

A new species of *Lepanthes* (Orchidaceae, Pleurothallidinae) from Guatemala

Fredy Archila Morales, Dariusz L. Szlachetko & Max Rykaczewski

Summary: A new species of *Lepanthes* is described and illustrated based on the material collected during field work in Guatemala. *Lepanthes swartzii* is similar to *L. pantomima* Luer & Dressler and *L. arachnion* Luer & Dressler from which it differs by 1-veined petals, lip with incurved basal lobes and obtuse apex, and by circular leaves with smooth margins. Identification key to all known Guatemalan species of *Lepanthes* with reticulated leaves is provided.

Keywords: *Lepanthes*, Pleurothallidinae, pseudocopulation, new species, Guatemala

The subtribe Pleurothallidinae Lindl. comprises ca. 4000 species and 30–40 genera, i.e. 15–20% of all species in Orchidaceae. Three very large genera attract attention in this subtribe: *Lepanthes* Sw., *Pleurothallis* R.Br. and *Stelis* Sw. containing almost $\frac{2}{3}$ of all Pleurothallidinae (LUER 1986). Without synonymic names, *Lepanthes* comprises about 1000 species widely distributed in Central and South America, but many species are restricted to small areas. *Lepanthes* spp. occur mainly in wet locations between mosses at 1000–3000 m (LUER 1993, 1996; TREMBLAY 1997; VAN DER CINGEL 2001; RIOFRIO et al. 2007; LUER & THOERLE 2010; CRAIN 2012; DORR 2014).

The genus *Lepanthes* was described in 1799 by SWARTZ to place four species of *Epidendrum* L. from Jamaica. Species belonging to this genus could be easily recognized by the combination of some characters, as ramicauls covered by tubular, ribbed and ciliate sheaths, inflorescence borne below leaf blade, bilobed, broader than longer petals and a trilobed lip with middle lobe strongly reduced to a minute appendix (SWARTZ 1799; LUER 1986, 1993, 1996; LUER & THOERLE 2010; DORR 2014).

Over the years, different systems of classification of *Lepanthes* have been presented. Almost sixty years after the description of the genus, REICHENBACH (1858) proposed a division into two sections, *Brachycladae* Rchb.f. with only one species: *Lepanthes nummularia* Rchb.f. and *Macrocladae* Rchb.f. The latter one, based on the length of the inflorescence, was divided into group A – *Elongatae* Rchb.f. with inflorescence longer than the leaf and into group B – *Effusae* Rchb.f. with inflorescence shorter than the leaf.

Based on the inflorescence structure, BARBOSA-RODRIGUES (1882) divided *Lepanthes* into three sections: *Longicaulae* Barb. Rodr., *Brevicaulae* Barb. Rodr. and *Phyllocaulae* Barb. Rodr. In 1910, COGNIAUX suggested that *Lepanthes* should be divided into sections on the basis of the position of the lateral lobes of the lip. In the same year, FAWCETT & RENDLE (1910) differentiated two sections of *Lepanthes* based on lip morphology. Species with a typical morphology of the lip (trilobed with reduced appendix) was allocated to the section *Diplocheilus* Fawc. & Rendle. Species of the section *Haplocheilus* Fawc. & Rendle were characterized by a flat, simple, unlobed or slightly bilobed lip without appendix (FAWCETT & RENDLE 1910). According to the protologue of *Lepanthes* by

Swartz, species considered as members of the section *Haplocheilus* do not correspond well to the description of *Lepanthes*.

Seventy years later, LUER (1986) made the most comprehensive studies of the genus. During studies of *Lepanthes* from South America, he found few species with features intermediate in form between *Haplocheilus* and *Diplocheilus* as well as in other historical divisions. He concluded that these sections are untenable (LUER 1986, 1996). Moreover, he proposed a new classification based on both vegetative and floral characters. He distinguished four subgenera: *Draconanthes* Luer, *Brachycladium* Luer, *Marsipanthes* Luer and the nominal one with few loose sections (LUER 1986, 1993). In 1996, LUER elevated *Draconanthes* to the generic level. ARCHILA MORALES (2009) transferred species of subgenus *Brachycladium* to a newly established genus *Neoreophila* Archila. Since 2010, *Lepanthes* consists of two subgenera without further sectional division (LUER & THOERLE 2010).

Many authors suggest that representatives of Diptera could pollinate *Lepanthes* species (VOGEL 1978; DRESSLER 1993; TREMBLAY & ACKERMAN 1993; SALAZAR & SOTO 1996; VAN DER CINGEL 2001). Nevertheless, only few field observations of insects visiting *Lepanthes* flowers were made. In 1986, DOD reported aphids on flowers of Dominican species; in 2001, ARCHILA MORALES observed Ceratopogonidae on flowers of *L. appendiculata* Ames, *L. gibberosa* Ames, *L. guatemalensis* Schltr., *L. samacensis* Ames, *L. stenophylla* Schltr., *L. vellifera* Luer & Béhar and *L. junckeri* Ames ex Yunck. (DOD 1986; ARCHILA MORALES 2001). Similarity of the midlobe of the *Lepanthes* lip to the female sexual organ of Diptera suggests that these orchids are pollinated by flies. The first well documented pollination report was recorded by BLANCO & BARBOZA (2005) in Costa Rica. They observed that the males of the fungus gnat *Bradysia floribunda* (Sciaridae) touch with their sexual organs the appendix of the lip of *Lepanthes glicensteinii* Luer. Moreover, flies try to copulate with the flowers. During pseudocopulation, the pollinia are removed from the gynostemium and are attached on the insect's abdomen. In the same publication, authors mentioned the successful pollination of *L. glicensteinii* by *Bradysia* flies. Further investigation of *L. glicensteinii* flowers by means of scanning electron microscopy did not show the presence of any osmophores or reward (e.g. nectar) for pollinators, but clearly displayed that a spermatophore was deposited on the surface of the gynostemium. CHRISTENSEN (1992) supposed that the calcium oxalate crystals on the top of the sepals of *Lepanthes* spp. could be a pseudonectary for visitors. Nonetheless, Christensen's observations were not confirmed by later researches (SALAZAR & SOTO 1996; BLANCO & BARBOZA 2005; PRIDGEON et al. 2005).

Taxonomic treatment

Lepanthes swartzii Archila, Szlach. & Rykaczewski, sp. nov. (Fig. 1)

Type. Guatemala. Alta Verapaz. Municipio de Cobán, Franja Transversal del Norte, F. Archila s.n. April 2016 [holotype: UGDA-spirit!, isotypes: BIGU!, UGDA!].

Etymology. Named in honour of Olof Swartz who described the genus *Lepanthes*.

Diagnosis. Species similar to *Lepanthes arachnion* Luer & Dressler and *L. pantomima* Luer & Dressler, but distinguishable by smaller flowers with single veined petals, incurved basal lobes and obtuse apex of the lip and circular leaves with smooth margins.

Description. Very small caespitose, epiphytic plant. Ramicauls 10 mm long, enclosed by 5 lepanthiform, scabrous, tightly fitting broadly opened sheaths. Leaves 8 mm long and wide,

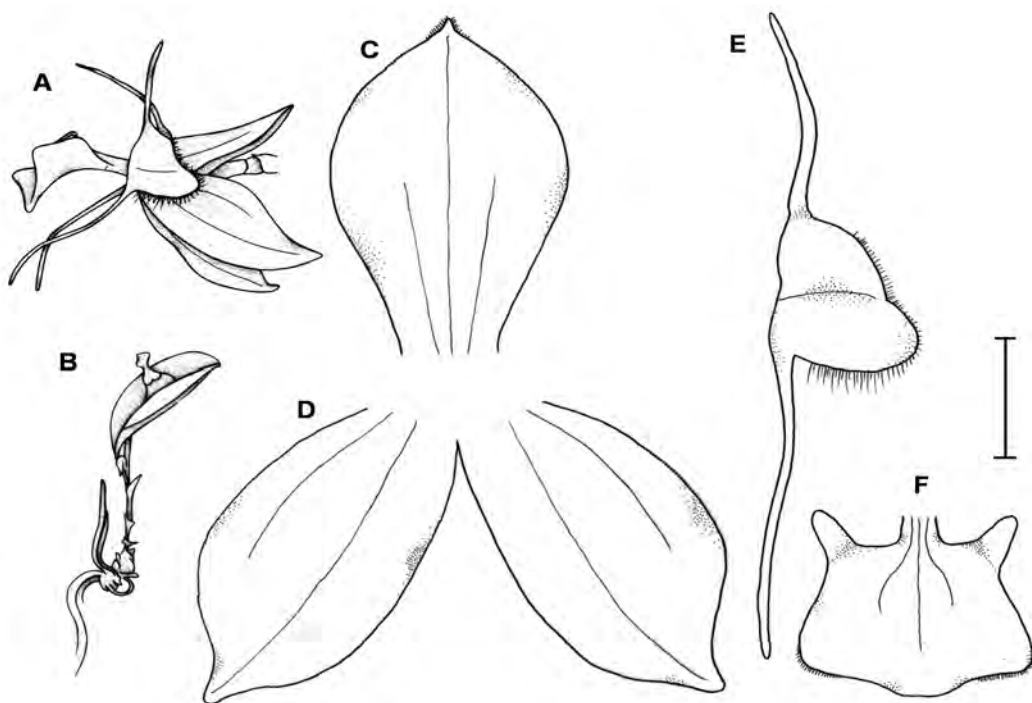


Figure 1. *Lepanthes swartzii* Archila, Szlach. & Rykaczewski. A – view of the flower; B – habit; C – dorsal sepal; D – lateral sepals; E – petal; F – lip. Scale bars = 2.5 mm (A); 1 cm (B); 1 mm (C–F). Drawn from holotype: A and B by N. Olędzżyńska and C–F by M. Rykaczewski.

circular, rounded, margins glabrous, base of the leaf forms a pseudopetiole 1.5 mm long. Inflorescence 5 mm long, dense, racemose, successively 1-flowered raceme. Flowers small, yellow-purple. Flower bracts 0.3 mm long. Pedicel 0.6 mm long, glabrous. Ovary 1.8 mm long, glabrous. Dorsal sepal 2.9 mm long, 1.9 mm wide, obovate, shortly acuminate, margins glabrous, minutely pubescent at the apex, 3-veined. Lateral sepals 2.6 mm long, 1.5 mm wide, shortly connate at the base, obliquely obovate-elliptic, shortly acuminate, margins glabrous, obscurely 2-veined. Petals 5.7 mm long, 1 mm wide, blade of petals 1 mm long, 1.3 mm wide, transversely broadly bilobed, lobes unequal, upper lobe obtuse-truncate, lower lobe truncate, margins pubescent, on lower lobe hairy, 1-veined. On the base of the petals two filiform appendages, the upper one 1.7 mm long, the lower one 2.7 mm long. Lip subquadrate 1.6 mm long, 1.9 mm broad, apex obtuse, the basal lobes (auricles) 0.3 mm long; minutely pubescent on the outer margins, adnate to the strongly reduced column foot by prominent claw. Gynostemium 1.3 mm long, embraced by the lip. Anther dorsal. Stigma subapical.

Habitat, ecology and distribution. Small epiphytic plant from humid subtropical forest at 300–750 m. Flowering occurs in April. Species is known exclusively from the type locality in Guatemala.

Taxonomic notes. As mentioned above, lack of the appendix of the lip is a rather unique character and can be found only in a few species of *Lepanthes*. It is proposed that species without reduced middle lobe have a different system of pseudocopulation, not described until now. Due to the unusual morphology of the lip, the new species proposed here does not exactly correspond to any subgenus of *Lepanthes* described by Luer. Nonetheless, striking similar species (e.g. *L. barbelifera*

Luer & Hirtz, *L. calodictyon* Hook., *L. saltatrix* Luer & Hirtz, *L. tentaculata* Luer & Hirtz and *L. volador* Luer & Hirtz) known from Ecuador were classified by Luer to *Lepanthes* subgen. *Lepanthes* (LUER 1996).

Determination key for Guatemalan *Lepanthes* species with reticulated leaves

1. Lip apex obtuse, unlobed, lip basal lobes incurved *L. swartzii*
- Lip apex bilobed, lip basal lobes not incurved 2
2. Lip basal lobes rounded, petals glabrous *L. pantomima*
- Lip basal lobes acute, petals ciliate *L. arachnion*

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