

PARADRYMONIA BADIA (GESNERIACEAE),
A NEW SPECIES FROM THE GUIANA SHIELD

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ABSTRACT

Paradrymonia badia sp. nov. is described from cultivated material originally collected in the Guianas. The new species has the same habit and grows in similar habitat as *P. campostyla*, but differs mainly from *P. campostyla* by the characters of the corolla: shape, size, and by the color and pattern of the markings inside the corolla tube.

RÉSUMÉ

Paradrymonia badia sp. nov. est décrite à partir de plantes en culture récoltées en Guyane française. L'espèce nouvelle a le même port que *Paradrymonia campostyla* et un habitat similaire, mais est différente de *P. campostyla* surtout par les caractères de la corolle: forme, taille, couleur, et le patron des marques à l'intérieur du tube.

KEY WORDS: Guianas; *Paradrymonia badia*

INTRODUCTION

In the subfamily Gesnerioideae, the genus *Paradrymonia* Hanst. belongs in the tribe Gesnerieae subtribe Columneinae (Weber et al. 2013; Mora & Clark 2016). Soon after he described the genus (Hanstein 1854), Hanstein (1865) placed it in the synonymy of *Episcia* Mart. where it remained until resurrected by Wiehler (1973). Then it became obvious that *Paradrymonia* as inflated by Wiehler (1973 and especially 1978) was a mixture of species that did not get a better place in the then-tribe Episcieae. The molecular study by Mora and Clark (2016) resulted in well-defined genera, with 8 species remaining in *Paradrymonia*.

For about 25 years, specimens of a *Paradrymonia* collected in French Guiana have been misidentified as *Paradrymonia campostyla* (Leeuwenb.) Wiehler (1978), a name based on *Drymonia campostyla* Leeuwenb. (1958), but with some doubt. The main obvious difference between those problematic collections and the bulk of *P. campostyla* material was the color of the trichomes on the stems and leaves, i.e., appearing white in *P. campostyla* and violet in specimens found only in the higher elevation part of the range of the plants with white trichomes, and commonly growing along with the white form. To confuse the issue even more, both have small (juvenile) or large (mature) leaves, as found in some species of other genera, e.g., *Drymonia alloplectoides* Hanst.

MATERIALS AND METHODS

During the 1980's the authors undertook field work in South America in preparation for the *Flora of the Guianas*. We were fortunate in being able to collect specimens and photograph *Paradrymonia campostyla* in French Guiana in 1985 and 1986 (Skog & Feuillet) and again in 2003 (Feuillet), and were able to observe the plant with violet-colored trichomes collected in 1986 from French Guiana and grown in the greenhouses of the Jardin Botanique de Montréal and the Smithsonian Institution in Washington (Fig. 3), from 2007. Some of the specimens now included with the new species were cited as *P. campostyla* in the treatment of the Gesneriaceae in the *Flora of the Guianas* (Skog & Feuillet 2008), but we soon realized that the plant with the violet-colored

trichomes was different and deserving of description as a new species, as it differed from the species originally described from Surinam by Leeuwenberg (1958).

The description of *Paradrymonia badia* relies on the study of dried specimens from many herbaria (particularly CAY and US), on field photographs, and field notes. Measurements were taken from herbarium specimens. Some of the specimens the authors consulted were from specimens gathered from the wild and grown in the greenhouses at the Montréal Botanical Garden and the Smithsonian Institution. These were preserved as herbarium specimens and are included in the specimens cited below. The authors also examined types of the other species currently in *Paradrymonia* for comparison with the new species.

TAXONOMIC TREATMENT

Paradrymonia badia Feuillet, L.E. Skog, & Barabé, **sp. nov.** (**Fig. 1**). TYPE. CANADA. QUEBEC: Specimens from greenhouse-grown plant cultivated at the Montréal Botanical Garden (accession no. 2132-86), "bouture rapportée de Guyane Française (Mt Galbao, Saül) en Décembre 1986 par D. Barabé," 23 Feb 2007 (fide Barabé), *D. Barabé 273* (HOLOTYPE: US!; ISOTYPE: MT!).

Note.—Origin of cultivated material: French Guiana, Saül Region, ascent of Monts Galbao from base at Mana River, 3°36'N, 53°17'W, 160–600 m, 8 Nov 1986, L.E. Skog, C. Feuillet, & A.Y. Rossman 7359 (CAY, US), and cuttings brought into cultivation in Montréal by D. Barabé.

Paradrymonia badia, species nova, *Paradrymoniae campostylae* (Leeuwenb.) Wiehler affinis; caules foliorumque pilis purpureis et corollis intus lateraliter badiis bivittatis, ventraliter late flavis differt.

Climbers creeping on shrubs and trees or pendent, herbaceous, becoming subwoody at base from germination occurring on the ground or on fallen rotting wood, trichomes purple-violet throughout on vegetative parts, sometimes hyaline in full shade. Stem fleshy, brownish red, shortly hirsute, becoming glabrous, climbing and appressed to tree trunks, branching and producing larger mature leaves when reaching stronger light, then shortly erect and then "hanging." Stipules absent. Leaves opposite, equal or nearly so in a pair: petiole 0.5–2.8 cm long, brownish red, short hirsute; lamina lanceolate-elliptic, 2.5–8.5 × 1.8–3.5 cm, green, base usually cordate, apex acuminate, margin nearly entire, ciliate, adaxially hirsute, trichomes shorter toward the apex, abaxially lighter green, indumentum denser, 5–7 main veins each side of the midrib. Flowers solitary (or rarely 2) in leaf axil; bracts lacking (or, if rarely present, then linear); pedicel 1.2–1.8 cm long, green, hirsute; sepals five, free nearly to base, narrowly triangular to linear, 1.5–2 cm long, up to 0.5 cm wide at base and 0.2 at the middle, pale green, hirsute, trichomes hyaline; corolla dorsally spurred at base, tube 3.5–4.5 cm long, white, hyaline hirsute outside, glabrous inside, limb lobes five, looking like six from the shallowly or deeply cleft ventral lobe, white, spreading, 0.7–1 cm long, margin of the dorsal and lateral lobes entire or undulate, ventral lobe slightly narrowed at base, adaxially glabrous, abaxially hirsute, corolla tube inside with brown lateral stripes on either side of the yellow ventral area; stamens four, borne near or on the base of the tube, nearly reaching the throat and then filaments coiling back after anthesis, anthers "V"-shaped, pendent with a short slit at base; nectary glands not observed; ovary covered with long trichomes parallel to the style, style elongating as the staminal filaments are coiling back, measured at 1.8 cm long, stigma clavate, style and stigma densely and very shortly hirsute. Mature fruit not seen; young fruits ovoid, green, hirsute.

Etymology.—The epithet of the new species highlights the color pattern of the inside of the corolla tube, i.e., a brown lateral stripe on each side of the yellow ventral area, from the Latin, *badius*, meaning brown.

Vernacular name.—In Wayāpi: yamuleka'a sili, ewo'i asikaluwu (Grenand et al. 2004).

Distribution.—*Paradrymonia badia* has been collected in Surinam (Brokopongo and Spalawini districts) and in French Guiana throughout the territory. It is probably present in Brazil, especially in Amapá. It grows in forests, usually, but not only, at mid elevation (100–675 m); in Surinam: Brownsberg, Emma Keten, and Nassau Mountains; and in French Guiana: Massif des Emerillons, Mt Bakra, Mtns de Kaw, Mts Galbao, Nouragues Inselberg, and Pic Matecho.

Phenology.—Flowering documented in February to May and July to November.

Specimens examined.—**SURINAM. Brokopongo:** in dense forest near Brownsweg, 11 Feb 1963, *Wessels Boer 634* (L, NY, US), Brownsberg Nature Park, 15 Mar 1972, *Koster s.n.* = LBB 13025 (L); Dept. van den Landbouw, propre Abontjeman, 55°W, 5°N, 15 May 1910, *Native collector 279* (SEL). **Sipaliwini:** Emmaketen, 10 Mar 1922, *Stahel 42* = BW 5642 (L, US); Nassau Mountains, Plateau C, 10 Mar 2013, *Grant 18056*



FIG. 1. *Paradrymonia badia* sp. nov. **A**. Flowering stem. **B**. Leaf trichomes. **C**. Flower (side view). **D**. Flower opened longitudinally, showing the stamens and the gynoecium. **E**. Flower (face view). **F**. Immature fruit. Based on *Barabé 273* (MT, US).

(BBS, US). **FRENCH GUIANA:** Chemin des Émérillons, à 10.7 km from Degrad Claude, à son intersection avec le Petit Tamouri, 27 Mar 1974, *Granville 2258* (CAY(2)); Crique Fromager, Bassin de l'Approuague, PK 11.2 après Régina sur la RN2, 4°14'N, 52°06'W, 24 Oct 1996, *Blanc 207* (CAY, US); Charvein, 6 Jan 1914, *Benoist 497* (P); entre Saut Mais & Pic Matecho, 30 km ENE de Saül, 13 Jul 1972, *Granville 3107* (CAY(2)); Fleuve Approuague, au Saut Grand Japigny, 7 Aug 1968, *Oldeman B-1775* (CAY, NY); Haut Oyapock, W of Trois Sauts, Crique Euleupousing, Saut Beco, 15 Jul 1975, *Granville T-1127* (CAY(2), P), idem, Saut Cambrouze, 17 Jul 1975, *Granville T-1145* (CAY, P); Montagnes des Nouragues, 52°42'W, 4°3'N, 260 m, Mar 1990, *Larpin 715* (CAY, US); Inselberg des Nouragues, Clairière du Camp à la base de l'inselberg, Réserve Naturelle des Nouragues, 52°42'W, 4°03'N, 100–120 m, 28 Aug 1987, *Feuille 4395* (CAY); Massif des Émérillons, zone central, 350 m, 12 Sep 1980, *Granville 3841* (CAY); Montagnes de Kaw, entre Camp Caïman & Relai Patawa, 8 Apr 1992, *Deroin 159* (CAY, P); Montagne de Kaw, track between Camp Caïman and Degrad Lalanne (South side of the mountain), 40 km SSE of Cayenne, 4°30'N, 52°10'W, 250–300 m, 20 Mar 1985, *Skog & Feuillet 5669* (CAY, US); Monts Bakra, 52°57'W, 3°18'N, 500 m, 17 Apr 1993, *Granville & Cremers 11752* (CAY); Monts Bakra, Pic Coudreau, 52°57'W, 3°18'N, 670 m, 19 Apr 1993, *Granville & Cremers 11837* (CAY, L, NY, P, US); Monts Galbao, 10 km environ au sud-ouest de Saül, 650 m, 12 Mar 1975, *Granville 2416* (CAY(2), P, US); Mont Galbao, Secteur Est, 53°17'W, 3°36'N, 600 m, 15 Jan 1986, *Granville 8733* (CAY, NY, US); Monts Galbao, WSW of Saül, 53°16'W, 3°35'N, 650 m, *Leeuwenberg 11739* (WAG(3)); Piste de Paul-Isnard, 7 Nov 1982, *Feuille 284* (CAY(2)); région de Saut Macaque, 7 Sep 1961, *Schnell 11907* (P(2)); Route de l'Acarouany, piste forestière vers les Roches, 53°51'W, 5°34'N, 9 Feb 1990, *Cremers & Hoff 11342* (B, CAY, COL, G, HAMAB, L, NY, P, STR, US, USM, VEN); Saül Region, cloud forest on the way toward the Mana River, Jun 2003, *Feuille 16332* (US); Trois-Sauts, 27 Mar 1979, *Jacquemin 2352* (CAY, US); Village Zidock, Haut Oyapock, 23 Aug 1985, *Prévost & Grenand 1988* (CAY); idem, 27 Aug 1985, *Prévost & Grenand 2000* (CAY(2)).

Other cultivated specimens.—[Origin: French Guiana, *Skog & Feuillet 5669* (CAY, US)]: Smithsonian Institution Botany Research Greenhouses accession number USBRG 1985-034, 31 Mar 2004, *Clark 8856* (US) & 24 May 2000, *Skog 8129* (US) & 10 Oct 2000, *Skog 8198* (US); USBRG 1985-115, 31 Mar 2004, *Clark 8855* (US).

KEY TO THE SPECIES OF *PARADRYMONIA* IN THE GUIANAS

(ADAPTED FROM SKOG & FEUILLET 2008)

1. Leaves much longer than the leafy part of the stem; leaves of a pair strongly unequal.
 2. Calyx lobes partly linear-acuminate. (Guyana, Surinam, French Guiana; Brazil, Colombia, Ecuador, Peru, Venezuela) _____ **P. ciliosa**
 2. Calyx lobes elliptic. (Venezuela, French Guiana) _____ **P. tepui**
1. Leaf base rounded or slightly cordate; leaves of a pair equal or subequal.
 3. Adventitious roots borne along a longitudinal line in contact with a support at and between nodes (like *Hedera helix*) or stems pendent; corolla ventral lobe long fimbriate. (Guyana) _____ **P. barbata**
 3. Adventitious roots borne in contact with a support only at nodes or stems pendent; corolla not fimbriate.
 4. Herbaceous vegetative parts with hyaline trichomes; corolla tube marked inside with a ventral red stripe sometimes becoming shortly yellow at throat; corolla ventral lobe narrowed above base. (Surinam, French Guiana; Brazil) _____ **P. campostyla**
 4. Herbaceous vegetative parts with purple-violet trichomes, at least in young parts; corolla tube marked inside with a ventral yellow stripe and 2 lateral brown ones; corolla ventral lobe slightly narrowed at base. (Surinam, French Guiana) _____ **P. badia**

DISCUSSION

The confusion between *Paradrymonia campostyla* and the new species was already in the description and protologue of *Drymonia campostyla* (Leeuwenberg 1958) where specimens of both species were cited. The description matching the holotype, *Jonker 625* (L, US), said “*tota planta... pilis hyalinis*”, a character of *P. campostyla* (Fig. 2) and “*corolla alba intus flava*”, a character present in *Stahel 42 = BW 5642* (L, US) which is typical of *P. badia* sp. nov. (Fig. 3) but used in Leeuwenberg (1958) for the illustration of *P. campostyla*.

In teasing apart the specimens of *Paradrymonia campostyla* into that and the new species, we find that the type specimens of the latter are from the same plant or clone collected in 1986 by Skog et al. as their 7359. Material of the same species but from the region of Montagnes de Kaw, track between “Camp Caïman” and “Degrad Lalanne,” 40 km SSE of Cayenne was collected by Skog and Feuillet in 1985 (as their 5669) and grown in the greenhouses of the Department of Botany, Smithsonian Institution as accession numbers 1985-034 and 1985-115. A specimen of the former accession (*Clark 8856*, 31 Mar 2004) was collected for molecular systematic studies and cited in Mora and Clark (2016) as *P. campostyla*.

Since the publication of the treatment of *Paradrymonia* in the *Flora of the Guianas* (Skog & Feuillet 2008), there has been a flurry of molecular studies in Gesneriaceae resulting in new combinations and resurrections of older names for many Guianan species. In *Paradrymonia*, only *P. barbata* Feuillet & L.E. Skog, *P. campostyla* (Leeuwenb.) Wiehler, and *P. ciliosa* (Mart.) Wiehler remain in the genus. Although *Paradrymonia campostyla*



FIG. 2. *Paradrymonia campostyla*, Montagnes de Kaw, French Guiana (photo C. Feuillet, 2003).

(Leeuwenb.) Wiehler and *P. barbata* Feuillet & Skog vegetatively differ by having the leafy part of the stem much longer than the leaves rather than clearly shorter and their leaves equal in a pair rather than strongly unequal. The new species in this paper has the same habit as those two and it is also endemic to the Guiana Shield. Furthermore, a species recently described (Feuillet, 2009) from the Venezuelan Guayana, *P. tepui*, was identified from collections made in French Guiana and Surinam. *Paradrymonia anisophylla* Feuillet & L.E. Skog is now *Codonanthopsis anisophylla* (Feuillet & L.E. Skog) Chautems and Mat. Perret (2013), *P. densa* is now *Centrosolenia densa* (C.H. Wright) M.M. Mora & J.L. Clark (2016), *P. longifolia* (Poepp.) Wiehler is now *Drymonia longifolia* Poepp., and *P. maculata* (Hook.f.) Wiehler is now *Pagothyra maculata* (Hook.f.) J.E. Smith & J.L. Clark (2013). The species remaining in *Paradrymonia* in the treatment by Mora and Clark (2016) are *P. buchtienii* (Mansf.) Wiehler originally described from Bolivia, and three species originally described from Venezuela, *P. glabra* (Benth.) Hanst., *P. lutea* Feuillet, and *P. yatua* Feuillet.

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FIG. 3. *Paradrymonia badia* sp. nov., Greenhouses of the Smithsonian Institution (photo L. Brothers, 2007).

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