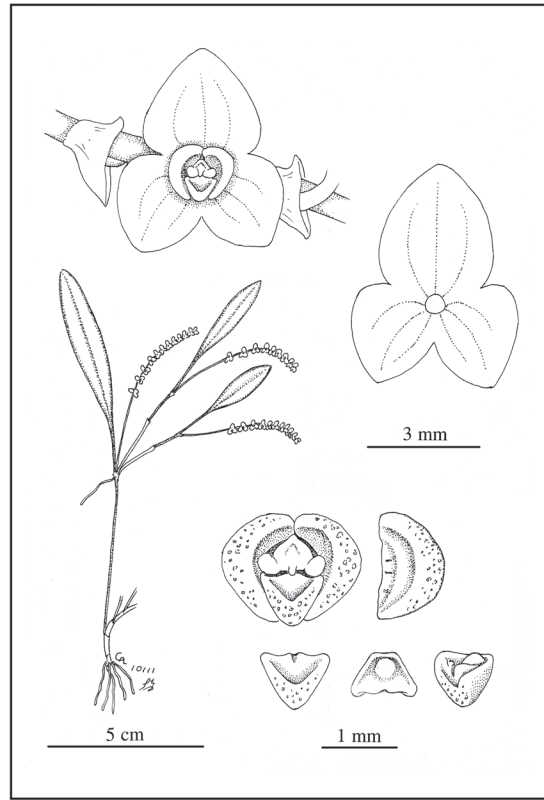


FIGURE 18. *Stelis ejuncida* Luer & R. Escobar

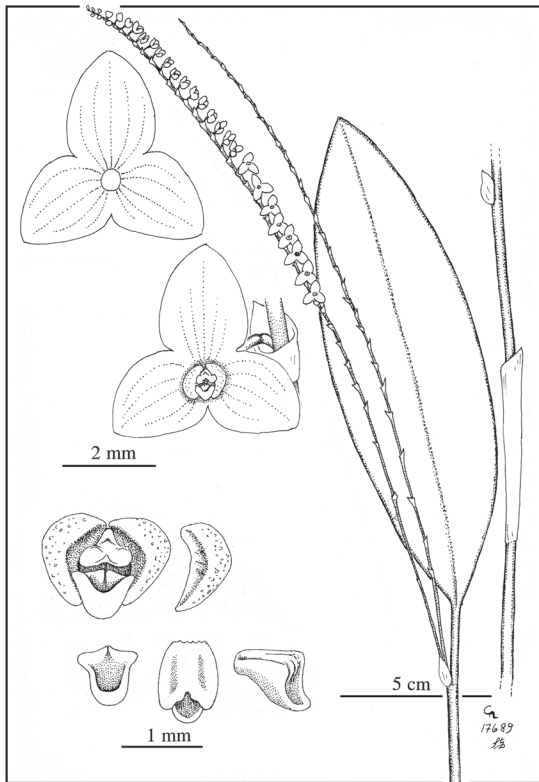


FIGURE 19. *Stelis ellipsophylla* Luer & R. Escobar

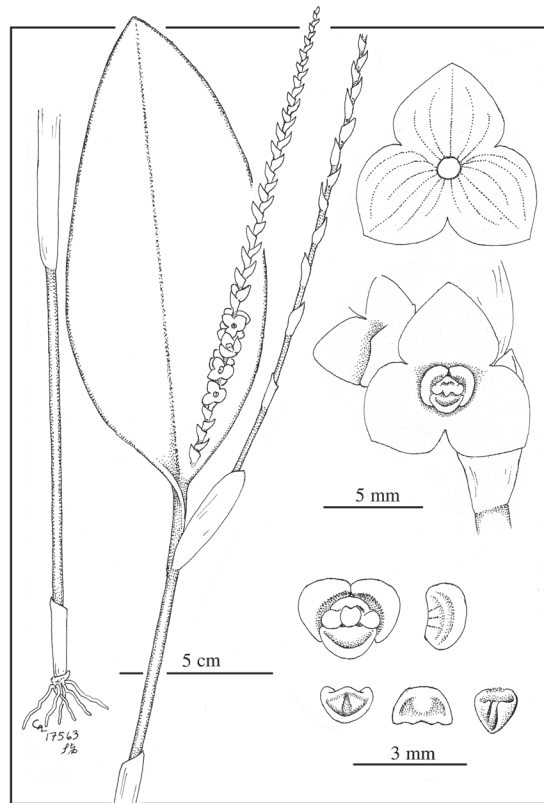


FIGURE 20. *Stelis enormis* Luer & R. Escobar

This very large species is characterized by a strong ramicaul; a large, petiolate leaf; a large spathe from which a many-flowered, large-bracted inflorescence slightly less than a half meter long emerges; obtuse, multiveined sepals; 3-veined petals; and a thick lip with rounded apex.

Plant very large, epiphytic, densely caespitose. Ramicauls erect, stout, to 27 cm tall, with a loose tubular sheath on the middle third, another 2 sheaths below and at the base. *Leaf* erect, coriaceous, ovate, subacute, 20 cm long including a petiole, 2.5 cm long, the blade 7 cm wide in the dry state, cuneate below to the petiole. *Inflorescence* single; to 45 cm tall, the raceme erect, congested, distichous, many-flowered; floral bracts imbricating, oblique, acute, 10 mm long below to 4 mm long toward the tip; pedicels ca. 5 mm long; ovary 3 mm long; peduncle ca. 10 cm long, subtended by a spathe 4 cm long, from a node below the apex of the ramicaul; *sepals* yellow, glabrous, transversely ovate, obtuse, connate to near the middle, the dorsal sepal 4.5 mm long, 5.5 mm wide, 5 veined, the lateral sepals 4 mm long, 5 mm wide, 5-veined with an accessory pair; *petals* brown, semilunate, 1 mm long, 1.5 mm wide, 3-veined, concave below a thick, rounded apex, with a transverse carina; *lip* brown, type A, subquadrate, 1 mm long, 1.5 mm wide, 1 mm long, shallowly concave below the bar with only a faint outline of a glenion, broadly obtuse at the apex, the dorsum convex with a low, rounded callus, the base broadly truncate, hinged to the base of the column; *column* stout, ca. 1 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *enormis*, “immense, huge” referring to the enormous habit.

This unusually large species cultivated by Colomborquídeas, is known from only one ramicaul with leaf and inflorescence, the ramicaul having been cut at the base. The ramicaul is clad near the middle by a short sheath; the huge, ovate leaf is petiolate, and with a large, foliaceous spathe; the inflorescence is nearly half a meter long; large, imbricating floral bracts cover the strict rachis; and the sepals are transversely ovate, the dorsal sepal being 5-veined. The type A lip is basically similar to those of several other large species, especially the frequent and variable *Stelis grandiflora* Lindl.

Stelis ephippium Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA, Norte de Santander: Alto de Santa Inéz, 2100 m, 13 May 1984, C. Luer, J. Luer & R. Escobar 10323 (MO). Fig. 21–22.

This large species is characterized by stout ramicauls; obtuse, elliptical leaves far surpassed by a many-flowered raceme; an acute, 3-veined dorsal sepal; obtuse lateral sepals; 3-veined petals; and a concave lip with a central, erect callus.

Plant large, epiphytic, densely caespitose. Ramicauls erect, stout, 4–5 cm long, with a loose tubular sheath from below the middle, another 2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, obtuse to rounded at the tip, 7–12 cm long including a petiole 1.5–2 cm long, the blade 2–2.7 cm wide in the dry state, cuneate below to the petiole. *Inflorescence* single; 20–25 cm tall, the raceme erect,

congested, distichous, many-flowered; floral bracts oblique, acute, 3–4 mm long; pedicels 2 mm long; ovary 1–1.5 mm long; the peduncle 7–8 cm long, subtended by a spathe ca. 1 cm long, from a node below the apex of the ramicaul; *sepals* dark purple, glabrous, the dorsal sepal ovate, acute, 5 mm long, 3 mm wide, 3-veined with an incomplete lateral pair, the lateral sepals broadly ovate, oblique, obtuse, 3 mm long, 3.5 mm wide, 3–4-veined; *petals* yellow with purple edge, transversely ovate, 1.2 mm long, 2 mm wide, 3-veined, concave below a thick, rounded apex, with a transverse carina; *lip* yellow with purple edge, subquadrate, 1.75 mm long, 1.4 mm wide, 1 mm deep, concave below a thick, protruding, rounded, solid callus, with a superficial glenion on the anterior surface, the apex rounded, the dorsum filled with the thick, erect, ovoid callus that extends from the base to include the bar, to within the space within the apical margin, the base truncate, hinged to the base of the column; *column* stout, ca. 1.5 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *ephippium*, “a saddle” in allusion to the shape of the lip.

Paratypes: COLOMBIA. Santander: Alto de Santa Inéz, ca. 2500 m, coll. by E. Valencia, fl. in cult., at Colomborquídeas 23 May 1995, C. Luer 17600 (Holotype: SEL); Alto de Santa Inéz, ca. 2500 m, probably coll. by E. Valencia, fl. in cult., at Colomborquídeas, 16 May 1993. C. Luer 16878 (Holotype: SEL).

This handsome species is characterized by rather large, elliptical leaves with shorter ramicauls and a long, multiflowered raceme with a proportionately small spathe. The sepals are unequal and dark purple, the dorsal sepal being ovate, acute and 3-veined, or incompletely 5-veined, with the lateral sepals being broadly ovate and obtuse. The lip is a modified type A with an erect, ovoid callus, with a superficial glenion on the anterior surface, filling the middle of the lip. The large callus suggests a saddle, the callus rising in the center, being the horn.

A collection cultivated by Tsubota varies with a wider leaf, a proportionately longer ramicaul, and a lip with a cleft bar replacing the protruding, solid callus, the horn of the saddle.

Stelis eucalypta Luer, nom. nov. to replace *Stelis infundibulosa* (Luer) Luer = *Crocodelanthe infundibulosa* (Luer) Luer, 2009, nom. illeg., not *Stelis infundubulosa* (Luer) Pridgeon & M.A. Chase, 2001. TYPE: COLOMBIA. Chocó: San José del Palmar, Cerro Torrá, mesa below the summit, 2500 m, 25 Aug. 1988, P.A. Silverstone-Sopkin 4793 (CUVC), C. Luer illustr. 21259. Fig. 23.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, more or less stout, 2–6 cm long, enclosed by a tubular sheath from below the middle and 2–3 other sheaths at the base. *Leaf* erect, thickly coriaceous, narrowly elliptical, subacute to acute, 2–9 cm long, 0.5–1 cm wide dry, contracted below into an indistinctly subpetiolate base. *Inflorescence* single; 3–14 cm tall, the raceme erect, subclax to congested, distichous, many-flowered with most flowers open simultaneously; floral bracts conspicuous, purple, broadly infundibular, oblique, acute, 4–6 mm long

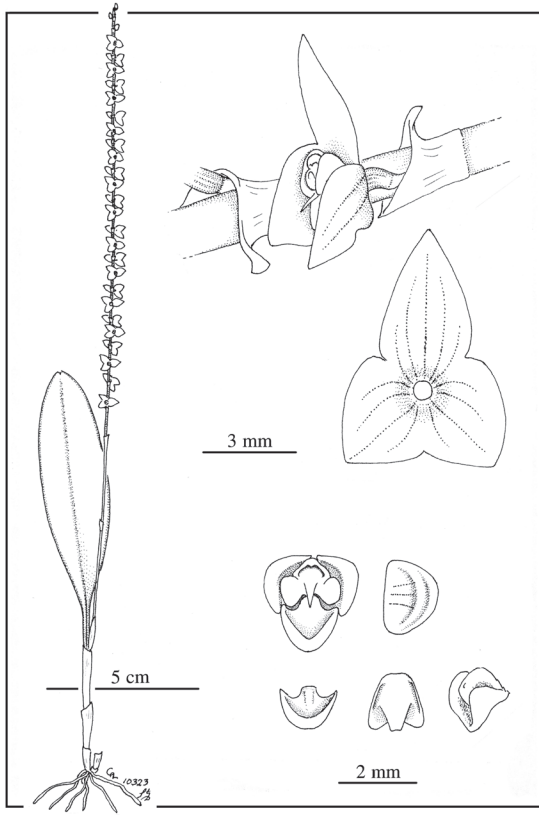


FIGURE 21. *Stelis ephippium* Luer & R. Escobar

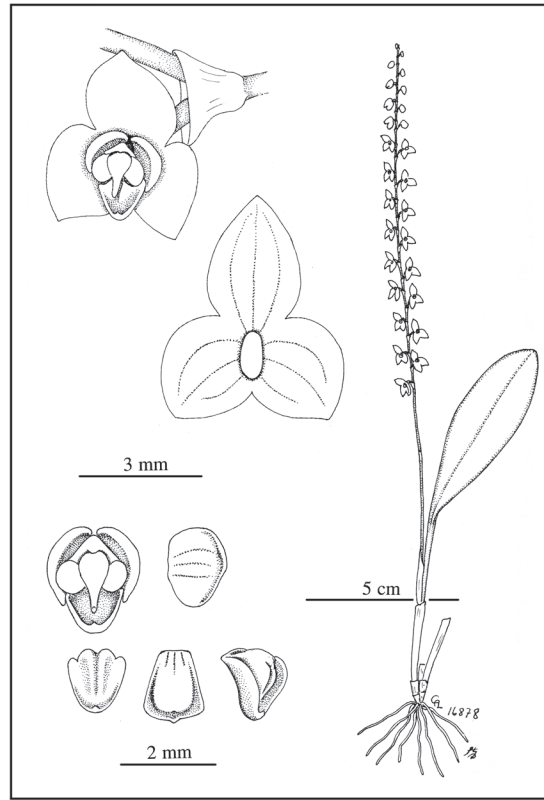


FIGURE 22. *Stelis ephippium* Luer & R. Escobar

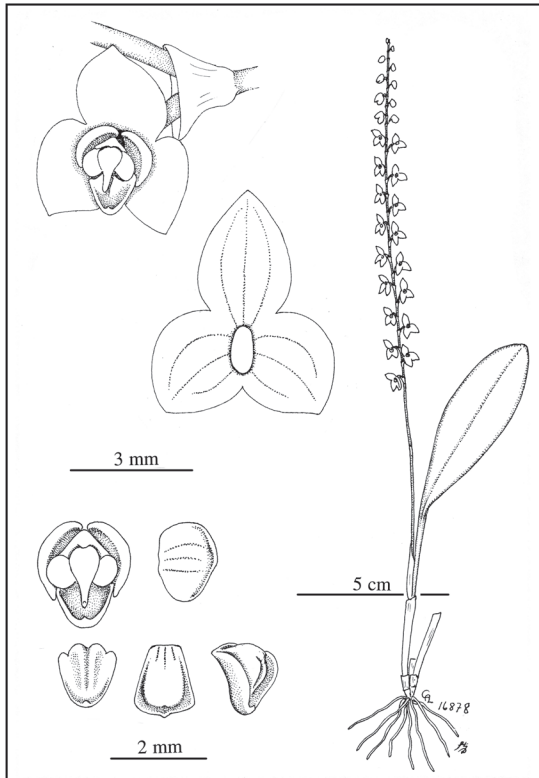


FIGURE 23. *Stelis eucalypta* Luer

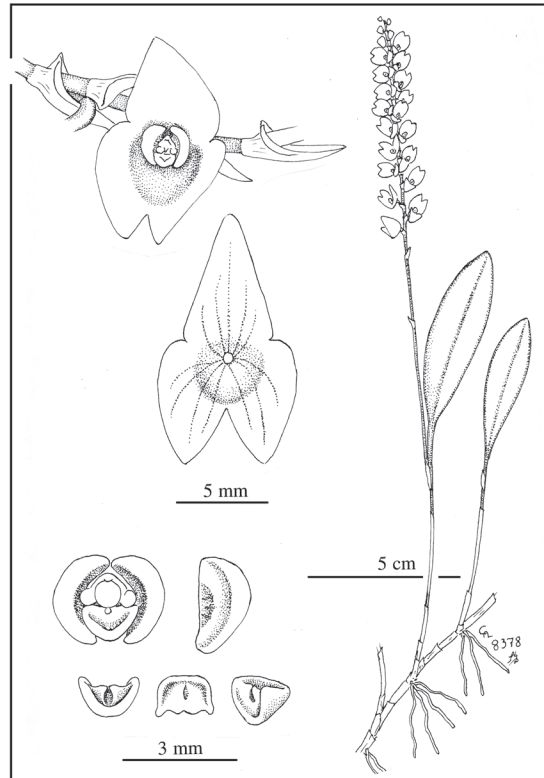


FIGURE 24. *Stelis euprepes* Luer & R. Escobar

and wide; pedicels 2–3 mm long; ovary 1–1.5 mm long; peduncle 0.5–3 cm long, subtended by a slender spathe 4–5 mm long, from a node below the apex of the ramicaul; flowers red-violet, purple, green or yellow; *sepals* similar, widely spread to semiexpanded, shortly pubescent, ovate, obtuse, 2–3 mm long, 2.3–2.5 mm wide, 3-veined, connate basally, the lateral sepals slightly oblique; *petals* transversely oblong, 0.75–1 mm long, 1–1.5 mm wide, 3-veined, the apex broadly rounded with a thickened margin, shallowly concave, no transverse callus seen; *lip* subquadrate, 0.6 mm long, 1 mm wide, 0.6 mm deep, shallowly concave below the bar with an indistinct glenion, the apex broadly rounded, the dorsum with a rounded callus, the base truncate, hinged to the base of the column; *column* semiterete, ca. 1 mm wide and long, the anther and the bilobed stigma apical.

Etymology: From the Greek *eucalyptos*, “well sheathed,” referring to the rachis well covered by floral bracts.

Paratype: Valle del Cauca: El Cairo, Serranía de los Paraguas, 2040 m, 2 April 1988, P.A. Silverstone-Sopkin 3989 (CUVC, MO).

Other collections: COLOMBIA. Antioquia: Frontino, Alto de Cuevas, 2050 m, 4 May 1983, C. Luer, J. Luer & R. Escobar 8942, 8960 (Holotype: SEL); above Frontino toward Nutibara, 1900 m, 5 May 1983, C. Luer, J. Luer & R. Escobar 9028 (Holotype: SEL); Yarumal, Llanos de Cuiba, 2750 m, 12 September 1984, C. Dodson & R. Escobar 15263, 15269 (Holotype: SEL); El Carmen, Alto de San Lorenzo, 2600 m, 17 September 1984, C. Dodson & R. Escobar 15318, 15324 (MO). Risaralda: near San Clemente, 2100 m, 20 April 1982, C. Luer, J. Luer & R. Escobar 7465 (Holotype: SEL).

This handsome species is characterized by an erect, distichous raceme with conspicuous, purple, inflated floral bracts, from which the small, “ordinary” flower protrudes. Vegetatively, the size is variable, as is the raceme, from sublux to markedly congested, at which time the flower remains only partially expanded. The pedicel is more or less elongated within the large, translucent bract; the sepals are obtuse, 3-veined and pubescent; the petals are broad and 3-veined; and the concave lip is a simple type A.

Stelis euprepes Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Cauca: Popayán, Páramo de Las Barbillas, SE of Popayán, 3150 m, 13 November 1982, C. Luer & R. Escobar 8378 (Holotype: SEL). Fig. 24.

This long-repent species is distinguished by elliptical leaves with equally long ramicauls; a simultaneously many-flowered raceme of relatively large flowers with the dorsal sepal 5-veined; 3-veined petals; and a shallowly concave lip with glenion and rounded apex.

Plant medium in size, epiphytic, repent, the rhizome stout, 2–3 cm between ramicauls; roots slender. Ramicauls ascending-erect, slender, 5–6 cm long, with a close, tubular sheath on the middle third, and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute, petiolate, 7–9 cm long including the petiole 1.5–2.5 cm long, the blade 1–2 cm wide in the dry state, cuneate below to the petiole. *Inflorescence* single; to 18 cm tall, the raceme erect, distichous, crowded, simultaneously many-flowered;

floral bracts oblique, acute, acuminate, 6 mm long; pedicels 1.5 mm long; ovary 2 mm long; peduncle 7–9 cm long, from a node at the tip of the ramicaul, with a spathe 1–1.5 cm long; *sepals* light green, suffused with rose, glabrous, expanded, ovate, the dorsal sepal narrowly obtuse at the tip, the sides more or less recurved, connate to lateral sepals about a fourth the length, 7 mm long, 5 mm wide, 5-veined, the lateral sepals oblique, connate and shallowly concave to near the middle, the apices parallel, but not in apposition, 6 mm long, 4 mm wide, 4-veined; *petals* yellow-green, thick, transversely semilunate, concave, thickened on the rounded margin of the apex, with a transverse callus, 1.5 mm long, 2.5 mm wide, 3-veined; *lip* subquadrate, type A, 1 mm long, 2.5 mm wide, 1 mm deep, shallowly concave below a low bar with a glenion, the apex rounded with a narrow margin, the dorsum slightly concave, the base truncate, hinged to the base of the column; *column* clavate, 1.5 mm wide and long, the anther and the bilobed stigma apical.

Etymology: From the Greek *euprepes*, “charming,” referring to qualities of a flowering plant.

This long-repent species is characterized by slender ramicauls produced at intervals of about two centimeters along a stout, creeping rhizome. Elliptical, petiolate leaves are surpassed by a crowded, large-flowered raceme with acuminate floral bracts, and with the peduncle as long as the leaf. The lateral sepals are shallowly concave and connate to near the middle, but the apices are free and parallel, not in apposition.

Stelis famelica Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia: Medellín, Cerro Padre Amaya, 2800 m, 21 Apr. 1983, C. Luer, J. Luer & R. Escobar 8768 (Holotype: SEL). Fig. 25.

This medium-sized, caespitose species is characterized by narrowly oblong, obtuse leaves with shorter ramicauls; a single, long, many-flowered raceme of gaping flowers with an erect, 3-veined dorsal above a concave synsepal; and a subquadrate lip with a deeply concave glenion and a hemispherical callus on the dorsum.

Plant medium in size, epiphytic, densely caespitose; roots slender. Ramicauls erect, stout, 2.5–3.5 cm long, with a loose, tubular sheath from below the middle, and another 1–2 sheaths below and about the base; *Leaf* erect, thickly coriaceous, elliptical, obtuse to rounded at the tip, 4–7 cm long including a petiole 1 cm long, the blade 0.8–1.1 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* single; 16–22 cm tall, the raceme erect, strict, secund, congested, simultaneously flowered; floral bracts oblique, acute, 2–2.5 mm long; pedicels 1.5 mm long; ovary 1 mm long; the peduncle 4–5 cm long, subtended by a slender spathe ca. 1.5 cm long, from a node below the apex of the ramicaul; flowers white; *sepals* glabrous, the dorsal sepal ovate, subacute, 4.5 mm long, 2.5 mm wide, 3-veined, connate basally to the synsepal, the lateral sepals ovate, subacute, oblique, connate to above the middle into a concave, ovoid synsepal with recurved margins, 3.5 mm long, 4.5 mm wide expanded, 6-veined; *petals* transversely ovate, 0.6 mm long, 1.1 mm wide, 3-veined, concave, the apical margin, rounded, thickened, with an indistinct

transverse callus; *lip* subquadrate, 0.6 mm long, 0.75 mm wide, 0.5 mm deep, concave below a widely cleft bar with a concave glenion, the apex rounded, the margins thin, the dorsum with a rounded, midline callus; the base truncate, hinged to the base of the column; *column* ca. 0.75 mm broad and long, the anther and stigmatic lobes apical.

Etymology: From the Latin *famelicus*, "hungry, famished" in allusion to the fancied appearance of the flowers to the open mouths of baby birds waiting to be fed.

The flowers this species are similar to those of *Stelis lacertina* Luer & R.Escobar described herein, but vegetatively the plants differ markedly. The ramicauls are less than half as long with proportionately smaller, narrow leaves. The inflorescence consists of a longer, single, instead of multiple racemes, and the flowers are white, instead of green. The base of the dorsal sepal is not connate to the synsepal to form a retrorse mentum. The petals and lip are very similar.

Stelis fascinata Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Putumayo: between La Cocha and Sibundoy. 2700 m, 30 July 1978, *C. Luer, J. Luer & R. Escobar 3160* (Holotype: SEL). Fig. 26.

This large, repent species is distinguished by a long inflorescence that far exceeds a narrowly elliptical leaf; yellow flowers with the dorsal sepal 3-veined and the synsepal multiveined; thick, 3-veined petals; and an ovoid lip with a prominently cleft glenion.

Plant large, epiphytic, repent, the rhizome thick, 1–1.5 cm long between ramicauls; roots slender. Ramicaul erect, stout, 9–15 cm long, with a tubular sheath from near the middle, another sheath below the middle, and one at the base. *Leaf* erect, coriaceous, narrowly oblong-ovate, narrowly obtuse, 7–12 cm long, 1.2–1.5 cm wide in the dry state, cuneate below into a petiole 1–1.5 cm long. *Inflorescence* single; to 35 cm long, the raceme erect, secund, densely many-flowered; floral bracts infundibular, acute, 3 mm long; pedicels 2 mm long; ovary 2 mm long; the peduncle 8–15 cm long, subtended by a slender spathe 1–1.5 cm long, from a node below the apex of the ramicaul; flowers yellow; *sepals* glabrous, the dorsal sepal ovate, convex, obtuse, 9 mm long, 4.5 mm wide, 3-veined, connate to the synsepal 1 mm, the lateral sepals connate to near subacute tips into a concave synsepal, 6.5 mm long, 7 mm wide, indistinctly 8-veined, with sides recurved; *petals* thick, transversely ovate, 1.25 mm long, 1.5 mm wide, 3-veined, with the apical margin obtuse, broadly thickened, with a transverse carina; *lip* ovoid, 1 mm long, 1 mm wide, 0.75 mm deep, deeply concave below a cleft bar within the thickened margins of the subacute apex, the dorsum thickened with a broad callus; *column* 1 mm broad and long, the anther and stigmatic lobes apical.

Etymology: From the Latin *fascinatus*, "fascinating," referring to the floral morphology.

This species from the Central Cordillera is related to *Stelis caliensis* Luer from the Department of Cauca in the Western Cordillera. Unfortunately, *Stelis caliensis* is known from only a single, incomplete collection with the ramicaul broken off five centimeters below the abscission layer.

Nevertheless, *Stelis fascinata* is distinguished by narrower leaves and a much longer raceme with a much longer peduncle. Instead of dark purple, the flowers are yellow, and the dorsal sepal is 3-veined instead of 5–7-veined. The lips of the two concepts are similar.

Stelis fissurosa Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Risaralda: Pereira, Ucumarí, Regional Nature Reserve, 2400 m, fl. in cult. at "La Pastora," May 1992, *A. de Wilde 058* (Holotype: SEL), *C. Luer* illustr. 21919. Fig. 27.

This medium-sized species is characterized by thick, narrowly linear leaves and a many-flowered raceme about as long; acute, glabrous, ovate sepals; 3-veined petals; and a deeply hollowed out lip beneath a deeply cleft, shelf-like bar.

Plant medium in size, epiphytic, caespitose. Ramicauls erect, relatively stout, 2.5–3.5 cm long, with a loose, tubular sheath from below the middle, and another 1–2 sheaths at the base. *Leaf* erect, thickly coriaceous, narrowly linear, acute, 5–7 cm long, 0.5–0.8 cm wide in the dry state, narrowed below into an indistinct petiole ca. 1 cm long. *Inflorescence* 1–2; 7–10 cm tall, the racemes erect, subflexuous, congested, distichous in liquid to secund when dry and pressed, many-flowered with most flowers open simultaneously; floral bracts oblique, acute, 2 mm long; pedicels 1.5 mm long; ovary 1.5 mm long; peduncle ca. 1 cm long, subtended by a slender spathe 6–7 mm long, from a node at the apex of the ramicaul; color of flowers unknown; *sepals* glabrous, expanded, ovate, acute, connate basally, 3-veined, the dorsal sepal 3 mm long, 2 mm wide, the lateral sepals 3.5 mm long, 2.5 mm wide; *petals* transversely ovate, 0.5 mm long, 1 mm wide, 3-veined, the apex broadly obtuse, thickened, concave below a transverse carina; *lip* subovoid, deeply hollowed out, 1 mm long, 0.5 mm wide, 0.6 mm deep, the apex obtuse, acuminate, thin, the bar deeply cleft above a deep cavity, apex acuminate, obtuse, thin, the dorsum cleft to the base, the base truncate connate to the base of the column; *column* stout, ca. 0.5 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *fissurosus*, "well-developed cleft," referring to the deeply cleft dorsum of the lip.

This medium-sized species with thick, narrowly linear leaves produces a crowded, subflexuous, many-flowered, crowded raceme about as long. The sepals are ovate, glabrous and acute, with the dorsal sepal slightly smaller than the lateral sepals. The petals are thick and 3-veined. The lip is deeply concave below a deeply cleft bar. The apex is acuminate, thin and obtuse.

Stelis fluxflorum Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia: Sonsón, between Sonsón and La Ceja, 2400 m, 29 April 1983, *C. Luer, J. Luer & R. Escobar 8876* (Holotype: SEL). Fig. 28.

This large, caespitose species is distinguished by multiple, many-flowered racemes that more or less equal acute, elliptical leaves in length; ovate sepals with the dorsal 5-veined; 3-veined petals with acuminate, lateral angles; and a lip with a descending dorsum with a rounded callus.

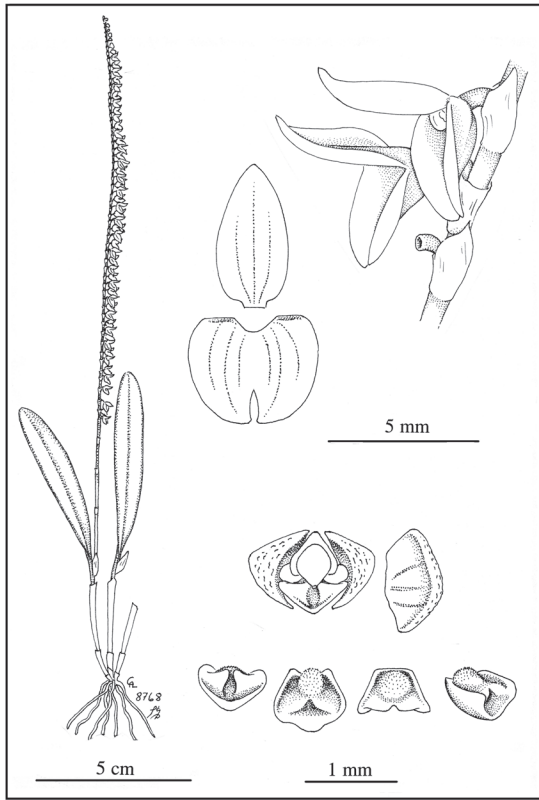


FIGURE 25. *Stelis famelica* Luer & R. Escobar

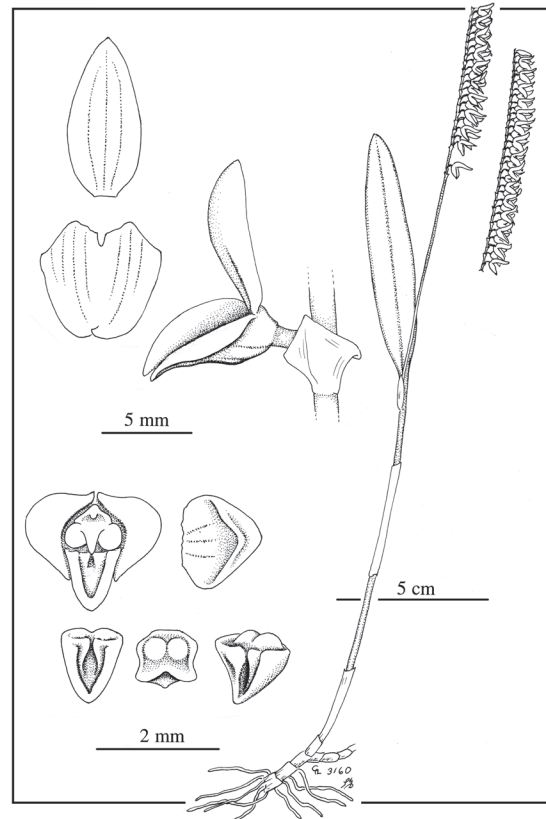


FIGURE 26. *Stelis fascinata* Luer & R. Escobar

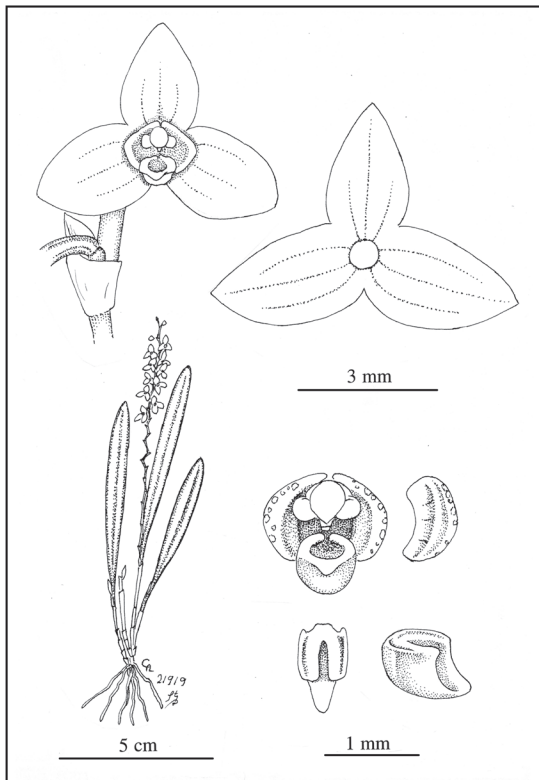


FIGURE 27. *Stelis fissurosa* Luer & R. Escobar

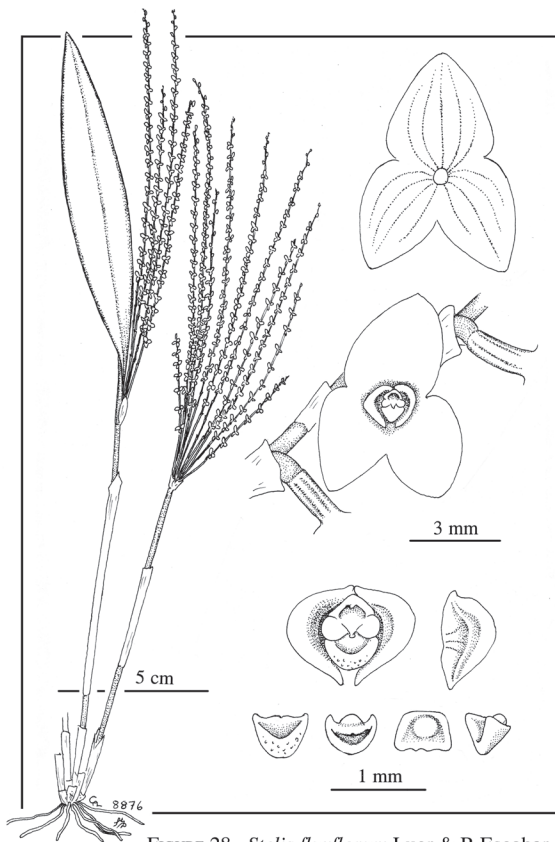


FIGURE 28. *Stelis fluxiflorum* Luer & R. Escobar

Plant large, epiphytic, densely caespitose, roots slender. Ramicauls erect, fasciculate, slender, 8–20 cm long, with a tubular sheath on the middle third, and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute, 11–16 cm long including a petiole 1.5–2 cm long, the blade 1.5–2.2 cm wide in dry state, cuneate below into the petiole. *Inflorescence* 5–14; 8–15 cm tall, the racemes strict, crowded, simultaneously many-flowered, floral bracts tubular, obtuse, 2 mm long; pedicels 1.5 mm long; ovary 1.75 mm long; the peduncle ca. 1 cm long, from a node above the apex of the ramicaul, with a spathe ca. 1 cm long; *sepals* yellow, suffused with purple, glabrous, expanded, ovate, subacute, connate below the middle, the dorsal sepal 4 mm long, 3.5 mm wide, the lateral sepals 3.5 mm long, 2.75 mm wide; *petals* yellow-green, transversely lunate with the basal angles slightly acuminate, the apex broadly obtuse and thickened on the margin, and with a transverse carina, 1 mm long, 1.5 mm wide, 3-veined; *lip* yellow-green, subquadrate, type A, 0.6 mm long, 0.8 mm wide, 0.5 mm deep, concave below the bar with a slight notch and within the rounded apex with a broad margin, the dorsum 45° deflexed with a rounded callus, base truncate, hinged to the base of the column; *column* clavate, ca. 1 mm wide and long, the anther and the bilobed stigma apical.

Etymology: From the Latin *flux florum*, “a flood of flowers,” referring to the racemes.

This tall species is most remarkable for the large number of many-flowered inflorescences that are produced simultaneously, but the racemes, up to 14 in number barely surpass the acute leaf. The medium-sized flowers with 5-veined dorsal sepals are not exceptional; the petals are 3-veined with a sharp transverse carina and slightly acuminate basal angles; and the lip is a common variation of type A, but with the dorsum sloping downward.

Stelis frondifera Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia: Yarumal, Raton Pelado, above of Yarumal, 2650 m, 1 May 1984, *C. Luer, J. Luer & R. Escobar 10051* (Holotype: SEL). Fig. 29–30.

This large, repent species is distinguished by numerous, slender ramicauls with a narrow, elliptical leaf; a single raceme; single-veined petals; and a minute, subquadrate lip with a minutely apiculate tip on the rounded margin, and with a proportionately large, smooth, central callus.

Plant large, epiphytic, repent, the rhizome slender, up to 20 cm long, 0.2–3 cm long between ramicauls; roots slender. Ramicauls ascending, erect, slender, 5–8 cm long, enclosed by a tubular sheath above the middle, another 1–2 sheaths below the middle and at the base. *Leaf* erect, coriaceous, narrowly elliptical, acute, 8–12 cm long, 0.5–1.2 cm wide in the dry state, narrowed below to the subpetiolate base. *Inflorescence* single; 15–20 cm long, the raceme erect, congested, distichous, many-flowered with many flowers open simultaneously; floral bracts oblique, acute, 2–2.5 mm long; pedicels 1 mm long; ovary 1 mm long; the peduncle ca. 2 cm long, subtended by a slender spathe 1 cm long, from a node below the apex of the ramicaul; flowers light yellow; *sepals* glabrous, ovate, subacute, 3-veined, the dorsal sepal

2.5–3 mm long, 1.8–2 mm wide, the lateral sepals antrorse, 2 mm long, 1.8 mm wide; *petals* membranous, transversely oblong, concave, broadly rounded at the apex, the margin narrowly thickened, subverrucose, 0.5 mm long, 0.75–1 mm wide, 1-veined; *lip* subquadrate, 0.5–0.6 mm long, 0.6–0.8 mm wide, 0.4 mm deep, concave within the broadly obtuse, minutely apiculate margin surrounding a proportionately large, smooth, rounded callus that fills the disc extending to the base, the base broadly truncate, hinged to the base of the column; *column* ca. 0.8 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *frondifer*, “branch-bearing,” referring to the numerous ramicauls.

Paratype: COLOMBIA. Antioquia: Yarumal, Santa Rosa de Osa, above Estadero Manicomio, 2580 m, 14 Mar. 1989, *C. Luer, J. Luer & S. Dalström & W. Teague 14144* (Holotype: SEL).

This medium-sized to large, creeping species is characterized by a slender rhizome with slender, ascending ramicauls, either closely spaced, or two centimeters apart, apparently depending upon local conditions. The leaves are narrowly elliptical, and far surpassed by a single, much longer, small-flowered raceme. The sepals are subacute and 3-veined, the lateral sepals antrorse; the petals are membranous and single-veined; and the minutely apiculate lip is filled with a large, rounded callus.

Stelis glomifera Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia: Frontino, above the airport below El Plateado, 1820 m, 3 May 1983, *C. Luer, J. Luer & R. Escobar 8977* (Holotype: SEL). Fig. 31–32.

This small species is distinguished by a flexuous raceme that bears one flower successively; a 5-veined dorsal sepal and semiconnate lateral sepals forming a synsepal; and a lip with a broad, semilunate margin, and a small, orbicular callus on the dorsum.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, 1–1.5 mm long, enclosed by a loose, tubular sheath from below the middle and another at the base. *Leaf* erect, coriaceous, elliptical, obtuse to rounded at the tip, 3–4.5 cm long including a petiole 0.5–1.5 mm long, the blade 1–1.5 cm wide in the dry state. *Inflorescence* single; 3–13 cm long, the raceme erect to arching, flexuous, successively single-flowered; floral bracts oblique, acute, 1–2 mm long; pedicels 2 mm long; ovary 1 mm long; peduncle 1.5–3 cm long, from a node at the apex of the ramicaul; *sepals* glabrous, the dorsal sepal purple, erect, broadly ovate, obtuse, 4.5–7 mm long, 5–6 mm wide, 5-veined, sometimes branching into 7 veins, connate 1–2 mm, the lateral sepals yellow, sometimes suffused with purple, broadly ovate, oblique, obtuse, connate near the middle, but adherent to the tip to form a deeply concave synsepal, 3.5–5 mm long, 3.5–4 mm wide, each 4- or 5-veined; *petals* purple, transversely semilunate to obovate, concave below the broad, rounded apex and concave below a transverse carina, 1–1.5 mm long, 1.5–2 mm wide, 3-veined. *Lip* purple, subquadrate, 0.8–1 mm long, 0.8–1.2 mm wide, 0.6 mm deep, concave below the bar, the anterior surface smooth,

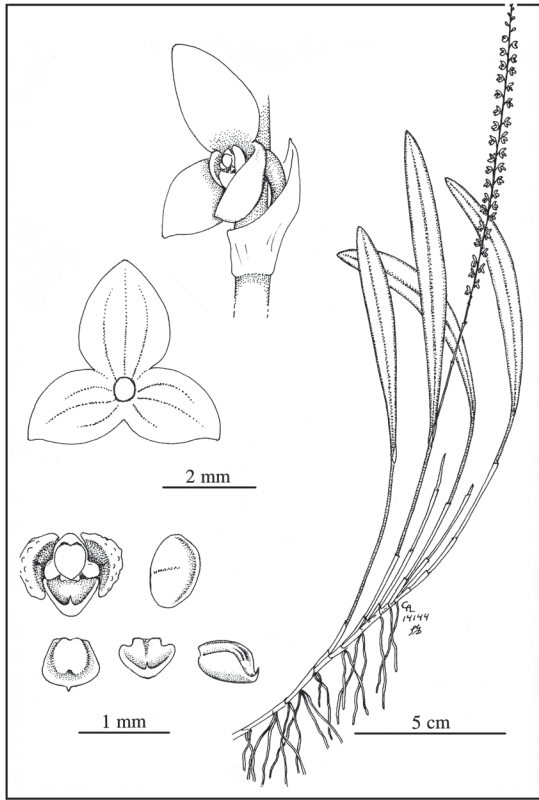


FIGURE 29. *Stelis frondifera* Luer & R. Escobar

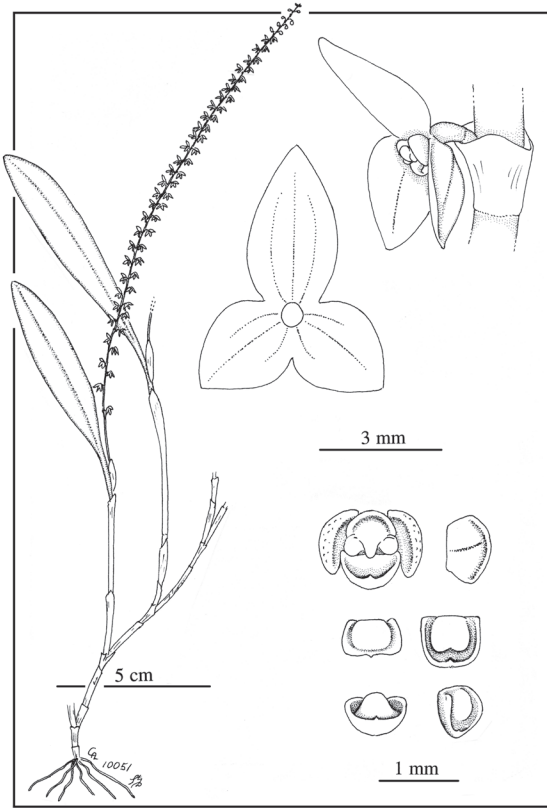


FIGURE 30. *Stelis frondifera* Luer & R. Escobar

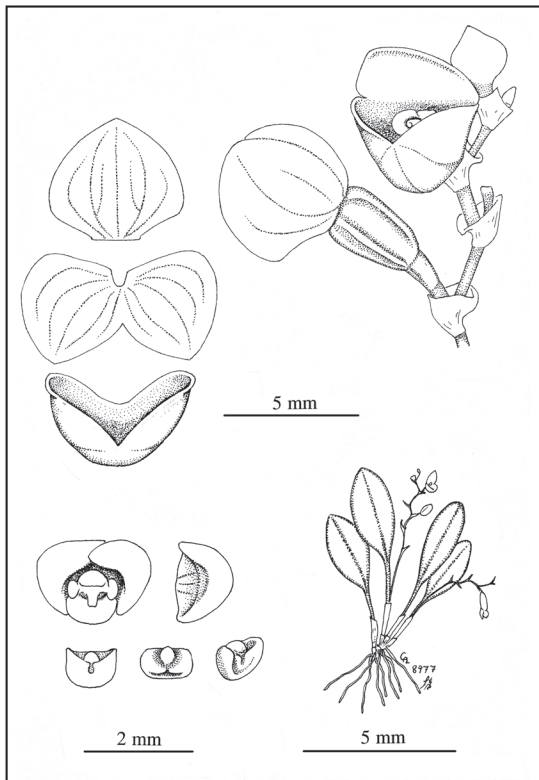


FIGURE 31. *Stelis glomifera* Luer & R. Escobar

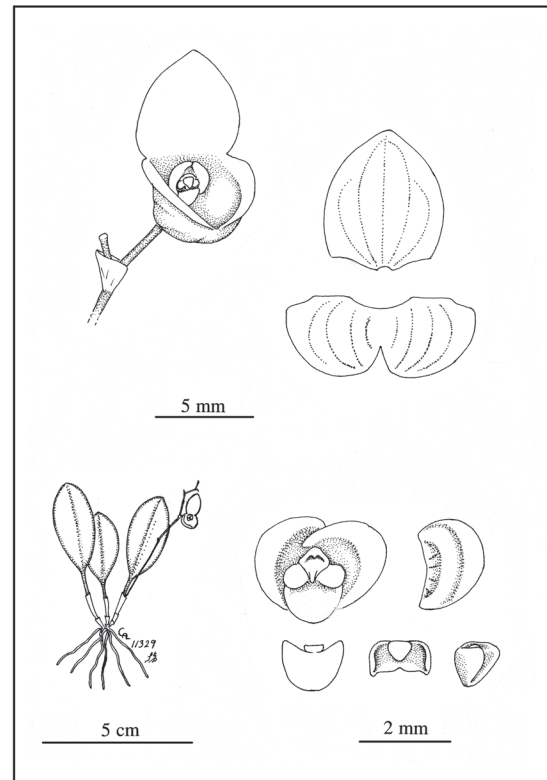


FIGURE 32. *Stelis glomifera* Luer & R. Escobar

the apex broadly rounded, the dorsum slightly concave, with a central, subspherical callus, the base truncate, hinged to the base of the column; *column* clavate, ca. 0.8 mm long and wide, the anther and the bilobed stigma apical.

Etymology: From the Latin *glomifer*, “ball-bearing,” referring to the ball-like callus on the lip.

Paratypes: COLOMBIA. Risaralda: Pueblo Rico, 1800–2000 m, collector unknown, fl. in cult. at Colombrorquídeas, 11 May 1985, *C. Luer 11329* (SEL); Chocó: San José del Palmar, 2400 m, collected and fl. in cult. by Antonio Gonzalez, October 1996 *C. Luer 18424* (SEL); Valle del Cauca: collected locally, 1000 m, fl. in cult. by Orquídeas del Valle, 15 March 1997 *C. Luer 18431* (SEL).

This small species is widely distributed in the Western Cordillera of Colombia. It is characterized by a successively single-flowered raceme that gradually equals, then exceeds the leaf with an arching, lengthening, flexuous rachis. The dorsal sepal is dark purple while the synsepal is yellow, or variously marked or suffused with purple. A distinct subspherical callus is present on the dorsum of the lip.

The flowers of this species are similar to those of *Stelis gongylophora* Luer & R. Escobar described herein, but the latter is a large plant with multiple, simultaneously flowered racemes.

Stelis gongylophora Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia: La Unión, 5 km W of Mesopotamia, 2400 m, 8 April 1988, *C. Luer, J. Luer, & R. Escobar 13071* (Holotype: SEL). Fig. 33.

This large species is distinguished by a several, subclaxly flowered racemes shorter to nearly as long as an elliptical, petiolate leaf; a 5-veined dorsal sepal; a shallowly concave synsepal; and a shallowly concave, semilunate lip, with a suborbicular callus that nearly fills the dorsum.

Plant large, epiphytic, caespitose; roots slender. Ramicauls erect, 10–18 cm long, with a tubular sheath from below the middle and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, subacute, 9–13 cm long including a petiole 2–3 cm long, the blade 2–3.5 cm wide in the dry state. *Inflorescence* 2–5 simultaneous; 7–8 cm long, the racemes erect, strict, subclax. mostly simultaneously many-flowered, nearly to the base; floral bracts oblique, acute, 2 mm long; pedicels 1.5 mm long; ovary 1.5 mm long; the peduncle ca. 1 cm long, with a spathe 7 mm long, from a node at the apex of the ramicaul; flowers light green; *sepals* glabrous, the dorsal sepal erect, broadly ovate, obtuse, 4 mm long, 3.5 mm wide, 5-veined, the lateral sepals broadly ovate, oblique, obtuse, connate near the apex to form a shallowly concave synsepal, 2 mm long, 4.5 mm wide; *petals* transversely semilunate, concave below a broadly rounded apex, and concave below a transverse carina, 1 mm long, 1.3 mm wide, 3-veined; *lip* obovoid, 0.75 mm long, 1 mm wide, 0.5 mm deep, shallowly concave below a smooth, rounded bar, the apex broadly rounded with a minimally thickened margin, the dorsum filled with a semiorbicular callus, the base truncate, hinged to the base of the column; *column* clavate, ca. 1 mm long and wide, the anther and the bilobed stigma apical.

Etymology: From the Greek *gongylophora*, “ball-bearing,” referring to the ball-like callus on the lip.

This large species is characterized by several, simultaneous, subclaxly flowered racemes that are shorter, or nearly as long, as an elliptical, petiolate leaf. The dorsal sepal is 5-veined, or seven-veined if a pair of incomplete attempts to make a vein are counted. The apex of the lip is shallowly concave and broadly rounded. While a smooth, semiorbicular callus occupies the dorsum.

Stelis humidensis Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Antioquia: La Humido, 1500 m, collector unknown, August 1980, fl. in cult. at Colombrorquídeas, 23 May 1995, *C. Luer 17575* (Holotype: SEL). Fig. 34.

This tall, densely caespitose species is distinguished by a slender ramicauls each with an acute elliptical leaf surpassed by one or two congested, small-flowered racemes; obtuse, glabrous, 3-veined sepals; 3-veined petals; and a lip with a large, concave glenion.

Plant large, epiphytic, densely caespitose; roots slender. Ramicaul erect, slender, 6–10 cm long, with a tubular sheath from below the middle, another 2 sheaths below and at the base. *Leaf* erect, coriaceous, narrowly elliptical, acute, 8–11.5 cm long, 1.2–1.5 cm wide in the dry state, cuneate below into a petiole 2 cm long. *Inflorescence* 1–2; 12–15 cm long, the racemes erect, distichous, densely many-flowered; floral bracts oblique, acute, 2.5 mm long; pedicels 2.5 mm long; ovary 1 mm long; the peduncle ca. 4 cm long, subtended by a slender spathe ca. 1 cm long, from a node below the apex of the ramicaul; *sepals* yellow-green, glabrous, broadly ovate, obtuse, 3-veined, connate to near the middle, the dorsal sepal 3 mm long, 2.8 mm wide, the lateral sepals 2 mm long, 2 mm wide; *petals* green, thick, transversely semilunate, 1 mm long, 1.5 mm wide, the apical margin rounded, thickened, 3-veined below a transverse carina; *lip* green, subquadrate, 0.75 mm long, 1.3 mm wide, 0.6 mm deep, concave below the bar and within the thickened margin of the rounded apex, the bar with a large, concave glenion that is continuous with a rounded callus on the dorsum, the base truncate, hinged to the base of the column; *column* stout, ca. 1 mm broad and long, the anther and stigmatic lobes apical.

Etymology: Named for La Humido, where this species was collected.

This caespitose species has no single feature that distinguishes it from other similar-appearing species. It keys out to *Stelis medinae* Luer & Hirtz in the *Stelis of Ecuador*, Part Four, Icones Pleurothallidarum, but it differs from the latter by proportionately longer ramicauls; petiolate leaves; and broader, ovate, obtuse, glabrous sepals.

Stelis imperialis Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Cauca: Popayán, Páramo de Las Barbillas, SE of Popayán, 3150 m, 13 November 1982, *C. Luer & R. Escobar 8380* (Holotype: SEL). Fig. 35–36.

This large species is distinguished by tall, stout ramicauls, occasionally proliferating; elliptical, petiolate leaves; one to three simultaneous, large-flowered racemes; a 5-veined

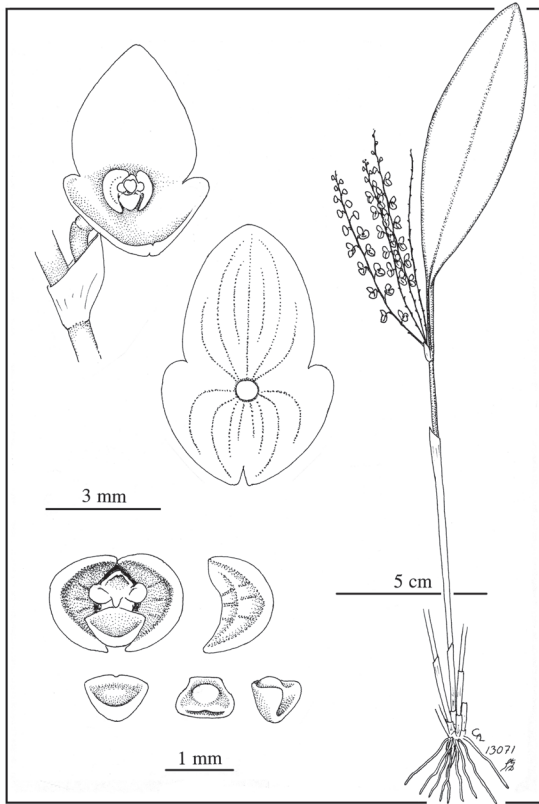


FIGURE 33. *Stelis gongylophora* Luer & R.Escobar

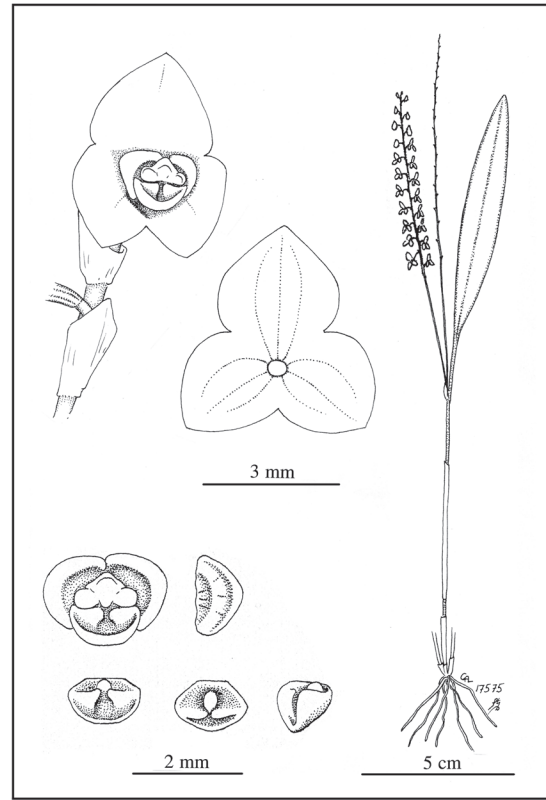


FIGURE 34. *Stelis humidensis* Luer

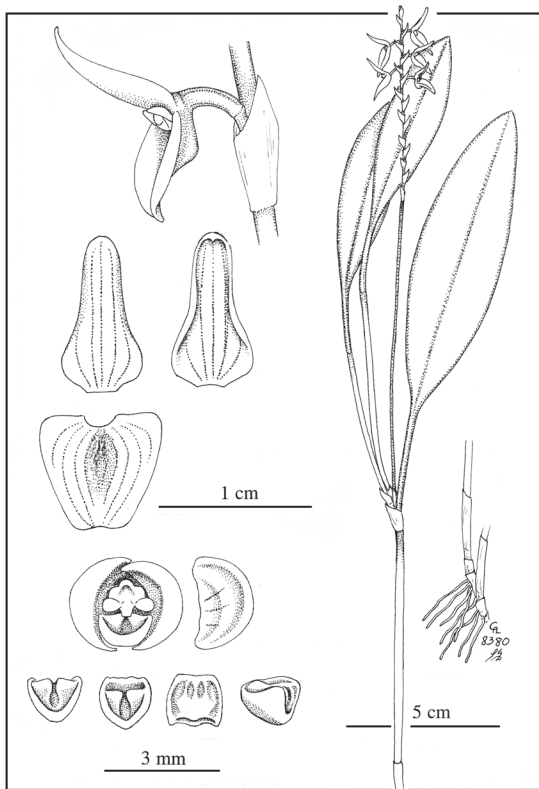


FIGURE 35. *Stelis imperialis* Luer & R.Escobar

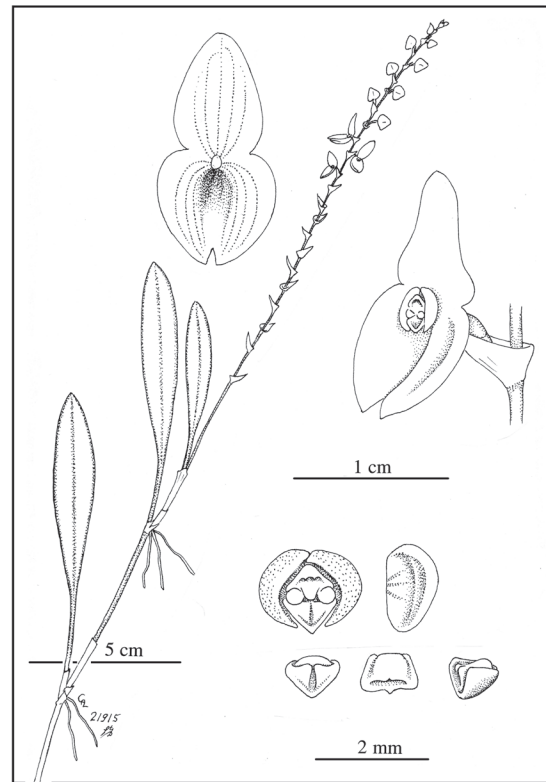


FIGURE 36. *Stelis imperialis* Luer & R.Escobar

dorsal sepal; an ovoid, multiveined synsepal with a basal mentum; 3-veined petals; and an obtuse lip with a glenion.

Plant large, epiphytic, caespitose; roots slender. Ramicauls stout, erect, 12–21 cm long, with a tubular sheath from near the middle and another 1–2 below and at the base, occasionally producing a plantlet at the abscission layer. *Leaf* erect, coriaceous, elliptical, acute to subacute, 8–15 cm long including a petiole 2–3 cm long, the blade 2–3.5 cm wide in the dry state. *Inflorescence* 1–3 simultaneous; 12–15 cm long, the racemes erect, strict, sublax. many-flowered; floral bracts oblique, acute, 8 mm long below to 5 mm long above; pedicels ca. 5 mm long; ovary 3–4 mm long; the peduncle 3–5 cm long, from a node below the apex of the ramicaul; *sepals* green, or green suffused and dotted with purple, glabrous, the dorsal sepal erect, ovate with recurved margins, obtuse with an incurved tip, 10 mm long, 6 mm wide, 6-veined, the lateral sepals connate into a ovate synsepal with recurved margins and a basal mentum, 8 mm long, 8 mm wide, 10-veined; *petals* yellow, transversely semilunate, concave, the apex rounded with thickened margin, 1.5 mm long, 2.3 mm wide, 3-veined, with a transverse carina; *lip* yellow, subquadrate, 1 mm long, 1.3 mm wide, 1.3 mm deep, concave below the bar with a glenion, the apex obtuse with a thickened margin, the dorsum slightly concave with the three veins thickened, the base truncate, hinged to the base of the column; *column* clavate, ca. 1 mm long and wide, the anther and bilobed stigma apical.

Etymology: From the Latin *imperialis*, referring to an imperial status among its fellow species.

Paratype: COLOMBIA. Cauca: Popayán, Páramo de Las Barbillas, SE of Popayán, 3150 m, 13 November 1982, C. Luer & R. Escobar 3379 (Holotype: SEL).

This large species is characterized by stout ramicauls that occasionally proliferate a plantlet at the apex with the leaf and one to three inflorescences. The sepals of one collection were green and suffused and dotted with purple. The flowers of a simultaneous collection were totally green. The floral bracts are long and acute; the dorsal sepal is erect and 5-veined; the synsepal is concave with recurved sides and a basal mentum; the petals are thick and 3-veined; and the lip is type A with a large glenion.

Stelis inamoena Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Norte de Santander: Páramo de Jurisdicciones, 3150 m, 10 November 1981, C. Luer, J. Luer & R. Escobar 6653 (Holotype: SEL). Fig. 37.

This medium-sized species is distinguished by clumps of slender ramicauls along an ascending rhizome; narrowly elliptical leaves; a few lax racemes as long as or longer than the leaf; minute flowers with obtuse, 3-veined sepals; single-veined petals; and a subquadrate, obtuse lip less than half a millimeter long.

Plant medium-sized, epiphytic, with densely caespitose components along a relatively stout, ascending rhizome 2–3 mm thick; roots slender. Ramicauls erect, slender, 6–10 cm long, with a tubular sheath from below the middle and another above the base. *Leaf* erect, coriaceous, narrowly elliptical, acute to subacute, 6–8 cm long, with a petiole 0.5–1 cm long, the blade 0.7–0.9 cm wide in the dry state,

narrowly cuneate into the petiole. *Inflorescence* 3–8, but not all simultaneous; 8–10 cm long, the racemes erect, strict, lax. many-flowered, distichous, with most flowers open simultaneously; floral bracts oblique, acute, 3 mm long below, 1 mm long above; pedicels 2–3 mm long; ovary 1 mm long; the peduncle ca. 1 cm long, with a spathe ca. 0.8 cm long, from a node below the apex of the ramicaul; flowers yellow-white; *sepals* glabrous, ovate, obtuse, 3-veined, connate below the middle, the dorsal sepal 1.4 mm long, 1.2 mm wide, the lateral sepals 1.2 mm long, 1 mm wide; *petals* thin obovate, broadly obtuse, shallowly concave, 0.75 mm long, 0.75 mm wide, 1-veined; *lip* subquadrate, 0.4 mm long, 0.3 mm wide, 0.2 mm deep, concave below the bar, the apex obtuse, the dorsum featureless, the base truncate, hinged to the base of the column; *column* clavate, ca. 0.4 mm wide and long, the anther apical, the stigmatic lobes within the margins of the clinandrium.

Etymology: From the Latin *inamoenus*, “not pretty by the describer’s standards,” referring to the untidy habit and tiny, simple flowers.

This medium-sized species produces untidy clusters of overlapping, caespitose components along stout, ascending rhizomes. Slender racemes of tiny flowers that hug the rachis are irregularly produced, and do not usually exceed the narrow leaves. The sepals are minute and 3-veined; the petals are thin and single-veined. The simple type A lip is less than half a millimeter long.

Stelis inedita Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Norte de Santander, Páramo de Jurisdicciones, 2570 m, 30 April 1982, C. Luer, J. Luer & R. Escobar 7655 (Holotype: SEL). Fig. 38.

This large, caespitose species is distinguished by one or two racemes much longer than an elliptical, petiolate leaf; a 3-veined dorsal and a concave synsepal, the sepals, ovaries, floral bracts and rachis with multiple, scattered deposits of an unidentified substance.

Plant large, epiphytic, caespitose; roots slender. Ramicauls erect, relatively stout, 4–6 cm long, with a loose, tubular sheath from below the middle and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, obtuse, petiolate, 6–10 cm long including a petiole 1.5 cm long, the blade 1.5–2 cm wide in dry state, cuneate below into the petiole. *Inflorescence* 1–2; 10–16 cm long, the racemes erect, strict, congested, secund, simultaneously many-flowered; floral bracts oblique, obtuse, 3 mm long; pedicels 1.5 mm long; ovary 1 mm long; the peduncle ca. 2 cm long, with a spathe 1 cm long, from a node below the apex of the ramicaul; *sepals* glabrous, light-yellow-green with multiple, irregular deposits of an unknown substance, the dorsal sepal ovate, subacute, 5 mm long, 2.5 mm wide, 3-veined, the lateral sepals ovate, obtuse, connate to above the middle, forming a deeply concave, ovoid synsepal, 4 mm long, 4 mm wide, 6-veined; *petals* transversely ovate, thick, concave, 0.8 mm long, 1 mm wide, 3-veined, the apex rounded, with a thick margin, with a transverse carina; *lip* subquadrate, 0.8 mm long, 0.8 mm wide, 0.4 mm deep, concave below the bar with a broad glenion, the apex obtuse, the dorsum convex centrally, microscopically pubescent,

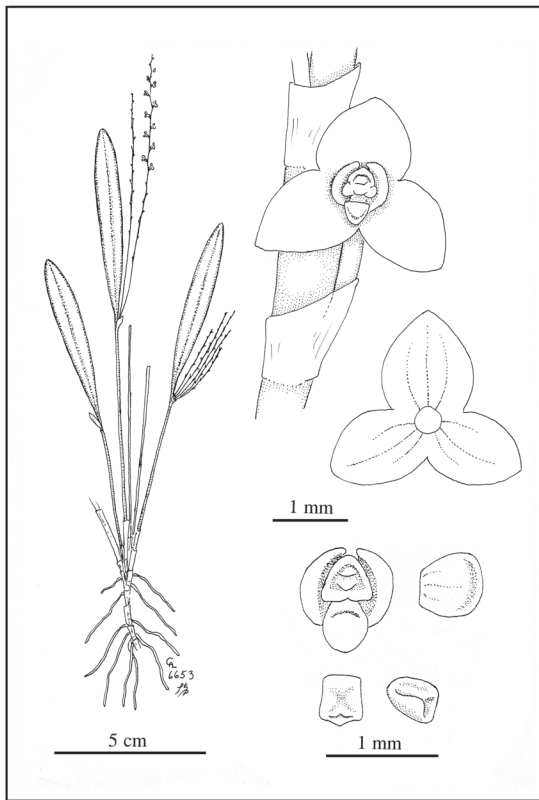


FIGURE 37. *Stelis inamoena* Luer & R. Escobar

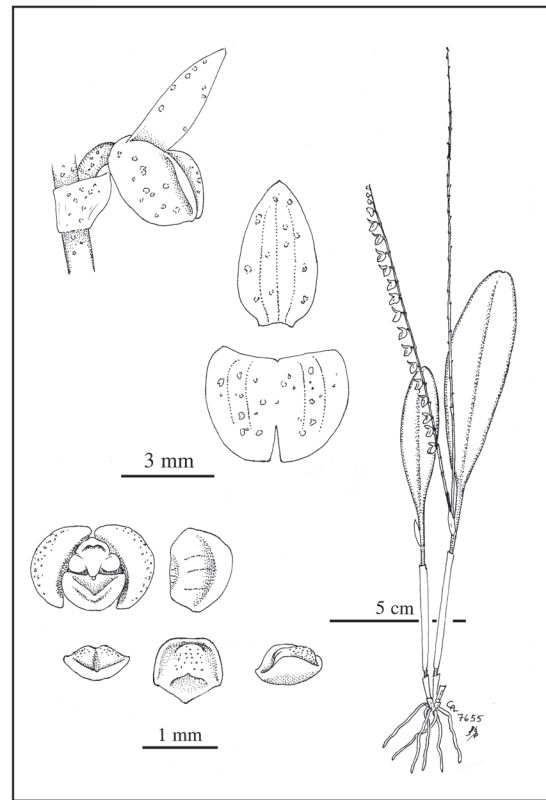


FIGURE 38. *Stelis inedita* Luer & R. Escobar

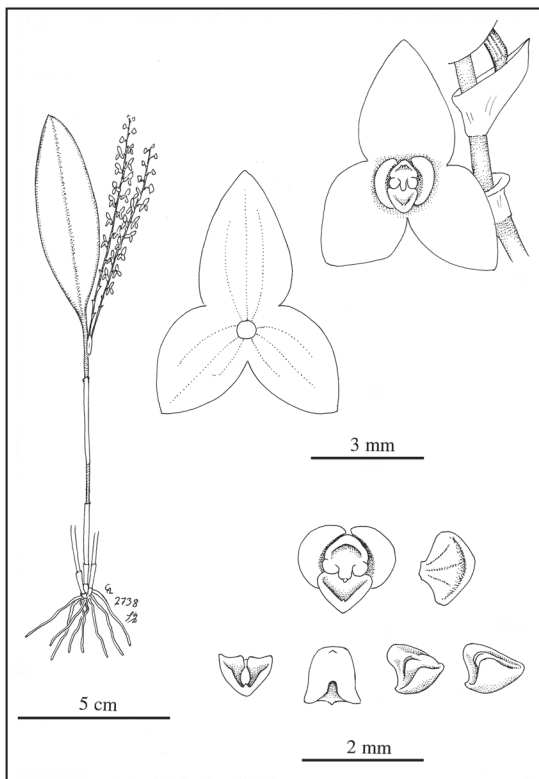


FIGURE 39. *Stelis ipialesensis* Luer & Hirtz

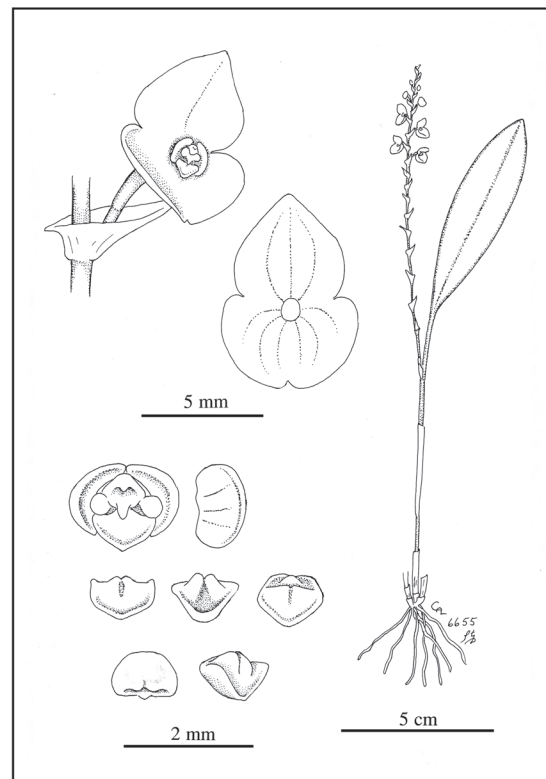


FIGURE 40. *Stelis jurisdiccensis* Luer & R. Escobar

the base truncate, hinged to the base of the column; *column* clavate, 0.8 mm wide and long, with the anther and the bilobed stigma apical.

Etymology: From the Latin *ineditus*, “unknown, unpublished,” referring to the substance deposited within the sepals, as well as other parts of the inflorescence.

This large species of section *Humboldtia*, found in both the Eastern and Central Cordillera of Colombia, is not remarkable except for small, irregular, scattered deposits of an unidentified substance found within the sepals, floral bracts and rachis. The inflorescence is a secund raceme with sepals 4–5 mm with the lateral sepals lightly adherent or partially connate into a concave synsepal. Both the sepals and petals are 3-veined. The lip is type A, obtuse and with a glenion.

Stelis ipialesensis Luer & Hirtz, *sp. nov.* TYPE: COLOMBIA. Nariño: SE of Ipiales toward La Victoria, 3800 m, 22 Feb. 1978, C. Luer, J. Luer & A. Hirtz 2738 (Holotype: SEL). Fig. 39.

This medium-sized, caespitose species is characterized by two to three subclax racemes slightly shorter than an elliptical leaf; glabrous 3-veined sepals and petals; and an ovoid, obtuse lip with a cleft bar and a truncate apex with a minute, broadly acuminate apiculum.

Plant medium in size, epiphytic, densely caespitose, roots slender. Ramicauls erect, slender, 6–8 cm long, with a close, tubular sheath from below the middle and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute, 6–8 cm long including a petiole 1.5–2 cm long, the blade 1.7–2 cm wide in dry state, cuneate below into the petiole. *Inflorescence* 2–3 simultaneous; 5–7 cm long, the racemes erect, strict, subcongested, distichous, many-flowered with most flowers open simultaneously; floral bracts oblique, acute, 2–2.5 mm long; pedicels 1.5 mm long; ovary 1.5 mm long; the peduncle ca. 1 cm long, with a spathe ca. 0.5 cm long, from a node below the apex of the ramicaul; flowers red-purple; *sepals* glabrous, ovate, 3-veined, connate below the middle, the dorsal sepal acute, 4 mm long, 2.5 mm wide, the lateral sepals subacute, 3 mm long, 2.5 mm wide; *petals* transversely ovate, broadly obtuse, concave below the narrowly thickened margin, 0.8 mm long, 1.25 mm wide, 3-veined, without a transverse carina; *lip* subquadrate, 0.6 mm long, 0.8 mm wide, 0.8 mm deep, concave below a widely cleft bar with a glenion, the apex truncate with a minute, broadly acuminate apiculum, the dorsum featureless, the base truncate, hinged to the base of the column; *column* clavate, ca. 1 mm wide and long, the anther and bilobed stigma apical.

Etymology: Named for the community of Ipiales near where this species was collected.

This species from southernmost Colombia in the Central Cordillera produces densely caespitose, slender ramicauls with acute, elliptical leaves, and a few, simultaneous, subclaxly flowered racemes nearly as long as the leaves. The sepals are ovate and 3-veined. The petals are 3-veined and transverse with a barely thickened apical margin. The lip is subquadrate with a widely cleft bar and a truncate apex with a minute, broadly acuminate apiculum.

Stelis juridicciensis Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Norte de Santander, Páramo de Jurisdicciones, 3130 m, 10 November 1981, C. Luer, J. Luer & R. Escobar 6655 (Holotype: SEL). Fig. 40.

This medium-sized, caespitose species is characterized by one or two inflorescences about as long as the leaf; acute floral bracts as long as the 3-veined sepals, the lateral sepals connate into a shallow synsepalum; thin, 3-veined petals; and a lip with the bar thick, elevated, and shallowly sulcate.

Plant medium in size, epiphytic, densely caespitose, roots slender. Ramicauls erect, slender, 7–9 cm long, with a close, tubular sheath on the middle third, and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute, 9–11 cm long including a petiole ca. 2.5 cm long, the blade 1.5–2 cm wide in dry state, cuneate below into the petiole. *Inflorescence* 1–2; 8–11 cm long, the raceme erect, strict, subclax, distichous, successively flowered; floral bracts oblique, acute, 4–5 mm long; pedicels 1.5 mm long; ovary 2 mm long; the peduncle ca. 1.5 cm long, with a spathe 6–7 mm long, from a node below the apex of the ramicaul; *sepals* pale yellow-green, glabrous, the dorsal sepal ovate, subacute, 4 mm long, 2.5 mm wide, 3-veined, connate below the middle to the lateral sepals, the lateral sepals connate into a shallowly concave, transversely ovate, obtuse synsepal, 3.5 mm long, 6 mm wide, 6-veined; *petals* yellow-green, thin, transversely ovate, broadly rounded at the apex with a thin margin. 0.75 mm long, 1.4 mm wide, 3-veined; *lip* yellow-green, subquadrate, 0.6 mm long, 1 mm wide, 0.6 mm deep, the bar thick, elevated, shallowly sulcate with a faint glenion, shallowly concave within the obtuse apex, the dorsum with a low, rounded callus, the base truncate, hinged to the base of the column; *column* clavate, ca. 1 mm wide and long, the anther and bilobed stigma apical.

Etymology: Named for the Páramo de Jurisdicciones in the Eastern Cordillera of Colombia where the species was collected.

This species from the Eastern Cordillera produces densely caespitose, slender ramicauls with acute, elliptical leaves, and one or two subclaxly flowered racemes about as long as the leaves. The dorsal sepal is ovate and 3-veined, the lateral sepals are connate into a shallowly concave, transversely ovate, obtuse synsepal. The petals are thin and 3-veined. The bar of the lip is thick, elevated, and shallowly sulcate.

Stelis lalinensis Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Tolima: La Linea, road to the TV antenna between Ibagué and Armenia, 3500 m, 20 October 1982, C. Luer & R. Escobar 8492 (Holotype: SEL). Fig. 41.

This medium-sized, caespitose species is characterized by slender ramicauls longer than acute, elliptical leaves and one or two racemes near the length of the leaves; ovate, 5-veined dorsal sepals; 3-veined petals; and a rounded lip.

Plant medium in size, epiphytic, densely caespitose; roots slender. Ramicauls slender, erect, 5–10 cm long, enclosed by a close, tubular sheath from below the middle, and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute, 5–7 cm long including a petiole ca. 1.5 cm long, the blade 1.5–2 cm wide in the dry state,

cuneate below to the petiole. *Inflorescence* 1–2; 6–8 cm tall, the racemes erect, strict, distichous, subdensely many-flowered; floral bracts oblique, acute, 3–3.5 mm long; the pedicel 1.5 mm long; ovary 1.5 mm long; the peduncle ca. 1 cm long, from the apex of a ramicaul with a spathe ca. 8 mm long; *sepals* yellow, suffused with brown externally below the middle, microscopically pubescent, broadly ovate, obtuse, the dorsal sepal 4 mm long, 5 mm wide, 5-veined, the lateral sepals 3 mm long, 4.5 mm wide, 4-veined; *petals* transversely elliptical, 1.6 mm long, 1.75 mm wide, 3-veined, concave, the apical margin rounded, thickened, with a transverse carina; *lip* subquadrate, 1 mm long, 1.4 mm wide, 1 mm deep, concave below a shallowly sulcate bar, the apex rounded with thickened margin, the dorsum with a low, trilobed callus, the base truncate, hinged to the column-foot; *column* stout, ca. 1 mm long and wide, the anther and stigmatic lobes apical.

Etymology: Named for La Linea, the power line between Ibagué and Armenia.

This high altitude, medium-sized, caespitose species, with slender ramicauls longer than an elliptical leaf, has no distinctive character. One or two rather large-flowered racemes approach or pass the tip of the leaf. The broad, obtuse sepals and thick, 3-veined petals are similar to those of *Stelis grandiflora* Lindl, but there, all similarities cease. The apex of a type A lip rounded, and the dorsum is thick with a low, trilobed callus.

Stelis magnesialis Luer & Hirtz, *sp. nov.* TYPE: COLOMBIA. Nariño: E of Ricaurte, above abandoned Magnesium mine, 1800 m, 1 November 1979, C. Luer, J. Luer & A. Hirtz 4520 (Holotype: SEL). Fig. 42.

This small, caespitose species is characterized by slender ramicauls; equally long, elliptical leaves; a twice longer raceme of small flowers with obtuse, 3-veined sepals, with the lateral sepals antrorse; thin, flabellate petals; and a subquadrate, truncate lip with a short, obtuse apiculum between obtuse, lateral corners.

Plant small, epiphytic, caespitose. Ramicauls erect, slender, 5–6 cm long, with a close, tubular sheath from below the middle, and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, narrowly elliptical, obtuse, 5–6 cm long including a petiole 1.5 cm long, the blade 1 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* single; 10–11 cm long, the raceme erect, secund, congested, with many flowers open simultaneously; floral bracts oblique, subacute, 2–2.5 mm long; pedicel 1 mm long; ovary 1 mm long; the peduncle ca. 1 cm long, subtended by a slender spathe 6–7 mm long, from a node near the apex of the ramicaul; flowers yellow; *sepals* microscopically pubescent, elliptical, subacute, 3-veined, connate to the base, the dorsal sepal erect, 2 mm long, 1.25 mm wide, the lateral sepals antrorse, 2 mm long, 1.25 mm wide; *petals* thin, flabellate, truncate, thickened toward the apex 0.5 mm long, 0.75 mm wide, faintly 3-veined; *lip* subquadrate, 0.5 mm long, 0.6 mm wide, 0.3 mm deep, the apex truncate trilobulate, a minute, obtuse apiculum flanked by similar, rounded, lateral corners, concave below a thick,

cleft bar, the sides of the cleft becoming apposed on the dorsum before separating for a microscopically pubescent callus above the base, the base truncate, connate to the base of the column; *column* stout, ca. 0.5 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: Named for habitat associated with a Magnesium mine.

This small, caespitose species with equally long leaves and ramicauls, and a twice longer, secund raceme of small flowers. The sepals are ovate with the laterals antrorse. The petals are truncate and faintly 3-veined. The lip is subquadrate the apex truncate and trilobulate, a short, obtuse apiculum bring flanked by similar, obtuse corners.

Stelis majuscula Luer, *sp. nov.* TYPE: COLOMBIA. Cundinamarca: Bogotá, near Usaquén, 2600–2700 m. 1939, Lorenzo Uribe U. 385 (Holotype: AMWS), C. Luer illustr. 21967. Fig. 43.

This species with narrow, linear leaves and a congested raceme with prominent floral bracts, is similar to *Stelis cochlearis* Garay, but with larger, 5-veined sepals, instead of 3-veined sepals; and a lip with a round, anterior callus below a thick, channeled bar, instead of a smooth, concave lip with a thin bar.

Plant medium in size, epiphytic, probably caespitose (ramicauls broken off at the base). Ramicauls erect, slender, 8–9 cm long, with 2–3 loose, tubular sheaths. *Leaf* erect, coriaceous, linear, subacute, 9–10 cm long, gradually narrowed below into an ill-defined petiole, ca. 1 cm long, the blade 0.8 cm wide in dry state. *Inflorescence* single; 11 cm long, the raceme erect, congested, strict, distichous; floral bracts oblique, acuminate, acute, 8 mm long below to 5 mm long toward the tip; pedicels 2 mm long; ovary 2 mm long; peduncle ca. 2 cm long, from a node near the apex of the ramicaul; *sepals* color unknown, pubescent, ovate, obtuse, expanded, and connate below the middle, 5-veined, the dorsal sepal 5 mm long, 4.5 mm wide, the lateral sepals 4 mm long, 4.5 mm wide; *petals* transversely ovate, concave below the broadly obtuse, thickened, apical margin, with a transverse carina, 1.5 mm long, 2 mm wide, 3-veined; *lip* subhemispherical with the apex rounded, 1.5 mm long, 2 mm wide, 1.5 mm deep, the bar thick, shortly but deeply cleft above a rounded callus between the cleft and the anterior margin, the lateral angles rounded and expanded, the dorsum with a low, inconspicuous, basal callus, connate to the base of the column; *column* stout, ca. 1.5 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *majusculus*, “somewhat larger,” referring to the flowers, compared to those of *Stelis cochlearis* Garay.

With narrow leaves and a congested raceme with prominent floral bracts, this species of the Eastern Cordillera is similar to *Stelis cochlearis* Garay of the Central Cordillera. The flowers of the former are larger with 5-veined sepals, instead of 3-veined sepals. Instead of a deeply concave lip with smooth surfaces below a thin bar, a rounded callus is present on the anterior surface between a shortly cleft, thick bar and the anterior margin.

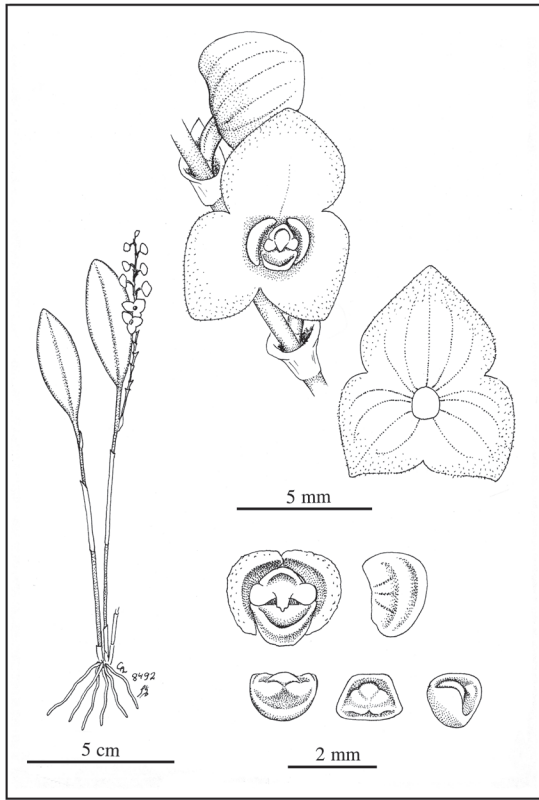


FIGURE 41. *Stelis lalinensis* Luer & R. Escobar

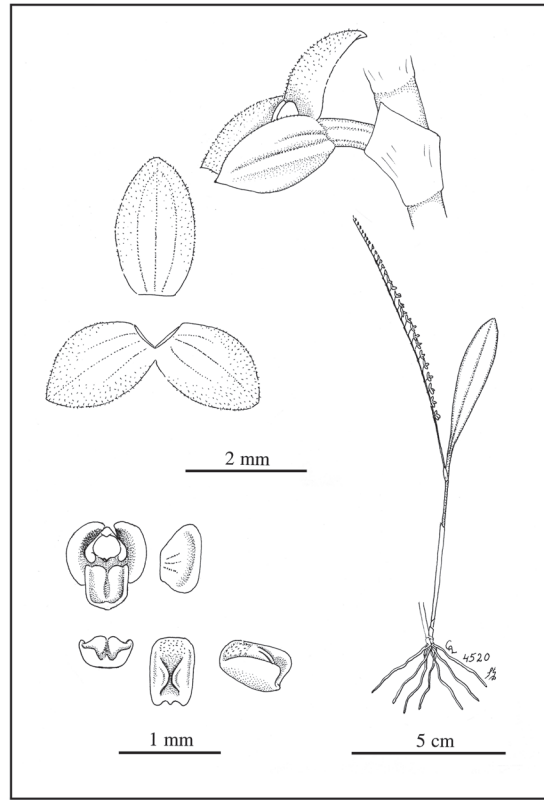


FIGURE 42. *Stelis magnesialis* Luer & Hirtz

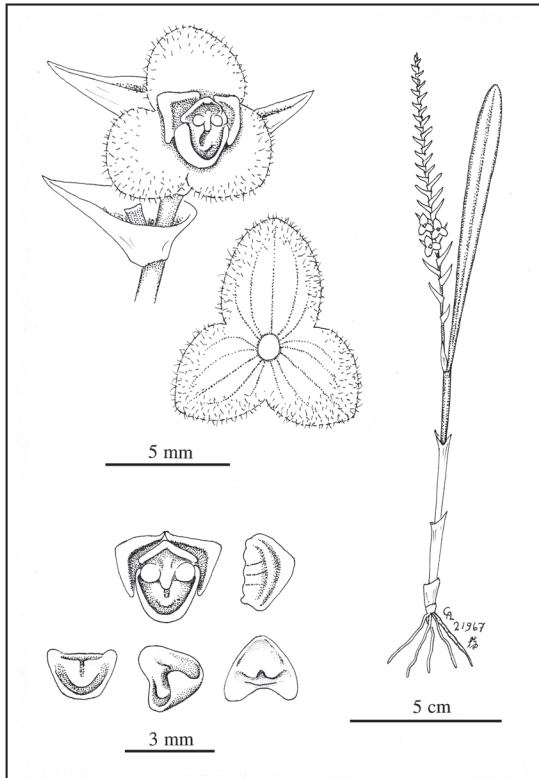


FIGURE 43. *Stelis majuscula* Luer

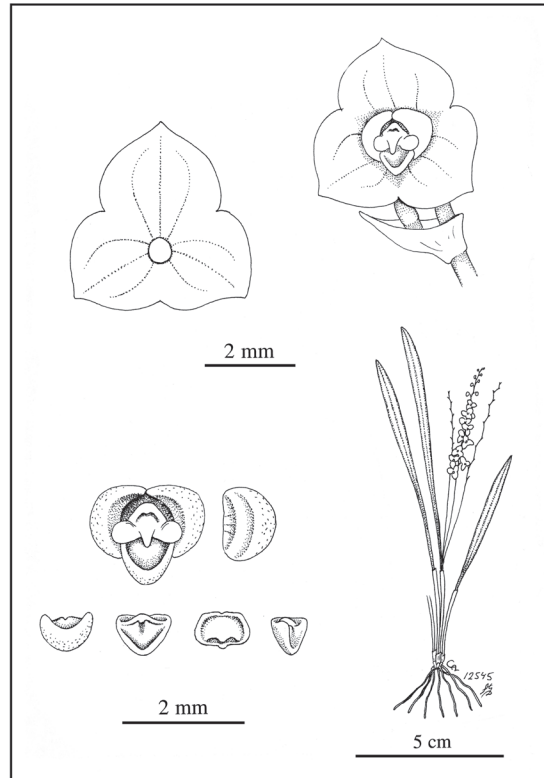


FIGURE 44. *Stelis morula* Luer & R. Escobar

Stelis morula Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Putumayo: E of the pass E of San Francisco toward Mocoa, 2100 m, 27 Jan. 1987, C. Luer, J. Luer, R. Escobar et al. 12545 (Holotype: SEL). Fig. 44.

This medium-sized, caespitose species is characterized by acute, narrowly linear-elliptical leaves longer than the ramicaul and one to four racemes of dark purple flowers; ovate, glabrous, broadly ovate, 3-veined sepals; 3-veined petals; and a subquadrate, obtuse lip with a sulcate bar.

Plant medium in size, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 2–3.5 cm long, enclosed by a close, tubular sheath from below the middle and another sheath at the base. *Leaf* erect, coriaceous, narrowly linear-elliptical, acute, 5–8 cm long, including a petiole 1.5–2 cm long, the blade 0.4–0.6 cm wide in the dry state, narrowed below into the petiole. *Inflorescence* 1–4; 9–10 cm tall, the racemes erect, congested, distichous, subflexuous, many-flowered, with many flowers open simultaneously; floral bracts oblique, acute, 2.5–3 mm long; pedicels 1 mm long; ovary 1 mm long; the peduncle 2–3 cm long, from a node at the apex of the ramicaul; flowers dark purple; *sepals* glabrous, expanded, broadly ovate, obtuse, 3-veined, the dorsal sepal 2.3 mm long, 2.6 mm wide, the lateral sepals 2 mm long, 2.3 mm wide; *petals* transversely ovate, concave, the apex broadly rounded with a thickened margin, with a transverse carina, 0.75 mm long, 1.25 mm wide, 3-veined; *lip* subquadrate, type A, 0.5 mm long, 0.8 mm wide, 0.6 mm deep, concave below a sulcate bar, the apex obtuse, the dorsum lowly convex, the base truncate, hinged to the base of the column; *column* clavate, ca. 1 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *morulus*, “black like a mulberry,” referring to the flowers.

This species characterized by one to four simultaneous, subflexuous racemes that are shorter than narrow, linear-elliptical leaves; dark purple flowers with glabrous, 3-veined sepals that are slightly acuminate at their tips; thick, 3-veined petals; and a type A lip with the apex obtuse, and a sulcate bar with the dorsum slightly convex.

Stelis nemoralis Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Norte de Santander, Páramo de Jurisdicciones, 2300 m, 30 April 1982, C. Luer, J. Luer & R. Escobar 7689 (Holotype: SEL). Fig. 45.

This large, caespitose species is distinguished by one or two loosely flowered racemes much longer than an elliptical, petiolate leaf; obtuse, 3-veined sepals and petals; and a subquadrate lip with a bulbous tip.

Plant large, epiphytic, caespitose; roots slender. Ramicauls erect, relatively stout, 7–9 cm long, with a tubular sheath from below the middle and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, obtuse, petiolate, 9–13 cm long including a petiole 2 cm long, the blade 2–2.8 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* 1–2; 10–14 cm long, the racemes erect, strict, loose, distichous, with many flowers open simultaneously; floral bracts oblique, obtuse,

2 mm long; pedicels 1.5 mm long; ovary 1 mm long; the peduncle 1–2 cm long, with a spathe 5 mm long, from a node below the apex of the ramicaul; *sepals* sparsely pubescent, light green, ovate, obtuse, 3-veined, connate below the middle, the dorsal sepal 3 mm long, 3 mm wide, the lateral sepals 2.5 mm long, 3 mm wide; *petals* transversely ovate, thick, 0.6 mm long, 1.2 mm wide, 3-veined, concave below the rounded apex with a thick margin, with a transverse carina; *lip* subquadrate, 0.8 mm long, 1.2 mm wide, 0.8 mm deep, concave below the bar with a narrow glenion, the apex rounded with a central, bulbous swelling, the dorsum slightly convex centrally, the base truncate, hinged to the base of the column; *column* clavate, 1.2 mm wide and long, with the anther and the bilobed stigma apical.

Etymology: From the Latin *nemoralis*, “of the woods,” referring to the forest habitat.

This large species has no remarkable feature to distinguish it from numerous other species, except for a bulbous swelling at the tip of an otherwise simple, type A lip, which might very well be variable.

Stelis obscula Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Santander: Bucaramanga, between Bucaramanga and Berlin, 2800 m, 27 Apr. 1982, C. Luer, J. Luer & R. Escobar 7600 (Holotype: SEL). Fig. 46.

This medium-sized species is distinguished by a congested, ascending-caespitose habit; stout, ramicauls with overlapping leaves; two or three longer, tiny-flowered racemes; thick, obtuse sepals; thick single-veined petals; and a minute, thick lip.

Plant medium in size, epiphytic, densely ascending-caespitose, roots slender, the rhizome 5 mm thick. Ramicauls erect, stout, 2–3 mm thick, 5–8 cm long, with a loose, tubular sheath from below the middle, and 1–2 other sheaths below and about the base. *Leaf* erect, coriaceous, elliptical, subacute, 6–7 cm long, including a petiole less than 1 cm long, the blade 1–1.8 cm wide in dry state, cuneate below into the petiole. *Inflorescence* 2–4; 12–17 cm long, the raceme erect, distichous, congested, simultaneously many-flowered; floral bracts tubular, obtuse, 1.5 mm long, 1 mm wide; pedicels 1 mm long; ovary 1 mm long; the peduncle 1.5–2 cm long, from a spathe 8 mm long below the apex of the ramicaul; flowers yellow-white; *sepals* glabrous, thickened, ovate, obtuse, 3-veined, connate near the base, the dorsal sepal 1.3 mm long, 1 mm wide, the lateral sepals, oblique, 1 mm long, 0.9 mm wide; *petals* elliptical, the apex broadly rounded with a thick margin, concave, without a transverse carina, 0.5 mm long, 0.6 mm wide, 1-veined; *lip* thick, subquadrate, 0.5 mm long, 0.4 mm wide, 0.4 mm deep, concave below a thick bar, the apex rounded, the dorsum microscopically pubescent toward the base, the base truncate, hinged to the base of the column; *column* clavate, ca. 0.5 mm wide and long, the anther and the bilobed stigma apical.

Etymology: From the Latin *obesculus*, “a little fat one,” referring to the thick, floral parts.

This strong species is characterized by a densely ascending-caespitose habit with a thick rhizome and stout

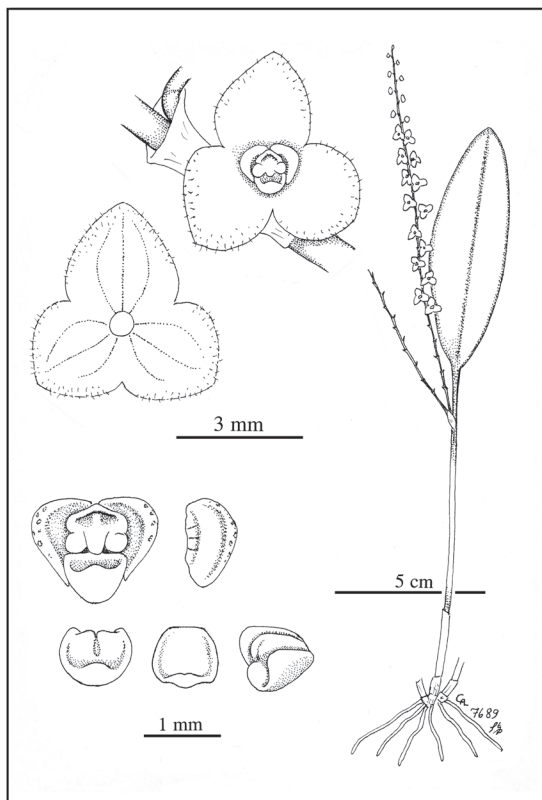


FIGURE 45. *Stelis nemoralis* Luer & R. Escobar

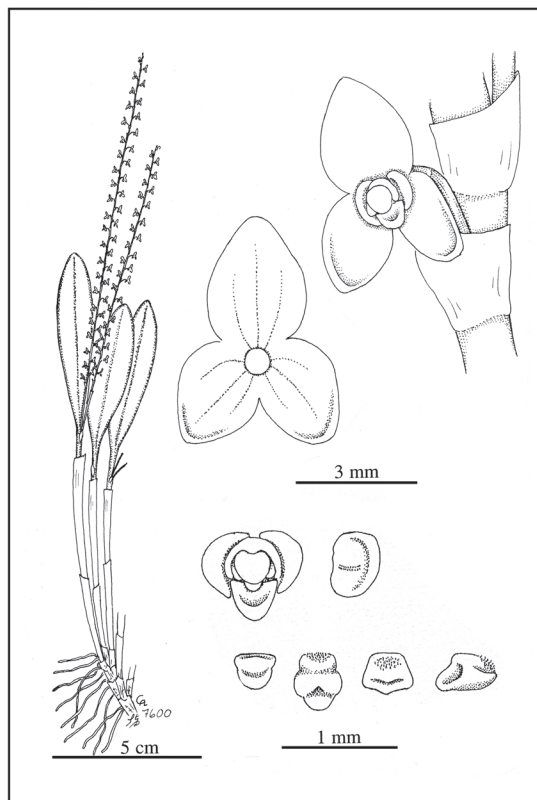


FIGURE 46. *Stelis obscula* Luer & R. Escobar

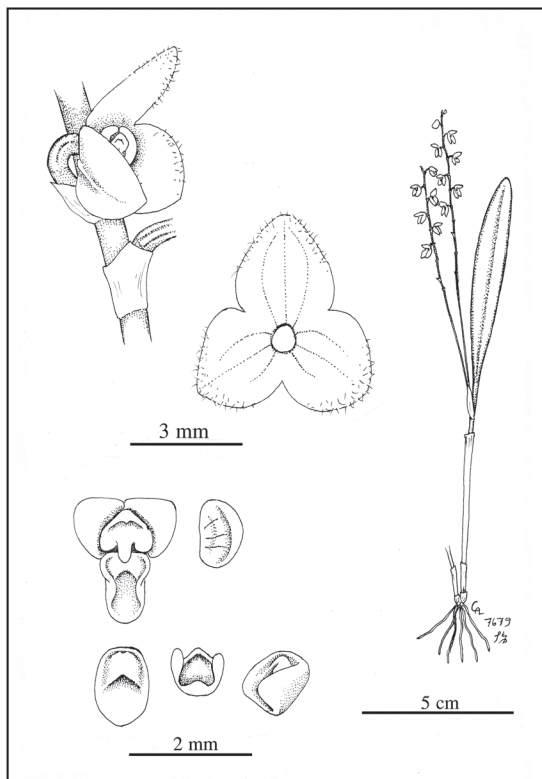


FIGURE 47. *Stelis palifera* Luer & R. Escobar

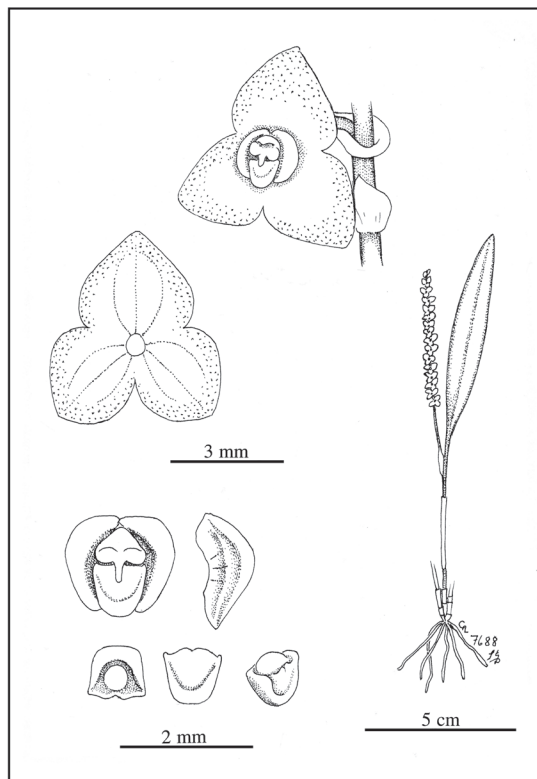


FIGURE 48. *Stelis pilicrepa* Luer & R. Escobar

ramicauls with overlapping leaves. Two or three long, congested racemes bear numerous, minute, fleshy flowers with obtuse, 3-veined sepals and concave, single-veined petals. The minute, fleshy lip is concave below a thick bar.

Stelis palifera Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Norte de Santander, Páramo de Jurisdicciones, 2300 m, 30 April 1982, C. Luer, J. Luer & R. Escobar 7679 (Holotype: SEL). Fig. 47.

This medium-sized, caespitose species is characterized by one or two racemes slightly longer than narrow, elliptical leaves; sparsely pubescent sepals with the lateral sepals antrorse and more or less connivent; thick, 3-veined petals; and an elliptical lip concave below the central bar and with the sides thin and erect.

Plant medium-sized, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 6–8 cm long, with a loose, tubular sheath from below the middle, and another 2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute to subacute, 7–10 cm long including a petiole ca. 1.5 cm long, the blade 0.8–1.2 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* 1–2 simultaneous; 7–12 cm long, the racemes erect, distichous, loose, strict; floral bracts oblique, obtuse, 2.5 mm long; pedicels 1.5 mm long; ovary 1.5 mm long; the peduncle 3–4 cm long, subtended by a spathe 1.2 cm long, from a node below the apex of the ramicaul; flowers yellow-green; *sepals* pubescence fine, sparse, the dorsal sepal ovate, obtuse, 3-veined, connate below the middle, 3 mm long, 2.6 mm wide, the lateral sepals antrorse, broadly ovate, 2.6 mm long, 2.6 mm wide; *petals* thick, transversely ovate, 0.75 mm long, 1.2 mm wide, 3-veined, concave below the rounded apex with a thick margin, with a transverse carina; *lip* suboblong, 1.25 mm long, 0.75 mm wide, 0.5 mm deep, concave below the bar near the middle of the lip, the apex rounded with the sides erect, also rounded, the dorsum smooth, the base truncate, hinged to the base of the column; *column* stout, ca. 0.75 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *palifer*, “scoop bearing,” referring to the shape of the lip.

The habit of this medium-sized, caespitose species with a many-flowered inflorescence longer than the leaf is similar to a myriad of other species, but the flowers with antrorse, more or less connivent lateral sepals, and the scoop-like lip are distinctive. The margins of the recurved sides of the obtuse apex of the lip are smooth and not thickened. A low, shelf-like bar lies cross the center.

Stelis pilicrepa Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Norte de Santander; Páramo de Jurisdicciones, 2900 m, 30 April 1982, C. Luer, J. Luer & R. Escobar 7686 (Holotype: SEL). Fig. 48.

This medium-sized, caespitose species is characterized by single, simultaneously flowered raceme slightly shorter than an elliptical leaf; glabrous, 3-veined sepals 3 mm long and wide; triangular, thick, 3-veined petals; and a lip with a hemispherical callus filling the dorsum.

Plant medium-sized, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 5–9 cm long, enclosed

by a tubular sheath from below the middle, and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute, 7–8 cm long including a petiole 1.5–2 cm long, the blade 0.8–1.4 cm wide in the dry state, cuneate below to the petiole. *Inflorescence* single; 5–6 cm long, the raceme erect, many-flowered, congested in two opposite facing rows; floral bracts oblique, acute, 2 mm long; pedicel 1 mm long; ovary 1 mm long; the peduncle 1–1.5 cm long, with a spathe 6 mm long from a node below the apex of a ramicaul; flowers purple; *sepals* glabrous with scattered cells, 3-veined, the dorsal sepal ovate, obtuse, 3 mm long and wide, the lateral sepals ovate, obtuse, oblique, 2.5 mm long and wide; *petals* semilunate with slightly acuminate angles, the apex broadly rounded with the margin thickened, 1 mm long, 2 mm wide, 3-veined below a transverse carina; *lip* subquadrate, 0.8 mm long, 1 mm wide, 0.8 mm deep, very shallowly concave below the bar, the apex rounded, the dorsum with a suborbicular callus, the base truncate, hinged to the column-foot; *column* stout, ca. 1 mm long and wide, the anther yellow, apical with the stigmatic lobes.

Etymology: From the Latin *pilicrepa*, “a ball player,” referring to the suborbicular callus that fills the dorsum of the lip.

This caespitose species is characterized by a congested raceme shorter than elliptical leaves. The sepals are ovate and glabrous, and the petals are thick and 3-veined. The lip is subquadrate with a rounded apex, and the anterior surface barely, if all, concave. Like a ball, a suborbicular callus lies half buried on the dorsum.

This species is similar to *Stelis coccidifera* Luer & R.Escobar described herein, but differs with a single raceme; twice larger flowers; and a large, hemispherical callus that fills the dorsum of the lip.

Stelis prodigiosa Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Tolima: S slope of Mt. Tolima, N of Ibagué, 2600 m, 21 April 1982, C. Luer, J. Luer & R. Escobar 7497 (Holotype: SEL). Fig. 49.

This large, caespitose species of section *Humboldtia* is distinguished by slender ramicauls; long-petiolate leaves; several racemes that exceed the leaf; a 7-veined, dorsal sepal and a concave synsepal; thick, 3-veined petals; and a proportionately small lip with an erect bar with a rounded callus on the anterior surface.

Plant large, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 8–10 cm long, with a tubular sheath above the middle, and another 2 sheaths below the middle and about the base. *Leaf* erect, coriaceous, elliptical, acute, long-petiolate, 10–17 cm long including the petiole 3–4 cm long, the blade 2–2.7 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* 3–5; 15–25 cm long, the racemes erect, secund, lax, many-flowered, floral bracts oblique, acute, 4–5 mm long; pedicels 4 mm long; ovary 2 mm long; the peduncle 6–8 cm long, with a spathe ca. 7 mm long below the apex of the ramicaul; *sepals* glabrous, the dorsal sepal purple, ovate, obtuse, 8 mm long, 6 mm wide, 7-veined, connate 1–2 mm to the lateral sepals, the lateral sepals yellow, microscopically ciliate, connate to the tip into a deeply concave, ovoid, subacute synsepal, 8 mm

long, 10 mm wide expanded, 10-veined; *petals* dark purple, thick, transversely semilunate, concave, the apex broadly rounded with a thick margin, and with a transverse carina, 1.5 mm long, 2.5 mm wide, 3-veined; *lip* dark purple, thick, subquadrate, 1.3 mm long, 1 mm wide, 0.6 mm deep, the bar elevated centrally with a rounded callus on the anterior surface above the round apex with a short apiculum, the back surface of the erect bar short above a deep, broadly rounded base with multiple, microscopic crystals, attached to the column; *column* clavate, ca 1 mm wide and long, the anther and the proportionately large stigmatic lobes apical.

Etymology: From the Latin *prodigiosus*, "extraordinary," referring to the lip.

This species is distinguished by slender ramicauls and long-petiolate leaves surpassed by secund racemes of relatively large, bilabiate flowers with a 7-veined dorsal sepal. The petals are large and thick while the lip is proportionately small. The bar of the lip is tall centrally with a round, central callus above the minutely apiculate apical margin.

Stelis putumayoënsis Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Putumayo: between La Cocha and Sibundoy, 2700 m, 30 July 1978, C. Luer, J. Luer, R. Escobar *et al.* 3081 (Holotype: SEL). Fig. 50

This large, caespitose species is distinguished by a two to four many-flowered racemes much longer than acute, elliptical-ovate leaves; long, acute floral bracts; medium-sized flowers with the sepals glabrous, 3-veined, the lateral sepals connate into a deeply concave synsepal; semilunate, 3-veined petals; and a subquadrate lip with a rounded apex and a shortly cleft bar.

Plant large, epiphytic, densely caespitose; roots slender. Ramicauls erect, 14–18 cm long, with a tubular sheath from below the middle and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical-ovate, acute, 8–9.5 cm long including a petiole 1.5 cm long, the blade 2.5–3 cm wide in the dry state. *Inflorescence* 2–4 simultaneous; 15–20 cm long, the racemes erect, strict, congested, distichous, many-flowered, with many flowers open simultaneously; floral bracts oblique, slender, acute, 10 mm long, to 5 mm long toward the tip; pedicels 2–3 mm long; ovary 2 mm long; peduncle 2–3 cm long, from a node below the apex of the ramicaul; *sepals* red-brown, glabrous, the dorsal sepal erect, ovate, obtuse, 4.5 mm long, 3 mm wide, 3-veined, connate basally, the lateral sepals ovate, concave, connate to the tip into a deeply concave synsepal, each sepal 4 mm long, 2.5 mm wide; *petals* yellow, transversely ovate, concave, the apex rounded with a broad margin, 1 mm long, 1.5 mm wide, 3-veined, with a transverse carina; *lip* yellow, subquadrate, 0.6 mm long, 1 mm wide, 0.75 mm deep, concave below a shortly cleft bar without an obvious glenion, the apex rounded, the dorsum smooth, slightly convex, the base truncate, hinged to the base of the column; *column* clavate, ca. 1 mm wide and long, the anther and the bilobed stigma apical.

Etymology: Named for Putumayo, the southernmost department of Colombia, where this species occurs.

With long, many-flowered racemes with long, acute

floral bracts, and a concave synsepal, this large species is superficially similar to *Stelis purpurea* (Ruiz & Pav.) Willd. However, the sepals are a little smaller and only 3-veined, with an obtuse, instead of acute, dorsal sepal, and the bar of the lip differs with a short cleft and a smooth dorsum.

Stelis sceptrumrubrum Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Norte de Santander, Páramo de Jurisdicciones, 2750 m, 30 April 1982, C. Luer, J. Luer & R. Escobar 7670 (Holotype: SEL). Fig. 51.

This medium-sized, caespitose species is distinguished by an inflorescence with a congested, secund, purple-flowered raceme about as long as the peduncle that exceeds a broadly, elliptical leaf that is about as long as either the peduncle or the raceme; a 5-veined dorsal sepal; 3-veined petals; and a relatively large, subquadrate lip with a shallowly sulcate, central callus.

Plant medium-sized, densely caespitose, epiphytic; roots slender. Ramicauls erect, stout, 3–5.5 cm long, enclosed by a fugacious sheath and 2–3 tubular sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, subacute at the tip, 7–9 cm long including the petiole 1.5 cm long, the blade 2–2.5 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* single; 14–16 cm long, the raceme erect, congested, secund, many-flowered with most flowers open simultaneously; floral bracts oblique, obtuse, 3 mm long, 2 mm broad; pedicels 1.5 mm long; ovary 1 mm long; the peduncle 6–7 cm long, subtended by a spathe 1.5 mm long, from a node below the apex of the ramicaul; flowers purple; *sepals* glabrous, convex, the dorsal sepal ovate, acute to subacute, 5 mm long, 4 mm wide, 5-veined, the lateral sepals broadly ovate, oblique, obtuse, 3 mm long, 4 mm wide, connate below the middle; *petals* transversely ovate, broadly rounded at the apex with a narrowly thickened margin, 1.3 mm long, 2 mm wide, 3-veined, without a transverse carina; *lip* subquadrate, 1.6 mm long, 2 mm wide, 1.5 mm deep, concave below the bar with a sulcate callus extending from the base to near the rounded, concave apex, the base truncate, hinged to the base of the column; *column* stout, 1.5 mm long and wide, the anther and the bilobed stigma apical.

Etymology: From the Latin *scrptrumrubrum*, "baton rouge, (red baton)" referring to the inflorescence.

This robust, caespitose species is distinguished by a congested, secund raceme of flowers with convex sepals, suggesting a solid, red baton. The dorsal sepal is 5-veined, the lateral sepals are 4-veined, and the petals are 3-veined. The subquadrate lip is remarkable with a central, sulcate callus overlying the bar.

Stelis scutellifera Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Cundinamarca: near pass between Bogotá and Fusagasuga, 2800 m, 22 April 1982, C. Luer, J. Luer & R. Escobar 7516 (Holotype: SEL). Fig. 52.

This large, caespitose species is characterized by slender to stout ramicauls; one or two many-flowered, inflorescences shorter than elliptical leaves; broadly ovate, shortly pubescent sepals with the dorsal sepal 5-veined; 3-veined petals; and a lip with a deep glenion.

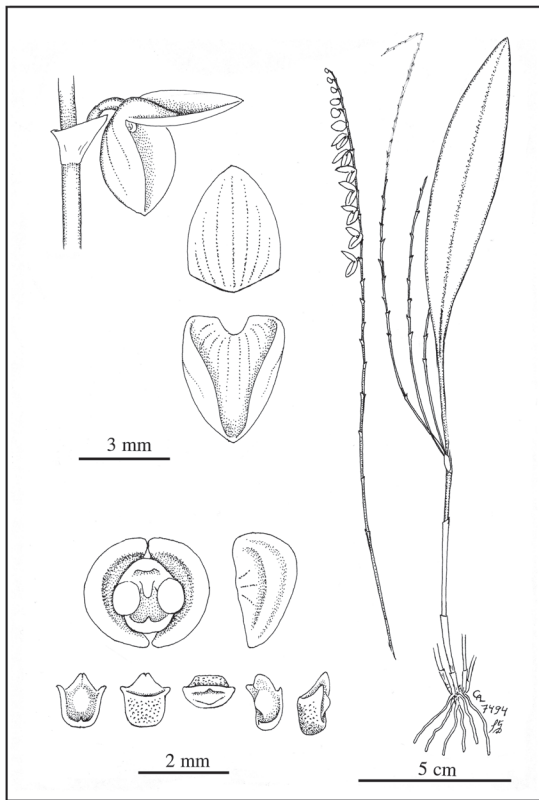


FIGURE 49. *Stelis prodigiosa* Luer & R.Escobar

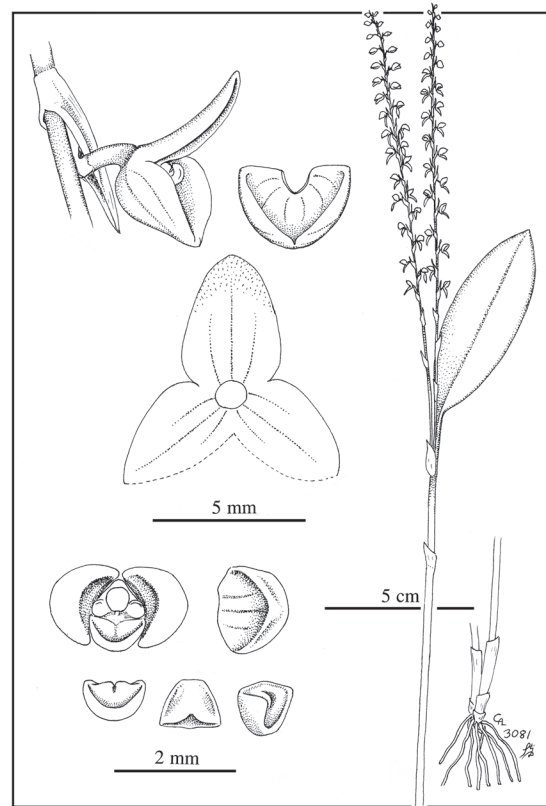


FIGURE 50. *Stelis putumayoënsis* Luer & R.Escobar



FIGURE 51. *Stelis sceptrumrubrum* Luer & R.Escobar

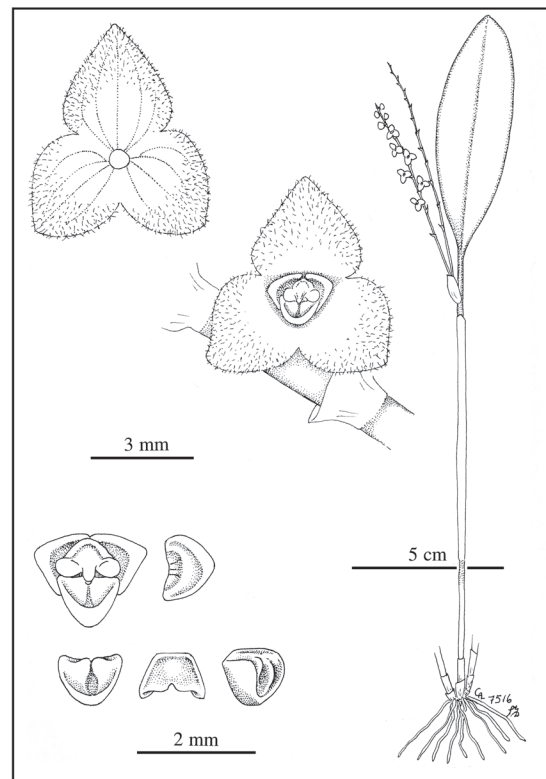


FIGURE 52. *Stelis scutellifera* Luer & R.Escobar

Plant large, epiphytic, caespitose; roots slender. Ramicauls erect, slender, but stout in larger plants, 6–14 cm long, with a tubular sheath from below the middle, and another 2 sheaths below and about the base. *Leaf* erect, coriaceous, elliptical, acute to subacute, petiolate, 9–11 cm long including the petiole 1.5–2 cm long, the blade 1.5–2.5 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* 1–2; 8 cm long, the raceme erect, distichous, laxly many-flowered, floral bracts oblique, acute, 3–4 mm long; pedicels 2–3 mm long; ovary 2 mm long; the peduncle 2–3 cm long, with a spathe 1 mm long below the apex of the ramicaul; *sepals* yellow, shortly pubescent, expanded, broadly ovate, subacute, connate below the middle, the dorsal sepal 3.3 mm long, 3.3 mm wide, 5-veined, the lateral sepals oblique, 3 mm long, 3 mm wide, 4-veined; *petals* dark purple, transversely ovate, concave, the apex broadly obtuse with a thick margin, with a transverse carina, 0.75 mm long, 1 mm wide, 3-veined; *lip* dark purple, subquadrate, 0.75 mm long, 1 mm wide, 0.75 mm deep, concave below a thick, shallowly cleft bar with a deep glenion, the apex broadly rounded with the margin thickened, the dorsum slightly convex; *column* clavate, ca 1 mm long and wide, the anther and the stigmatic lobes apical.

Etymology: From the Latin *scutellifer*, “little target bearing,” referring to the dark purple central apparatus surrounded by yellow sepals.

This large, caespitose species is distinguished by a combination of morphological features that are not unusual: stout ramicauls in larger plants; elliptical leaves, and one or two inflorescences that do not exceed the leaves; broad, obtuse, shortly pubescent sepals with the dorsal sepal 5-veined; 3-veined petals; and a thick, subquadrate, type A lip with a deep glenion. The dark purple central apparatus seems to be the bull’s eye of a yellow target.

Stelis triplaris Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Norte de Santander: Páramo de Jurisdicciones, 2750 m, 30 April 1982, C. Luer, J. Luer & R. Escobar 7665 (Holotype: SEL). Fig. 53.

This small, caespitose species bears one or two racemes of flowers with three expanded, similar, narrowly ovate, acute sepals; single-veined petals; and a lip with a small, convex, obtuse lip.

Plant small, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 2–4 long, with a tubular sheath from below the middle third, and another sheath below and at the base. *Leaf* erect, coriaceous, elliptical, subacute, 4–5 cm long including a petiole 1–1.5 cm long, the blade 0.7–1 cm wide in dry state, cuneate below into the petiole. *Inflorescence* 1–2; 9–13 cm long, the raceme erect, subclax, secund, mostly simultaneously flowered; floral bracts oblique, inflated, acute, 3 mm long; pedicels 2 mm long; ovary 1.5 mm long; the peduncle 3–6 cm long, from a node near the apex of the ramicaul; *sepals* light green externally, gray within, purple at the base, glabrous, expanded, narrowly ovate, acute, 3-veined, connate basally, the dorsal sepal 4 mm long, 2 mm wide, the lateral sepals 3.5 mm long, 2 mm wide; *petals* light purple, transversely ovate, concave, the

broadly obtuse apical margin thickened, 0.6 mm long, 0.76 mm wide, 1-veined; *lip* light purple, type C, subquadrate, with apex obtuse to minimally acuminate at the tip, 0.6 mm long, 0.8 mm wide, 0.4 mm deep, convex within the margins, shallowly concave within the apex below a shallow sulcus, the dorsum convex, the base truncate, hinged to the base of the column; *column* clavate, ca. 0.8 mm wide and long, the anther and stigmatic lobes apical.

Etymology: From the Latin *triplaris*, “threefold,” referring to the three, acutely ovate sepals.

This small, densely caespitose species is characterized by a subacute, elliptical leaf surpassed by a subclax, secund raceme of flowers with expanded, narrowly ovate, acute sepals. The petals are single-veined, and the small, convex, subquadrate lip is a variation of type C.

Stelis tritriangulata Luer & R.Escobar, *sp. nov.* TYPE: COLOMBIA. Cauca: (S of Popayan) “Paletara,” forest NE of “Hiano,” 3100–3300 m, 15–17 June 1922, F.W. Pennell 7001 (Holotype: AMES), C. Luer illustr. 21963. Fig. 54.

This medium-sized species is distinguished by an erect, long-repent rhizome, and a raceme that exceeds a narrowly elliptical leaf; 3-veined, subacute sepals with the lateral sepals semiconnate and antrorse; thick, triangular petals with the apex acute; and a lip triangular below the middle with the apex acute.

Plant medium in size, epiphytic, long-repent, scandent, the rhizome slender, erect, 1.5–4 cm long between ramicauls; roots slender. Ramicauls ascending, erect, 2–4.5 cm long, with 1–2 evanescent sheaths; *Leaf* erect, coriaceous, narrowly elliptical, acute, 6–9 cm long including a petiole 1–1.5 cm long, the blade 1–1.7 cm wide in the dry state. *Inflorescence* single; 8–10 cm long, the raceme erect, strict, subclax, distichous, with many flowers open simultaneously; floral bracts oblique, obtuse, 3 mm long, 3 mm broad; pedicels 2 mm long; ovary 1 mm long; peduncle 2–3 cm long, with a spathe less than 1 mm long, from a node at the apex of the ramicaul; *sepals* yellow, glabrous, elliptical-ovate, subacute, 3-veined, the dorsal sepal erect, connate basally, 5.5 mm long, 4 mm wide, the lateral sepals oblique, semiconnate, antrorse, 5.5 mm long, 7 mm wide together; *petals* purple, transversely triangular, concave, below the thick, acute apex, 1 mm long, 1.5 mm wide, 3-veined; *lip* purple, rhomboid, 1 mm long, 1 mm wide, 0.5 mm deep, concave below the bar, with a superficial glenion, the apex triangular, the dorsum convex with an low, rounded callus, the base narrowly truncate, hinged to the base of the column; *column* clavate, ca. 1 mm wide and long, the anther and the bilobed stigma apical.

Etymology: From the Latin *tritriangulata*, “three-triangled,” referring to the two petals and lip.

This long-repent species is characterized by a rhizome that produces at intervals a short, erect ramicaul with an acute, elliptical leaf with a subclaxly flowered raceme. The sepals are elliptical-ovate with the lateral sepals connate into a synsepal. The apices of the thick petals and the apex of the lip are triangular and acute.

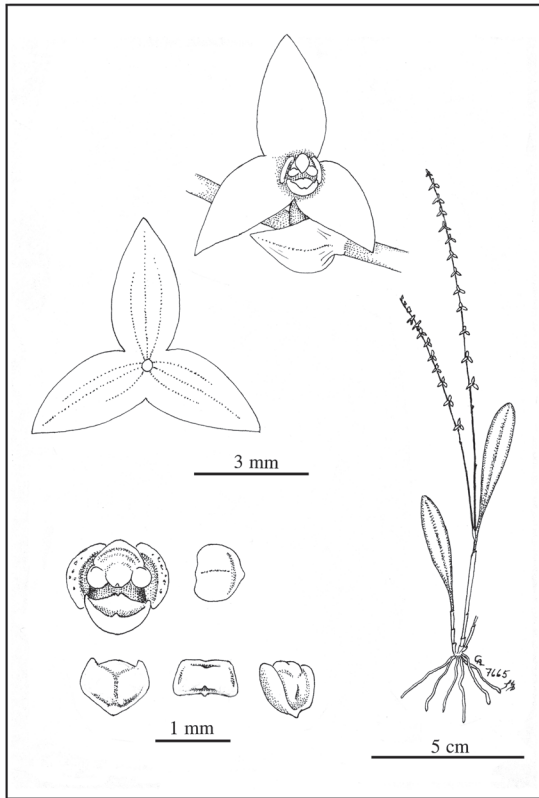


FIGURE 53. *Stelis triplaris* Luer & R. Escobar

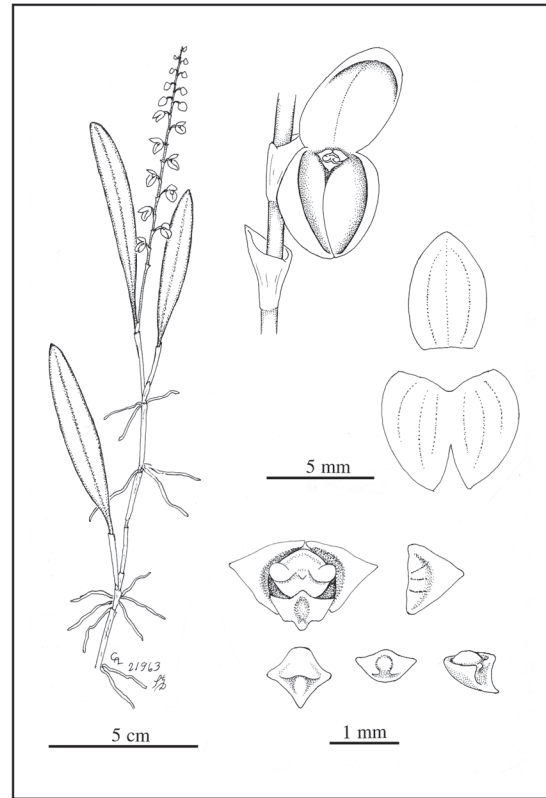


FIGURE 54. *Stelis tritriangulata* Luer & R. Escobar

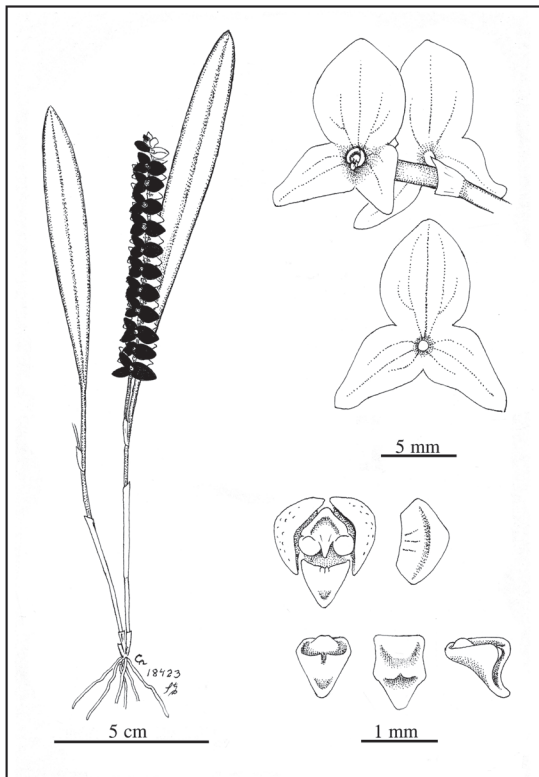


FIGURE 55. *Stelis uribeorum* Luer & R. Escobar

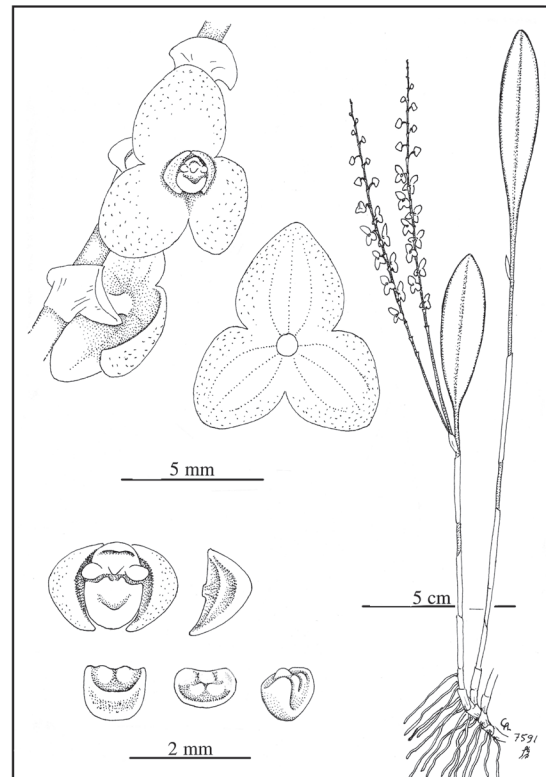


FIGURE 56. *Stelis validipes* Luer & R. Escobar

Stelis uribeorum Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Probably Valle del Cauca: without collection data, fl. in cult. by Orquídeas del Valle, 21 March 1997, C. Luer 18423 (Holotype: MO). Fig. 55.

This species is similar to *Stelis megaloglossa* Luer, but differs with inflorescences not longer than the leaf, and larger, glabrous flowers with ovate, spreading, nearly free lateral sepals.

Plant large, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 6–8 cm long, enclosed by a loose, tubular sheath from below the middle, and 1–2 tubular sheaths below and at the base. *Leaf* erect, coriaceous, narrowly elliptical, acute, petiolate, 13–15 cm long, including a petiole 3–4 cm long, the blade 1.5–1.8 cm wide when dry, narrowed below to the petiole. *Inflorescence* single; 8–12 cm long, the raceme erect, congested, many-flowered, in 2 opposite-facing rows; floral bracts tubular, obtuse, 2 mm long; pedicels 1 mm long; ovary 1 mm long; the peduncle 1.5–2 cm long, subtended by a marrow spathe 1 cm long, from a node below the apex of the ramicaul; flowers shiny dark purple; *sepals* glabrous, the dorsal sepal broadly ovate, broadly obtuse to rounded at the apex, 8 mm long, 6 mm wide, incompletely 5-veined, the lateral sepals ovate, narrowly obtuse, oblique, 6 mm long, 4 mm wide, 3-veined, connate less than 1 mm; *petals* transversely ovate, 0.6 mm long, 1 mm wide, 3-veined, concave, the apex broadly obtuse with the margin minimally thickened, without a transverse carina; *lip* a modified type A, subquadrate, the bar shortly channeled between rounded halves that descend onto the dorsum, the apex acute with the tip rounded, 0.6 mm long, 0.6 mm wide, 0.6 mm deep, the dorsum with a low, rounded callus at the base, the base truncate, hinged to the base of the column; *column* semiterete, ca. 0.6 mm long and wide, the anther and the bilobed stigma apical.

Eponymy: Named for Andrea and Juan Carlos Uribe of Orquídeas del Valle, Cali, Colombia, in whose nursery this species was being cultivated.

This species and the closely related *Stelis megaloglossa* Luer are unusual members of section *Nexipous*. *Stelis uribeorum* is characterized by a narrow, elliptical leaf and a shorter, double-ranked raceme of shiny, dark purple flowers. The rows crowded flowers with a large, rounded dorsal sepal are reminiscent of shelves lined with a collection of human skulls in a museum. The smaller lateral sepals are connate below the middle. The central apparatus is minute, the petals are 3-veined, and the apex of the lip is triangular.

Stelis uribeorum is similar to *Stelis megaloglossa*, but it

is distinguished from the latter by the raceme that does not exceed the leaf, and larger flowers with twice larger, spreading lateral sepals that are connate only toward the base.

Stelis validipes Luer & R. Escobar, *sp. nov.* TYPE: COLOMBIA. Santander: Bucaramanga, between Bucaramanga and Berlin, 2800 m, 27 April 1982, C. Luer, J. Luer & R. Escobar 7591 (Holotype: SEL). Fig. 56.

This large, shortly repent species is characterized by erect ramicauls borne by a thick, ascending rhizome; elliptical leaves; two or three much longer, many-flowered racemes; obtuse sepals with large, scattered cells; 3-veined petals; and a rounded lip with a rounded callus on the dorsum.

Plant large, epiphytic, shortly ascending-repent, the rhizome stout, 4–5 mm thick, ca. 5 mm between ramicauls; roots slender. Ramicauls erect, slender, 8–16 cm long, with a close tubular sheath from above the middle, and another 1–2 sheaths below and at the base. *Leaf* erect, coriaceous, elliptical, acute to subacute, petiolate, 7–9 cm long including a petiole 1.5–2 cm long, the blade 1.3–1.8 cm wide in the dry state, cuneate below into the petiole. *Inflorescence* 2–3 simultaneous; 11–17 cm tall, the raceme erect, strict, distichous, many-flowered; floral bracts oblique, obtuse, dilated, 2.5–3 mm long and wide; pedicels 1.5 mm long; ovary 1.5 mm long; the peduncle 2–4 cm long, from a node below the apex of the ramicaul; *sepals* rose colored, with large, scattered cells, broadly ovate, obtuse, 3-veined, connate in lower fourth, the dorsal sepal 4 mm long, 4 mm wide, the lateral sepals 3 mm long, 3.5 mm wide; *petals* transversely semilunate, 0.75 mm long, 1.5 mm wide, 3-veined, broadly rounded and thick at the apex, concave below a transverse carina; *lip* subquadrate, 0.75 mm long, 1 mm wide, 0.5 mm deep, shallowly concave below a thick, bigibbous bar with an indistinct glenion, the apex rounded with a broad margin, the dorsum with a central, rounded callus between the gibbous halves of the bar, the base truncate, hinged to the base of the column; *column* clavate, ca. 1 mm wide and long, the anther and stigmatic lobes apical.

Etymology: From the Latin *validipes*, “strong-footed,” referring to the thick rhizome.

This large, ascending-species is distinguished by tall, slender ramicauls produced along a thick rhizome, elliptical leaves and two or three much longer racemes. The relatively large sepals are sparsely studded within with large cells. The lip is type A with a broad, rounded apex, and a bigibbous bar with a subspherical callus between the humps of the bar.

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OCOTEA BATATA (LAURACEAE), A NEW SPECIES FROM BRAZIL

PEDRO LUÍS RODRIGUES DE MORAES^{1,2} AND MATHEUS CARVALHO VERGNE¹

Abstract. *Ocotea batata*, a new species from the Brazilian Atlantic rain forest of Bahia and Espírito Santo States is described and illustrated. Its relationships within the genus are discussed.

Resumo. *Ocotea batata*, uma espécie nova da Mata Atlântica brasileira dos estados da Bahia e Espírito Santo é descrita e ilustrada. Suas relações dentro do gênero são discutidas.

Keywords: Lauraceae, *Ocotea*, new species, Bahia, Espírito Santo, Brazil

In the course of preparing the treatments of Lauraceae for the Flora of Bahia and for the Reserva Natural Vale, Linhares, Espírito Santo, Brazil, an undescribed species of *Ocotea* Aubl. was encountered. Its description and illustrations are presented below.

Ocotea is the largest genus of Lauraceae in the Neotropics found from Mexico to Argentina. Rohwer (1993) estimated the existence of about 350 species, most of them occurring in tropical and subtropical America and about 50 in Madagascar, seven in Africa, and one in the Canary Islands. More recently, van der Werff (2011) estimated the existence of 350 to 400 species, but an additional 44 species have been described since then by several authors (Brotto and Baitello, 2012; van der Werff, 2012, 2013a, b, 2014; Assis and Santos, 2013), and another 21 will be published soon (H. van der Werff, pers. comm.). In Brazil, there are about 170 species recognized to date (156 in Quinet et al., 2010): at least 48 occur in Bahia, and 32 in Reserva Natural Vale, Espírito Santo. The genus is characterized by having paniculate-cymose inflorescences, flowers with

nine 4-celled stamens with the locelli arranged in two superposed pairs and the fruits seated in a cupule (van der Werff, 2009). The genus is likely polyphyletic (Chanderbali et al., 2001) and in need of a revision. However, the large size of the genus makes a revision of the entire group difficult to accomplish, being beyond the scope of most botanists (van der Werff, 2014). The last revision of *Ocotea* sensu Kostermans (1957), including *Nectandra* Rol. ex Rottb. and *Pleurothyrium* Nees, dates back to the *Lauraceae Americanae* of Mez (1889). Rohwer (1986) published a synopsis of the genus *Ocotea*, proposing subdivision into smaller informal entities, which encompassed 29 groups of species sharing morphological affinities, and 54 species treated singly. No subsequent monographic treatments of such groups have been published, except for the study of the *Ocotea indecora* (Schott) Mez group undertaken by Assis and Mello-Silva (2010). A synopsis of the Central American species was published (van der Werff, 2002), but the South American species are still less well known (Moraes and van der Werff, 2011).

MATERIAL AND METHODS

This study was based on literature review and morphological analysis of specimens deposited in the following herbaria: ALCB, B, BAH, BHCB, BR, C, CEN, CEPEC, CVRD, E, ESA, F, G, G-DC, GOET, GZU, HAL, HB, HBG, HRB, HRCB, HUEFS, HUESBVC, HUNEB, IAN, IBGE, INPA, IPA, K, KIEL, L, LE, LISU, M, MBM, MBML, MEL, MG, MO, NY, OXF, P, PEUFR, R, RB, SP, SPF, SPSF, TUB, U, UB, UEC, UESC, UFP, and VIES (acronyms according to Thiers, continuously updated). Photographs of flower structures were obtained with a stereomicroscope (Leica, M80) equipped with a camera (Leica, IC80 HD), using the software LAS (Leica Application Suite) Interactive Measurements.

Photographs of leaves were obtained with a digital equipment Faxitron X-ray (model LX-60 number 120807305) coupled to a computer with the software Faxitron DX version 1.0, where the images were captured by using an X-ray exposure time of 19 seconds at a voltage of 30 kV. Photographs of leaf areoles were obtained with a light microscope (Leica, M500) equipped with camera and software LAS. Leaf diaphanization was done according to Moraes and Paoli (1999). Descriptive terminology of leaf venation follows Hickey (1973) and Coe-Teixeira (1980). Abbreviations used in the text are as follows: fl. = flower; fr. = fruit; immat. fr. = immature fruit; ster. = sterile.

We thank the curators and staff of the herbaria we consulted (see list below) and of those that sent loans and gifts to HRCB. Our sincere gratitude to Mario Tomazello Filho (ESALQ/USP) for making available the X-Ray equipment, to Henrique L. Ribeiro for producing the map, to Geovane S. Siqueira for all support and help during field work in Reserva Natural Vale, and to Isabel C. L. da Cruz for the diaphanization of leaves. The senior author thanks CAPES for the grant 0781/2014 (Proc. 88881.030430/2013-01), and CNPq for the grant PQ2 (Proc. 304985/2012-0). The junior author thanks CNPq and CAPES for the M. Sc. scholarships.

¹ Universidade Estadual Paulista "Júlio de Mesquita Filho," Instituto de Biociências, Departamento de Botânica, Av. 24 A 1515, Bela Vista, Caixa Postal 199, 13506-900 Rio Claro, SP, Brazil;

² Author for correspondence; pmoraes@rc.unesp.br

NOMENCLATURE

Ocotea batata P.L.R.Moraes & Vergne, *sp. nov.* TYPE: BRAZIL. Espírito Santo: Linhares, Reserva Natural Vale, 19°11'11.1"S, 39°54'40.6"W, 12 December 2012, bud, fl. ♂, P. L. R. de Moraes & G. S. Siqueira 3528 (Holotype: HRCB [59814]; Isotypes: CVRD, HBG). Fig. 1.

Ocotea batata is remarkable among the Brazilian species of the genus and can be separated from them by a combination of a peculiar fissured, yellowish bark, twigs with lenticels, glabrous leaves above, pubescent below, with barbellate-foveolate domatia in the axils of the primary and secondary veins, very short, axillary, pubescent, few-flowered inflorescences, fruit ellipsoid seated on a shallow, infundibuliform cupule.

Trees up to 7 m. *Twigs* terete, angular when young, glabrous to glabrescent at the base, dense to sparse pubescent or sericeous near the tip, with long, straight and appressed trichomes, lenticelled; terminal buds pubescent, with yellowish trichomes. *Leaves* alternate, 3.5–16.8 × 1.2–6.2 cm, elliptic to ovate to obovate, chartaceous, glabrous above, except for some sparse trichomes on midrib, papillose, pubescent below, with ± short, straight, appressed trichomes, papillose, the base acute, short cuneate, asymmetric, the margin sclerified, flat, the apex shortly to long acuminate; venation pinnate, eucamptodromous to weak brochidodromous, areole development incomplete, randomly arranged, with branched veinlets; midrib and secondary veins impressed above, raised below, secondary veins 3–5 on each side of the midrib; barbellate-foveolate domatia in the axils of secondary veins; petioles 0.4–1.4 cm long, semiterete, flat to slightly canaliculate above, glabrescent in older leaves, densely pubescent in young ones. *Inflorescences* pubescent, tyrsoid, much shorter than leaves, 0.5–1.5 cm long, few-flowered, mainly in the axils of distal leaves, peduncle short. *Flowers* unisexual, white in live material, tube shallow, urceolate, with very short pedicels, sparsely pubescent, with long, appressed, straight to curled trichomes; *male flowers*: inside pubescent, pedicels 1.0–1.3 × 0.7–0.8 mm, fertile stamens 9 (whorls I, II and III) exerted, all 4-celled, 2.2–2.4 × 3.1–4.4(–5.0) mm, the filaments equal to shorter than the anthers, the outer six with the locelli introrse, the inner three with the locelli extrorse-lateral and 2 globose glands at the base; tepals 6, equal, spreading in anthesis, about 1.7–2.7 × 1.3–1.8 mm, elliptic to ovate, outside pubescent, with straight, appressed, short to long trichomes, inside glabrous to slightly pubescent, the trichomes as the ones on outside, tip roundish, obtuse, papillose; stamens of whorl I glabrous, 1.5–2.0 mm long, anthers ovate, tip truncate, subemarginate, 0.9–1.0 × 0.9–1.0 mm, filaments slender, slightly pilose at the base, 0.6–1.0 mm long; stamens of whorl II equal to the whorl I, slightly shorter, 1.3–1.8 mm long, anthers 0.9–1.0 × 0.7–0.8 mm, filaments 0.6–0.9 mm long; stamens of whorl III clavate, glabrous, 1.7–1.9 mm long, anthers rectangular, tip truncate, subemarginate, papillose, 0.8–0.9 × 0.6–0.7 mm, filaments slender, 0.8–0.9 mm long, glands globose, slightly shorter than the filaments, 0.5–0.7 × 0.6–0.8 mm, stalk 0.2–0.3 mm long; stamimodia of whorl IV liguliform, densely pubescent, 0.4 mm long; pistillode glabrous, 1.8–2.0 mm long, stipitiform, stigma discoid, well-developed; *female*

flowers: equal in shape to male flowers, larger, 2.8–2.9 × 2.8–3.6 mm, subsessile; tube deeper, inside pubescent; tepals 6, equal, spreading in anthesis, elliptic to ovate, about 1.7–2.1 × 1.1–1.3 mm, tip obtuse, roundish, rarely acute, papillose, outside pubescent, inside slightly pubescent; staminodia 12 (whorls I, II, III, and IV), equal in shape to the stamens of male flowers, but smaller, clavate, glabrous, pilose at the base; whorl I 0.7–0.8 mm long; whorl II 0.7–0.8 mm long; whorl III 0.8–1.3 mm long, glands globose, 0.3–0.4 × 0.4–0.6 mm, stalk 0.1–0.3 mm long; whorl IV liguliform, densely pubescent, 0.6 mm long; pistil glabrous, 1.2–1.7 mm long, style cylindrical, robust, twisted, 0.6 mm long, ovary urceolate, 0.9–1.0 × 0.7–0.9 mm, stigma discoid, large. *Fruits* dark purple in live material, 1.3–1.7 × 1.1–1.3 cm, ellipsoid, subglobose, exerted from the shallow, 0.7–0.9 × 0.5–0.9 cm, infundibuliform cupule (red in live material); the pedicel swollen, but shrunken in dried material. Figs. 2–4.

Phenology: Flowers collected from December to April. Immature fruits collected from September to December; mature fruits collected in December.

Etymology: The common name of the new species has been coined by Domingos Folli as “canela-batata,” in allusion to the color of the bark of the trunk that resembles the color of the peel of potato tubers (*Solanum tuberosum* L.), which is called “batata” in Portuguese. We propose the specific epithet name *batata*, based on its common name, here used as a noun in apposition, thus in reference to the peculiar color of the bark of the trunk, which is unusual for the known Brazilian species of *Ocotea*.

Distribution and habitat: *Ocotea batata* is known only from few locations of the Atlantic rain forest domain (Fig. 5). It is relatively abundant in the understory of the tabuleiro forest (lowland ombrophilous dense forest) of Reserva Natural Vale, Linhares, Espírito Santo, in an altitudinal range of 28–65 m. It has been also collected in montane ombrophilous dense forest in Santa Lúcia Biological Station, Santa Teresa, Espírito Santo, at 650 m, and in the region of Arataca, southern Bahia, in an altitudinal range of 500–800 m. It is also registered from small fragments of submontane ombrophilous dense forest in the region of Itamaraju, at about 115 m.

Additional specimens examined: BRAZIL. Bahia: Arataca, Rod. Arataca/Una, Serra do Peito de Moça, RPPN Palmeiras/IESB, trilha que leva ao topo da serra, 15°10'27"S, 39°20'22"W, 500–800 m, 18 December 2005, immat. fr., J. G. Jardim *et al.* 4869 (CEPEC, NY, RB); Itamaraju, Fibra, 3 December 2014, fl. ♀, fr., P. L. R. de Moraes *et al.* 4328 (HRCB, MO). Espírito Santo: Linhares, Reserva Natural Vale, estrada Paraju km 0.15, 5 October 1982, immat. fr., D. A. Folli 401 (CVRD, ESA, MO, SPSF); idem, BR 101 km 1.2, próximo ao Córrego Pau Atravessado, 3 April 1999, fl. bud, D. A. Folli 3390 (CVRD, HRCB, HUEFS, MO); idem, estrada Gávea, RFL-01/80 Bloco D Trat-5, 23 February 2004, fl. bud, D. A. Folli 5033 (CVRD, ESA, HRCB, HUEFS, RB); idem, estrada Alameda 03, 3 March 2005, fl. ♂, D. A. Folli 5035 (CVRD, HRCB, HUEFS); idem, estrada Peroba Amarela, 19°09'45.5"S, 40°04'11.5"W, 16 November 2006, immat. fr., A. Quinet 1051 (CVRD,

FIGURE 1. Holotype of *Ocotea batata* P.L.R. Moraes & Vergne (Moraes 3528, HRCB).

HRCB); idem, estrada Louro, 12 April 2010, fl. ♂, *G. S. Siqueira 541* (CVRD, HRCB); idem, estrada Ipê Amarelo, 12 February 2011, fl. ♂, *D. A. Folli 6765* (CVRD, HRCB); idem, 6 September 2011, ster., *P. L. R. de Moraes et al. 3175* (HRCB); idem, 19°07'01.6"S, 39°55'05.3"W, 11 December 2012, fl. ♀, *P. L. R. de Moraes & G. S. Siqueira 3530* (CVRD, HBG, HRCB); idem, estrada Jueirana Vermelha, 10 September 2015, immat. fr., *P. L. R. de Moraes & M. C. Vergne 4957* (HRCB); Santa Teresa, Estação Biológica de Santa Lúcia, Valsugana Velha, 650 m, 19 March 1999,

fl., *L. Kollmann & E. Bausen 2193* (MBML, SPF, UEC); Sooretama, Reserva Natural Vale, estrada Jueirana Facão, 3 October 2014, immat. fr., *G. S. Siqueira 1010* (CVRD, HRCB, RB); idem, Reserva Biológica de Sooretama, área da sede, 14 March 1972, fl., *D. Sucre 8693* (MO, RB).

Given the combination of morphological characters found in *Ocotea batata* (Table 1), it is difficult to place the new species in any of the informal groups of species with unisexual flowers proposed by Rohwer (1986). It appears to fit best in the *Ocotea dispersa* group, which includes

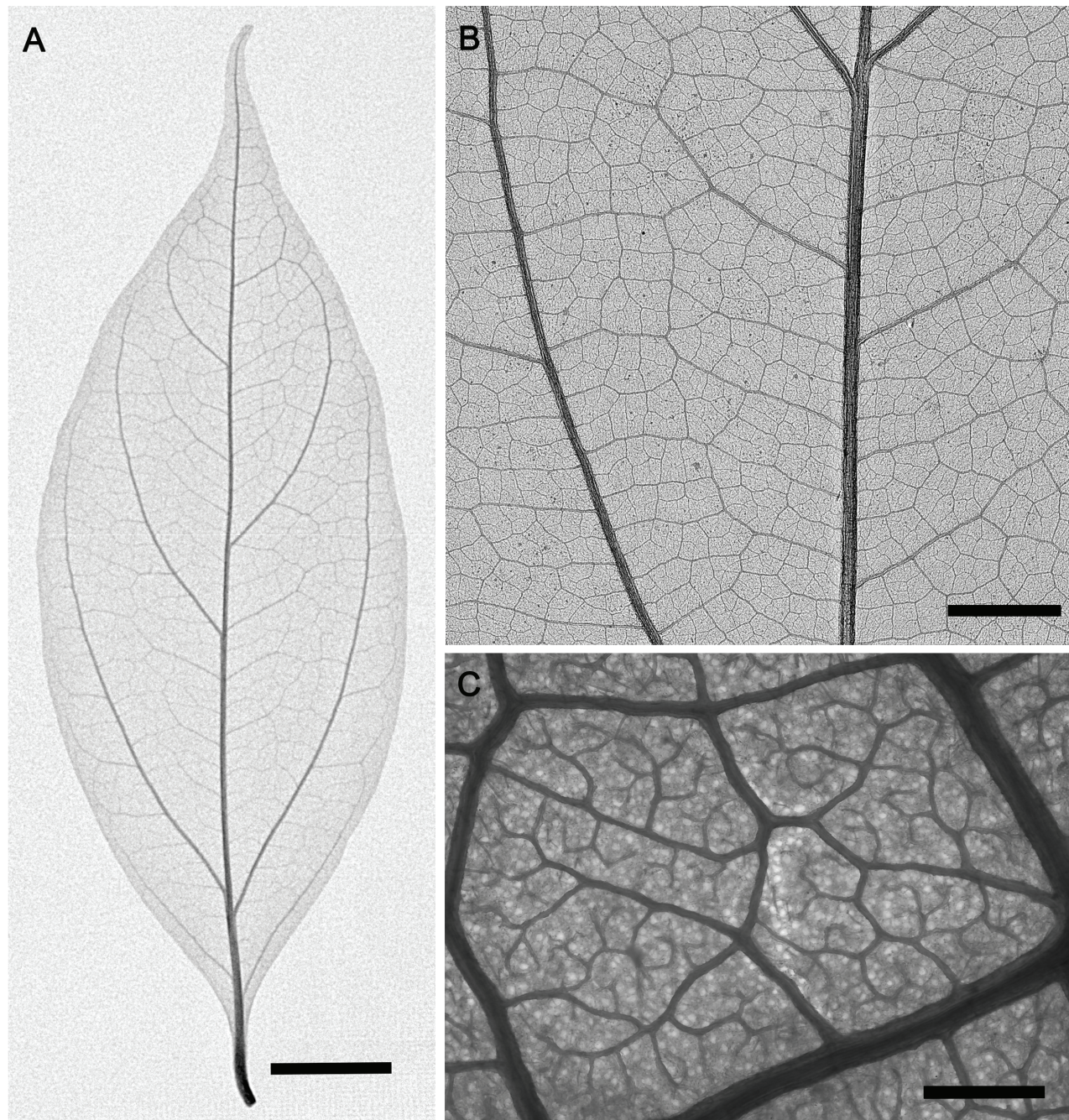


FIGURE 2. Leaf venation of *Ocotea batata* P.L.R. Moraes & Vergne (*Moraes 3528*). **A**, mature leaf, pinnate, weak brochidodromous; **B**, detail of reticulation, areoles incomplete, randomly arranged; **C**, detail of areoles incomplete, with branched veinlets. Bars = 1 cm (A); 0.33 cm (B); 0.5 mm (C).



FIGURE 3. *Ocotea batata* P.L.R. Moraes & Vergne. **A**, trunk showing the peculiar yellowish bark; **B**, branch with inflorescences (*Moraes* 3528); **C**, female flower (*Moraes* 3530); **D**, immature fruit (*Moraes* 4957); **E**, mature fruit (*Moraes* 4328).

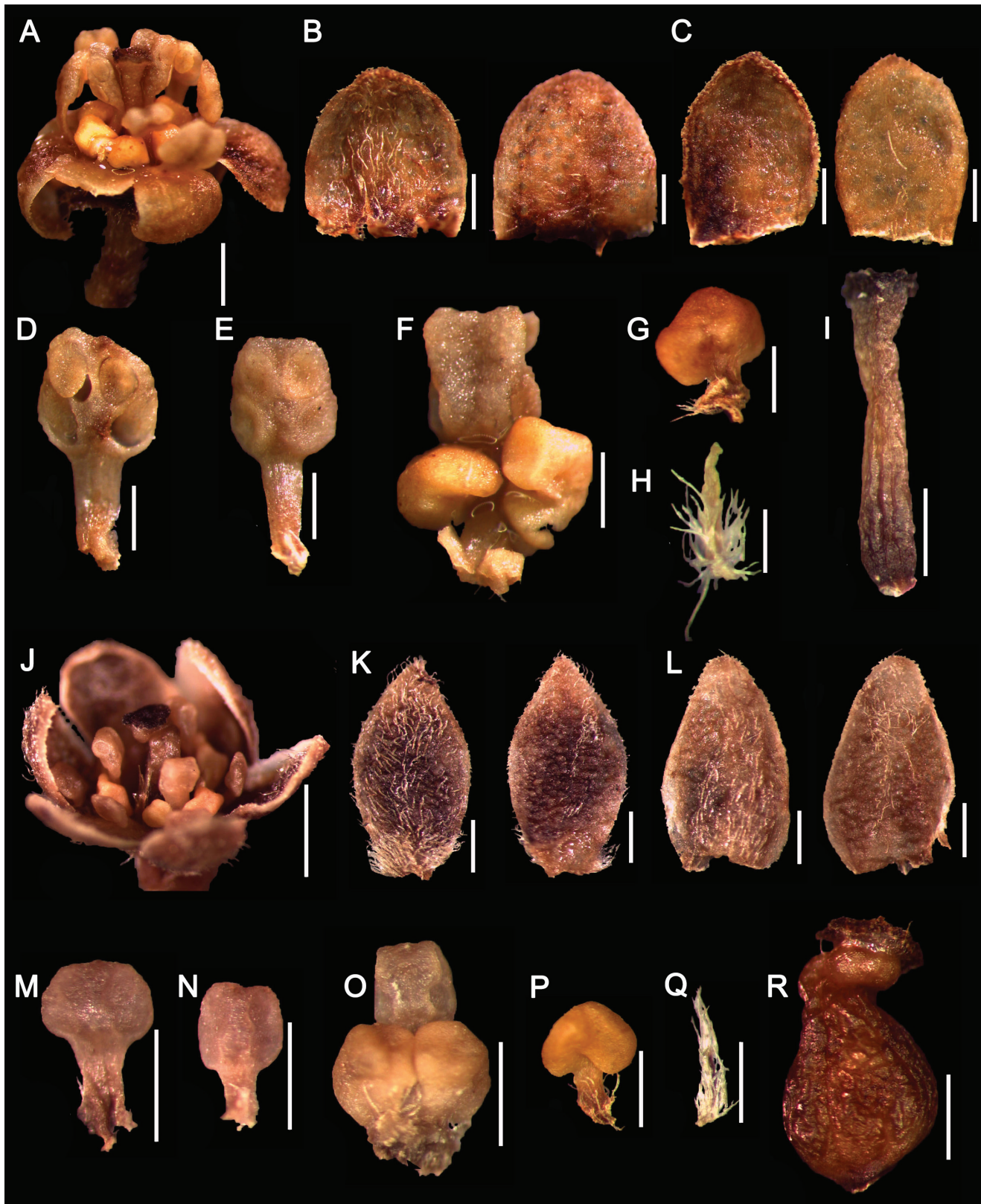


FIGURE 4. *Ocotea batata* P.L.R. Moraes & Vergne. A–I. Male flower from Moraes 3528 (HRCB). A, flower; B, outer tepals, abaxial and adaxial surfaces; C, inner tepals, abaxial and adaxial surfaces; D, stamen of whorl I; E, stamen of whorl II; F, stamen of whorl III; G, gland; H, staminode of whorl IV; I, pistillode. J–R. Female flower from Moraes 3530 (HRCB). J, flower; K, outer tepals, abaxial and adaxial surfaces; L, inner tepals, abaxial and adaxial surfaces; M, staminode of whorl I; N, staminode of whorl II; O, staminode of whorl III; P, gland; Q, staminode of whorl IV; R, pistil. Bars = 1 mm (A, J); 0.5 mm (B, C, D, E, F, G, I, K, L, M, N, O, Q, R); 0.2 mm (H, P).

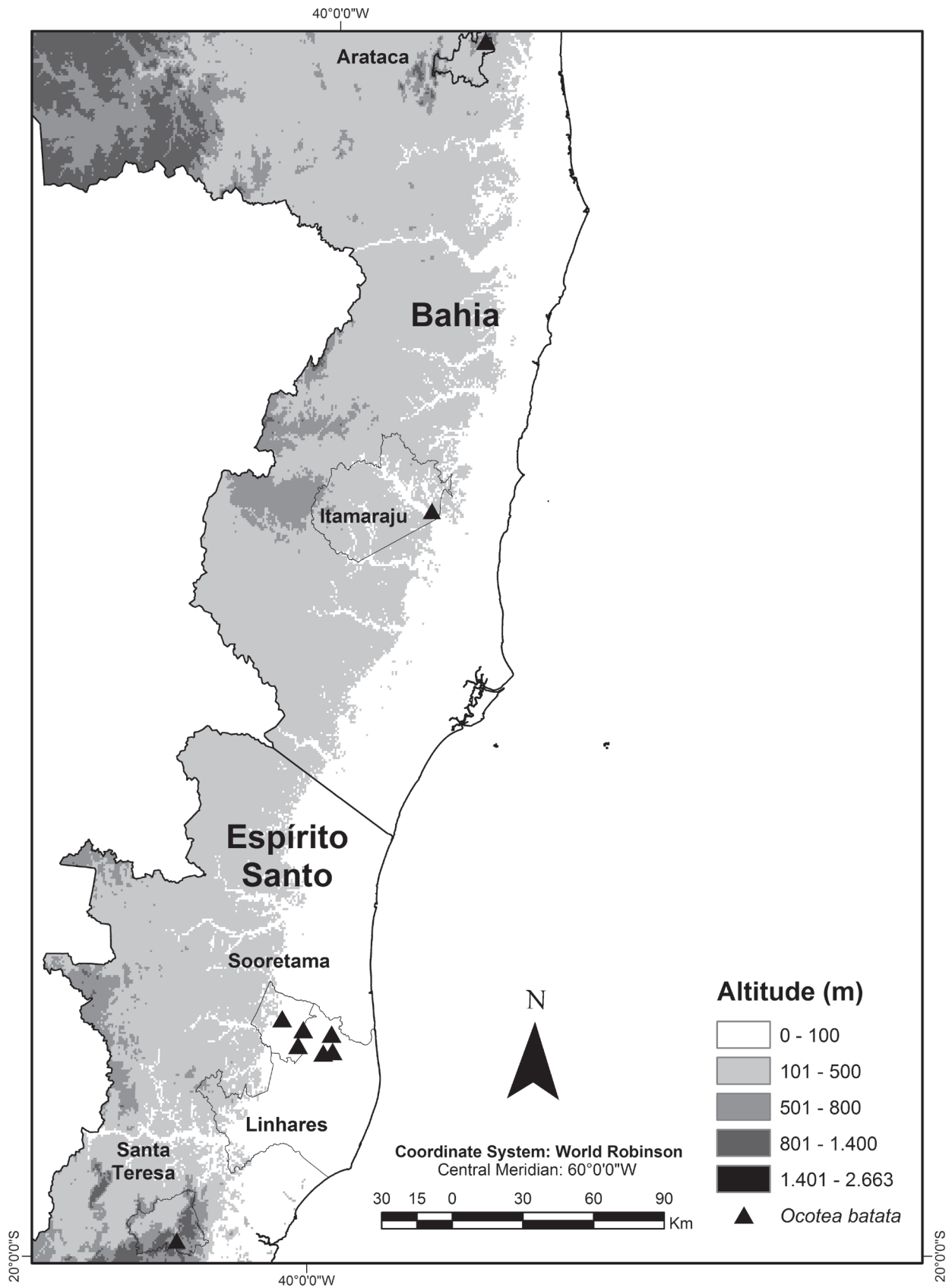


FIGURE 5. Geographic distribution of *Ocotea batata* P.L.R. Moraes & Vergne.

TABLE 1. Comparative morphology and geographic distribution of *Ocotea batata* and putative related species (States of Brazil: AM = Amazonas, AP = Amapá, BA = Bahia, ES = Espírito Santo, MG = Minas Gerais, PA = Pará, PR = Paraná, RJ = Rio de Janeiro, SC = Santa Catarina, SP = São Paulo).

CHARACTERS	<i>O. BATATA</i>	<i>O. DISPERSA</i>	<i>O. DIVARICATA</i>	<i>O. PERCURRENS</i>
Habit	Tree (7 m)	Tree (16 m)	Tree (18 m)	Tree (35 m)
Twig indument	Dense to sparsely pubescent at the tip, glabrous to glabrescent at the base	Pubescent at the tip, glabrescent at the base	Glabrous to sparsely pubescent or pubescent	Pubescent
Twig lenticels	Present	Present	Present at the base	Absent
Phyllotaxy	Alternate	Alternate to subopposite at tip	Alternate	Alternate
Leaf form	Elliptic to ovate to obovate	Elliptic to obovate	Wide-elliptic to obovate	Elliptic
Leaf size (cm)	3.5–16.8 × 1.2–6.2	3.5–13.4 × 1.7–5.2	2–20 × 1.6–15	4.8–13.7 × 2.3–5.1
Leaf indument	Glabrous above, pubescent below	Glabrous to glabrescent above, sparsely to dense pubescent below	Glabrous above, glabrescent below	Glabrous above, glabrescent to pubescent below
Domatia	With trichomes and pit	With trichomes and pit	With trichomes and pit	With trichomes
Petiole length (cm)	0.4–1.4	0.6–1.1	0.4–1.8	0.5–1.2
Petiole-cross section	Slightly canaliculate	Canaliculate	Slightly canaliculate	Non-canaliculate
Petiole indument	Glabrescent	Glabrescent to pubescent	Glabrous	Pubescent
Inflorescence indument	Pubescent	Pubescent	Glabrous	Pubescent
Inflorescence size (cm)	0.5–1.5	2–3	5–10	4–7.2
Flower indument	Sparsely pubescent	Dense to sparsely pubescent	Glabrescent	Pubescent
Flower size (mm) ♂	2.2–2.4 × 3.1–4.4(–5.0)	2–4 × 2–3	2.1–2.4 × 2–2.8	3.0–3.7 × 2.5–3
Tepal size (mm) ♂	1.7–2.7 × 1.3–1.9	0.9–1.1 × 0.5–0.8	1.3–2 × 1–2	1.0–1.7 × 0.6–1.1

TABLE 1 CONT. Comparative morphology and geographic distribution of *Ocotea batata* and putative related species (States of Brazil: AM = Amazonas, AP = Amapá, BA = Bahia, ES = Espírito Santo, MG = Minas Gerais, PA = Pará, PR = Paraná, RJ = Rio de Janeiro, SC = Santa Catarina, SP = São Paulo).

CHARACTERS	<i>O. BATATA</i>	<i>O. DISPERSA</i>	<i>O. DIVARICATA</i>	<i>O. PERCURRENS</i>
Outer stamens length (mm) ♂	1.3–2.0	1–1.5	1.1–1.3	0.6–1.2
Inner stamens length (mm) ♂	1.7–1.9	1.0–1.6	1.1–1.2	0.8–1.3
Pistillode (mm) ♂	1.8	Absent to vestigial	Absent to present: 0.3–0.4	1.1–1.8
Flower size (mm) ♀	2.8–2.9 × 2.8–3.6	2.1–3 × 2.1–2.2	1.9–2.2 × 1.9–2	2.8–3.7 × 2.9–3.4
Tepal size (mm) ♀	1.7–2.1 × 1.1–1.3	0.9–1.4 × 0.6–1.1	1.2–1.3 × 0.9–1.2	0.9–1.2 × 0.6–0.8
Outer staminodia length (mm) ♀	0.7–0.8	0.6–0.8	0.7–0.8	0.4–0.5
Inner staminodia length (mm) ♀	0.8–1.3	0.7–0.8	0.7–0.9	0.5–0.6
Pistil ♀	Glabrous	Glabrous	Glabrous	Glabrous or nearly so
Pistil length (mm) ♀	1.2–1.7	1.6	1–1.1	1.5–1.6
Style length (mm) ♀	0.6	0.5–0.6	0.04–0.09	0.5–0.7
Ovary length (mm) ♀	0.9–1.0	0.8–0.9	0.8–1.2	0.6–0.8
Fruit size (cm)	1.3–1.7 × 1.1–1.3	0.9–1.2 × 0.6–0.8	0.7–2 × 0.6–2.5	0.9–1.5 × 0.5–0.8
Habitat	Understory of lowland, submontane and montane ombrophilous dense forests	Understory of lowland and montane ombrophilous dense forests, and in montane ombrophilous mixed forest	Submontane and montane ombrophilous dense forests, in semideciduous forests, and in restinga	Northeastern part of the Amazon Basin, with disjunct distribution in the Atlantic forest in Bahia
Geographical distribution	BA, ES	ES, MG, PR, RJ, SC, SP	BA, ES, MG, RJ, SP	Brazil: AM, AP, BA, PA; French Guiana; Suriname

O. dispersa (Nees & Mart.) Mez, *O. nutans* (Nees) Mez, and *O. glauca* (Nees & Mart.) Mez, which are essentially Brazilian species. Characteristic of this group are the relatively small trees (up to 16 m), leaves about 5–15 cm long, shape varying from \pm elliptic, ovate-elliptic to oblanceolate, inflorescences shorter than the leaves and only slightly branched, flower diameter about 3–4 mm, pistillode varying from relatively well developed (stipitiform) to completely reduced (vestigial), pubescent or glabrous, fruit elliptic seated on a cup-shaped to almost hemispherical cupule, which usually keeps remnants of tepals on the single rim. Actually, *O. batata* resembles *O. dispersa* in the general vegetative aspect and some herbarium specimens have been wrongly determined as the latter (*Kollmann 2193*; *Sucre 8693*). Both species share features like twigs with lenticels, leaves of almost same shape and size, barbellate-foveolate domatia in the axils of secondary veins, short inflorescences, pubescent, and flowers short pedicelled. However, they differ in the different indument of twigs and leaves: the trichomes of *O. dispersa* are longer, usually denser, and ascending, while in *O. batata* they are appressed. Additionally, the trunk of *O. batata* has the bark fissured and yellowish vs. smooth and greyish in *O. dispersa*, and flowers relatively wider, fruits larger, cupule infundibuliform, shallow, smooth, enclosing only the base of the fruit vs. cup-shaped, usually 6-lobed, warty, enclosing about 1/3 of the fruit in the latter. The male flowers of *O. dispersa* have smaller stamens, stout filaments, absent or liguliform staminodia, and vestigial or absent pistillode, while in *O. batata* the filaments are relatively slender, the liguliform staminodia are always present, and the pistillode is stipitiform.

The fruit specimen collected by *Jardim 4869* in Arataca, Bahia was identified by A. Amorim (CEPEC) and by L. Assis (RB) as allied to *Ocotea divaricata* (Nees) Mez, a species that belongs to the *Ocotea cernua* (Nees) Mez group proposed by Rohwer (1986). Although the leaves and fruits of that specimen at first glance generally would resemble those of *O. divaricata* in shape and size, a detailed examination of the exsiccate shows that the indument on the twigs, leaves and petioles, presence of barbellate-foveolate domatia, and the axillary, short pedicelled fruits, developed from no peduncle, closely match the other known specimens of *O. batata*. Since *O. divaricata* has inflorescences relatively large, often with an axis in zigzag, many-branched, many-flowered, usually glabrous to sparsely pubescent, its fruits usually have relatively long pedicels developed from the branches of former inflorescences, thus not straight from the axils of leaves or bracts like in *O. batata*. Moreover, *O. batata* could not be closely related to *O. divaricata* because their floral parts are quite distinct.

Ocotea batata could also be confounded at first glance with *O. percurrens* Vicentini, a species with a disjunct distribution between the Amazon and Atlantic forest domains. Their leaves can be similar in shape and size and in the general aspect of the dried material. However, *O. percurrens* is a tall tree and also differs in the indument covering the terminal buds and twigs, by erect and crisped trichomes, petioles non canaliculate, barbellate domatia, smaller filaments of stamens of male flowers, pistillode with stigma inconspicuous, and female flowers with tube glabrous inside, for instance.

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COUSINIA AZMARENSIS (ASTERACEAE, CARDUEAE), A NEW SPECIES FROM KURDISTAN, IRAQ

SAMAN A. AHMAD,¹⁻³ AZAD RASTEGAR,⁴ AND FARIDEH ATTAR⁴

Abstract. *Cousinia azmarensis* (Asteraceae, Cardueae), an endemic species from Kurdistan region (Iraq), is described and illustrated, and its distinguishing characters are discussed. It is easily separated from closest relatives *C. cymbolepis* DC. by having 115–125 flowers per head (vs. 80–90), heads 3.5–5.5 cm in diameter (vs. 3–4 cm), purple corolla (vs. pink), and 4–5 spines on each side of median bracts (vs. 2 or 3). It differs from *C. qandilica* by having 115–125 flowers per head (vs. 80–120), heads 3.5–5.5 cm in diameter (vs. 3–4), purple corolla (vs. yellow), and 4–5 spines on each side of median bracts (vs. 2 or 3). *Cousinia calocephala* is recorded herein for the first time in Iraq.

Keywords: Asteraceae, *Cousinia*, Azmar-Goizha, QaraDagh, Kurdistan, Iraq

Cousinia Cass. was described in 1827 based on *Carduus orientalis* Adams (= *Cousinia carduiformis* Cass.) (Cassini, 1827: 503). It is one of the largest genera in Asteraceae, with 600–700 species distributed in central and western Asia (Susanna and Garcia-Jacas, 2006). Rechinger (1986) and Knapp (1987) recognized eight major centers of species diversity in SW and C Asia: SE Anatolian and N Zagros Mts. (SE Turkey and NW Iran), Zagros Mountains (Iran and N Iraq), Elburz Mountains (Iran), Kopet Dagh Mountain (Turkmenistan), West Hindu Kush (C and W Afghanistan), East Hindu Kush (NE Afghanistan), Pamir-Alay (Tajikistan, Uzbekistan), and Tian-Shan (C Asia). Section *Cynaroideae* Bunge, which includes 89 species (Tscherneva, 1962; Rechinger, 1972, 1979; Huber-Morath, 1975), is the largest in the genus, and all its species are Irano-Turkestanian elements (Rechinger, 1986). Iraq and Turkey have 17 and eight species, respectively. By contrast, Iran has 77 taxa, 66 of which are endemics, and it is the diversity center for the section (Attar and Ghahreman, 2006).

The Azmar-Goizha and QaraDagh Mountains (Kurdistan region, Iraq) are part of Zagros Mountain system. During the years 2014–2016 the Kurdistan Botanical Foundation conducted extensive floristic fieldwork in Azmar-Goizha and QaraDagh Mountains; all herbarium vouchers are deposited at KBFH. Several species were found to be either new to science or new to Iraq, and the following two species of *Cousinia* are reported herein.

Cousinia azmarensis S.A.Ahmad, A.Rastegar, & F.Attar, *sp. nov.* (sect. *Cynaroideae*). TYPE: IRAQ. Kurdistan region, Sulaimani Province: Azmar Mountains, above Welayer village, vineyard beside the road, slope 45–60%, sun exposure SE to NW, 1542 m, 35°31'40"N, 45°31'55"E,

18 June 2014, S.A.Ahmad, A. Hama, and R. Ali 14-2048 (Holotype, KBFH; Isotypes: HKS, KBFH). Fig. 1.

Cousinia azmarensis is most closely related to *C. qandilica* Rech.f. and *C. cymbolepis* Boiss. by having 115–125 flowers per head, head diameter 3.5–5.5 cm, 4–6 spines on each side of median bracts, and purple corolla. By contrast, *C. qandilica* has 80–120 flowers per head, head diameter 3–4 cm, 2 or 3 spines on each side of median bracts, and yellow corolla, whereas *C. cymbolepis* has 80–120 flowers per head, head diameter 3–4 cm, 2 or 3 spines on each side of median bracts, and pink corolla (see detailed differences in Table 1).

Plant monocarpic, perennial. *Stem* up to 35 cm high, green-grayish, scarcely arachnoid-tomentose, branched from middle. *Leaves* slightly tomentose adaxially, reticulate veined; basal leaves 10–13 × 5–7 cm, pinnatisect-pinnatifid, margins densely spinulose, lateral spines up to 10 mm, midvein prominent; cauline leaves 5–6 × 1.5–2.5 cm, spatulate, base attenuate, densely leafy to beneath capitula. *Capitula* homogamous, discoid, 3.5–5 cm diam., 115–125-flowered; involucre spherical, 3.5–4 cm diam.; phyllaries 95–100, appendiculate; median phyllary appendages 13–15 × 10–11 mm, triangular-acuminate, margins spinulose with 4–6 spines on each side, phyllary appendages not recurved, innermost phyllaries 25–30 mm, attenuate toward apex into a straw-colored spine; receptacle bristles not scabrous, 3–5 mm; corolla pink to purple, up to 2 cm l, corolla lobes 3–5 mm, glabrous, eglandular. *Achenes* 5–6 × 2–2.5 mm, longitudinally ribbed, milky-gray with sparse brown spots, glabrous, slightly attenuate toward base; pappus setae 10–15 mm.

Etymology: The specific epithet refers to the Azmar Mountain in Kurdistan region of Iraq.

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¹ College of Agricultural Sciences, University of Sulaimani, Sulaimani, Iraq.

² Kurdistan Botanical Foundation, Sulaimani, Kirkuk Main Road, The American University of Iraq-Sulaimani, Iraq.

³ Author for correspondence: saman.ahmad@kurdistanbotanical.org; www.kurdistanbotanical.org

⁴ School of Biology and Center of Excellence in Phylogeny of Living Organisms, College of Science, University of Tehran, P.O. Box 14155-6455, Tehran, Iran; az.rastegar@ut.ac.ir

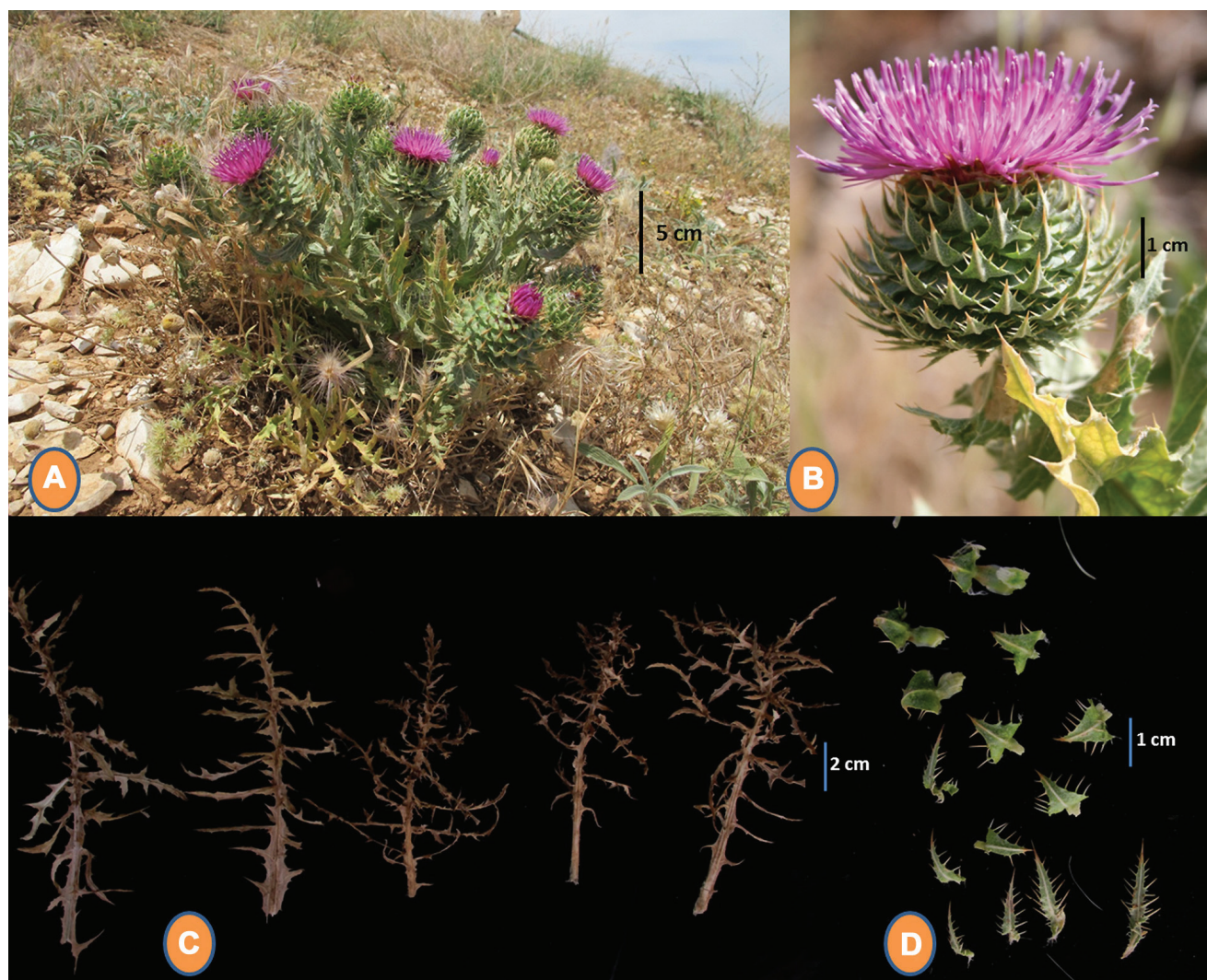


FIGURE 1: *Cousinia azmarensis* S A. Ahmad, Rastegar, & Attar. **A**, Habit; **B**, Basal leaves; **C**, Capitulum; **D**, Phyllaries.

Distribution: Endemic to Azmar-Goizha Mountain, Kurdistan, Iraq.

Habitat: Rocky places, grassland, and among vineyards beside the roads.

Phenology: Flowering period, May to June; fruiting, July to August.

Mehregan and Kadereit (2008) divided *Cousinia odontolepis* into two subspecies and reduced seven species to their synonymy. *Cousinia cymbolepis* has globular capitulae and recurved phyllaries densely spiny on their margins. It is quite distinct from *C. odontolepis* which has smaller capitulae, not recurved phyllaries, and less number of phyllary rows. Finally, *C. qandilica* has broad and elongated phyllaries with more than three spines on each side.

Additional material examined: IRAQ. Kurdistan region, Sulaimani Province: Goizha mountain, 1528 m, 35°34'27"N, 45°29'22"E, 21 May 2014, S. A. Ahmad, A. Hama, S. Babarasil, & R. Ali 14-1151 (KBFH); same general locality, 1499 m, 35°35'24"N, 45°29'03"E, 21 May

2014, S. A. Ahmad, A. Hama, S. Babarasil, & R. Ali 14-1243 (KBFH). 1468 m, 35°35'21"N, 45°28'40"E, 21 June 2014, S. A. Ahmad, A. Hama, S. Babarasil, & R. Ali 14-1728 (KBFH); 1517 m, 35°34'31"N, 45°29'18"E, 23 June 2014, S. A. Ahmad, A. Hama, S. Babarasil, & R. Ali 14-2255 (KBFH). Azmar Mountain, 1652 m, 35°34'55"N, 45°29'43"E, 1 June 2015, S. A. Ahmad, A. Hama, S. Babarasil, R. Ali, & S. R. Fayaq 15-1147 (KBFH); Azmar Mountain, 1601 m, 35°34'45"N, 45°29'38"E, 7 June 2014, S. A. Ahmad, A. Hama, S. Babarasil, & R. Ali 14-1728 (KBFH); same general locality, 1642 m, 35°35'16"N, 45°29'36"E, 7 June 2014, S. A. Ahmad, A. Hama, S. Babarasil, & R. Ali 14-1773 (KBFH); 1343 m, 35°39'56"N, 45°27'16"E, 1 June 2015, S. A. Ahmad, A. Hama, S. Babarasil, R. Ali, & S. R. Fayaq 15-1227 (KBFH). Welayar Mountain 1609 m, 35°31'33"N, 45°31'52"E, 18 June 2014, S. A. Ahmad, A. Hama, & R. Ali 14-2029 (KBFH). Azmar Mountain, Khamza Village, 1490 m., 35°39'41"N, 45°27'18"E, 9 June 2015, S. A. Ahmad 15-1325, R. Ali., K. M. Ahmad, & S. R. Fayaq.

TABLE 1. Differences between *Cousinia azmarensis*, *C. cybolepis*, and *C. qandilica*.

CHARACTERS	<i>C. AZMARENSIS</i>	<i>C. CYBOLEPIS</i>	<i>C. QANDILICA</i>
Number of flowers per capitulum	115–125	80–90	80–120
Head diameter (cm)	3.5–5.5	3–4	3–4
Corolla color	Purple	Pink	Yellow
Achene size (mm)	5–6 × 2–2.5	4 × 2	5 × 2
Basal leaf size (cm)	10–13 × 5–7	Unknown	20 × 10
Plant height (cm)	up to 35	30–50	20–30
Number of bracts	95–100	100–120	ca. 120
Size of medianphyllaries appendage (mm)	13–15 × 10–11	10–15 × 4	12 × 6
Number of lateral spine pairs of median phyllaries	4–6	2 or 3	2 or 3

IUCN Red List Category: *Cousinia azmarensis* is extremely rare and occupies a very restricted area. Based on GeoCAT (Bachman et al. 2011), the extent of occurrence for *C. azmarensis* is ca. 1 km², and its area of occupancy is ca. 4 km². Based on these data, the species may be assessed as Critically Endangered (CR).

Cousinia calocephala Jaub. & Spach., Ill. Pl. Orient. 2(17–18): 96, t. 178. 1846. TYPE: IRAN. Ghilan [“Hyrcania”]: *P. M. R. Aucher-Éloy 4817* (P 00757441).

Habitat: Limestone mountain slope, eroded places, near the road.

Record voucher: QaraDagh Mountain 1170 m, 35°15'58"N, 45°21'07"E, 15 June 2015, S. A. Ahmad, S. Babarasul, K. M. Ahmad, & S. R. Fayaq 15-1 (KBFH).

Distribution: This species was previously known to be endemic to C, NW, and W Iran (Rechinger, 1972; Mehregan and Kadereit, 2008). The above Collection from Kurdistan region of Iraq represents a range extension. Because a detailed description of the species is given in Flora Iranica (Rechinger, 1972), it felt unnecessary to repeat it herein. *Cousinia calocephala* is closely related to *C. behboudiana*, from which it differs from it by much taller habit (60 cm vs. 30 cm), involucre diam. (1.5–2 cm vs. up to 1.5 cm), corolla color (purple vs. yellow), and number of flowers and phyllaries (50–100, 90–125 vs. 45–125, 80–100, respectively).

IUCN Red List Category: This species is extremely rare; its IUCN Red List category (IUCN, 2001) remains uncertain and it is currently assessed as Data Deficient (DD).

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Page 74 intentionally left blank.

INDEX TO NEW NAMES AND COMBINATIONS

<i>Bengt-Jonsellia</i> Al-Shehbaz, <i>gen. nov.</i>	1
<i>Bengt-jonsellia laurentii</i> (Jonsell) Al-Shehbaz, <i>comb. nov.</i>	2
<i>Bengt-jonsellia tsaratananae</i> (Jonsell) Al-Shehbaz, <i>comb. et stat. nov.</i>	2
<i>Cousinia azmarensis</i> S.A.Ahmad, A.Rastegar, & F.Attar, <i>sp. nov.</i>	71
<i>Ocotea batata</i> P.L.R.Moraes & Vergne, <i>sp. nov.</i>	62
<i>Odontonema guayaquilense</i> X.Cornejo, <i>sp. nov.</i>	13
<i>Randia tafallana</i> Cornejo, <i>nom. nov.</i>	11
<i>Stelis adinfinatum</i> Luer & R.Escobar, <i>sp. nov.</i>	27
<i>Stelis amaliae</i> Luer & R.Escobar, <i>sp. nov.</i>	27
<i>Stelis baudoënsis</i> Luer & R.Escobar, <i>sp. nov.</i>	29
<i>Stelis boyacensis</i> Luer & R.Escobar, <i>sp. nov.</i>	29
<i>Stelis calopsix</i> Luer & R.Escobar, <i>sp. nov.</i>	29
<i>Stelis caudex</i> Luer & R.Escobar, <i>sp. nov.</i>	30
<i>Stelis cladophora</i> Luer & R.Escobar, <i>sp. nov.</i>	30
<i>Stelis crassisejala</i> Luer & R.Escobar, <i>sp. nov.</i>	33
<i>Stelis craticula</i> Luer & R.Escobar, <i>sp. nov.</i>	33
<i>Stelis cupreata</i> Luer & R.Escobar, <i>sp. nov.</i>	33
<i>Stelis dendrophila</i> Luer & R.Escobar, <i>sp. nov.</i>	34
<i>Stelis dewildei</i> Luer & R.Escobar, <i>sp. nov.</i>	34
<i>Stelis dithele</i> Luer & R.Escobar, <i>sp. nov.</i>	36
<i>Stelis divergens</i> Luer & R.Escobar, <i>sp. nov.</i>	36
<i>Stelis dinamica</i> Luer & R.Escobar, <i>sp. nov.</i>	36
<i>Stelis ejuncida</i> Luer & R.Escobar, <i>sp. nov.</i>	37
<i>Stelis ellipsophylla</i> Luer & R.Escobar, <i>sp. nov.</i>	37
<i>Stelis enormis</i> Luer & R.Escobar, <i>sp. nov.</i>	37
<i>Stelis ephippium</i> Luer & R.Escobar, <i>sp. nov.</i>	39
<i>Stelis eucalypta</i> Luer, <i>sp. nov.</i>	39
<i>Stelis euprepes</i> Luer & R.Escobar, <i>sp. nov.</i>	41
<i>Stelis famelica</i> Luer & R.Escobar, <i>sp. nov.</i>	41
<i>Stelis fascinata</i> Luer & R.Escobar, <i>sp. nov.</i>	42
<i>Stelis fissurosa</i> Luer & R.Escobar, <i>sp. nov.</i>	42
<i>Stelis fluxflorum</i> Luer & R.Escobar, <i>sp. nov.</i>	42
<i>Stelis frondifera</i> Luer & R.Escobar, <i>sp. nov.</i>	44
<i>Stelis glomifera</i> Luer & R.Escobar, <i>sp. nov.</i>	44
<i>Stelis gongylophora</i> Luer & R.Escobar, <i>sp. nov.</i>	46
<i>Stelis humidensis</i> Luer, <i>sp. nov.</i>	46

<i>Stelis imperialis</i> Luer & R.Escobar, <i>sp. nov.</i>	46
<i>Stelis inamoena</i> Luer & R.Escobar, <i>sp. nov.</i>	48
<i>Stelis inedita</i> Luer & R.Escobar, <i>sp. nov.</i>	48
<i>Stelis ipialesensis</i> Luer & Hirtz, <i>sp. nov.</i>	50
<i>Stelis juridicciensis</i> Luer & R.Escobar, <i>sp. nov.</i>	50
<i>Stelis lalinensis</i> Luer & R.Escobar, <i>sp. nov.</i>	50
<i>Stelis magnesialis</i> Luer & Hirtz, <i>sp. nov.</i>	51
<i>Stelis majuscula</i> Luer, <i>sp. nov.</i>	51
<i>Stelis morula</i> Luer & R.Escobar, <i>sp. nov.</i>	53
<i>Stelis nemoralis</i> Luer & R.Escobar, <i>sp. nov.</i>	53
<i>Stelis obescula</i> Luer & R.Escobar, <i>sp. nov.</i>	53
<i>Stelis palifera</i> Luer & R.Escobar, <i>sp. nov.</i>	55
<i>Stelis pilicrepa</i> Luer & R.Escobar, <i>sp. nov.</i>	55
<i>Stelis prodigiosa</i> Luer & R.Escobar, <i>sp. nov.</i>	55
<i>Stelis putumayoënsis</i> Luer & R.Escobar, <i>sp. nov.</i>	56
<i>Stelis sceptrumrubrum</i> Luer & R.Escobar, <i>sp. nov.</i>	56
<i>Stelis scutellifera</i> Luer & R.Escobar, <i>sp. nov.</i>	56
<i>Stelis triplaris</i> Luer & R.Escobar, <i>sp. nov.</i>	58
<i>Stelis tritriangulata</i> Luer & R.Escobar, <i>sp. nov.</i>	58
<i>Stelis uribeorum</i> Luer & R.Escobar, <i>sp. nov.</i>	60
<i>Stelis validipes</i> Luer & R.Escobar, <i>sp. nov.</i>	60

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Harvard Papers in Botany

Volume 22, Number 1

June 2017

A Publication of the Harvard University Herbaria Including
The Journal of the Arnold Arboretum

Ihsan A. Al-Shehbaz

Bengt-jonsellia (Brassicaceae), a new genus from Madagascar 1

Leonardo Biral and Julio Antonio Lombardi

The first record of *Zinowiewia* in the Brazilian flora
and a short account of its history 5

Xavier Cornejo

Randia tafallana (Rubiaceae): A new name for *Mussaenda parvifolia* Tafalla ex Estrella,
a tree from the dry forests of coastal Ecuador 9

Xavier Cornejo

Odontonema guayaquilense (Acanthaceae),
a new species from the deciduous dry forest of coastal Ecuador 13

Laurence J. Dorr, Fred W. Stauffer, and Leyda Rodríguez

Albert Mocquerys in Venezuela (1893–1894):
A commercial collector of plants, birds, and insects 17

Carlyle A. Luer

Icones Stelidarum (Orchidaceae) Colombiae III 27

Pedro Luís Rodrigues de Moraes and Matheus Carvalho Vergne

Ocotea Batata (Lauraceae), a new species from Brazil 61

Saman A. Ahmad, Azad Rastegar, and Farideh Attar

Cousinia Azmarensis (Asteraceae, Cardusae),
a new species from Kurdistan, Iraq 71

Index to New Names and Combinations 75

Harvard Papers in Botany

Volume 22, Number 1

June 2017

A Publication of the Harvard University Herbaria Including
The Journal of the Arnold Arboretum

Arnold Arboretum

Botanical Museum

Farlow Herbarium

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Oakes Ames Orchid Herbarium

