

Revista Brasil. Bot., V.33, n.4, p.653-659, out.-dec. 2010

New species of *Luxemburgia* A. St.-Hil. (Ochnaceae)¹

FABÍOLA FERES^{2,3}

(received: October 21, 2009; accepted: September 21, 2010)

ABSTRACT – (New species of *Luxemburgia* A. St.-Hil. (Ochnaceae)). Three new species of *Luxemburgia* named as *L. furnensis* Feres, *L. leitonii* Feres and *L. mogolensis* Feres are described and illustrated. A map with the geographical distribution of the new species is provided. *Luxemburgia furnensis* and *L. polyandra* A.St.-Hil., both from Minas Gerais, are similar in the absence of cilia on the leaf margin, but *L. furnensis* differs in the leaf shape, inflorescence and flowers size. *Luxemburgia leitonii* (also from Minas Gerais) differs from *L. macedoi* Dwyer (from Goiás) by the smaller flowers and absence of cilia at the margins of the bracts and bracteoles. *Luxemburgia mogolensis* (from Minas Gerais) resembles *L. glaziouviana* (Engl.) Beauverd (from Rio de Janeiro) in the leaf, bracts and bracteoles shape, and differs by the presence of cilia at the sepals.

Key words - *Campo rupestre* vegetation, Minas Gerais, taxonomy

RESUMO – (Novas espécies de *Luxemburgia* A. St.-Hil. (Ochnaceae)). São descritas e ilustradas três novas espécies do gênero *Luxemburgia*, denominadas de *L. furnensis* Feres, *L. leitonii* Feres e *L. mogolensis* Feres. É apresentado um mapa com a distribuição geográfica das novas espécies. *Luxemburgia furnensis* e *L. polyandra* A.St.-Hil., ambas de Minas Gerais, são semelhantes quanto à ausência de cílios na margem foliar, mas *L. furnensis* difere quanto à forma da lâmina foliar e tamanho da inflorescência e flores. *Luxemburgia leitonii* (de Minas Gerais) difere de *L. macedoi* Dwyer (de Goiás) pelas flores menores e ausência de cílios na margem das brácteas e bractéolas. *Luxemburgia mogolensis* (de Minas Gerais) assemelha-se a *L. glaziouviana* (Engl.) Beauverd (do Rio de Janeiro) na forma das folhas, brácteas e bractéolas, e difere pela presença de cílios nas sépalas.

Palavras-chave - Campos rupestres, Minas Gerais, taxonomia

Introduction

Luxemburgia A. St.-Hil. is an exclusively Brazilian genus of the Ochnaceae family. The species of *Luxemburgia* are shrubs with yellow flowers and occur in the *campo rupestre* vegetation of Brazil, in mountains above 1,000 m a.s.l. They are found primarily in Minas Gerais, but also in Bahia throughout the Espinhaço Range, in Goiás, Rio de Janeiro (Feres 2001), and Espírito Santo (Fraga & Feres 2007).

Luxemburgia was described as a genus of Frankeniaceae by Saint-Hilaire (1822), who dedicated the genus to the Duke of Luxemburg, Ambassador of France to Rio de Janeiro. The taxonomic review of the genus was performed about 50 years ago (Dwyer 1951), and was out of date (Feres 2001). Since then, new species were described (Dwyer 1955, Sastre 1981, Fraga & Feres 2007). Recently the genus has been treated in local florulas, such as Azevedo (1994), for the Reserva Ecológica of Macaé de Cima, Rio de Janeiro, Sastre (1995), for the Flora of Pico das Almas, Bahia,

and Yamamoto & Sastre (2004), for the Flora of Grão-Mogol, Minas Gerais. In this work, three new species of *Luxemburgia* are described, commented and illustrated. A map with the geographical distribution of the new species is presented.

Materials and methods

The taxonomic review of the genus *Luxemburgia* (Feres 2001), was based on a bibliographic review, field observations and collection of specimens, and analysis of herbarium specimens (including type specimens) from ESA, F, HB, HUEFS, IAN, INPA, K, M, MBM, MO, NY, PARNASO, R, RB, SP, SPF, UB, UEC, and US. During this study, new species for *Luxemburgia* were recognized and they are described below.

Results and discussion

Luxemburgia furnensis Feres sp. nov. Type: BRAZIL. MINAS GERAIS: Passos, Reserva de Furnas, em afloramento rochoso próximo à entrada das eclusas, 500 m após a barragem da usina, 1-III-1999, F. Feres, S. Crespo & R. Belinello 99/01 (holotype UEC; isotypes F, NY, R, SP, SPF).

Figure 1

Luxemburgiae polyandrae A. St.-Hil. *longitudine petioli et sepalis eciliatis similis sed lamina majore*

1. Part of the first author's MSc Dissertation, Programa de Pós-Graduação em Biologia Vegetal of Universidade Estadual de Campinas, Campinas, SP, Brazil.
2. Universidade Estadual de Campinas, Instituto de Biologia, Departamento de Botânica, Caixa Postal 6109, 13083-970 Campinas, SP, Brazil.
3. Address for correspondence: fabiola.feres@gmail.com

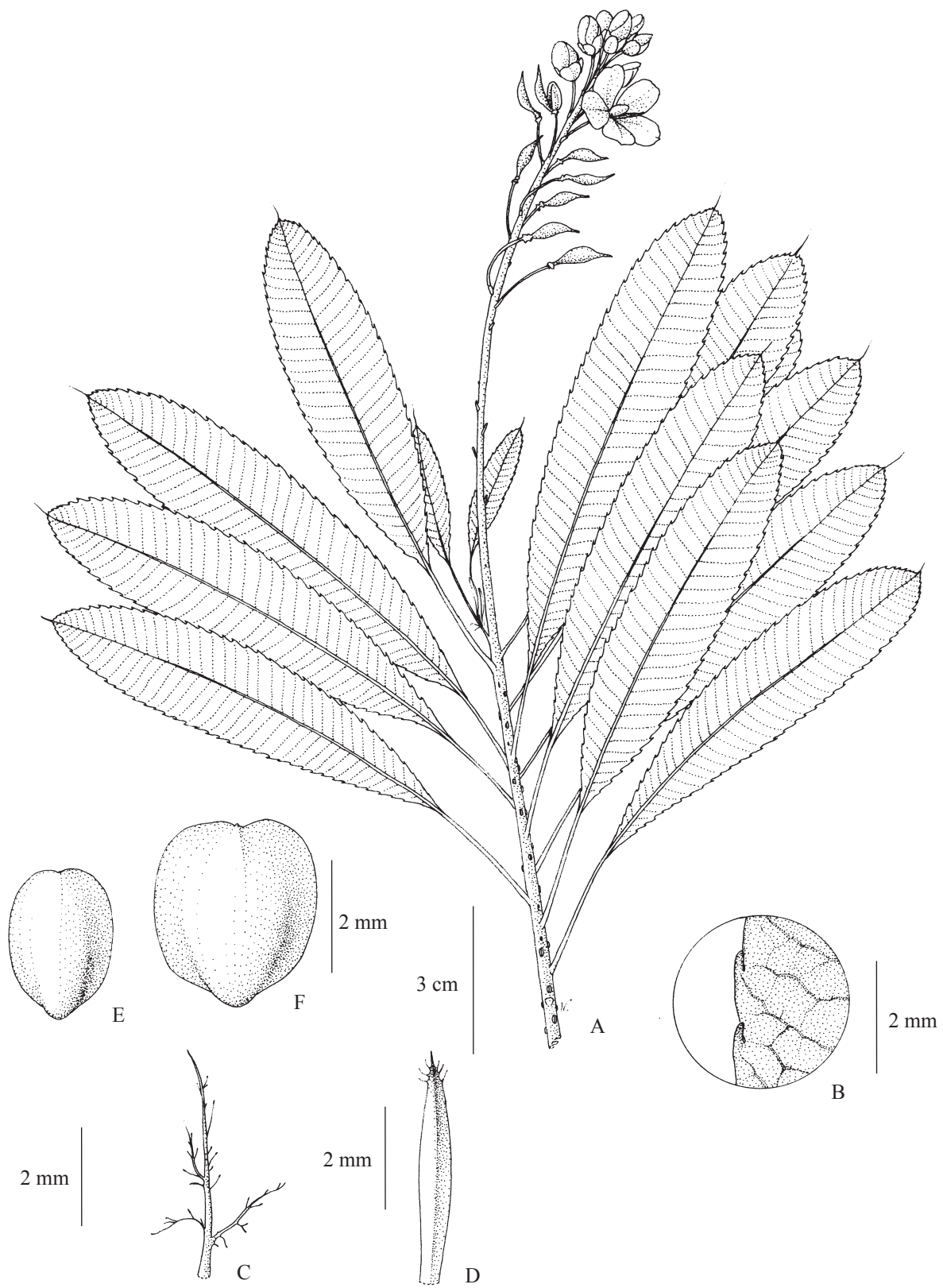


Figure 1. *Luxemburgia furnensis* Feres. A. Flowering branch. B. Detail of leaf margin, abaxial side. C. Stipule. D. Bracteole. E. Outer sepal. F. Inner sepal. (Feres et al. 99/01).

5-15 × 1.2-3.2 cm, oblonga vel elliptica numquam obovata, inflorescentia majore 1-11 × 15-25 cm, floribus majoribus 2-5 mm, calyce recto numquam reflecto differt; ab *Luxemburgia macedoi* Dwyer bracteis et bracterolis eciliatis, articulo pedicelli 3 mm supra basem differt.

Shrub 0.8-2(-3) m tall; lenticels 1-4 mm long, orbicular, oblong to elliptic. Stipules 4-5 mm long, caducous, dissected, often reddish. Petiole 0.8-2 cm long, glabrous; lamina 5-15 × 1.2-3.2 cm, coriaceous, oblong to elliptic, apex obtuse, acute to acuminate, apical cilium 3-6 mm long, base cuneate to slightly asymmetric, margin toothed, teeth 1-2 mm long, uncinata, rarely ciliate, when present the cilia 0.5-1 mm long, laterally emergent on the lamina, midrib prominent on both sides, secondary veins prominent on the adaxial side and plane on the abaxial side. Inflorescence 15-25 cm long, 20-45-flowered, bracts and bracteoles 3-5 × 1 mm, caducous, narrowly oblong to lanceolate, apex 5-8-ciliate, cilia 0.2-0.5 mm long, or only 1 terminal cilium present, margin not ciliate; pedicel 0.5-1.5 cm, articulated 1-2(-3) mm from the base. Outer sepals (2-)2.5-4 × 2-3 mm, inner sepals (3-)4-6 × 3-4 mm, orbicular to obovate, apex obtuse or retuse, margin not ciliate; petals 1.2-1.7 × 0.9-1 cm, obovate, apex rounded to retuse; stamens 18-27, arranged in 3-4 series, anthers 5-7 × 1 mm; ovary 4-5 × 2 mm, style 2-3 × 0.5-1 mm, suberect. Capsule 1.2-2 × 0.5-0.8 cm, oblong to elliptic (mature). Seeds 1-1.5 × 0.5-0.8 mm, oblong to obovate.

Paratypes: BRAZIL. MINAS GERAIS: Alpinópolis, way to Morro do Chapéu, 20°52' S, 46°24' W, 12-II-1998, R. Goldenberg et al. 464 (UEC); Passos, Reserva de Furnas, 03-VII-1994, J.A. Lombardi 583 (UEC), 13-II-1998, R. Romero et al. 5127 (UEC), 2-III-1984, S.J. Santi & D. Santos Filho 15895 (UEC), 20-II-1978, G.J. Shepherd et al. 7008 (HUEFS, UEC).

Distribution, habitat and phenology – *Luxemburgia furnensis* occurs in *campo rupestre* vegetation in Minas Gerais. This species is mainly found at Furnas Power Plant Reserve in Passos, but was also collected in Alpinópolis, Minas Gerais (Figure 2). It has been collected with flowers from February to March, and with fruits from March to July.

This species has often been incorrectly identified as *Luxemburgia polyandra* A. St.-Hil., that occurs in Diamantina, Minas Novas, Rio Vermelho and Serra do Cipó (Minas Gerais), because both have petioled leaves, rarely ciliate on the margin. However, *L. furnensis* is distinguished by its oblong or elliptic lamina, which in

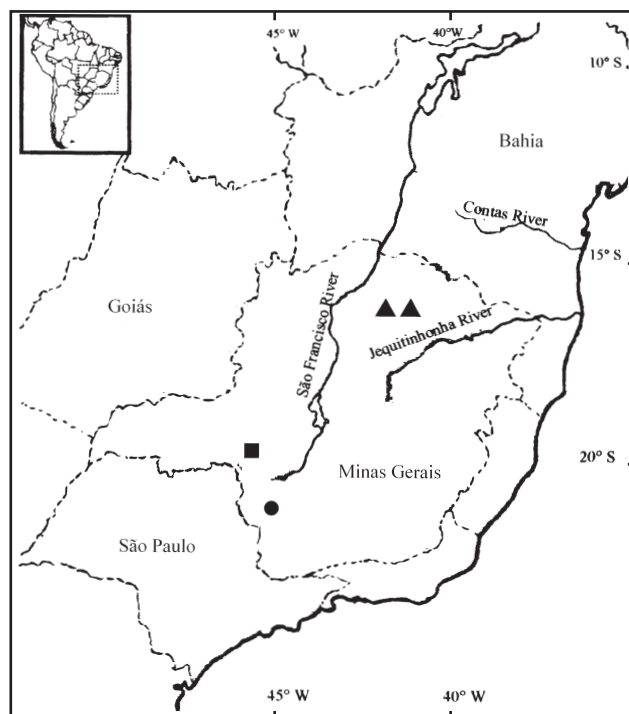


Figure 2. Geographical distribution of *Luxemburgia furnensis* Feres (●), *L. leitonii* Feres (■), and *L. mogolensis* Feres (▲) in Minas Gerais State.

L. polyandra is generally obovate. Besides, *L. polyandra* has smaller inflorescences (7-14 cm) and flowers with reflexed sepals.

One of the remarkable characteristics of this new species is the presence of cilia only at the bracts and bracteoles apex, differing from *L. polyandra* and from the majority of the species of the genus. *Luxemburgia flexuosa* Sastre, from Diamantina and Serra do Cipó (Minas Gerais), also has bracts and bracteoles without cilia on the margins, bearing only a cilium at the apex, and differs from *L. furnensis* by its sessile leaves, the persistent and subulate stipules, whereas in *L. furnensis* the leaves are distinctly petioled and the stipules are caducous and dissected.

Luxemburgia furnensis resembles *L. macedoi* Dwyer, from Goiás, because of the oblong to elliptic shape of the leaves and the size of the flowers, but differs by the presence of cilia only at the apex of the bracts and bracteoles, absence of cilia on the sepals margins, and also by the articulation of the pedicel, only 3 mm from the base, while in *L. macedoi* the articulation is located ca. 5 mm from the base of the pedicel.

The new species is being named in reference to the main locality of its occurrence, the Furnas Power Plant Reserve, in Passos, Minas Gerais.

Luxemburgia leitonii Feres *sp. nov.* Type: BRAZIL. MINAS GERAIS: Araxá, campo rupestre da Serra da Canastra, 5-XII-1977, H.F. Leitão-Filho, J.B. de Andrade & G. Bunfarah 6589 (holotype UEC, isotype RB).

Figure 3

Luxemburgiae macedoi Dwyer *forma oblonga et magnitudine foliorum* 5-10.5 × 1.5-3.5 cm, *marginē laminae dentibus uncinatisque similis, sed pedicellis parvis* 1-2.5 cm, *marginibus bractearum et bracteolarum eciliatis differt; ab* *Luxemburgia furnensis* Feres *petiolo breve, bracteis et bracteolis in apice nonnisi cilio unico differt. Ab omnibus speciebus generis inflorescentiis usque 50 cm longis, 40-80-floris differt.*

Shrub up to 0.8 m tall; lenticels 1-5 mm long, narrowly elliptic. Stipules 4-10 mm long, caducous, dissected. Petiole 0.3-1 cm long; lamina 5-10.5 × 1.5-3.5 cm, coriaceous, elliptic, oblong to obovate, apex obtuse to acute, apical cilium 3-5 mm long, marginal teeth 2-3 mm long, uncinuate to erect, rarely ciliate, when present, cilia 1-2 mm long near the lamina base, midrib prominent near the base and plane towards the apex on both sides, secondary veins prominent in both sides. Inflorescence 22-50 cm long, with 40-80 flowers; bracts and bracteoles 4-5 × 1 mm, caducous, linear, apex acuminate, glandular, margin not ciliate; pedicel 1-2.5 cm long, articulated 5-8 mm from the base. Outer sepals 3-5 × 3 mm; inner sepals 5-6 × 3-4 mm, oblong to ovate, occasionally orbicular (outer), apex acuminate, rounded to emarginated, margin not ciliate; petals 1-2 × 0.8 cm, obovate, apex cuspidate to obtuse; stamens 26-37, in 3-4 series, anthers 7-8 × 0.8-1 mm; ovary 6-8 × 1-3 mm, style 2-3 mm long, suberect. Capsule 1.3-1.7 × 0.4-0.6 cm, elliptic to oblong (immature). Seeds 1 × 0.8 mm, oblong.

Distribution, habitat and phenology – *Luxemburgia leitonii* occurs in Minas Gerais, in boundary regions with Serra da Canastra, including Araxá (figure 2). It has been collected with flowers and fruits in December. This species is known only from the type collection.

The specimen collected in Araxá resembles very much *Luxemburgia macedoi* Dwyer, which occurs only in Goiás, in the oblong shape, size 5-10.5 × 1.5-3.5 cm and uncinuate toothed margin of the leaves. It differs from *L. macedoi* by the smallest pedicel of 1-2.5 cm, and the margins of the bracts and bracteole not ciliate. Therefore, the specimen *Leitão Filho et al.* 6589 is being considered here as belonging to a new species, *L. leitonii*, named in honour of the collector, the late Prof. Dr. Hermógenes de Freitas Leitão Filho, professor and researcher on

Angiosperm taxonomy, of the Universidade Estadual de Campinas.

This species also resembles *L. furnensis* Feres, but the petiole is shorter, up to 1 cm long, the bracts and bracteoles are glabrous and with an acuminate apex, while *L. furnensis* has up to 8 cilia on the apex of the bracts and bracteoles. In *L. leitonii* the secondary veins are prominent on the abaxial side of the leaf, while in *L. furnensis* the secondary veins are plane.

The most remarkable characteristics observed in *Luxemburgia leitonii*, and not seen in other species of the genus, is the inflorescence length, which can reach 50 cm, and the number of flowers per inflorescence, that can be up to 80.

This species is probably restricted to boundary regions of the Serra da Canastra (figure 2). In the study of endemic plant species of the Parque Nacional da Serra da Canastra (Romero & Nakajima 1999) there is no record for *Luxemburgia* species.

Luxemburgia mogolensis Feres *sp. nov.* Type: BRAZIL. MINAS GERAIS: Grão-Mogol, Trilha da Tropa, 16°35' S, 42°54' W, ca. 1000-1200 m, 11-XII-1989, A. Freire-Fierro, J.R. Pirani, P.T. Sano & T.R. Silva 12462 (holotype UEC, isotype SPF).

Figure 4

Luxemburgiae glaziovianae (Engl.) Beauverd *forma foliorum oblongis, bractearum et bracteolarum similis, sed sepalis ciliatis, ciliis marginē foliari emergentibus, nervis secundariis in pagina foliari abaxiali differt.*

Shrub 1.5-2(-4) m tall; lenticels 1-3 mm long, oblong to elliptic. Stipules 2-4 mm long, caducous, dissected. Petiole 1.2-3 cm long, glabrous; lamina 4-9 × 1.3-3 cm, chartaceous, oblong to obovate, apex acute to acuminate, apical cilium 4-10 mm long, base cuneate to slightly asymmetric, margin toothed, teeth 1-1.5 mm long, uncinuate, all ciliate, cilia 60-90 of 3-5 mm long, emergent exactly on the margin, midrib prominent on both sides, secondary veins prominent on adaxial side and plane on abaxial side. Inflorescence 8-16 cm long, with 32-40 flowers; bracts and bracteoles 5-8 × 1-1.5 mm, caducous, lanceolate to narrowly oblong, margin ciliate, except at the base; cilia ca. 17, 1-2 mm long; pedicel 1-2 cm long, articulated ca. 1-3 mm from the base. Outer sepals 5-6 × 4-6 mm, inner sepals 6-7 × 5-7 mm, ovate to orbicular (outer) and obovate (inner), apex cuspidate, with glandular apiculus 0.5-1 mm long, margin ciliate, except at the base, cilia ca. 30, 1-2 mm long; petals 0.9-2 × 0.8-1 cm, obovate to oblong, apex cuspidate, with glandular apiculus ca. 0.5 mm long; stamens 28-32,

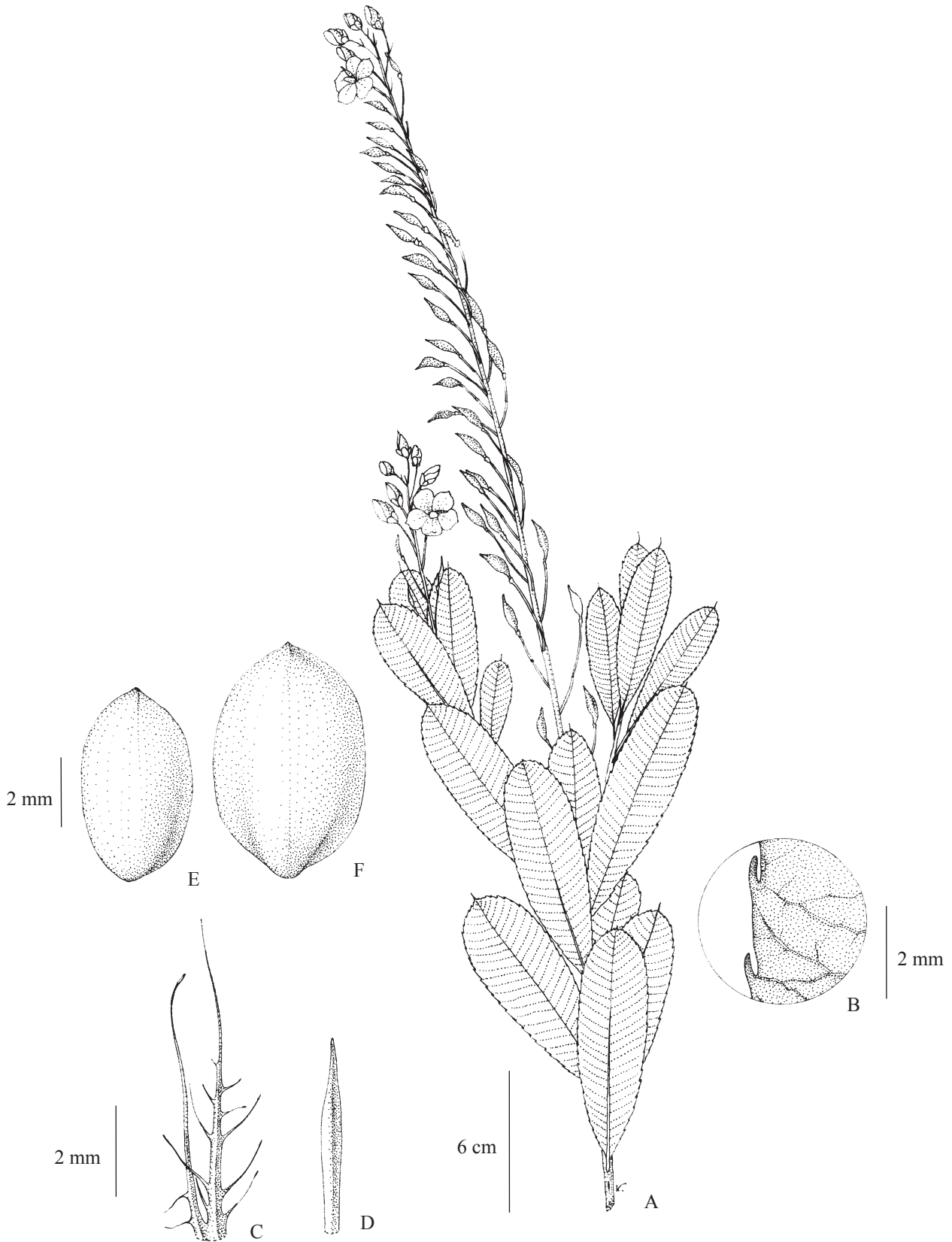


Figure 3. *Luxemburgia leitonii* Feres. A. Flowering branch. B. Detail of leaf margin, adaxial side. C. Stipule. D. Bracteole. E. Outer sepal. F. Inner sepal. (Leitão Filho et al. 6589).

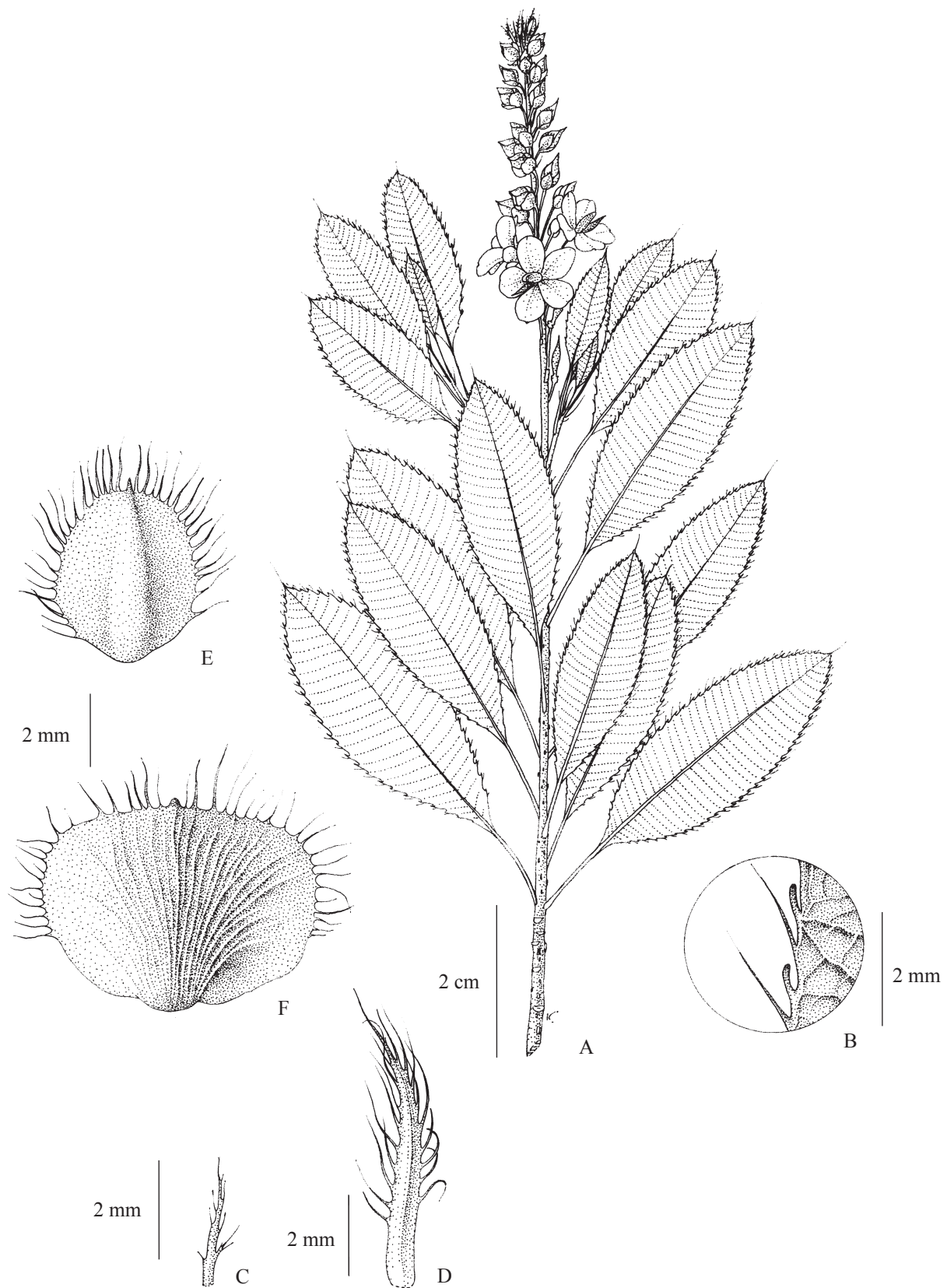


Figure 4. *Luxemburgia mogolensis* Feres. A. Flowering branch. B. Detail of leaf margin, adaxial side. C. Stipule. D. Bracteole. E. Outer sepal. F. Inner sepal. (A-C: Freire-Fierros *et al.* 12462; D-F: Harley *et al.* 6511).

arranged into 4-5 series, anthers 4-7 × 0.8-1 mm; ovary 4-6 × 2-3 mm, style 2-4 mm long, suberect. Capsule 1-1.5 × 0.5-0.7 cm, oblong (mature). Seeds 2 × 1 mm, oblong.

Paratypes: BRAZIL. MINAS GERAIS: Cristália, Morro do Chapéu, 16°43' S, 42°51' W, 6-I-1986, J.R. Pirani *et al.* CFCR 8897 (F, SPF); Grão-Mogol, 16°35' S, 42°54' W, 27-XI-1984, R.M. Harley *et al.* CFCR 6511 (UEC); 12-XI-1938, F. Markgraff *et al.* 3481 (R, RB); trilha dos Garimpeiros, 12-II-1991, G. Hatschbach & O.S. Ribas 55087 (MBM); Itacambira, 17°00' S, 53°50' W, 9-I-1986, J.R. Pirani *et al.* CFCR 9114 (SPF); 14-XII-1989, P.T. Sano *et al.* CFCR 12759 (UEC).

Distribution, habitat and phenology – *Luxemburgia mogolensis* is found among rocks in *campo rupestre* vegetation in the Grão-Mogol region, Minas Gerais (figure 2). It has been collected with flowers from November to January, and with fruits from December to January.

Luxemburgia mogolensis is characterized by its oblong to obovate petiolate leaves with toothed and entirely ciliate margins, bracts and bracteoles lanceolate to narrowly oblong, with margins ciliate, except at the base, the outer sepals ovate to orbicular and the inner sepals obovate with the margins ciliate, except at the base.

This species resembles *L. glazioviana* (Engl.) Beauverd, from Rio de Janeiro, because its oblong to obovate leaves, and bracts and bracteoles lanceolate to narrowly oblong. Because of such similarity, Yamamoto & Sastre (2004) mentioned the occurrence of *L. glazioviana* in the Flora of Grão-Mogol, Minas Gerais. The analysis of the specimens cited by Yamamoto & Sastre (2004) revealed that they actually belong to a species distinct to *L. glazioviana*. In *L. glazioviana* the sepals are always glabrous whereas in *L. mogolensis* the sepals are always ciliate, especially the outer ones. Another conspicuous difference between the two species is that in the new species, the marginal cilia of leaves are emergent exactly from the leaf margin, while in *L. glazioviana* the cilia are emergent from the adaxial side of the leaf.

Luxemburgia mogolensis is the northernmost species of the genus in Minas Gerais, and was named after the locality where it is mainly found, Grão-Mogol (figure 2). This area is known for its high levels of endemism in many plant groups (Giulietti & Pirani 1988, Pirani *et al.* 2003). The new species proposed here, *L. mogolensis*,

provides another case of endemism for the region of Grão Mogol.

Acknowledgments – The author are most grateful to Maria do Carmo Estanislau do Amaral and Volker Bittrich for many helpful suggestions during the development of this work. To Fapesp for financial support. To Eduardo Kickhöfel, who made the species illustrations. To the Editorial Board and referees, for their valuable comments, essential for the improvement of this work.

References

- AZEVEDO, A.P. 1994. Ochnaceae. In Reserva Ecológica de Macaé de Cima – Nova Friburgo, RJ – Aspectos florísticos das espécies vasculares (M.P.M. Lima & R.R. Guedes-Bruni, eds.). Jardim Botânico do Rio de Janeiro, Rio de Janeiro, p.309-313.
- DWYER, J.D. 1951. The genus *Luxemburgia* (Ochnaceae). *Lloydia* 14:82-97.
- DWYER, J.D. 1955. Family Ochnaceae. *Journal of Washington Academy of Sciences* 45:198-199.
- FERES, F. 2001. O gênero *Luxemburgia* A. St.-Hil. (Ochnaceae) – Revisão taxonômica e estudo cladístico. Dissertação de mestrado, Universidade Estadual de Campinas, Campinas.
- FRAGA, C.N. & FERES, F. 2007. *Luxemburgia misteriosa* (Ochnaceae), a new species from the Atlantic Rain Forest of Espírito Santo, Brazil. *Harvard Papers in Botany* 12:405-408.
- GIULIETTI, A.M. & PIRANI, J.R. 1988. Patterns of geographic distribution of some plant species from the Espinhaço Range, Minas Gerais and Bahia, Brazil. In *Proceedings of a workshop on Neotropical Distribution Patterns* (W.R. Heyer & P.E. Vanzolini, eds.). Academia Brasileira de Ciências, Rio de Janeiro, p.39-69.
- PIRANI, J.R., MELLO-SILVA, R. & GIULIETTI, A.M. 2003. Flora de Grão-Mogol, Minas Gerais. *Boletim de Botânica da Universidade de São Paulo* 21:1-25.
- ROMERO, R. & NAKAJIMA, J.N. 1999. Espécies endêmicas do Parque Nacional da Serra da Canastra, Minas Gerais. *Revista Brasileira de Botânica* 22:259-265.
- SAINT-HILAIRE, A. 1822. Aperçu d'un voyage dans l'intérieur du Brésil. *Mémoires du Muséum d'Histoire Naturelle* 9:352.
- SASTRE, C. 1981. Ochnaceas novas do Brasil. *Bulletin van de Nationale Plantentuin van België* 51:397-413.
- SASTRE, C. 1995. Ochnaceae. In *Flora of the Pico das Almas: Chapada Diamantina, Bahia, Brasil* (B.L. Stannard, ed.). Royal Botanical Gardens, Kew, p.519-523.
- YAMAMOTO, K. & SASTRE, C. 2004. Flora de Grão-Mogol, Minas Gerais: Ochnaceae. *Boletim de Botânica da Universidade de São Paulo* 22:343-348.

