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New Gesneriaceae from Minas Gerais, Brazil

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ABSTRACT

CHAUTEMS, A. (2002). New Gesneriaceae from Minas Gerais, Brazil. *Candollea* 56: 261-279. In English, with English, Portuguese and French abstracts.

A new combination, *Paliavana gracilis* (Mart.) Chautems, and five new species from the state of Minas Gerais, Brazil, are described and illustrated, *Paliavana plumerioides* Chautems, *Vanhouttea brueggeri* Chautems, *V. hilariana* Chautems, *V. leonii* Chautems, *V. pendula* Chautems. Conservation status is given following IUCN criteria and most of the species are classified as endangered. With the additional new taxa, *Paliavana* Vand. now has six species and *Vanhouttea* Lem. eight species. A key to the taxa of the two genera is provided.

RESUMO

CHAUTEMS, A. (2002). Novas Gesneriaceae de Minas Gerais, Brasil. *Candollea* 56: 261-279. In English, resumos em inglês, português e francês.

Uma nova combinação, *Paliavana gracilis* (Mart.) Chautems, e cinco espécies novas do estado de Minas Gerais, Brasil, *Paliavana plumerioides* Chautems, *Vanhouttea brueggeri* Chautems, *V. hilariana* Chautems, *V. leonii* Chautems, *V. pendula* Chautems são descritas e ilustradas. O estatus de conservação de acordo com os critérios da UICN é estabelecido, no qual a categoria "Em perigo" aparece na maioria das espécies. Com a inclusão dos novos taxons, *Paliavana* Vand. tem agora seis espécies e *Vanhouttea* Lem. oito. Uma chave das espécies incluidas nestes dois gêneros é proposta.

RÉSUMÉ

CHAUTEMS, A. (2002). Nouvelles Gesneriaceae du Minas Gerais, Brésil. *Candollea* 56: 261-279. En anglais, résumés en anglais, portuguais et français.

Une nouvelle combinaison, *Paliavana gracilis* (Mart.) Chautems, et cinq nouvelles espèces de l'état de Minas Gerais, Brésil, *Paliavana plumerioides* Chautems, *Vanhouttea brueggeri* Chautems, *V. hilariana* Chautems, *V. leonii* Chautems, *V. pendula* Chautems sont décrites et illustrées. Leur statut de conservation selon les critères de l'UICN est présenté, faisant apparaître la catégorie "En danger" pour la plupart des espèces. Avec l'addition de ces nouveaux taxa, *Paliavana* Vand. compte maintenant six espèces et *Vanhouttea* Lem. huit. Une clé des espèces de ces deux genres est proposée.

KEY-WORDS: Taxonomy – *Sinningieae* – *Paliavana* – *Vanhouttea* – Conservation status – Campo rupestre.

Following previous accounts on Brazilian *Gesneriaceae* (CHAUTEMS, 1988, 1990, 1991a, 1991b, 1995, 1997; CHAUTEMS & al., 2000) and in the course of preparing a treatment of the tribe *Sinningieae* for "Flora Neotropica", one misplaced species and several undescribed taxa were encountered. The tribe comprises three genera: *Sinningia* Nees (ca. 65 species), which are plants with perennial tubers producing annual herbaceous (rarely suffrutescent and perennial) shoots, *Paliavana* Vand. (6 species) and *Vanhouttea* Lem. (8 species), both with woody stems and lacking tuber, but distinguished by campanulate (bat or bee syndrome) or tubular

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(hummingbird syndrome) flowers respectively. Based on such characters, the undescribed taxa are assigned to the latter two genera.

Recent molecular results (analyzing most of the *Sinningieae* taxa) show that the monophyly of the tribe is well supported, but the genera *Paliavana* and *Vanhouttea* appear embedded within *Sinningia* sensu lato (PERRET & al., in prep.). Five clades emerge, but one is weakly supported and poorly resolved for several species (including the type species of *Vanhouttea* and *Paliavana*). A new generic circumscription is in preparation. Before proposing a satisfactory treatment, complex nomenclatural problems have to be solved and an improved resolution at the molecular level obtained. Meanwhile, a conservative point of view, based only on morphological characters, is adopted in the present paper.

All the taxa mentioned below are rare with distribution restricted to one type of vegetation ("campo rupestre" or "campo de altitude"). The map (Fig. 1) shows the restricted distributions inferred to some mountain masses in Minas Gerais. Because of their unpublished status at that time, they did not appear in the recently published Red list of the Minas Gerais flora (MENDONÇA & LINS, 2000). Their conservation status following IUCN criteria is then given here.

Paliavana gracilis (Mart.) Chautems, **comb. nova** (Fig. 2)

≡ *Gloxinia gracilis* Mart., Nov. Gen. Sp. 3: 64, tab. 226. 1829.

≡ *Ligeria gracilis* (Mart.) Hanst. in Mart., Fl. Bras. 8(1): 390. 1864.

≡ *Sinningia gracilis* (Mart.) Fritsch in Engl. & Prantl, Nat. Pflanzenfam. IV(3b): 182. 1894.

Shrub rupicolous, woody at base, suffrutescent towards the apex, without perennial tuber. *Stems* 40-120 cm tall and 0.5-1 cm in diameter, irregularly branched, glabrescent at base, pubescent on new shoots, internodes 4-10 cm long, often deciduous on the basal section. *Leaves* decussate or ternate, equal to slightly anisophyllous, petiole 4-8 mm long, green; blade ovate to elliptic, 3.5-7.5 cm long × 1.5-3 cm wide, apex acute, base attenuate, above green, paler beneath, margin irregularly serrate with teeth 1 mm high × 1-3 mm wide, 5-7 pairs of veins with denser pubescence. *Inflorescence* composed of 1-2 flowers in upper leaf axils, peduncle obsolete, bracts ligulate, 8-10 mm. Flowers borne on pedicels, 8-12 mm long. *Calyx* campanulate, fused at base for ca. 3-6 mm, lobes subequal, 20-35 mm long, subulate, 3-5 mm wide at base, margin entire, green, sometimes reddish at bud stage, pubescent. *Corolla* campanulate, ventricose, slightly oblique in the calyx, 3.2-4.4 cm long, inflated at base 5-7 mm in diam., then briefly constricted and gradually expanding in a tube 12-16 mm wide, dorsal side slightly curved in a central ridge, green-yellow in bud, turning purple at anthesis, glabrescent, lobes 10-12 × 8-10 mm, spreading, the ventral one 2-4 mm wider, horizontal, dark purple on the inner side, tube inside cream and light purple with darker speckles. Stamens 4, included, filaments 17-21 mm long, white, glabrous, anthers coherent in a square, pollen white; nectary consisting of 5 equal glands; ovary greenish, style 23-29 mm, white. *Fruit* a capsule, calyx base accrescent and adherent for 6-10 mm, 1.5-2 cm long × 0.8-1.2 cm wide; seeds elliptical, obliquely striate.

Type: BRAZIL, Rio de Janeiro: "In rupibus madidis ad Gouvea et alibi Prov. Sebastionopolitanae", XI. s.a., *Martius s.n.* (Holo-: M).

Distribution. – In the Diamantina plateau (part of the Espinhaço Range) and on both side of the Caparaó mountain mass, with a surprising gap in the well explored Serra do Cipó area.

Conservation status. – Vulnerable. Most of the localities of occurrence do not benefit from legal protection.

Ecology. – Plant growing in thin pocket of soil on granite outcrops with thicket vegetation, part of "campo rupestre", between 750 and 1300 m.

Phenology. – Flowering from (December) February to May, fruiting from April to July.

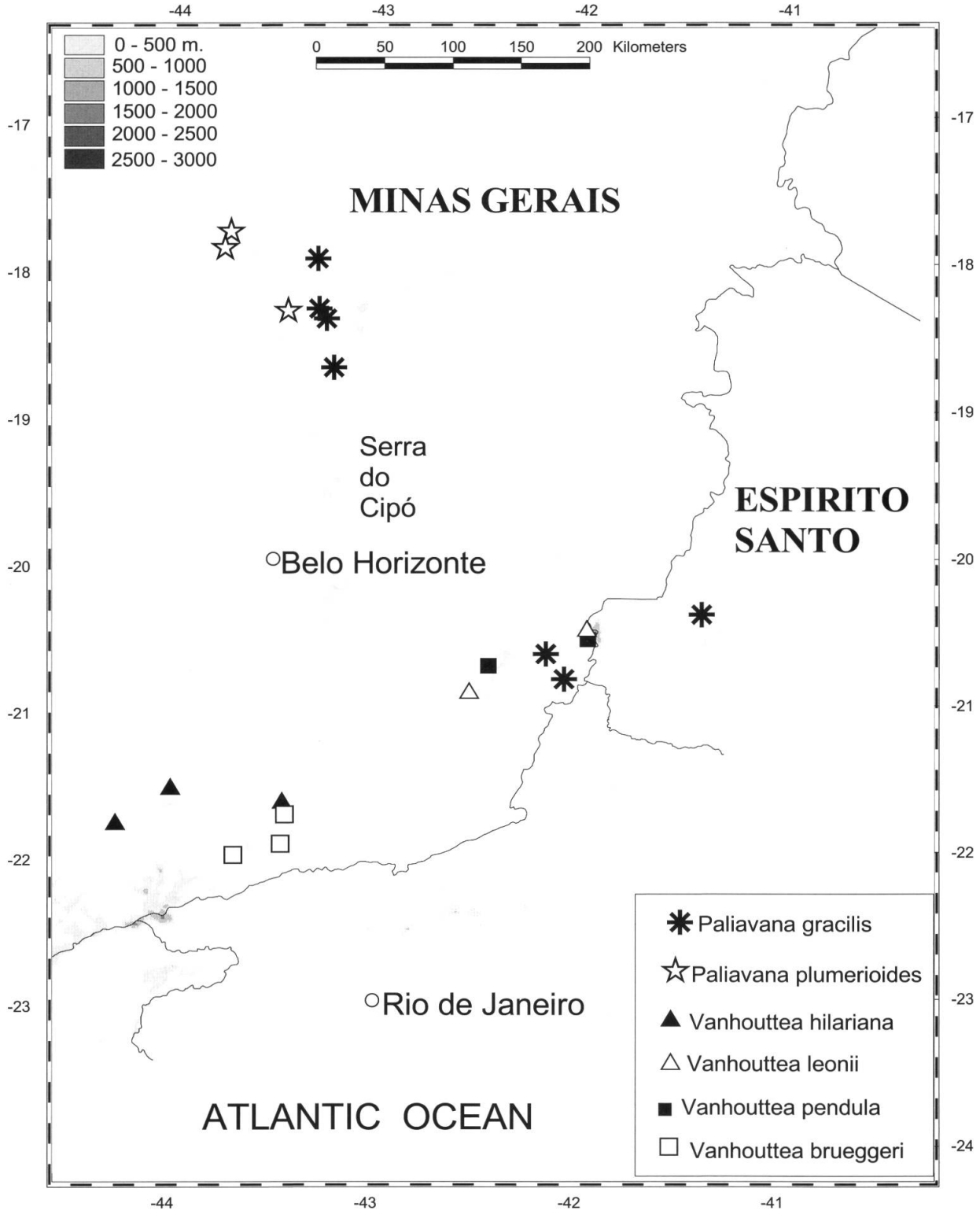

Fig. 1. – Distribution of *Paliavana gracilis*, *P. plumerioides, Vanhouttea brueggeri*, *V. hilariana*, *V. leonii* and *V. pendula*. The elevations are indicated by darker color every 500 m in order to clearly show the mountain masses.

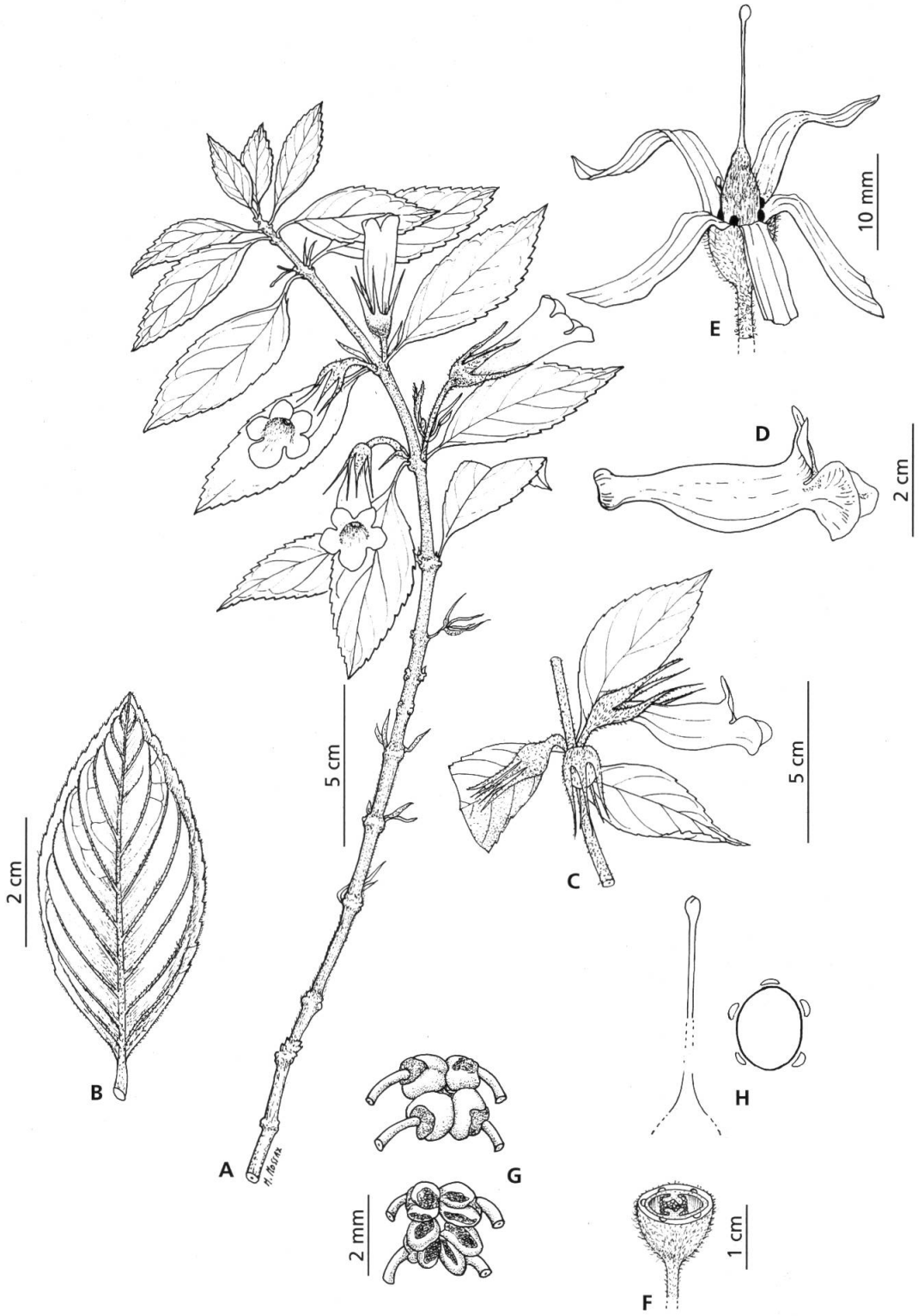

Fig. 2.– *Paliavana gracilis* (Mart.) Chautems

A, habit; **B,** abaxial leaf venation; **C,** node with axillary flowers; **D,** corolla; **E,** ovary surrounded by nectary and calyx; **F,** cross section of ovary; **G,** anthers in dorsal and frontal view; **H,** nectary glands and stigma.

[**A, B,** from *Irwin & al. 22924*; **C-H,** from pickled flowers and slides of cultivated material accession number AC-1809].

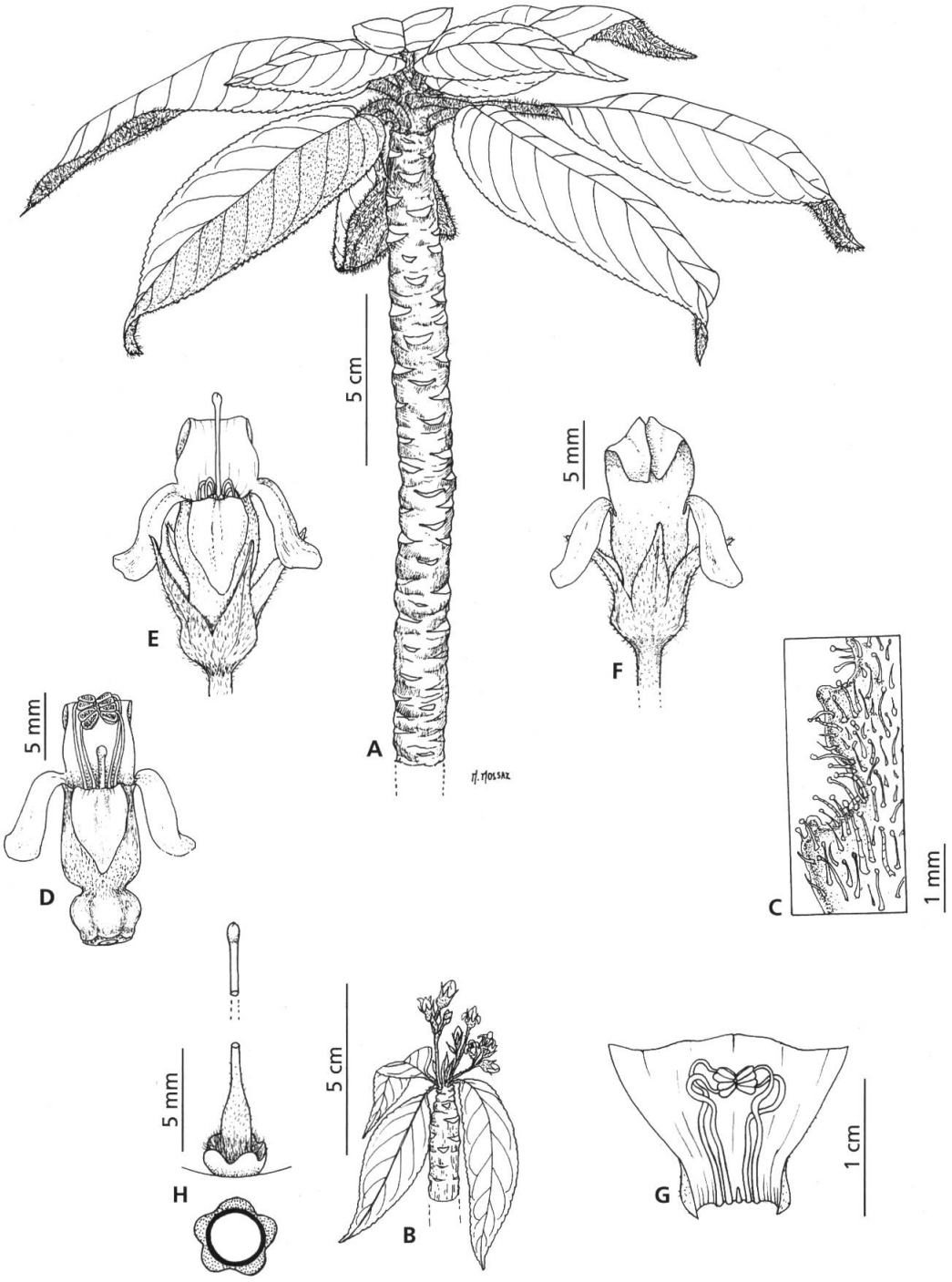

Fig. 3.– *Paliavana plumerioides* Chautems

A, habit; **B,** flowering stem apex; **C,** abaxial leaf margin; **D,** corolla at anthesis; **E,** corolla after anthesis; **F,** flower in dorsal view; **G,** open corolla showing coiling stamens after anthesis in frontal view; **H,** nectary glands and stigma.

[**A,** from cultivated material accession number AC-2401; **B,** from *Davis & al. 2408;* **C,** from *Arbo & al. 4384*; **D-H,** from *Chautems & al. 460*].

Material examined. – **BRAZIL, Espirito Santo**, "Venda Nova, arredores, dos paredões rochosos", IV.1984, *G. Hatschbach 47847* (MBM); **Minas Gerais**, "Diamantina, 9 km by road SW of Mendanha and the Rio Jequitinonha on road to Diamantina, 1150 m", [18°04'S 43°31'W], 14.IV.1973, *W. R.. Anderson 8875* (F, K, MO, NY, R, UB, US); "Diamantina, 15 km SE de Diamantina, caminho a Milho Verde, 18°20'S 43°33'W", 14.II.1991, *M. M. Arbo & al. 5136* (SPF); "saddleback journey to Araponga, 800-1100 m", III.1924, *L. H. Bailey & E. Z. Bailey 1083* (BH); "Alto Jequitinonha, Serra dos Cristais", 5.VI.1967, *A. P. Duarte 10456* (RB); "Diamantina", XII.1984, *V. F. Ferreira 3690* (GUA); "Diamantina", XII.1984, *V. F. Ferreira 3711* (GUA); "Diamantina, ca. 25 km NE of Diamantina road to Mendanha, 1200 m", 30.I.1969, *H. S. Irwin & al. 22924* (IAN, NY); "road to Inhaí, ca.7 km N of São João da Chapada, 1150 m", III.1970, *H. S. Irwin & al. 28622a* (NY, US); "Carangola, Morro da Torre, próx. a estação Rádio Telemig, 900 m", 21.V.2000, *L. S. Leoni 4430* (GFJP); "Divino, Faz. do Rochedo", 11.III.1992, *L. S. Leoni & F. Lourenço 1812* (G, GFJP); "Serra do Brigadeiro, área perturbada sobre formação rochosa ao lado da estrada", 26.III.1995, *L. S. Leoni 2849* (GFJP); "Divino, Faz. Rochedo", 750 m, 15.V.1999, *L. S. Leoni 4204* (G, GFJP).

MARTIUS (1829) had included this species in the genus *Gloxinia* L'Hér. (including also *Paliavana* and *Sinningia*) based on the "terete" calyx and large purple flower similar to "*Gloxinia speciosa* Lodd.", the wild form of the well known "florist Gloxinia" (transferred to *Sinningia speciosa* (Lodd.) Hiern in 1878). His original diagnosis starts with "Tuber magnitudine pomi", the reason why HANSTEIN (1864) transferred the taxon to the genus *Ligeria* Decne. in the tribe *Eugesnereae* including also *Gesnera* Mart. non L., *Dolichodeira* Hanst., and *Sinningia*, all being herbs (rarely woody at base) with a tuber, while *Gloxinia* and *Mandirola* Decne. are defined by scaly rhizomes. No mention of a tuber is made by the collectors of any of the material examined and cited above. I observed live material in the *Leoni 1812* and *Leoni 4204* collecting sites, as well as in cultivation and never found any form of tuber.

Some discrepancies are found between the type label and its citation in MARTIUS (1829): "Crescit in humo pingui uda super saxa ad montem Corcovado et prope Tijuca praedium, Prov. Sebastianopolitanae, floret mensibus Octobri, Novembri". Size of the plant differs also in Martius' description "duos ad quatuor pedes [60-120 cm]" and HANSTEIN (1864) "1-1,5 ped. alto" [30-45 cm]. *Paliavana gracilis* has never been recollected around Rio de Janeiro. Based on the fact that the area is probably the most extensively investigated by botanists in Brazil, one can suspect erroneous information or a confusion in herbarium labels for the material referred to by MARTIUS (1829). *Sinningia speciosa* shows strong similarity in flower shape and color to *P. gracilis* and is frequent in the surroundings of the city of Rio de Janeiro. In some cases, stems of *S. speciosa* reaching 10-20 cm are encountered and the two species may have been confused. The flowering period indicated by HANSTEIN (1864) (October, November) is discordant with what was established for *P. gracilis* (February to May). This is another element suggesting a possible switch of labels, as *S. speciosa* is frequently found in flower during the period indicated by HANSTEIN.

Paliavana plumerioides Chautems, **spec. nova** (Fig. 3)

Species insignis caulibus nudis ramosisque candelabro similis, foliis deciduis tempore florendi, corollis tubulosis parvis (1.8-2 cm longis), ab congeneris valde distincta.

Type: BRAZIL, Minas Gerais: "Serra do Cabral, Joaquim Felicio", VIII.1985, *R. Mello Silva & al. CFCR 8067* (Holo-: SPF; iso-: CEPEC, G).

Shrub rupicolous, without perennial tuber. *Stems* 0.6-2.5 (-4) m tall and 1-3.5 (-5) cm in diameter, candelabriform branching, naked for most of its length with conspicuous scars of fallen leaves, woody and often covered with lichens at base, succulent on younger shoots, glandular pubescent at the apex, glabrous below, internodes between leaf scars ca. 0.5 cm long. *Leaves* usually deciduous at flowering time, in verticils of 3 or 4, reduced to 2-3 whorls at the stem apex, equal to slightly anisophyllous, glandular pubescent, petiole 1.5-3.5 cm long, green; blade ovate to elliptic, 5-12 cm long × 2-6 cm wide, apex acute, base obtuse, above green, paler beneath with a dense indument, margin irregularly crenate with teeth 0.5-1 mm high × 1-2 mm wide, 7-10 pairs of veins. *Inflorescence* in cymes bearing 4-6 flowers in axillary position on the apex of the stem, peduncle 2-3 cm, erect, reddish. Flowers on erect pedicels 3-4 cm long, reddish at base, greenish towards apex. *Calyx* campanulate, fused at base for ca. 2-3 mm, lobes subequal, lanceolate, acuminate, 7-8 mm long × ca.3 mm wide, margin entire, greenish to reddish,

pubescent. *Corolla* tubular, bilabiate, erect in the calyx, 1.8-2 cm long, inflated at base in a 5-lobed ring 3 mm long × 7-9 mm in diam., then markedly constricted to ca. 3 mm diam. and abruptly expanding in a tube 7-8 mm long × ca. 7-10 mm wide, in bud yellowish, at anthesis tube outside greenish ventrally, maroon dorsally, lobes inside and throat cream, pubescent, lobes of the limb unequal, ventral and lateral ones reflexed, 6-7 mm long × ca.4 mm wide, dorsal ones fused for about half of their length, erect and forming a galea, 8-9 mm long × ca.6 mm wide, reflexed and with divided lobes at the apex. Stamens 4, included, filaments 14-16 mm long, greenish, glabrous, anthers coherent in a rectangle, pollen cream; nectary consisting of 5 glands, fused in a ring at base, ovary greenish, style and stigma cream. *Fruit* a capsule, 12-15 mm long × 4-7 mm wide, sericeous, calyx tube adnate for 5-6 mm to the base, seeds fusiform, ca. 1 mm long, maroon, striate.

Etymology. – The specific epithet refers to the peculiar habit with thick succulent stems very similar to *Plumeria rubra* L. in branching pattern and conspicuous leaf scars on naked stems with terminal leaves and inflorescences.

Distribution. – Restricted to the Serra do Cabral and around Diamantina, between 600 and 1200 m.

Conservation status. – Endangered. The Serra do Cabral belongs to the list of priority areas for flora conservation (MENDONÇA & LINS, 2000), but so far no legal protection has been granted to this area.

Ecology. – Isolated shrubs on sandstone and quartzite outcrops, along with some small columnar *Cactaceae*. At the time of my visit, a small and metallic green hummingbird with a straight beak (possibly *Chlorostilbon aureoventris pucherani* or *Amazilia. sp.*) was observed visiting flowers; two visits at an interval of 15 minutes were recorded around 5 p.m., shortly before dusk. No particular odor was noticed, but other characters such as pale corolla color and an annular nectary able to produce abundant nectar could indicate chiropterophilous flowers.

Phenology. – Flowering from July to September, fruiting from August to October, leaves observed from May to July, deciduous during flowering period. New leaves are formed on the very apex and seem to develop after fruiting period.

Additional material examined. – **BRAZIL, Minas Gerais**, "Diamantina, 20-26 km WSW de Diamantina, camino a Conselheiro Mata, MG-220, 18°17'S 43°49'W", V.1990, *M. M. Arbo & al. 4384* (G, SPF); "ca. 15 km W J. Felicio, camino a Varzea da Palma", V.1990, *M. M. Arbo & al. 4561* (G, SPF); "Joaquim Felicio, Serra do Cabral", VIII.1998, *A. Chautems & M. Peixoto 460* (CEPEC, G); "Serra do Cabral, entrada de Buenópolis", VII.1976, *Davis & al. 2285* (E, UEC); "50 km N de Corinto, Serra do Cabral-Joaquim Felicio", VII.1976, *Davis & al. 2408* (E, UEC); "ca. 50 km N de Corinto, Serra do Cabral, estr. para Buenópolis", V.1977, *P. Gibbs & al. 5151* (UEC); "Buenópolis, Serra do Cabral, a 7 km da cidade, 950 m, 17°53'S 44°15'W", X.1988, *R. Harley & al. 24904* (G, NY, SPF); "about 20 km from Concepção, along road Concep. to Diamantina", VIII.1960, *B. Maguire & al. 49110* (GH, NY, RB, US); "Buenópolis, Serra do Cabral-Joaquim Felicio, alto da Serra nas pedras em touceiras isoladas", IX.1942, *Mendes Magalhães 4562* (RB).

This weird looking species is best placed in the genus *Paliavana* based on its woody stems, greenish flowers, and rocky habitat. It possesses pronounced xerophytic adaptations with few leaves produced at the apex of succulent stems and flowers reaching maturity when leaves are fallen, at the peak of the dry season. The growing pattern matches the Leeuwenberg architectural model, based on HALLÉ & OLDEMAN (1970). Stem elongation is very slow, reaching 1 or 2 cm each year, as observed on cultivated material (M. PEIXOTO, pers. comm.). Deduced from the colony of crustaceous lichens observed on the bark of the basal stem portion, the plants must take at least 30 to 50 years to reach 1 meter (P. CLERC, pers. comm.). This slow growth is one more reason to take action for the preservation of this rare species.

The genus *Paliavana* now comprising six species can be considered a characteristic element of "campo rupestre" vegetation, in addition to the genera listed by GIULIETTI & al. (1997), the only exception being *P. prasinata* (Ker Gawl.) Benth. occurring on inselbergs and rocks within the coastal rainforest of Espírito Santo and Rio de Janeiro.

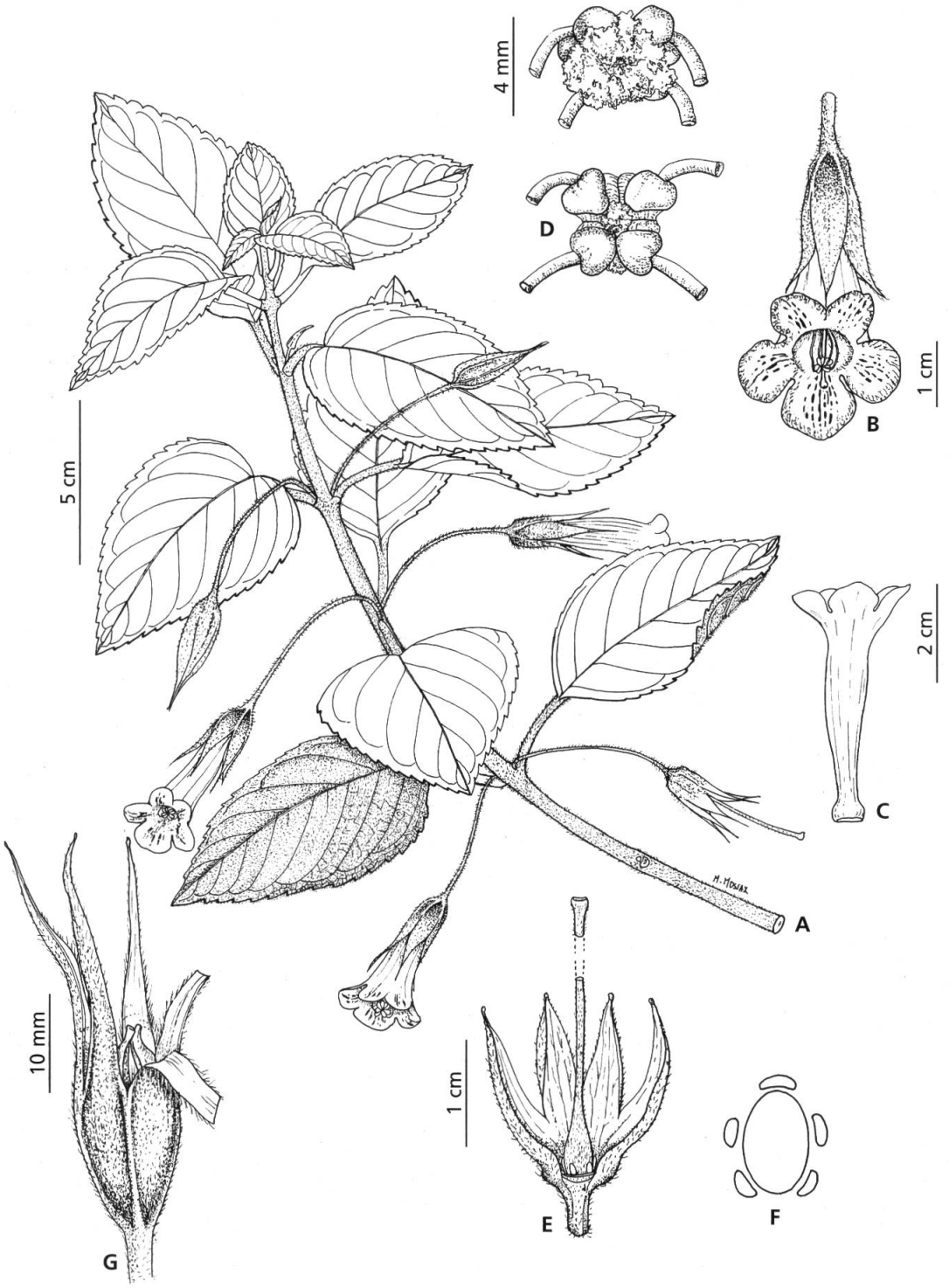

Fig. 4.– *Vanhouttea brueggeri* Chautems

A, habit; **B,** flower; **C,** corolla; **D,** anthers in dorsal and frontal view; **E,** open flower with corolla removed showing nectary, ovary and stigma; nectary glands and stigma; **F,** nectary glands; **G,** capsule enclosed in accrescent calyx.

[**A-E,** from *Chautems 411a*; **G,** from *Lisboa s.n.*].

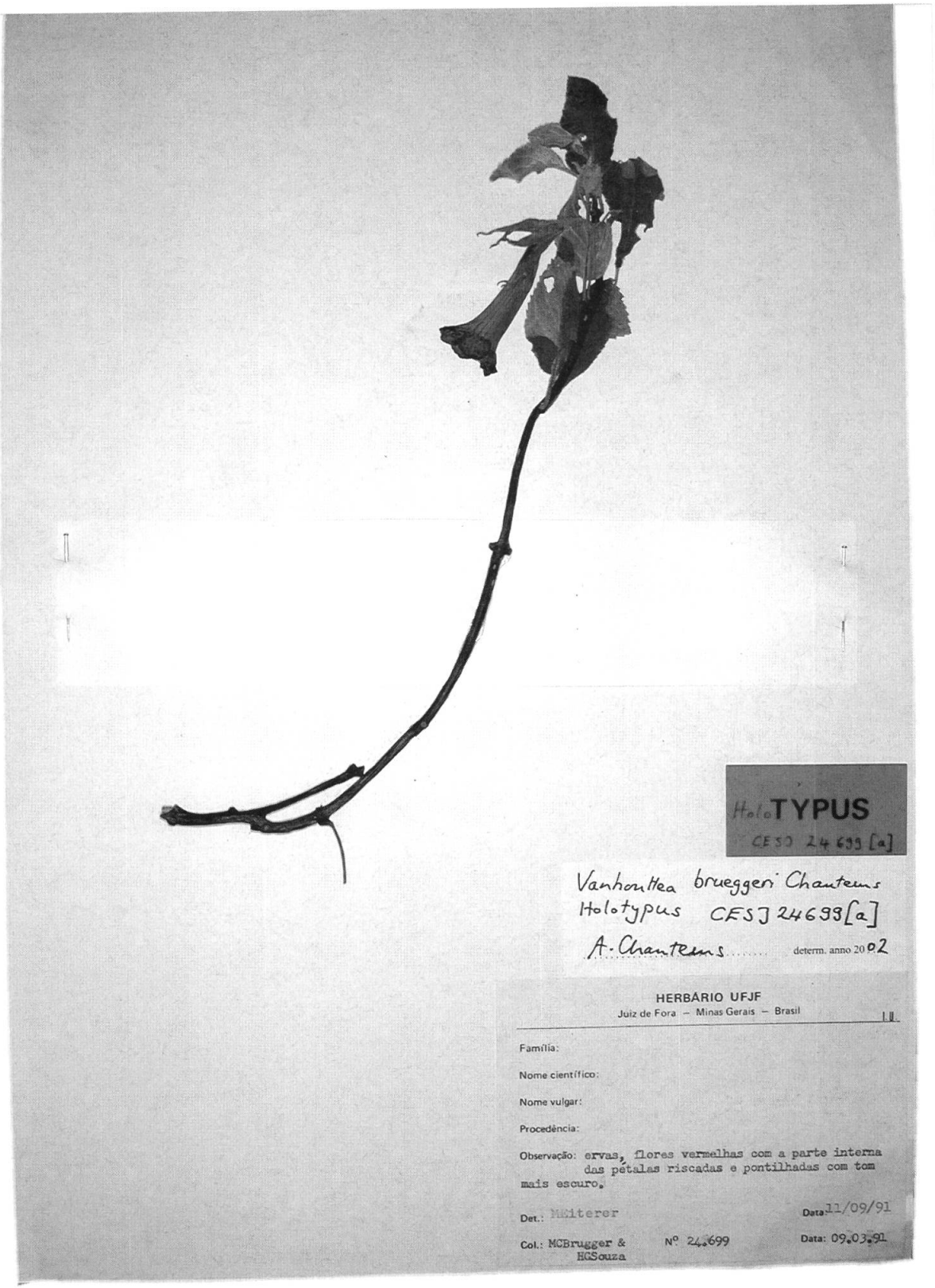

Fig. 5. – Holotypus de *Vanhouttea brueggeri* Chautems [*Bruegger & Souza s.n.* CESJ 24699 [a]].

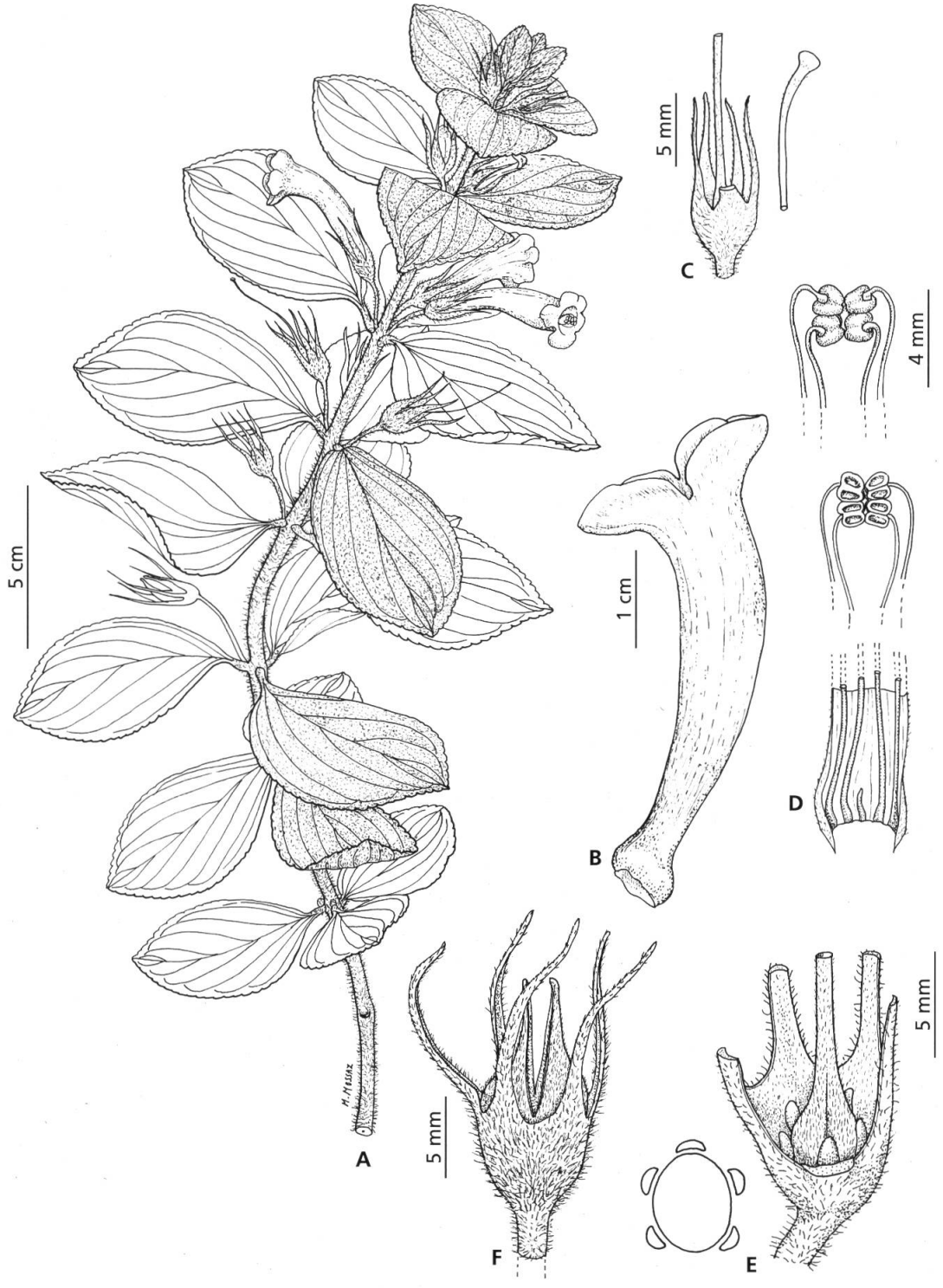

Fig. 6.– *Vanhouttea hilariana* Chautems

A, habit; **B,** corolla; **C,** calyx and style and stigma; **D,** filaments insertion and anthers in dorsal and frontal view; **E,** nectary glands and ovary; **F,** capsule half enclosed in accrescent calyx.

[**A,** from *Oliveira 112*; **B-F,** from *Eiterer & Oliveira s.n.*].

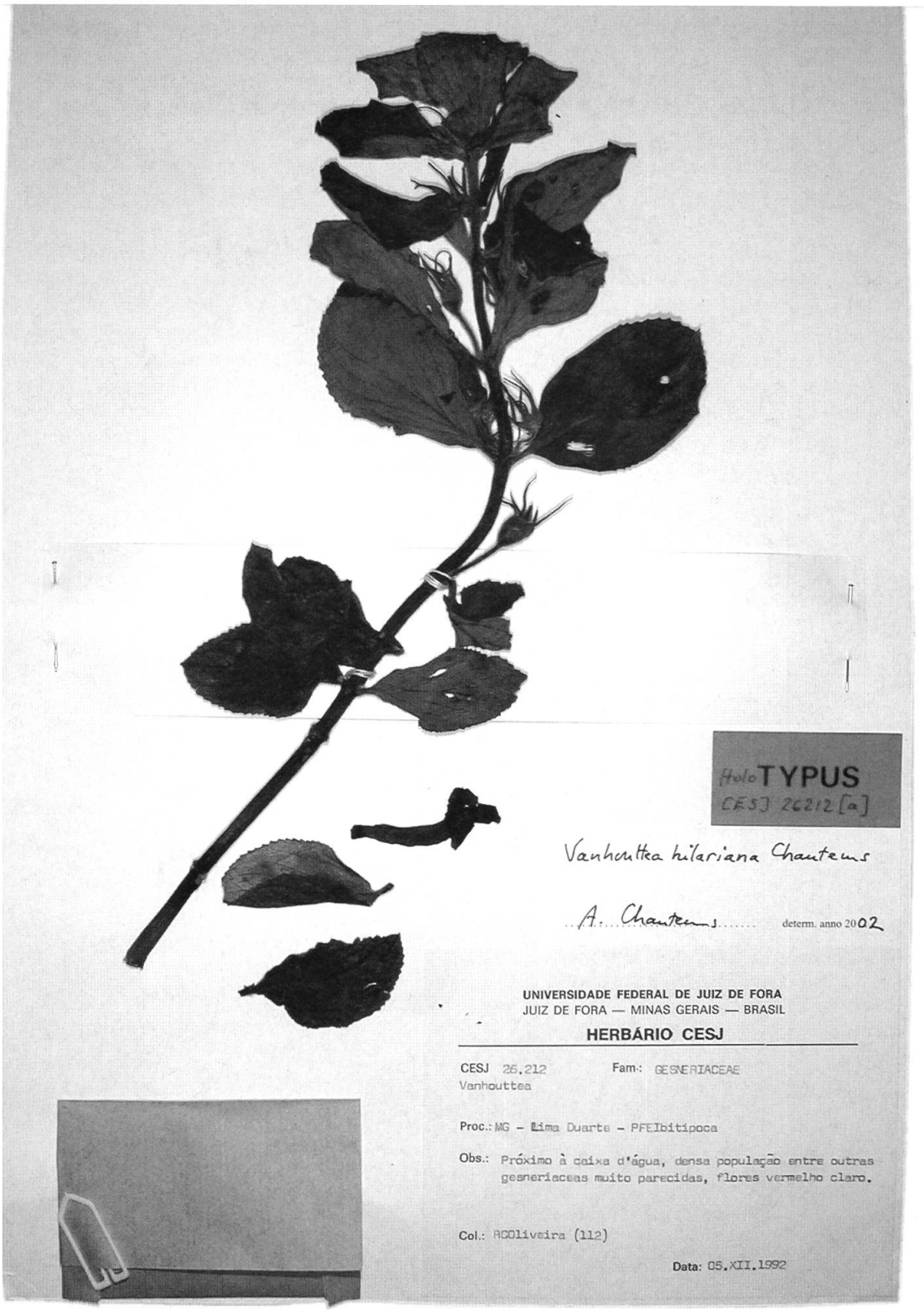

Fig. 7. – Holotypus de *Vanhouttea hilariana* Chautems [*Oliveira 112* CESJ 26212 [a]].

Vanhouttea brueggeri Chautems, **spec. nova** (Fig. 4, 5)

Vanhoutteae calcaratae affinis sed foliis latioribus, superficie adaxiali argentea, pedicelo oblique pendulo, basi calycis cum suturis carinatis, lobis corollae maioris differt.

Type: BRAZIL, Minas Gerais: "Monte Verde de Cima, Serra Negra", III.1991, *M. Brügger & H. G. Souza s.n.* (Holo-: CESJ 24699[a], iso-: CESJ 24699).

Shrub rupicolous, without perennial tuber. *Stems* erect, 40-150 cm tall and 0.5-1.5 cm in diameter, woody, brown to reddish on young parts, pubescent, internodes 0.5-4 cm long. *Leaves* decussate, equal to slightly anisophyllous, petiole 0.5-2.5 cm long, greenish, pubescent; blade ovate to elliptic, 3-8 cm long × 2.3-4.5 cm wide, apex acute, base obtuse, silvery green above, canescent beneath, margin irregularly serrate with teeth 0.5-1.5 mm high × 1-5 mm wide, 5-8 pairs of veins. *Inflorescence* of 1-2 flowers in axillary position in the upper nodes. Flower borne on descending to horizontal pedicel, 2-5 cm long, green to reddish. *Calyx* campanulate, completely fused in bud, lobes subequal at maturity, fused at base for ca. 7-10 mm and keeled at their suture, lanceolate, apiculate, 15-20 mm long × ca. 5 mm wide, margin entire, silvery green. *Corolla* tubular, erect in the calyx at base, somewhat curved dorsally, 4.5-5 cm long, inflated at base in a ring ca. 4-5 mm in diam., then briefly constricted and expanding gradually in a tube ca. 7-9 mm wide, yellowish in bud, turning pink at anthesis, puberulous, lobes of the limb spreading, the ventral and lateral ones 9-12 mm wide × 8-10 mm long, the dorsal ones 8-10 mm wide × 8-9 mm long, tube inside cream with red striations, prolonged and interspersed with dots on the inner face of lobes. Stamens 4, included, filaments 3.8-4 cm long, cream, glabrous, anthers coherent in a star, pollen white; nectary consisting of 5 glands, greenish, ovary greenish, style cream, stigma greenish. *Fruit* a capsule, ca. 1.2-1.8 cm long × 0.5 cm wide, calyx accrescent and adherent for two thirds of the capsule, seeds elliptic, obliquely striate.

Etymology. – This species is named for Márcio C. Brügger, a colleague from the Federal University of Juiz de Fora who first discovered the taxon in Minas Gerais.

Distribution. – The species is restricted to a few localities on the northern side of the Serra da Mantiqueira.

Conservation status. – Endangered.

Ecology. – Grows in rocky outcrop in "campo de altitude" vegetation, between 1400 and 1600 m; in the Serra das Flores, some plants were observed growing in pure quartzite sand.

Phenology. – Flowering from November to May, fruiting from March to July, occasionally flowers are produced in July and September.

Additional material examined. – **BRAZIL, Minas Gerais**, "Olaria, S. Fco. do Prata, S. das Flores (Faz. Cachoeirinha), 1400 m", II.1992, *A. Chautems & al. 411a* (CESJ 25881); "Olaria, S. Fco. do Prata, S. das Flores (Faz. Cachoeirinha), 1400 m", II.1992, *A. Chautems & al. 411b* (CESJ 25882); "Lima Duarte, arredores do P.F.E. de Ibitipoca, trilha que sai da portaria do Parque para o lado esquerdo", II.2001, *R. C. Forzza & al. 1803* (G); "P. Fl. Est. de Ibitipoca, prox. ao Lago das Miragens", XI.1991, *M. L. G. Lisboa s.n.* (CESJ 25891); "Serra das Flores, S. Francisco do Prata", III.1991, *F. Salimena Pires & al. s.n.* (CESJ); "Bom Jardim de Minas", VII.1991, *F. Salimena Pires & al. s.n.* (CESJ 24840); "S. Fco. do Prata, S. das Flores", IX.1991, *F. Salimena Pires & al. s.n.* (CESJ 24613).

This species presents a downy indument on leaf undersides like *Vanhouttea calcarata* Lem., but differs by having wider leaf blades (of silvery appearance on live material), longer calyx with keeled sutures at base and broader corolla with larger lobes.

Vanhouttea hilariana Chautems, **spec. nova** (Fig. 6, 7)

Species insignis venis basalis foliorum longe curvatis fere apicem attingentis, calicis lobis linearibus, corola arcuata.

Type: BRAZIL, Minas Gerais: "Lima Duarte, P. Fl. Est. Ibitipoca, prox. à caixa d'água", XII.1992, R. C. *Oliveira 112.* (Holo-: CESJ 26212[a]; iso-: CESJ 26212).

Shrub rupicolous, without perennial tuber, the whole plant pubescent, especially on stem and leaf underside. *Stems* 50-150 cm tall and 0.3-0.8 cm in diameter, erect, woody, internodes 0.5-5 cm long. *Leaves* usually decussate, sometimes ternate, equal to slightly anisophyllous, petiole 0.3-8 cm long, pale green; blade ovate to elliptic, 2.5-6 cm long × 1.5-3.5 wide, apex acute, base obtuse, above green, beneath slightly paler, margin irregularly serrate with teeth 1 mm high × 2-3 mm wide, 4-5 pairs of veins, long curved, the basal ones nearly reaching the apex. *Inflorescence* of 1-2 flowers in axillary position on the upper nodes. Flowers borne on erect pedicels, 0.5-1.5 cm long, pale green. *Calyx* campanulate, lobes subequal, fused at base for ca. 5 mm, forming sinuses at their base, linear, 1-1.5 cm long × 1.5-2 mm wide, margin entire, pale green. *Corolla* tubular, erect in the calyx, 4-5 cm long, inflated at base in a ring 3-4 mm in diam., then briefly constricted and expanding gradually in a tube 8-10 mm wide, somewhat arcuate, light pink with yellow orange apex in bud, turning carmine red at anthesis, puberulous, lobes of the limb subequal, 8-11 mm wide × 6-8 mm long, tube inside light pink, darker dots on the inner face of lobes. Stamens 4, included, filaments ca. 4 cm long, white, glabrous, anthers coherent in a square, pollen white; nectary consisting of 5 glands, white, ovary greenish, style and stigma cream to reddish. *Fruit* a capsule, ca. 1.2-1.5 cm long × 0.6-0.8 cm wide, seeds elliptic, ca. 1 mm long, obliquely striate.

Etymology. – Vanhouttea hilariana is named in honor of Auguste de Saint-Hilaire, who made the first collection of this species during his explorations in Brazil.

Distribution. – The species is restricted to a few mountainous areas between 1200 and 1600 m in the northern part of the Serra da Mantiqueira.

Conservation status. – Endangered, the only place with effective protection is in the Ibitipoca State Park.

Ecology. – Occurs in high areas, in the "campo de altitude" vegetation.

Phenology. – Flowering from November to May, fruiting from March to July.

Additional material examined. – **BRAZIL, Minas Gerais**, "Lima Duarte, P. Est. Ibitipoca", I.1987, *P. Andrade 871* (CESJ); "Lima Duarte, P. Est. Ibitipoca", II.1987, *P. Andrade 921* (CESJ, RB, UEC); "Lima Duarte, P. Est. Ibitipoca, Gruta dos Viajantes", IV.1988, *P. Andrade & N. A. Drummond 1169* (CESJ); "Conceição do Ibitipoca, P. Fl. Est. Ibitipoca, trilha para a Gruta dos Três Arcos", VII.1991, *M. Eiterer s.n.* (CESJ 24884); "Conceição do Ibitipoca, P. Fl. Est. Ibitipoca, trilha para a Gruta do Pião", II.1992, *M. Eiterer* & G. S. *Freitas s.n.* (CESJ 25756); "Conceição do Ibitipoca, P. Fl. Est. Ibitipoca, prox. à Gruta dos Viajantes", II.1992, *M. Eiterer & G. S. Freitas s.n.* (CESJ 25757); "Conceição do Ibitipoca, P. Fl. Est. Ibitipoca, Aceiro, trilha para a Cachoeirinha", II.1992, *M. Eiterer* & G. S. *Freitas s.n.* (CESJ 25758); "Conceição do Ibitipoca, P. Fl. Est. Ibitipoca, na Cachoeirinha", II.1992, *M. Eiterer* & G. S. *Freitas s.n.* (CESJ 25764); "Conceição do Ibitipoca, P. Fl. Est. Ibitipoca, trilha para a Gruta do Pião", II.1992, *M. Eiterer* & G. S. *Freitas s.n.* (CESJ 25766); "Conceição do Ibitipoca, P. Fl. Est. Ibitipoca, prox. ao cruzeiro", VI.1991, *M. Eiterer* & R. C. *Oliveira s.n.* (CESJ 25467); "São Tomé das Letras, prox. cidade, 1200 m", II.1986, *C. Farney* & S. A. *Geromel 1065* (G, RB); "Serra de Ibitipoca", V.1970, *L. Krieger s.n.* (CEPEC, CESJ 8750); "Ibitipoca, grutas de arenito", II.1977, *L. Krieger s.n.* (CESJ 14626); "Serra de Ibitipoca", V.1952, *L. Krieger s.n.* (CESJ 16673); "Carrancas, Cachoeira da Fumaça e Serra de Carrancas", XII.1983, *Leitão F°. & al. 15427* (UEC); "São Tomé das Letras, Pico do Gavião, contrafortes sudeste, 1250 m", II.1999, *R. Mello Silva & al. 1609* (RB, SP, SPF); "Lima Duarte, P. Fl. Est. Ibitipoca, prox. à caixa d'água", XII.1992, *R. C. Oliveira s.n.* (CESJ 26214); "P. Fl. Est. Ibitipoca, mata ciliar da Gruta da Cruz, ca. 1650 m", II.1996, *L. G. Rodella s.n.* (CESJ 28948); "Pq. Fl. Est. Ibitipoca, prox. à Gruta dos Coelhos, mata sombreada", V.1991, *F. Salimena Pires & al. s.n.* (CESJ 24673); s.l., s.d., *St. Hilaire D 82* (P); "Serra de Ibitipoca, Pico do Pião, 1580-1600 m", V.1970, *D. Sucre & L. Krieger 6703* (CEPEC, RB).

Based on Saint-Hilaire's number D 82 and the itinerary established by URBAN (1906), it is possible to deduce that he visited the "Serra da Ibitipoca" on the 16.II.1822.

Leitão Filho & al. 15427 varies with a denser indument on leaf undersides and calyces.

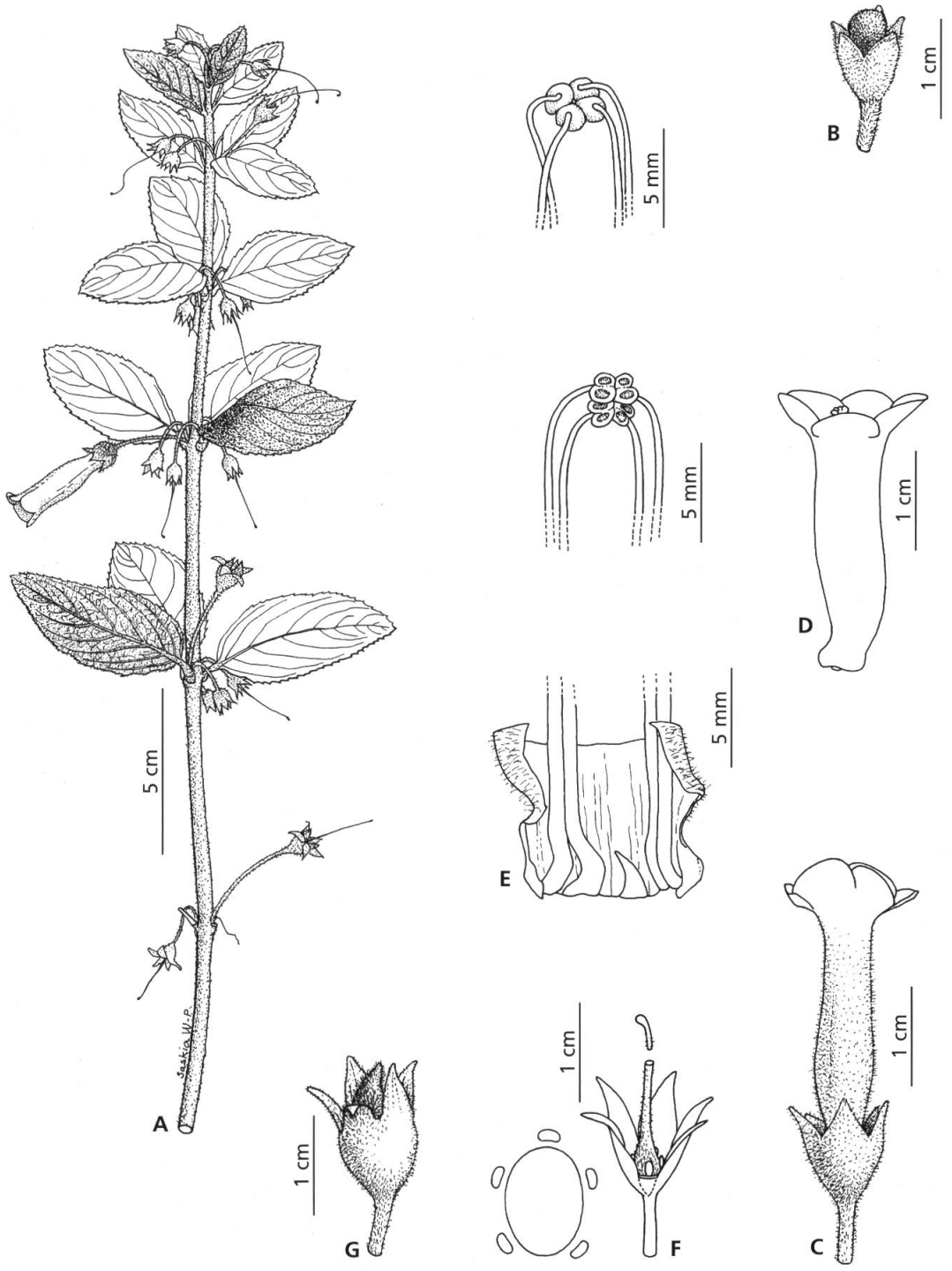

Fig. 8.– *Vanhouttea leonii* Chautems

A, habit; **B,** flower bud; **C,** flower; **D,** corolla; **E,** filaments insertion and anthers in dorsal and frontal view; **F,** nectary glands and ovary; **G,** capsule half enclosed in accrescent calyx.

[**A-F,** from *Leoni 4202*].

Introgression between *Vanhouttea brueggerii* and *V. hilariana* apparently occurs in Ibitipoca, where the two species grow in adjacent populations, for example *Krieger s.n. (*CESJ 14626); putative hybrids can be distinguished by the intermediate calyx lobes width.

Vanhouttea leonii Chautems, **spec. nova** (Fig. 8)

Haec species laminis foliarum subtus cum venis prominentibus, lobis calycis breve triangularis, corola parva (2.5-3.2 cm) ab congeneris distinguitur.

Type: BRAZIL, Minas Gerais: "Alto Caparaó, P. Nac. Caparaó, próx. a trilha em direção ao "Pinheiro", campos de altitude, 2200 m", III.1999, *L. S. Leoni 4159* (Holo-: GFJP; iso-: G).

Shrub rupicolous, without perennial tuber. *Stems* 40-90 cm tall and 0.5-1 cm in diameter, erect, woody, pubescent in younger parts, internodes 2-7 cm long. *Leaves* ternate or opposite, equal to slightly anisophyllous, petiole 2-6 mm long, pale green, densely pubescent; blade obovate to elliptic, 2.5-5.5 cm long × 1.5-2.5 cm wide, apex acute, base obtuse, above green, beneath paler, margin finely serrate with teeth 0.5-1 mm high × ca. 2 mm wide, 5-6 pairs of veins markedly salient abaxially, the 2 or 3 basal ones terminating around the middle of the blade. *Inflorescence* 1-3 flowers in axillary position on the upper nodes. Flowers borne on pedicel 1-1.5 cm long. *Calyx* campanulate, fused at base for ca. 5 mm, lobes subequal, triangular, 4-6 mm long × 2 mm wide, green, margin entire, pubescent at the apex, canescent at base. *Corolla* tubular, erect in the calyx, 2.5-3.2 cm long, inflated at base in a ring ca. 5 mm in diam., then briefly constricted and expanding gradually in a tube ca. 5 mm wide, yellow orange in bud, turning orange to maroon red at anthesis, darker towards apex, puberulous, lobes of the limb subequal, 5-6 × 6-8 mm, tube inside cream with reddish striations. Stamens 4, included, filaments 25 mm long, cream, glabrous, anthers coherent in a rectangle pollen white; nectary consisting of 5 glands, ovary greenish, style pinkish, puberulous, stigma white. *Fruit* a capsule, ca. 10-15 mm long × 6-8 mm wide, seeds elliptic, obliquely striate.

Etymology. – I take pleasure in naming this new species for its collector, Lúcio Leoni, curator of the Guido Pabst herbarium (GFJP), in recognition of his extensive and enthusiastic contribution to the knowledge of the Minas Gerais Flora.

Distribution. – The species is restricted to the Brigadeiro and Caparaó Range, between 1500 and 2200 m.

Conservation status. – Endangered.

Ecology. – In open vegetation above forest limit called "campo de altitude" vegetation.

Phenology. –Flowering in January and from March to June, fruiting from March to August.

Additional material examined. – **BRAZIL, Minas Gerais**, "Serra do Brigadeiro, Faz. Pedro Dutra, alto da Serra, 1700 m", VI.1946, *Drummond & al. s.n.* (VIC); "P. Nac. Caparaó, acima da Tronqueira, 1990 m", III.1991, *L. S. Leoni 1428* (G, GFJP); "Alto Caparó, P. Nac. Caparaó, do lado da trilha que conduz ao Vale Encantado, 2200 m", VI.1995, *L. S. Leoni 2962* (GFJP); "Alto Caparó, P. Nac. Caparaó, Vale Encantada, 1980 m", I.1998, *L. S. Leoni 3868* (GFJP); "Alto Caparó, P. Nac. Caparaó, ao lado da trilha (lado esquerdo) em direção ao Terreirão, 2200 m", V.1999, *L. S. Leoni 4202* (G, GFJP); "Carangola, Serra da Araponga, a caminho da Pedra do Pato, campo de altitude, 1500 m, 20°43'S 42°29'W", I.1990, *L. S. Leoni & L. C. Medeiros 1046* (GFJP, US); "P. N.Caparaó, subida para o Pico da Bandeira, 1200 m", [sic!] [2200 m], VI.1991, *G. Hatschbach & J. M. Silva 55446* (G, MBM).

This small and compact species reflects its adaptation to high altitude campo. It is easily distinguished from other *Vanhouttea* species by shorter corollas and triangular calyx lobes.

Vanhouttea pendula Chautems, **spec. nova** (Fig. 9)

Haec species ab congeneris floribus pendulis, lobis calycis anguste lanceolatis (8-10 mm longis), tubo corollae in medio inflato distinguitur.

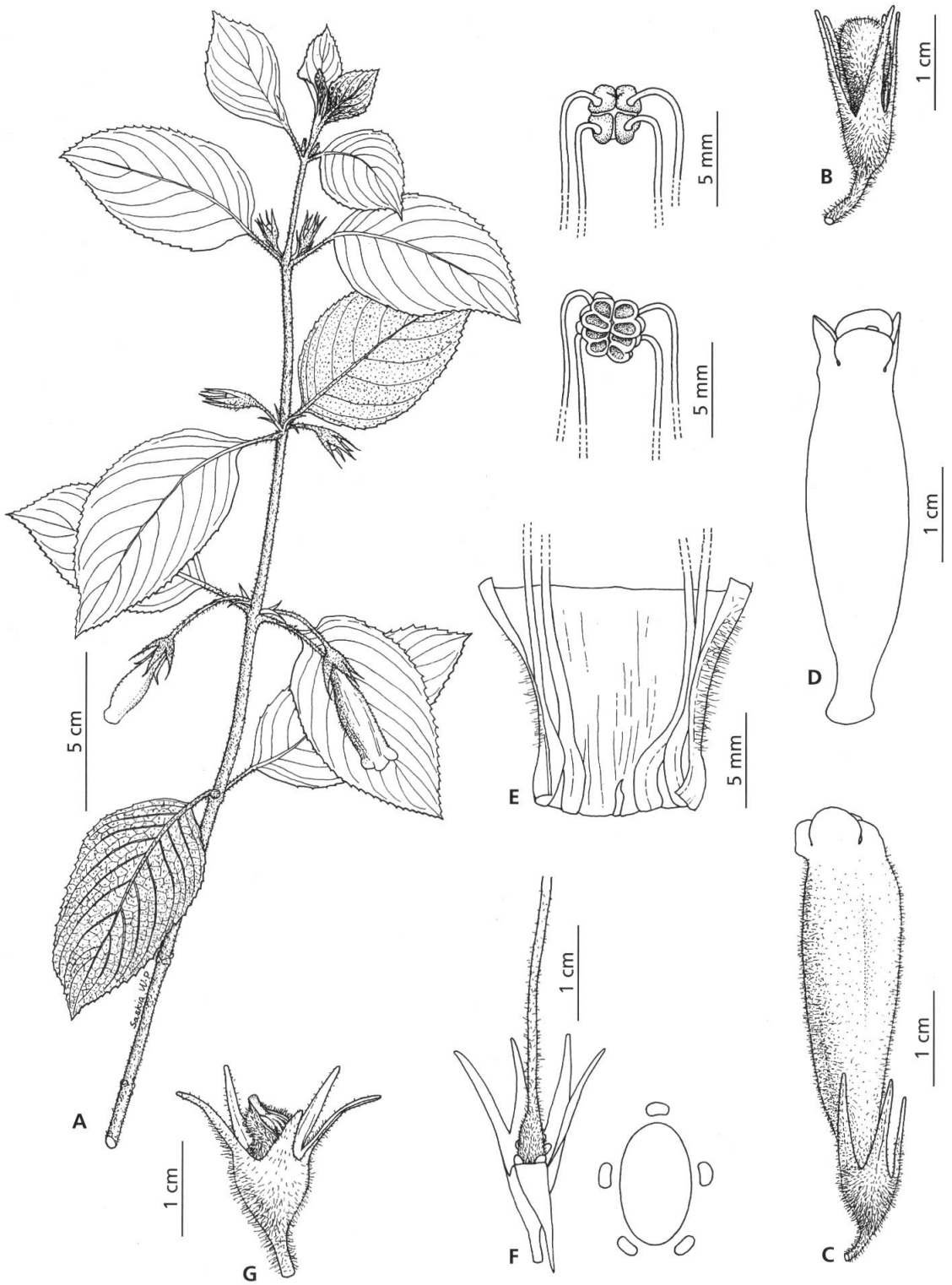

Fig. 9.– *Vanhouttea pendula* Chautems

A, habit; **B,** flower bud; **C,** flower; **D,** corolla; **E,** filaments insertion and anthers in dorsal and frontal view; **F,** nectary glands and ovary; **G,** capsule half enclosed in accrescent calyx.

[**A,** from *Leoni 1519*; **B-G,** from *Leoni 4197*].

Type: BRAZIL, Minas Gerais:: "Alto Caparaó, Parque Nacional Serra do Caparaó, do lado da trilha em direção a "Tronqueira", 1400 m", 14.V.1999, *L. S. Leoni 4197* (Holo-: GFJP; iso-: G).

Shrub terrestrial, without perennial tuber. *Stems* 60-180 cm tall and 0.5-1 cm in diameter, erect, woody, glabrescent at the base, pubescent towards apex, as well as the leaves and flowers, internodes 2-5 cm long. *Leaves* usually opposite, equal to slightly anisophyllous, petiole 0.5-1.5 cm long, green to reddish; blade ovate to elliptic, 4-9 cm long × 2-4.5 cm wide, apex acute, base obtuse, above green, beneath pale green, margin irregularly serrate with teeth 0.5-1 mm high × 1-3 mm wide, 6-7 pairs of veins, the 2 or 3 basal ones terminating around the middle of the blade. *Inflorescence*: usually of 1 or rarely 2 flower(s) in axillary position on the upper nodes, borne on an obsolete peduncle. Flowers borne on hanging pedicels, 2-3 cm long, reddish. *Calyx* campanulate, lobes fused at base for ca. 2-3 mm, subequal, narrowly lanceolate, 8-10 mm long × 3 mm wide, margin entire, green, canescent towards base. *Corolla* tubular, erect in the calyx, 3.4-4 cm long, inflated at base in a ring ca. 4-5 mm in diam., then briefly constricted and expanding gradually in a tube ca. 6-7.5 mm wide, somewhat swollen in the middle, greenish in bud, turning carmine pink at anthesis, lobes of the limb subequal, 4-5 mm long × 5-6 mm wide, tube inside cream with pink striations. Stamens 4, included, filaments 3 cm long, white, glabrous, anthers coherent in a square, pollen white; nectary consisting of 5 glands, ovary greenish, style and stigma white, puberulous. *Fruit* a capsule, markedly curved at the apex, ca. 12-15 mm long × 7-8 mm wide, seeds elliptic, obliquely striate.

Etymology. – The specific epithet comes from *pendulus*, Latin for pendent, referring to the flowers with pedicels tending to hang downwards.

Distribution. – Caparaó mountain mass and Brigadeiro Range, between 1000-1800 m.

Conservation status. – Endangered.

Ecology. – Forest margin, humid rocks.

Phenology. – Flowers from February to July, fruits from April to September.

Additional material examined. – **BRAZIL, Minas Gerais**, "P. N.Caparaó, subida para o Pico da Bandeira, 1300 m", VI.1991, *G. Hatschbach & J. M. Silva 55448* (G, MBM, NY, US); "P. N.Caparaó, 1400 m", II.1973, *G. Hatschbach & Z. Ahumada 31437* (HBR, MBM); "Alto Caparaó", V.1981, *Heringer 18182* (IBGE); "P. N. Caparaó, caminho da Tronqueira para o Vale Encantado", V.1988, *L. Krieger & al. s.n.* (CESJ 22298/FPNC 142); "P. N. Caparaó, campos altos, 1700 m", IV.1989, *L. Krieger & al. s.n.* (CESJ 23552/FPNC 819); "Carangola, Faz. Montes Castelo, 1050 m, 20°48'S 42°11'W", VII.1988, *L. S. Leoni 318* (GFJP, R, US); "Carangola, Serra da Grama, 20°44'S 42°28'W", IV.1991, *L. S. Leoni 1519* (G, GFJP); "Serra do Boné, área de transição entre a floresta tropical e os campos do Pico do Boné, 1800 m, 20°40'S 42°26'W", IV.1994, *L. S. Leoni 2503* (GFJP); "Serra da Araponga, Parque Estadual da Serra do Brigadeiro, Faz. Neblina, ao lado da trilha "Ranunculaceae", 1300 m, 20°43'S 42°29'W", V.1994, *L. S. Leoni 2565* (GFJP); "Serra da Grama, sopé da Pedra do Navio, área perturbada ao lado do córrego, junto a Pedra do Navio", V.1995, *L. S. Leoni 2906* (GFJP); "Ervália, área perturbada ao lado da estrada, em meio a vegetação invasora", VI.1995, *L. S. Leoni 2952* (GFJP); "Serra de São Bento, Parque Estadual da Serra do Brigadeiro, campo montano, ao lado co córrego, area perturbada, 1200 m", VII.1995, *L. S. Leoni 2979* (GFJP); "P.N.Caparaó, 1400 m", III.1988, *R. F. Novelino & al. s.n.* (CESJ 22231/FPNC 70).

The hanging flowers and dark pink corollas of this species reminds one somewhat of *Sinningia sellovii*, but the lack of a tuber, the shrubby perennial habit, and larger flowers truly justify its placement in the genus *Vanhouttea*.

The following key to the species of *Paliavana* and *Vanhouttea* is provided to identify the new taxa.

1. Corolla campanulate, greenish or purple, perennial woody shrubs 0.4-4 m tall: ***Paliavana*** 2

1a. Corolla tubular, red orange or pink, suffrutescent to woody perennial shrubs 0.1-1.8 m tall: ***Vanhouttea*** 7

2. Compound inflorescence, at apex of leafless stem . . . . . .***Paliavana plumerioides***

2a. Simple inflorescence, axillary or terminal on leafy stem 3

3. Corolla purple 4
3a. Corolla green or yellowish 5
4. Calyx lobes subulate ..... ***Paliavana gracilis***
4a. Calyx lobes lanceolate ..... ***Paliavana tenuiflora***
5. Leaves large (10-20 cm long), corolla green ..... ***Paliavana prasinata***
5a. Leaves small (4-8 cm long), corolla yellowish 6
6. Apex of calyx lobes long acuminate, erect, green ..... ***Paliavana werdermannii***
6a. Apex of calyx lobes obtuse, usually reflexed and maroon ..... ***Paliavana sericiflora***
7. Suffrutescent plants 10-30 cm tall ..... ***Vanhouttea fruticulosa***
7a. Shrubs 40-180 cm tall 8
8. Sepal tips free in bud 9
8a. Sepal tips fused in bud 11
9. Leaf with basal secondary veins nearly reaching the blade apex, calyx lobes linear, corolla arcuate ..... ***Vanhouttea hilariana***
9a. Leaf blade with basal secondary veins reaching the blade middle, calyx lobes triangular or lanceolate, corolla straight 10
10. Corolla 2.5-3.2 cm long, calyx lobes triangular ..... ***Vanhouttea leonii***
10a. Corolla 3.4-4 cm long, calyx lobes lanceolate ..... ***Vanhouttea pendula***
11. oung stems, leaves and calyces lanose, corolla ca. 2.5 cm ..... ***Vanhouttea lanata***
11a. Young stems, leaves and calyces not lanose, corolla 2.5-5 cm 12
12. Leaves with abaxial face and calyx lobes glabrescent ..... ***Vanhouttea gardneri***
12a. Leaves with abaxial face and calyx lobes finely tomentose 13
13. Calyx 2-3 cm long, lobes fused at base for 7-10 mm, lobes of the corolla limb reaching 9-12 mm wide, flowers borne on descending to horizontal pedicels ..***Vanhouttea brueggeri***
13a. Calyx 1.5-2.5 cm long, lobes fused at base for 4-6 mm, lobes of the corolla limb 5-8 mm wide, flowers borne on ascending pedicels ..... ***Vanhouttea calcarata***

Vanhouttea bradeana Hoehne is not included in the key, because, as already suspected by HOEHNE (1958), this taxon is probably a hybrid between *V. calcarata* and *V. gardneri.*

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