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**The Gesneriad Flora of the Los Cedros Biological Reserve, Northwest Ecuador, Part 2: New Species in *Alloplectus*, *Dalbergaria*, *Paradrymonia* and *Pentadenia* (Gesneriaceae)**

by

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With 2 Figures

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Summary

FREIBERG M. 1997. The Gesneriad flora of the Los Cedros Biological Reserve, Northwest Ecuador, part 2: New species in *Alloplectus*, *Dalbergaria*, *Paradrymonia* and *Pentadenia* (*Gesneriaceae*). – *Phyton* (Horn, Austria) 37 (1): 133–140, 2 figures. – English with German summary.

The Gesneriad flora of the Los Cedros Biological Reserve in Northwest-Ecuador has been investigated. The new species *Alloplectus penduliflorus* M. FREIBERG, *Dalbergaria albovinosa* M. FREIBERG, *Paradrymonia splendens* M. FREIBERG and *Pentadenia lutea* M. FREIBERG are described and illustrated. The complete list of all 35 identified species and a general discussion is presented.

Zusammenfassung

FREIBERG M. 1997. Die Gesneriaceen-Flora der Los Cedros Biological Reserve in Nordwest Ecuador, Teil 2: Neue Arten von *Alloplectus*, *Dalbergaria*, *Paradrymonia* und *Pentadenia* (*Gesneriaceae*). – *Phyton* (Horn, Austria) 37 (1) 133–140, 2 Abbildungen. – Englisch mit deutscher Zusammenfassung.

Die Gesneriaceen-Flora der Los Cedros Biological Reserve in Nordwest-Ecuador wurde untersucht. Die neuen Arten *Alloplectus penduliflorus* M. FREIBERG, *Dalbergaria albovinosa* M. FREIBERG, *Paradrymonia splendens* M. FREIBERG and *Pentadenia lutea* M. FREIBERG werden beschrieben und illustriert. Eine vollständige Liste aller 35 identifizierten Arten und eine allgemeine Diskussion werden präsentiert.

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*Alloplectus penduliflorus* M. FREIBERG spec. nova (Fig. 1 A)

Diagnosis: *Alloplecti schultzei* MANSF affinis, sed caulibus ascendentibus suffruticosis vel scandentibus, petiolis rotundis, foliis minoris, floribus solitariis, pedicellis longioribus pendulisque et lobis calyce angustioribus.

Description: Terrestrial ascending halfshrub or liana with few ramifications, between 2 and 5 (8) m tall. Stems appressed pubescent; vegetative internodes 8–12 cm long, generative internodes 5–8 cm long. Leaves opposite, subanisophyllous; the smaller blade ovate, 5 cm long, 2–3 cm wide, the larger ovate, 8–9 cm long, 3–4 cm wide, tip acuminate, margin denticulate, base obtuse, appressed pubescent above, green, appressed pubescent below, especially on venation, green, 5–7 secondary veins per side; petiole 1–2 cm long, brownish pubescent. Inflorescence a cyme reduced to 1–2 flowers in the upper leaf axils; peduncles absent, pedicels pending, 8–20 cm long. Calyx lobes subequal, narrow-ovate, green, brownish-pubescent; tip acute, sometimes brick-red; margin toothed-subincised, lightgreen; ventral lobes 20 mm long, 8 mm wide; lateral lobes 22 mm long, 8 mm wide; dorsal lobe 23 mm long, 5 mm wide. Corolla resupinate, 5.5 cm long, densely whitish-villose, coccineus; tube cylindrical, 2.5 cm long, 0.8 cm wide, 0.8 cm high; spur inflated, 1.2 cm in diameter, white; corolla distally oblique campanulate-widened, 2 cm long, 1.4 cm wide, 1.6 cm high, petal lobes oblique, triangulate, 0.8–1.0 mm × 0.5 mm × 0.7 mm; aperture 1.5 cm high, on ventral side 6 mm wide, on dorsal 1 mm. Filaments subtomentose, 3.5 cm free, 0.6 cm fused with the corolla tube, fused part wider; anthers elliptical, 2.5 × 1.5 mm; singles dorsal nectary gland threelobed, 10 mm long, 1 mm thick, 6 mm high, glabrous, central lobe up to 4 mm long. Ovary superior, hispid, 5 mm long, 3 mm thick, 6 mm high; style up to 35 mm long, 1 mm in diameter; stigma simple. Fruit a flattened capsule, seeds even, brownish, 1 × 0.3 mm.

*Alloplectus penduliflorus* was often found ascending in shrubs and small trees all over the reserve, especially in light rich habitats close to paths or on the edge of secondary forests. This species also occurred in the lower parts of the Bosque Protector Otonga at an altitude of 1600 m a.s.l. near San Francisco de las Pampas, 70 km southwest of Quito.

Etymology: The ornithophilous flowers of this species are characterized by their spectacular long pendulous pedicels.

Holotype: QCA M. FREIBERG 96210, 27. 06. 1996 (Isotypes ULM, QCNE)

*Dalbergaria albovinosa* M. FREIBERG spec. nova (Fig. 1 B)

Diagnosis: *Dalbergariae variabilis* WIEHLER affinis, sed corollae tubo albo, petalis lobis rectis vinosisque et prophyllis angustioribus differt.

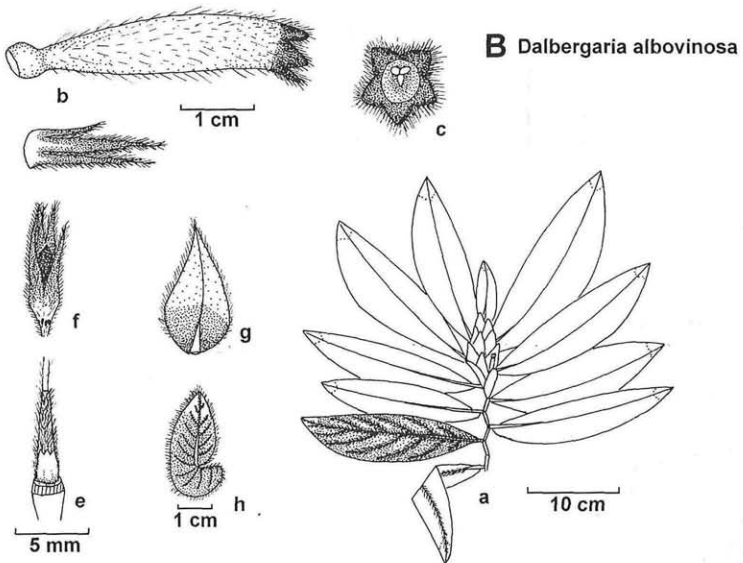
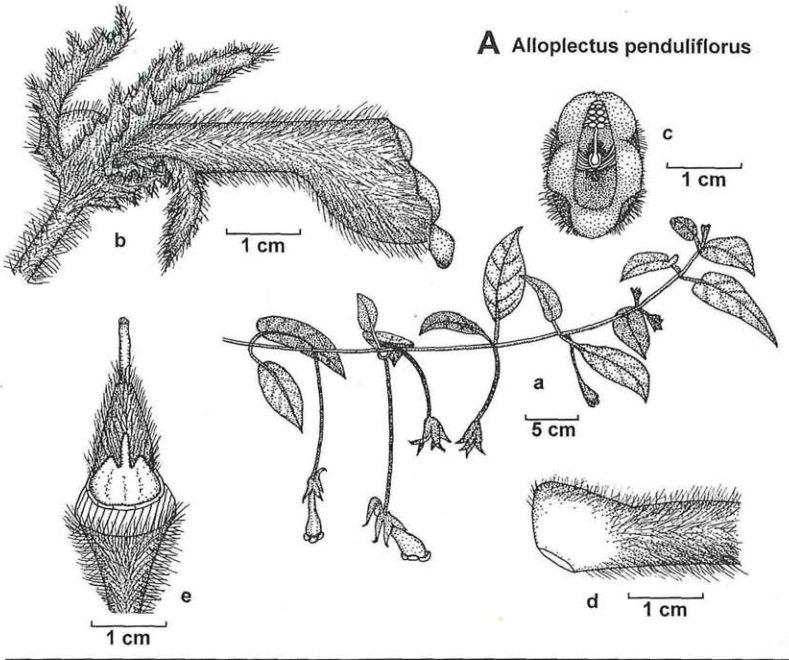


Fig. 1. – A *Alloplectus penduliflorus* M. FREIBERG. – B *Dalbergaria albovinosa* M. FREIBERG. – a: habit. b: side view of corolla and calyx. c: front view of corolla. d: base of corolla showing spur. e: view on the base of gynoecium, sepals and petals removed, showing nectaries. f: young fruit. g: prophyll. h: minor leaf.



Description: Terrestrial half-shrub, sometimes ascending and hemiepiphytic. Stems nearly unbranched, 0.5–1.5 m tall, sericeous; internodes 2–5 cm long. Leaves opposite, anisophyllous; the blade oblanceolate, the larger 18–22 cm long, 3.5–5 cm wide, the smaller similar, 1 cm long, 0.5 cm wide; tip acuminate, margin denticulate, shortly rose ciliate, base hemicordate, subserrate above, especially on main veins, verdigris-green, sericeous below, green; about 1 cm of larger leaf tip and upper 50% of smaller leaf coral red and translucent; 8–10 secondary veins per side; petiole less than 5 mm long; prophylls lanceolate, yellow, 25 × 7 mm. Inflorescence a cyme reduced to 1, rarely up to 3 flowers per leaf axil; peduncles absent, pedicels 5–8 mm long; bracts narrow lanceolate, 10 × 20 mm, sericeous, yellow. Calyx lobes subequal, lanceolate, acute, white yellowish green, up to 2.5 cm long, 4–5 mm wide; margin serrate-laciniate, ca. 4–5 small teeth per side. Corolla tubular, erect in the calyx, tube sericeous, white, 3.5 cm long, diameter up to the central part 7–8 mm, at the base 3 mm; petal lobes subequal, triangular, 3 × 4 mm, acute, sericeous, wine-coloured. Filaments sparsely sericeous at the base, terminally glabrous, 32 mm long, 1 mm attached to the tube; anthers coherent 1.5 × 1.5 mm; nectary double, connate, dorsal, glabrous, 0.5 mm thick, 2 mm wide, 3 mm tall. Ovary superior, 5 mm tall, pilose; style 30 mm long, glabrous at the base, upper third glandular; stigma bilobed. Fruit a ovate, elongated berry, wine-coloured, ca. 2 cm tall; yellow seeds 1 × 0.25 mm.

*Dalbergaria albovinosa* grows mostly terrestrial and rarely ascending on old trunks in parts of the area above 1500 m.

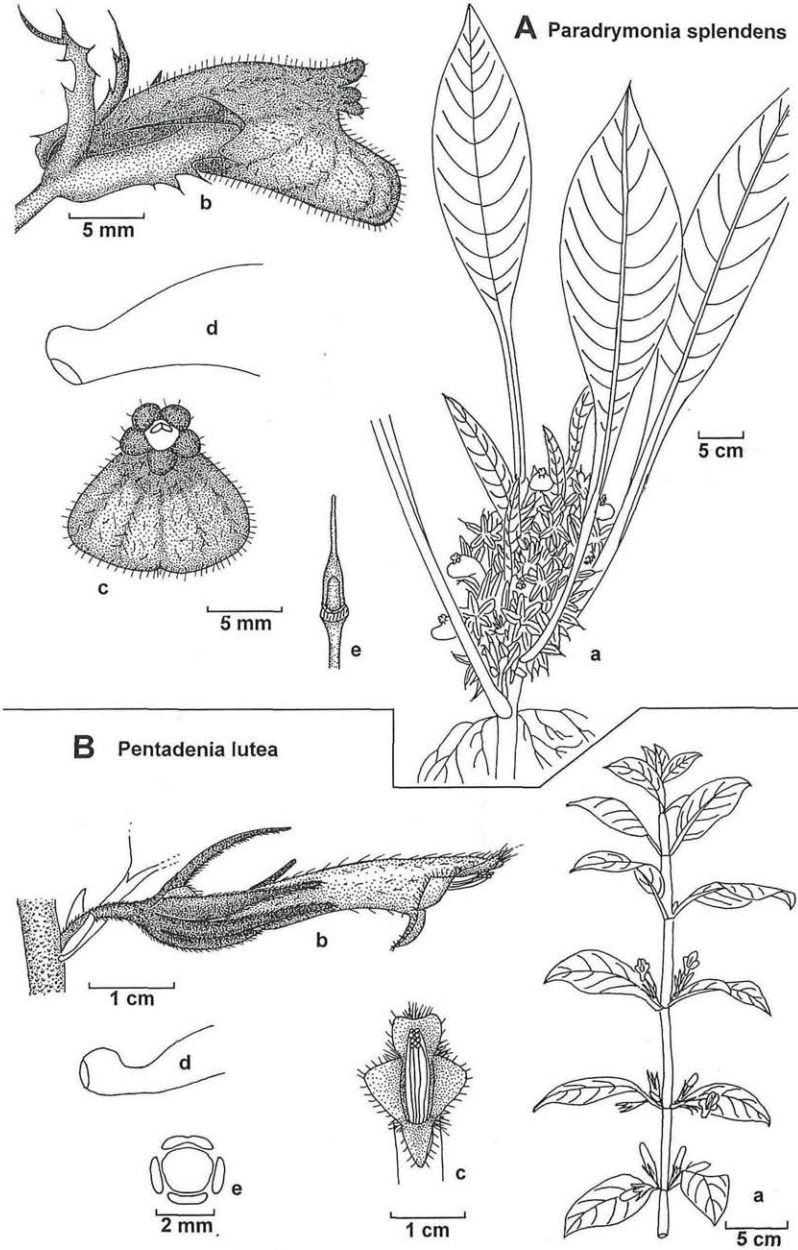
Etymology: “*albovinosa*” refers to the coloration of the white corolla tube contrasting with the wine-coloured petal lobes.

Holotype: QCA M. FREIBERG 96216, 29. 06. 1996 (Isotypes ULM, QCNE)

*Paradrymonia splendens* M. FREIBERG spec. nova (Fig. 2 A)

Diagnosis: *Paradrymoniae hypocyrtae* WIEHLER et *Paradrymoniae binatae* WIEHLER similis, sed corolla sacculo quam ore duplo vel triplo latiore, flammea-aurantiaca, lobis et partibus corollis dorsalis puniceis; calycis corallineis, marginibus laciniatis, lobis brevioribus, 3–5 utrinque.

Description: *Paradrymonia splendens* is very similar to *P. hypocyrtae* WIEHLER and *P. binata* WIEHLER, but the pouch of the flower is broader. The flower coloration features a unique combination of flame-red and orange yellow tube and pouch contrasting with the coral-red petal lobes and nearby parts. The coral-red calyx has lacinate margins with only 3–5 lobes per side.



*Paradrymonia splendens* is mostly a terrestrial herb or sometimes ascends a few meters on preferably dead trunks. Troops of 5 to 20 individuals are scattered throughout the area, but not above 1500 m.

Etymology: "*splendens*" refers to the brilliant color combination of orange and coral-red of the corolla.

Holotype: QCA M. FREIBERG 96008, 17. 03. 1996 (Isotypes ULM, QCNE)

*Pentadenia lutea* M. FREIBERG spec. nova (Fig. 2 B)

Diagnosis: Differt a *Pentadenia ecuadorana* WIEHLER pedicellis longioribus, lobis calycibus angustioribus longioribusque, corollis luteis et lobis inaequalibus majoribus et subrecurvatis.

Description: Epiphytic shrub, rarely terrestrial rooting when fallen down, perennial, ascending, branched, up to 2 m tall. Stems scaly, rose-pilose; internodes 3–6 cm long, subsucculent. Leaves opposite, isophyllous; blades oval, (5) 6 × 2.5 cm, tip acute, margin entire, above subsericeous, green, below sericeous, whitish-green, veins dull red; 4 secondary veins per side; petiole 1–1.5 cm, rosy-pubescent. Inflorescence a cyme reduced to 1–4 flowers per leaf axil; peduncule absent, pedicels 1–1.5 cm long, prophylls lanceolate, 5–10 × 3–4 mm. Calyx lobes subequal, narrow-lanceolate, blood-red, rusti-red sericeous, 18–21 mm long, 4 mm wide; tip acute; margin entire, ciliate. Corolla tubular, deep-yellow, in total 3.5 cm long, tube 2.2 cm long, diameter in front 5 mm, close to the spur 3 mm; petals sericeous, slightly recurved, dorsal lobe 5 × 3 mm, lateral lobes 4 × 6 mm, ventral lobes 6 × 4 mm; corolla opening 6 mm tall, 4 mm wide; sericeous on the outside, front part of the inside glandular. Filaments sparsely pilose at the base, 28 mm free, 6 mm attached to the tube; anthers coherent 1 × 1.5 mm; glabrous nectary glands 5 : 2 ventral glands connate, 1.5 mm long, 0.8 mm thick, 1.2 mm tall, 3 dorsal glands free, 1.5 mm long, 0.8 mm thick, 1.5 mm tall. Ovary superior pilose, 2 mm long, 1.5 mm thick, 3 mm tall; style up to 35 mm long, pilose at base, on the upper side glandular. Fruit a white, round berry, 5–8 mm in diameter.

The species of *Pentadenia* and *Trichantha ciliata* WIEHLER are the only true epiphytic *Gesneriaceae* in Los Cedros.

Etymology: "*lutea*" refers to the deep-yellow corolla.

Holotype: QCA M. FREIBERG 96019, 22. 03. 1996 (Isotypes ULM, QCNE)

Species List of *Gesneriaceae* of Los Cedros Biological Reserve

The following list includes the Gesneriads collected or seen by the author between March and July 1996. The study of the herbarium material



of QCA and QCNE showed this to be the only collection of Gesneriads from Los Cedros until then.

*Alloplectus andinus* WIEHLER, *A. dodsonii* WIEHLER, *A. penduliflorus* M. FREIBERG, *A. purpureus* KVIST & SKOG, *A. sprucei* (KUNTZE) WIEHLER, *A. tenuis* BENTH., *A. tetragonoides* MANSE, *A. teuscheri* (RAYMOND) WIEHLER

*Besleria* spec. 1

*Dalbergaria albovinosa* M. FREIBERG, *D. medicinalis* WIEHLER, *D. picta* KARSTEN, *D.* spec. 1

*Diastema racemifera* BENTH.

*Drymonia brochidodroma* WIEHLER, *D. chiribogana* WIEHLER, *D. rhodoloma* WIEHLER, *D. serrulata* (JACQ.) MART, *D.* spec. 1

*Gasteranthus crispus* (MANSE) WIEHLER, *G. quitensis* BENTH., *G. giganteus* M. FREIBERG, *G. imbaburensis* M. FREIBERG, *G. leopardus* M. FREIBERG, *G. trifolius* M. FREIBERG, *G.* spec. 1

*Kohleria spicata* (KUNTH) OERST., *K. villosa* (FRITSCH) WIEHLER, *K.* spec. 1

*Monopyle macrocarpa* BENTH.

*Paradrymonia splendens* M. FREIBERG

*Pentadenia byrsina* WIEHLER, *P. lutea* M. FREIBERG, *P. spatulata* (MANSE) WIEHLER

*Trichantha ciliata* WIEHLER

## Discussion

The *Gesneriaceae* are a very plastic and young family, evolutionarily active and flexible (WIEHLER 1983). In the most recent and complete classification of the family, over 3700 species in 147 genera, 11 tribes and 3 subfamilies have been recognized (BURTT & WIEHLER 1995). About half of the species occurs in the Neotropics with distribution centers in the Andean areas of Colombia and Ecuador.

For the classification of the new species described in this study the widely accepted system elaborated by WIEHLER 1973, 1983 is used. In contrast to other systems using strictly traditional characters for taxa delimitation, the classification system of WIEHLER additionally considers a series of ecological characters, making the system much more useful for field work. This led to the status of *Trichantha*, *Dalbergaria*, *Pentadenia* and *Columnea* as separate genera instead of keeping them as sections of a 'supergen' *Columnea* (KVIST & SKOG 1993).

An introduction to the locality of the Los Cedros Biological Reserve has been given in FREIBERG 1996. A very remarkable element of the Los Cedros Flora is the genus *Gasteranthus*. While most of the species have ventricose or funnellform flowers, in the Los Cedros area all species, with exception of *G. leopardus*, have urceolate and thus ornithophilous flowers

(FREIBERG 1996). Further investigations on their pollination systems are needed to clarify this phenomenon.

In this study, out of a total of 35 species, 8 new species have been described. Further 5 new Gesneriads not yet described need some more investigation. Expeditions to the forest near Playa Rica at the western slope of the Andes and to the Bosque Protector Otonga southwest of Quito showed the same percentage of new Gesneriad species (FREIBERG in prep.). Studies of the Flora of the Rio Palenque Science Center in western Ecuador revealed 13 out of 32 *Gesneriaceae* to be new (WIEHLER 1977). One reason for the high percentage of unknown Gesneriads and probably other vascular plants in Ecuador, can be found in the highly ridged and often inaccessible Andean mountain valleys: a rapid Gesneriad speciation rate leads to very local distribution patterns. A species may occur only in a single valley or ridge or only in a small altitudinal range, as in *Gasteranthus leopardus*. The probability for botanists to find new species is thus relatively high, as is the probability for destruction of the total distribution range of a species by just destroying a few hectares of forest. The protection of the vanishing cloud forests – exhibiting an extraordinary biodiversity – in Ecuador, the Neotropics and throughout the world therefore deserves much more effort.

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