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ANDREAS FLEISCHMANN, ANDREAS WISTUBA &amp; STEWART MCPHERSON

## *Drosera solaris* (*Droseraceae*), a new sundew from the Guayana Highlands

### Abstract

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*Drosera solaris* is described as a new species from Guyana and illustrated. It belongs to *D.* subg. *Drosera* sect. *Drosera* and seems to be related to *D. felix* and *D. kaieteurensis*, the only other neotropical species with cup-like dehiscent capsules. Data on its distribution, habitat and ecology as well as an identification key to the three related species are given.

Key words: carnivorous plants, *Drosera felix*, *Drosera kaieteurensis*, Guyana, taxonomy.

Eight species of *Drosera* have been recorded from Guyana so far (Brummer-Dinger 1955, Duno de Stefano 2003), all of them occurring in the Venezuelan Guayana as well (Duno de Stefano & Culham 1998). An expedition revealed the existence of a new, undescribed endemic *Drosera* in the Pakaraima Mountains of western Guyana. It is only known from a small plateau in the Pakaraima Mountains southeast to the famous Mt Roraima, which is located at the border of Venezuela, Guyana and Brazil (Huber 1995).

*Drosera solaris* A. Fleischm., Wistuba & S. McPherson, **sp. nov.**

Holotype: Guyana, Pakaraima Mountains, Mt Yakontipu, just below the summit of the plateau, 2065 m, Wistuba & McPherson (BRG; isotypes: B, M) – Fig. 1.

*Drosera felix* Steyererm. & L. B. Sm. affinis sed caulibus elongatis ramosis vel ramosissimis, stipulis conspicuis 7.5-8 mm longis et sepalis glabris differt.

Perennial herb. *Stems* erect, up to 10 cm long, apically branched, densely covered with persistent dead leaves. *Leaves* rosetted, young leaves ascendent, becoming reflexed with age. *Stipules* 7.5-8 mm long, membranaceous, white (yellowish brown with age), adnate at the base and attached to the petiole for c. 1 mm, at 1/4 to 1/5 of their length 4-laciniate, segments c. 7 mm long, narrowly

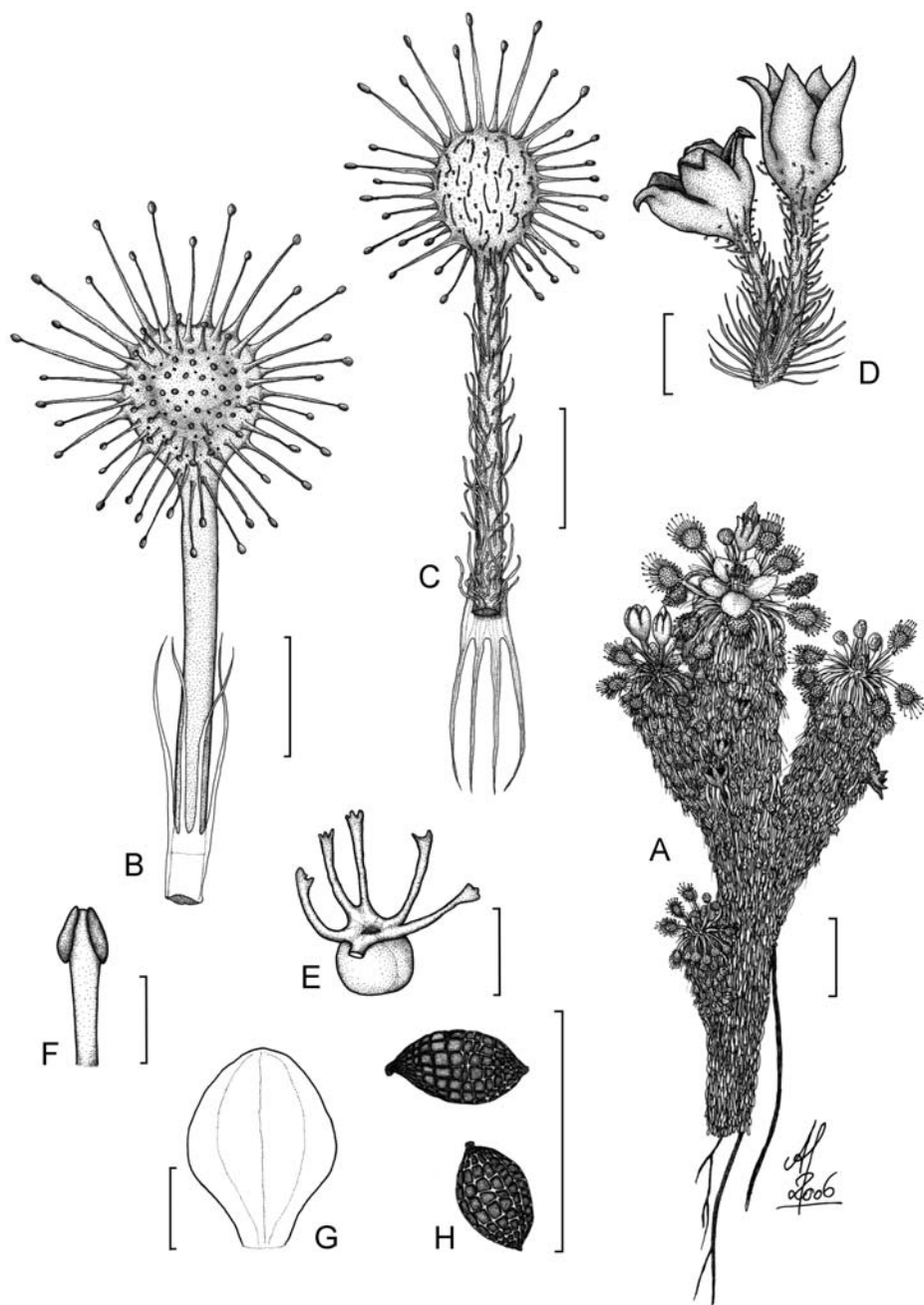


Fig. 1. *Drosera solaris* – A: habit of flowering plant; B: leaf, upper surface, with attached stipule; C: leaf lower surface, with attached stipule bent backwards; D: 2-flowered inflorescence after anthesis; E: ovary and styles (one style branch partially removed); F: stamen, G: petal, H: seeds. – Scale bars: A = 10 mm, B–D = 2 mm, E–H = 1 mm; after the type material drawn by A. Fleischmann.

linear-lanceolate to filiform, tapering gradually into the acute apex. *Petiole* 7-7.5 mm long, up to 1 mm wide, green to golden-yellow, upper surface minutely papillose, lower surface covered with appressed, simple white hairs 1-2 mm long. *Lamina* suborbicular, apex rounded, 2-3 × 2-2.5 mm, red, margins and centre covered with retentive glands on the upper side, lower surface covered with appressed, simple white hairs. *Scapes* 1 or 2, erect, 1- or 2-flowered, 6-7.5 mm long, peduncle very short, 0-0.2 mm long; pedicels erect, 4-5.5 mm long, basally densely covered with simple white hairs 1-2.5 mm long; hairs shorter (c. 1 mm long), more scattered and intermixed with short-stalked glands to the apex of the pedicels. *Calyx* campanulate, c. 4 × 3 mm, sparsely covered with simple white hairs c. 0.5 mm long and scattered short-stalked glands. *Sepals* 5, broadly lanceolate, 2-2.5 mm long, up to 2 mm wide at half of their length, red, glabrous, erect at anthesis, recurved in fruit. *Petals* 5, broadly obovate, c. 2.5 × 2 mm, white to pinkish white. *Stamens* 5, filaments to 0.2 mm broad near the apex, white; connective dilated; anthers yellow; pollen yellow. *Ovary* subglobose, 1 × 1 mm, glabrous, greenish yellow. *Styles* 3, each divided from about 0.1 mm above the base, united at the base; style branches c. 2 mm long, glabrous, reddish at the base, white towards the apex; stigma flabellate to bifurcate. *Capsule* loculicidal, after ripening cup-like, pedicels erect in fruit. *Seed* c. 0.6 mm long, ovoid to subglobose, apiculate, shiny, black, testa reticulate.

*lc.* – Fig. 1; further figures (colour photographs) are provided in the electronic supplement to this paper at <http://www.bgbm.org/willdenowia/willd37/fleischmann+al.htm>.

*Distribution.* – *Drosera solaris* is known so far only from the type collection from Mt Yakontipu, Guyana, but may occur on neighbouring mountains in Brazil and Venezuela as well.

The mountain on which *Drosera solaris* was discovered, was first recorded on an illustration chart produced by George Tate in 1930. The mountain on Tate's map is named 'Mt Yakontipu'. This small plateau of c. 2150 m elevation is a boundary marking of the Guyanan-Brazilian border, therefore the Portuguese spelling 'Monte Iacontipu' or 'Monte Yacontipu' can be found as well.

*Habitat and ecology.* – *Drosera solaris* grows in swamps of *Bonnetia roraimae* Oliv. (*Theaceae*) on a plateau at 2065 m, just below the summit of Mt Yakontipu. It was discovered in an isolated population within a small clearing in the *B. roraimae* cloud forest, on peaty substrate rich in leaf litter and organic matter. The plants grow in dappled shade, generally in 10-50 % shade, the most colourful individuals, however, occur in areas exposed to intense sunlight. Accompanying plants in these habitats are the natural hybrid of *Heliamphora glabra* (Maguire) Nerz & al. and *H. nutans* Benth. (*Sarraceniaceae*), *Epidendrum* spp. (*Orchidaceae*), *Stegolepis guianensis* Körn. (*Rapateaceae*), *Xyris* spp. and *Orectanthe sceptrum* (Oliv.) Maguire (*Xyridaceae*). *D. solaris* appears to be restricted to the *Bonnetia roraimae* cloud forest vegetation and seems to be absent from the swampy, open wetlands of Yakontipu summit, where *D. roraimae* (Diels) Maguire & J. R. Laundon occurs in great abundance.

The petioles of *Drosera solaris* are green to golden-yellow in plants growing in full sun and therefore contrast well in colour with the wine red lamina and tentacles. These "bicoloured" rosettes are unique among all known South American species of *Drosera*. This colour differentiation is absent only in seedlings and young plants up to about 1 cm in height.

*Drosera solaris* has very short scapes that are erect in fruit. The ripe capsule opens cup-like, the sepals are reflexed in fruit and the seeds are relatively big and roundish. In most other species of *Drosera* the capsule opens by slits, the sepals are often erect in fruit and the seeds are rectangular to fusiform in outline. So far, only *D. felix* Steyerm. & L. B. Sm. and *D. kaieteurensis* Brumm.-Ding. from the Neotropics are known to have the same cup-like capsules, both in combination with rather stiff and short scapes and pedicels that stay upright in fruit. Whereas in most *Drosera* species, of which the flower stalks are tall and flexuous and the seeds are narrow and light, we may assume wind dispersal (the seeds are shed from the capsules), water seems to be the vector for seed dispersal in *D. felix*, *D. kaieteurensis* and *D. solaris*. The roundish seeds, which are presented in the open shallow cups, are easily splashed out by water droplets during occasional rainfalls (so called 'splash-cup' mechanism).

Like the related *Drosera felix* and *D. kaieteurensis*, *D. solaris* has sweetly perfumed flowers. Another *Drosera* from the Guayana Highlands of Venezuela with scented flowers is *D. arenicola* Steyerl. All these species have in common a rather short flower scape, thus the flower odour might have evolved to attract insect pollinators to the flowers, while keeping them away from the carnivorous leaves. The small white flowers close early in the afternoon, thus nocturnal pollinators might be excluded. Within the genus, nocturnal insect pollinators are to be expected only in some Australian *Drosera* with scented flowers that remain open at night (Lowrie 1987); this, however, is not the case with respect to *D. solaris*.

*Etymology.* – The epithet ‘solaris’ (gr. ‘sunny’ or ‘sunloving’) was chosen to illustrate the bright and shiny appearance of this sundew, with its bright yellowish green petioles contrasting with the bright red leaf blades.

*Taxonomic affinities.* – *Drosera solaris* belongs to *D.* subg. *Drosera* sect. *Drosera* (sensu Diels 1906, Seine & Barthlott 1994) and it seems to be closely related to *D. felix* and *D. kaieteurensis*, two further species from the savannas of the Guayana Highlands (Brunner-Dinger 1955, Steyerl & Smith 1974).

With its branched upright stems, the bristly looking, conspicuous, white and deeply lacinate stipules and the almost sessile flowers which are nested within the rosette, *Drosera solaris* looks superficially reminiscent of *D. meristocaulis* Maguire & Wurdack of the monotypic section *Meristocaulis* (Maguire & Wurdack 1957), an isolated species endemic to the summit of Cerro de la Neblina at the Venezuelan-Brazilian border. But the 3 simple styles and the multiple-branched stigmas clearly separate *D. meristocaulis* from all other South American species of *Drosera*.

Key to species of *Drosera* with cup-like capsules that occur in the Guianas

1. Plants caulescent with branched stems; stipules long and conspicuous; sepals glabrous; Guyana, expected in adjacent Brazil and Venezuela . . . . . 1. *D. solaris*
- Plants acaulescent or with only short, unbranched stems of persistent old rosette leaves; stipules short; sepals hairy . . . . . 2
2. Scape 1-20 mm long, 1-2(-3)-flowered, covered sparsely with red appressed hairs; lamina suborbicular (about as wide as long); Venezuela . . . . . 2. *D. felix*
- Scape 20-80 mm long, usually with more than 2 flowers (up to 8), covered with long white hairs and short-stalked glands; lamina rotundate to widely obovate (wider than long); Guyana, Venezuela . . . . . 3. *D. kaieteurensis*

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