



Two new species of *Leandra* s.str. (*Melastomataceae*) from the Atlantic Forest in Espírito Santo, Brazil

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Key words

eastern Brazil
Miconieae
taxonomy

Abstract Two species of *Leandra* that occur in the Atlantic Forest, in the state of Espírito Santo, eastern Brazil, are described and illustrated here. *Leandra cristata* has been found in the understory of montane rain forest, and can be recognized by the distinct nodal ridges on the young branches, by the leaves with decurrent bases and transversal nerves consistently perpendicular to the main nerve, by the triangular external teeth, and by the dorsal bump on the stamen connective. *Leandra fontanae* has been found in shrubby vegetation on inselbergs, and can be recognized by the small and cordate leaves with five main nerves plus a faint submarginal pair, by the apical and lateral inflorescences made up by single dichasia or a triad, by the flowers mostly 4-merous and by the 2-celled ovary.

Published on 9 January 2013

INTRODUCTION

Leandra Raddi is a genus with c. 250 species, all restricted to the Neotropics (Martin et al. 2008). While the whole genus seems to be polyphyletic, most of the species fall into three distinct clades. One of them (*Leandra* 'sensu stricto') includes almost all species of the genus occurring in eastern Brazil, plus some species previously described in the genera *Ossaea* DC., *Clidemia* D. Don, and all *Pleiochiton* A. Gray, also from eastern Brazil (Michelangeli et al. 2004, Martin et al. 2008). The species in this group have shrubby habit, non-scorpioid inflorescences, narrow petals and unappendaged seeds.

In the last 50 years, 22 species of *Melastomataceae* from Espírito Santo have been described as new (Meirelles et al. 2012), mostly in genera with better taxonomic background, like *Behuria*, *Dolichoura*, *Miconia* and *Ossaea*. From these 22 species, only two belong to *Leandra* (Camargo & Goldenberg 2011), but several more will be certainly described in the future, since this genus is very rich and poorly known in the area (Goldenberg & Reginato 2006). The two species described here have been collected several times during the last 12 years in Espírito Santo, and also recently by the authors, in the same state. Both species have been thoroughly examined, but no similar species were found either in bibliography, herbaria or in our databases and image banks.

DESCRIPTIONS

1. *Leandra cristata* Reginato & R. Goldenb., sp. nov. — Fig. 1a, b, 2a–d, 3

Typus. L. Kollmann 2494, E. Bausen & W. Pizzolo (holo MBML; iso RB, UPCB), Brazil, Espírito Santo, Santa Teresa, São Lourenço, Estação Biológica da Caixa d'água, 14 Apr. 1999.

Etymology. The name refers to the conspicuous nodal ridges.

Shrub, up to 3 m. *Young stems* terete, with nodal ridges distinctly projected, glabrous, but with the nodal line sparsely covered with small reddish glandular trichomes (0.1 mm long). *Leaves* isophyllous; petiole 0.5–1 cm long, glabrous; blade 7–17 by 1.5–3.5 cm, lanceolate, chartaceous, apex acuminate, base long decurrent, margin obscurely serrulate, ciliate (0.35 mm) and plane; secondary veins suprabasal, with 2 pairs plus an additional marginal faint pair, diverging 1–2.5 cm above the base, symmetrical or sometimes asymmetrical, veins printed on the adaxial surface and prominent on the abaxial surface, both surfaces glabrous, but with sparse, reddish, small (c. 0.1 mm), glandular trichomes restricted to the main vein on the abaxial surface. *Thyrse* 7–9 cm long, terminal, slightly pendent, glabrous, with no accessory branches, 3–5 pairs of paraclades, flowers on lax triads; bracts 1.5–2 cm long, linear to lanceolate, entire; bracteoles similar to the bracts. *Flowers* on pedicels 0.2 mm long. *Hypanthium* 3.2–3.8 by 2.1–2.4 mm, campanulate to slightly pyriform, both surfaces glabrous, but with several, dense, minute druses on the external surface, conspicuous with hand lenses, androecial fringe absent. *Calyx tube* 0.3–0.5 mm long at anthesis, the lobes 0.1–0.2 mm, obscurely deltoid; calyx teeth triangular, 2.3–2.7 mm, sparsely covered by small (0.1 mm), reddish, glandular trichomes. *Petals* 5, 1.5–1.9 by 0.5–0.8 mm, white at anthesis, ovate, apex acuminate, margin entire, glabrous. *Stamens* diplostemonous, isomorphic, anthers c. 1.4 mm long, oblong with the apex slightly attenuated, connective not prolonged, dorsally bumped. *Ovary* 3-locular, 1/5 superior, the free portion projecting 0.5–0.6 mm, cylindrical, glabrous; style and stigma not seen. *Berries* 6–7 by 4–5 mm, dark violet to black. *Seeds* 0.8–0.9 by 0.4–0.5 mm, ovate elongated, the hilum covering 90 % of the seed, slightly conspicuous tertiary sculpturing, testa yellow, the cells periclinal walls flat or slightly concave, the anticlinal walls jigsaw-like, unappendaged.

Distribution & Habitat — Endemic to the state of Espírito Santo, Brazil. It has been collected in three neighbouring localities in the municipality of Santa Teresa. The species is found in the Atlantic Forest, more precisely in the understory of montane rain forest, at altitudes between 700 and 850 m.

Other specimens examined. BRAZIL, Espírito Santo, Santa Teresa, Nova Lombardia, Reserva Biológica Augusto Ruschi, 10 Jan. 2002 (fl), L. Kollmann 5291 & E. Bausen (MBML), idem, 29 Jan. 2002 (fr), L. Kollmann 5383 & E. Bausen (MBML, RB, UPCB), idem, 2 Apr. 2002 (fr), R.R. Vervloet 52, E. Bausen

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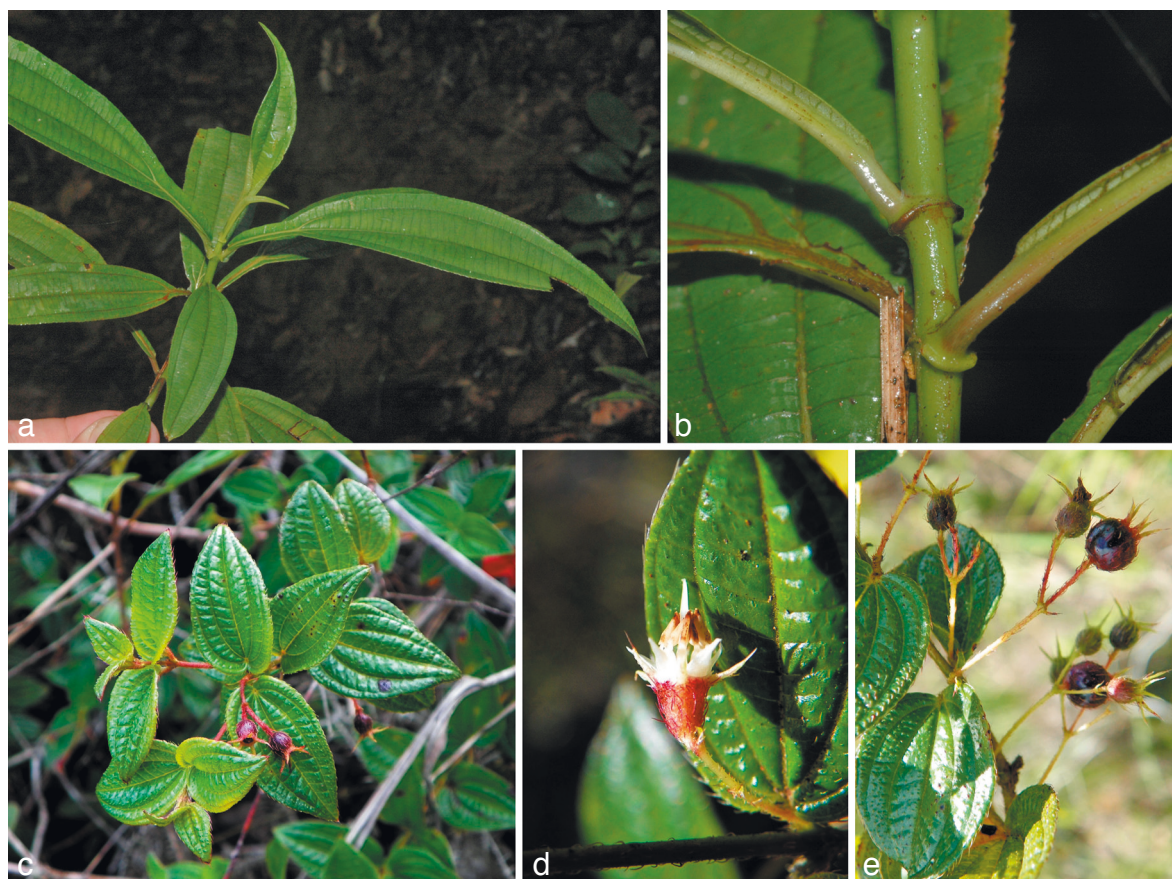


Fig. 1 a, b. *Leandra cristata* Reginato & R.Goldenb. a. Non-fertile branch; b. detail of the ridges nodes. — c–e. *Leandra fontanae* Reginato & R.Goldenb. c. Fruiting branch; d. flower; e. infructescences (a, b: *R. Goldenberg et al.* 1524; c–e: *Reginato et al.* 1190; all NY, UPCB).

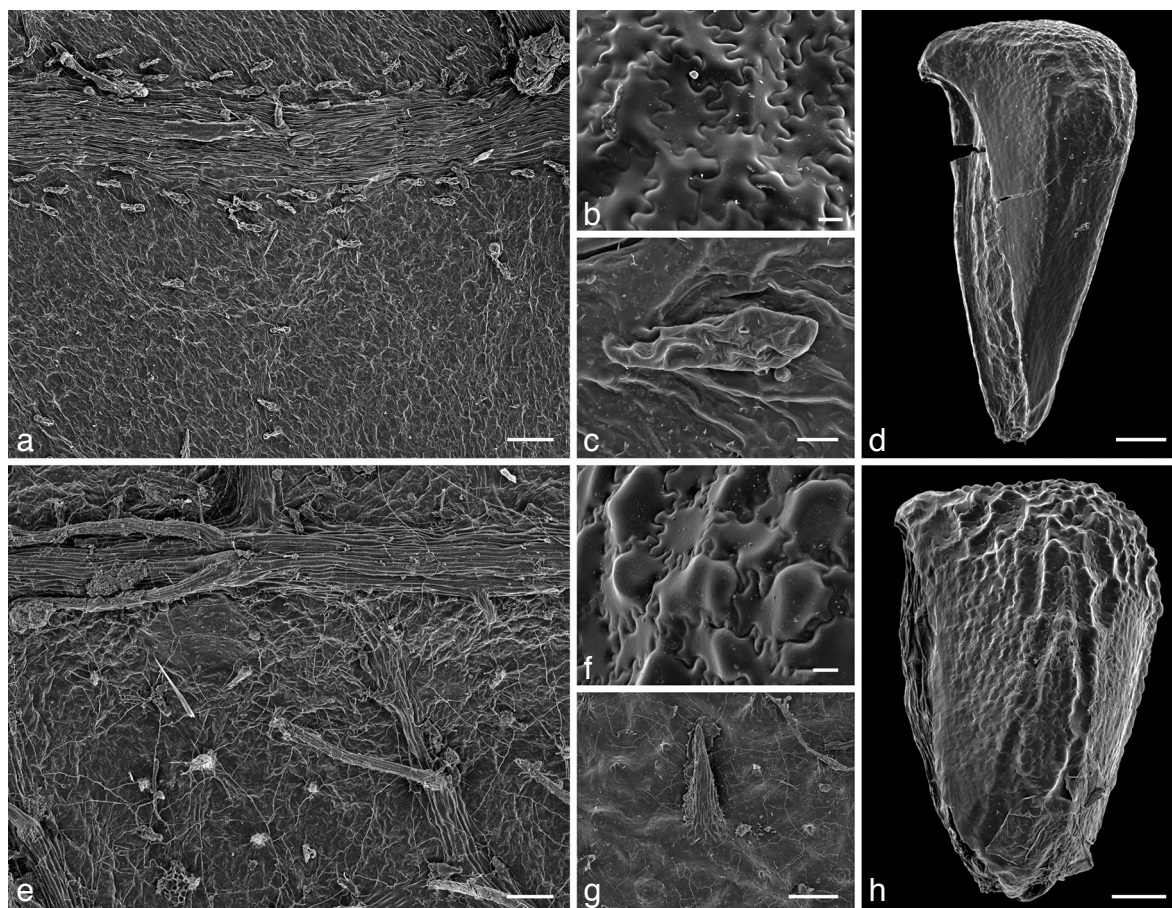


Fig. 2 a–d. *Leandra cristata* Reginato & R.Goldenb. a. Leaf on abaxial view; b. detail of the seed testa; c. detail of the small reddish glandular trichomes; d. seed. — e–h. *Leandra fontanae* Reginato & R.Goldenb. e. Leaf on abaxial view; f. detail of the seed testa; g. detail of the simple trichome on leaf adaxial side; h. seed (a–d: *Vervloet* 52, MBML, UPCB; e–h: *Reginato et al.* 1190, NY, UPCB). — Scale bars: a, d, e, h = 100 µm; b, c, f = 10 µm.

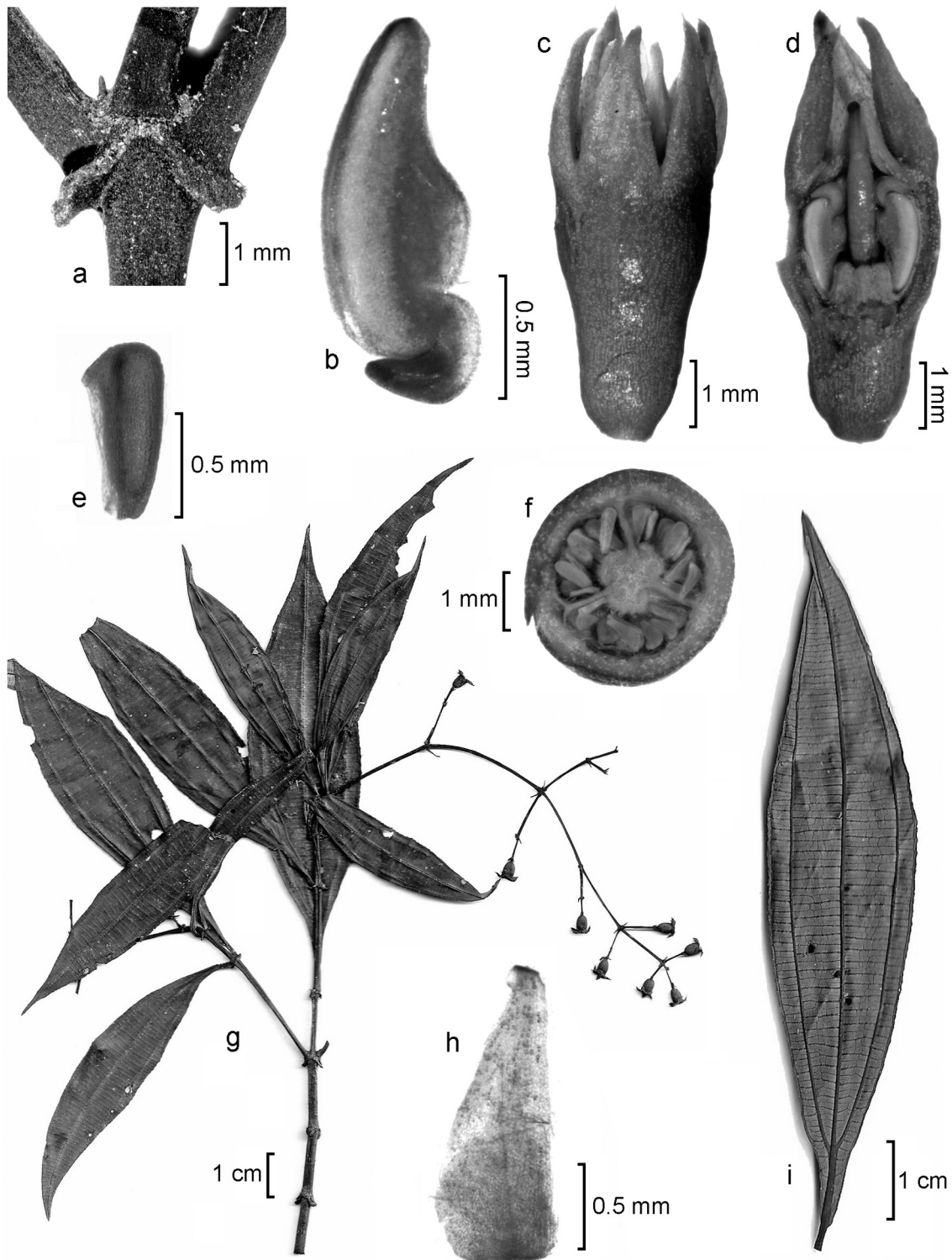


Fig. 3 *Leandra cristata* Reginato & R. Goldenb. a. Detail of the nodes showing the projected ridges; b. anther; c. floral bud; d. longitudinal section of the floral bud; e. seed; f. transversal section of the 3-locular fruit; g. branch with inflorescence; h. petal on adaxial view; i. leaf on abaxial view (a, e–g, j: holotype; b–d, h, i: *L. Kollmann* 5291, MBML).

& W. Pizziolo (MBML, UPCB), idem, 20 Mar. 2003 (fr), R.R. Vervloet 2024 & E. Bausen (MBML, RB, UPCB); Santa Teresa, Nova Lombardia, Terreno do Furlani, 7 Feb. 2011 (sterile), R. Goldenberg et al. 1524 (NY, UPCB); Santa Teresa, Santo Henrique, 22 July 2005 (fr), L. Kollmann 8156 & A.P. Fontana (MBML, UPCB).

Notes — The description of the reproductive characters has been made on buds and young fruits, since the specimens available have no mature flowers. This explains why some measurements (i.e. filaments, pore and style) have not been provided here. The persistence of the dorsal bump found in the stamens from the buds still stands to confirmation in specimens with mature flowers.

As for the sectional placement, this species could be assigned to three different sections, as proposed by Cogniaux (1886, 1891). Sections *Chaetodon* Cogn., *Oxymeris* Cogn. and *Carassanae* Cogn. are probably not monophyletic (Martin et al. 2008, pers. obs.), but have been traditionally recognized based on the pseudolateral or pendent inflorescences (*Chaetodon*), glabrous or furfuraceous hypanthia (*Oxymeris*), and terminal, erect inflorescences, and non-glabrous neither setose hypanthia (*Carassanae*). *Leandra cristata* has terminal but pendent inflorescences and glabrous hypanthia as the ones found in the two first sections. Its seeds with tertiary sculpturing (Martin & Michelangeli 2009) are found more frequently among species

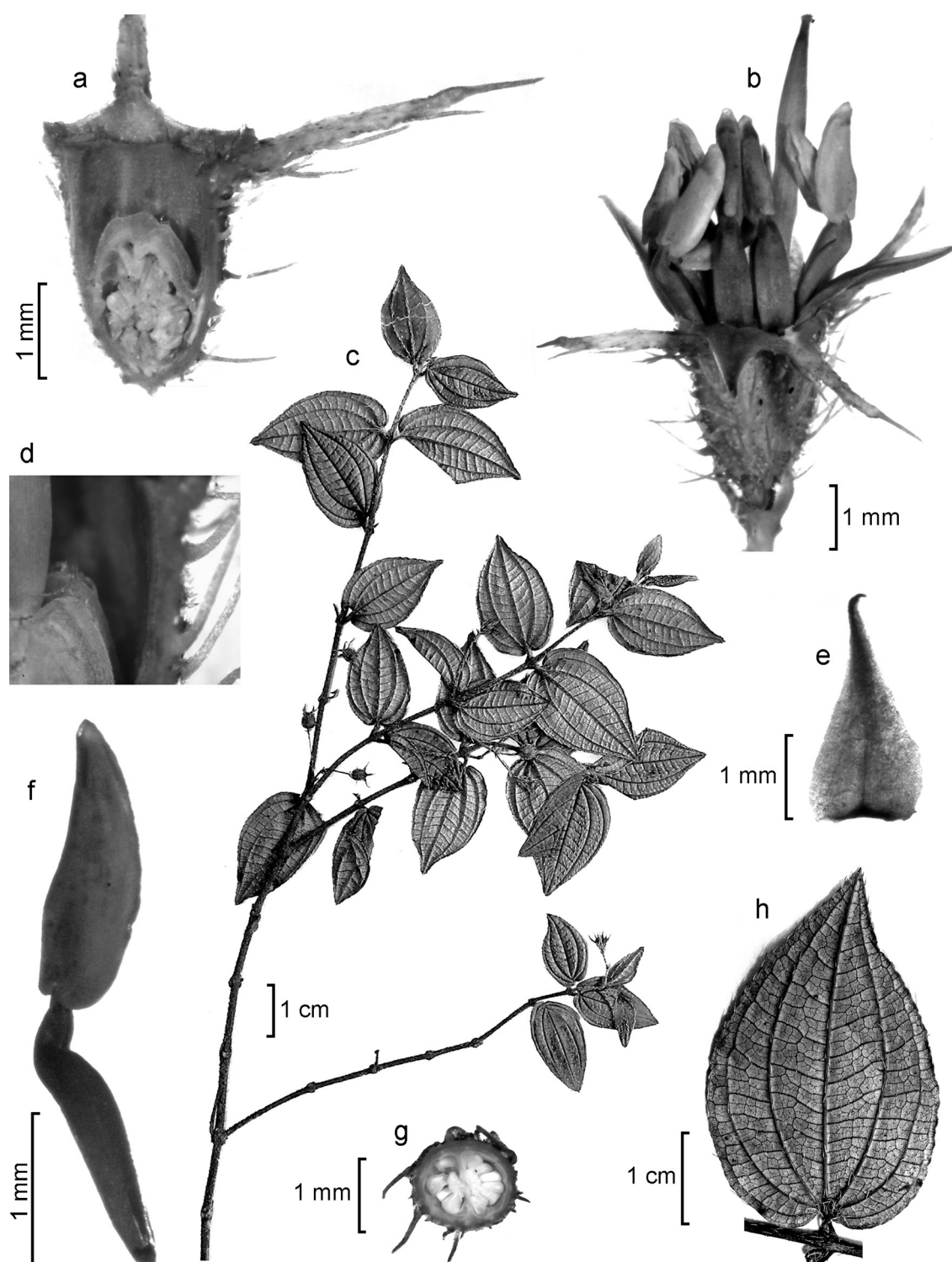


Fig. 4 *Leandra fontanae* Reginato & R. Goldenb. a. Longitudinal section of the hypanthium; b. flower; c. branch with inflorescences; d. detail of the longitudinal section of the hypanthium, showing the simple and dendritic trichomes mixed; e. petal on adaxial view; f. stamen; g. transversal section of the 2-locular ovary; h. leaf on abaxial view (all: holotype).

assigned to sections *Carassanae* and *Niangae*, both of which with pilose hypanthia, which in turn is absent in this species. Since there is no way to assign this species precisely in one of Cogniaux's sections, we opted to compare this species with all similar *Leandra*, no matter to which section they belong.

Leandra cristata can be recognized by the distinct nodal ridges on the young branches, and also by the leaves with decurrent bases and transversal nerves consistently perpendicular to the main nerve, by the triangular external teeth, and by the dorsal bump on the stamen connective. All species that can be regarded as morphologically similar, like *L. brackenridgei* Cogn., *L. laevigata* (Triana) Cogn., *L. mouraei* Cogn. and *L. pilonensis*

Wurdack, lack the nodal ridges, the leaves with long decurrent bases and the dorsal bumps on the connective. They also have the leaves with inclined transversal nerves, and subulate external calyx teeth, with the exception of *L. pilonensis*, that also has triangular calyx teeth. *Leandra longisetosa* Cogn. and *L. multiplinervis* (Naudin) Cogn. also have leaves with decurrent bases and calyces with triangular external teeth, but both lack the nodal ridges and have ovate leaves, a dense indument of simple trichomes mixed with small dendritic ones and an urceolate hypanthium.

Leandra cristata has a remarkable character that may not be useful as diagnostic, but contrasts with the absence of trichomes:

the large amount of druses found on the hypanthium, even visible at its external surface. These druses are also found in other flower parts in the same species, and are almost always found throughout *Leandra* and other genera in tribe *Miconieae* (pers. obs.), but seldom in the same quantity. Perhaps these strongly abundant druses act on repelling herbivores (Cortez & Carmello-Guerreiro 2008), in the same way that trichomes do (Palaeari & Santos 1998), and in a certain sense, may compensate for the absence of trichomes in an essentially glabrous plant.

2. *Leandra fontanae* Reginato & R. Goldenb., sp. nov. — Fig. 1c–e, 2e–h, 4

Typus. R. Goldenberg 1520, M.K. Caddah, F.A. Michelangeli & M. Reginato (holo UPCB; iso MBML, NY), Brazil, Espírito Santo, São Roque do Canaã, Alto Misterioso, 6 Feb. 2011.

Etymology. This species is named after the botanist André Paviotti Fontana, who has been intensely collecting in this state, and was the first collector of this species.

Shrub, up to 0.5 m. *Young stems* terete, moderately covered by appressed simple trichomes (1–1.5 mm long) mixed with small dendritic trichomes (0.1 mm long), soon glabrescent, internodes longitudinal ridges absent. *Leaves* isophyllous; petiole 2–4 mm long, the indumentum the same as on the shoots; blade 2.3–3.6 by 1.3–2.5 cm, ovate to lanceolate, chartaceous, apex acute to acuminate, base cordate, margin obscurely serrulate, ciliate (1.3–1.6 mm) and revolute, secondary veins basal, with 2 pairs plus an additional marginal faint pair, veins printed on adaxial surface and prominent on abaxial surface, adaxial surface sparsely covered with pedicellate glands (0.1 mm), with simple trichomes restricted to the veins, abaxial surface sparsely covered by simple trichomes, mixed with pedicellate glands (0.1 mm). *Inflorescences* terminal and lateral, made up by simple dichasia or triad, 1.7–3 cm long; anthopodia 5–15 mm long, moderately covered by appressed, simple trichomes, mixed with small (0.1 mm), dendritic trichomes; bracts 1–2 mm, linear to lanceolate, entire, glabrous; bracteoles similar to the bracts. *Flowers* on pedicels 0.5–1 mm long. *Hypanthium* 2–3 by 1.5–2.5 mm long, campanulate, external surface moderately covered with appressed, simple trichomes mixed with small (0.1 mm), dendritic trichomes, internal surface glabrous, androecial fringe composed by simple trichomes (0.3 mm). *Calyx tube* 0.3–0.4 mm long, the lobes 0.4–0.6 mm, deltoid; calyx teeth linear, 2.5–4.5 mm long. *Petals* (3–)4(–5), 2–3 by 1–1.5 mm, white at anthesis, ovate, apex acuminate, margin entire, glabrous. *Stamens* diplostemonous, isomorphic; filament 1.5–2 mm long, glabrous, white; anthers 1.5–2 mm long, oblong with the apex attenuate, opening by 1 dorsally inclined pore, c. 0.15 mm wide, white; connective not prolonged, slightly caudate, unappendaged. *Ovary* 2-locular, 1/2 inferior, the free portion 0.9 by 1 mm, attenuate, apex sparsely covered by simple trichomes (c. 0.3 mm); style 6 mm long, straight, white, glabrous; stigma punctiform. *Berries* 3–4 by 2.5–3.5 mm, dark violet to black, the indument and calyx persistent when mature. *Seeds* 0.8 by 0.5 mm long, ovate to oblong-ovate, the hilum covering 90 % of the seed, with tertiary sculpturing, testa yellow, cells periclinal walls flat or slightly concave, the anticlinal walls jigsaw-like; unappendaged.

Distribution & Habitat — Endemic to the state of Espírito Santo, Brazil. It has been collected in two neighbouring municipalities, Santa Teresa and Santa Leopoldina, about 20 km distant from each other. The species is found in shrubby vegetation on shallow soils, on rocky outcrops on inselbergs in the Atlantic Forest domain, at an altitude of c. 900 m.

Other specimens examined. BRAZIL, Espírito Santo, Santa Leopoldina, Luxemburgo, 15 Mar. 2005 (fl, fr), A.P. Fontana 1170, L. Kollmann & L. Kosanke (MBML, UPCB); São Roque do Canaã, Alto Misterioso, 20 Mar. 2007 (fr), C. Esgario 142 & A.P. Fontana (MBML), idem, 6 Feb. 2011 (fl, fr), M. Reginato 1190, F.A. Michelangeli, R. Goldenberg, M.K. Caddah (NY, UPCB).

Notes — Since these plants have both terminal and lateral inflorescences, we opted to describe this species in *Leandra*, and not in *Ossaea*. Within *Leandra*, this species could be placed either in sect. *Chaetodon*, due to its inflorescences that are also lateral, or in sect. *Carassanae*, due to the indument on the hypanthium and also the seeds with tertiary sculpturing.

Leandra fontanae can be recognized by the small and cordate leaves with five main nerves plus a faint submarginal pair, the apical and lateral inflorescences made up by single dichasia or triads, the 2-celled ovary and flowers mostly 4-merous. The three petals found in some flowers are remarkably rare among *Leandra*, but cannot be regarded as diagnostic. Most of the species that are morphologically similar to *L. fontanae* are also from rocky outcrops, and are also tiny shrubs with minute leaves, depauperate inflorescences (but never single dichasia or triads) and short, stout anthers. However, they are not sympatric with *L. fontanae*, occurring in southern states (Rio de Janeiro, São Paulo, Paraná and Santa Catarina). *Leandra itatiaiae* (Wawra) Cogn. has non-cordate leaves; *L. riograndensis* (Brade) Wurdack has non-cordate leaves and much shorter calyx teeth; *L. microphylla* Cogn. (incl. *M. dusenii* Cogn.) has dendritic trichomes on the hypanthia; and *L. cordigera* (Triana) Cogn. has glandular trichomes on the hypanthia.

Acknowledgements We would like to thank Ludovic Kollmann, Fabian Michelangeli and Mayara Caddah for the help in the field, which was permitted by CNPq (001726/2010-2 – ‘expedição científica’). Fieldwork and MR had been supported by the PBI Miconieae grant to F.A. Michelangeli (NSFDEB-0818399). RG received a grant from CNPq (‘produtividade em pesquisa’).

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