

Article



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A Remarkable new *Lepanthes* (Orchidaceae: Pleurothallidinae) hidden in plain sight

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Abstract

Here we describe a charismatic miniature orchid species, *Lepanthes attenboroughii* which for many years has been commonly found in private and public collections, misidentified as its related species, *L. caprimulgus*. The new proposed species, *L. attenboroughii* has inflated flowers with stripes similar to *L. caprimulgus*. Nevertheless, *L. attenboroughii* shows rounder flowers when compared to the longer, tubular flowers with a narrowing of the sepaline cup towards the middle of *L. caprimulgus* with flowers reminiscent of a peanut. Also, the hidden petals and lip are consistently different when the two species are compared in detail. Most remarkable in this new species are the inflated flowers with the free reflexed portion of the synsepal extending significally farther than the middle of the total length of the sepaline cup.

Keywords: Ecuador, subgenus *Marsipanthes*, new miniature orchid species, Peru

Resumen

Se describe una especie de orquídea miniatura y carismática, *Lepanthes attenboroughii*, que por muchos años ha sido común en colecciones privadas y públicas, pero erróneamente identificada como su especie hermana *L. caprimulgus*. *Lepanthes attenboroughii* tiene flores en forma de bolsa con rayas, similares a *L. caprimulgus*. Sin embargo, *L. attenboroughii* tiene flores más infladas y redondeadas que las flores tubulares que se angostan hacia la mitad de la copa sepalina de *L. caprimulgus* con flores que recuerdan a las de un manì. Adicionalmente, los pétalos y labelo escondidos a simple vista son consistentemente diferentes cuando las dos especies son comparadas. Lo más notable de esta nueva especie es la parte libre y reflexa del synsépalo que se extiende considerablemente más allá de la mitad de la longitud total de la copa sepalina.

Introduction

The Neotropical miniature orchid genus *Lepanthes* Sw. (85: 1799) is a highly diverse genus which includes over 1200 morphologically diverse species (Bogarín *et al.* 2020). The rate of new species discovery in *Lepanthes* is also fast paced (*e.g.*: Baquero & Monteros 2020, Tobar *et al.* 2021, Restrepo *et al.* 2022, Baquero *et al.* 2021, Pupulin 2021). *Lepanthes* is distinguished by a set of morphological features which include ramicauls enclosed by infundibuliform sheaths, flowers with transverse petals, transverse lips with frequently complex structures which include a body, two connectives that hold a couple of blades which frequently embrace the column, and a minute appendix in the lower part (Luer 1986, 1996). Most of the species in the genus have dorsal sepals with one to three veins, nevertheless, a

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reduced group of species with 5 to 7 veins in the dorsal sepal, and other morphological characteristics, were included by Luer in the Lepanthes subgenus Marsipanthes (Luer 1986). Besides the numerous veining of the dorsal sepals, the species belonging to the subgenus Marsipanthes commonly have cupped or deeply connated flowers blooming at the adaxial side of the leaves from long pedicels which frequently surpass the length of the leaves. The lips have simplified shapes (compared to the vast majority of Lepanthes species) and are commonly bilobed (lacking structures as the body, connectives and blades) with small central acuminate (Luer 1996). The subgenus includes: L. caprimulgus Luer (1976: 12), L. carunculigera Reichenbach (1886: 557), L. felis Luer & R. Escobar (1983: 1264), L. lucifer Luer & Hirtz (1987: 1016), L. niesseniae Luer (2003: 7), L. portillae Luer (1999: 143), L. quadricornis Luer & R. Escobar (1994: 108), L. ribes Luer (1976: 14), and the atypical L. tulcanensis Baquero & Monteros (2020: 332). Two of the species of the subgenus *Marsipanthes* bear uniquely cupped flowers: L. ribes with its round, cupped flowers and the tubular flowered L. caprimulgus. Lepanthes caprimulgus is unique among the rest of the species of Marsipanthes in that the tubular flowers have lateral sepals fussed into a 8 veined (versus 4-veined in the rest of the Marsipanthes) bifid lamina with a small, broadly ovoid lip underneath the column (not surrounding the column like the rest of species in the subgenus) and transversely bilobed petals (versus erect, thick, fleshy and sometimes forked petals from the rest of the species of Marsipanthes). Also, L. caprimulgus is the only known species of the subgenus from the eastern Andes of South America from Huanuco, Peru (Luer, 1996).

Here we describe a previously misidentified, unnamed species closely related to *L. caprimulgus*. Plants of the newly proposed taxon are well-known by miniature-orchid growers and widely distributed throughout private collections and erroneously identified as *L. caprimulgus*. Close examination of cultivated plants and plants collected from the wild fitting the description of *L. caprimulgus* and several individuals from the new proposed taxon were compared, revealing significant morphological differences between both taxa and supporting the recognition of a new species.

Materials and methods.

Material studied from the new species was acquired from several sources, encompassing *in vitro* cultured specimens and wild specimens from Peru. *In vitro* cultivated plants of *Lepanthes sp.* (misidentified as *L. caprimulgus*) and a wild specimen (belonging to the same misidentified taxa) which was found growing in Pasco, Peru, were compared with the protologue and the illustration of the type *L. caprimulgus* (isotype, Luer 12812) including dissected flowers (Luer 1976). Several studied specimens of *L. attenboroughii* are plants in culture commercialized by an Ecuadorian tropical plant business propagated from original plants collected by Hugo Medina (pers. com.) allegedly found in northwestern Ecuador close to Lita, at approximately 1000-1200 m elevation (Figures 1–4). The area has been extensively explored by the authors for the past two decades and at the time of the research leading to this manuscript and no similar fertile or infertile plants were to be found.

All original descriptions, herbarium specimens and plates belonging to the most similar species, *L. caprimulgus*, were consulted including a plate (Bennett & Christenson 1998) identified as *L. caprimulgus* which the authors consider belongs to a representative illustration of what we describe here as *L. attenboroughii* (Fig. 6). Fresh flowers of *L. attenboroughii* were collected and preserved in 70% ethanol and 1% glycerol. Digital images of vegetative parts and flowers from *L. attenboroughii* and *L. caprimulgus*, including dissected flowers, were taken with a Nikon D5100 camera mounted with a 60 mm AF-S Micro Nikkor lens.

Taxonomy

Lepanthes attenboroughii Baquero & Yeager, sp. nov. (Figures 1–4)

Type:—PERU. Pasco: Santa Cruz, km 10 of the Oxapampa highway to Villa Rica, 2030 m, flowered in cultivation in Huaytianum Center for the Study and Conservation of the Orchid, 23 March 2022, *Ocupa & C. Martel 305* (holotype: USM!).

Lepanthes attenboroughii is similar to L. caprimulgus in both having striped, deeply cupped flowers but it can easily distinguished from the later in having the rounder flowers in an oblique, leaning position with rounder sepaline cups (vs. vertical long-tubular, shaped as a peanut fruit with oblong flowers with a waist near the middle), the broad-obovate, shallowly concave, dorsal sepal with an acute apex (vs. the oblong dorsal sepal, deeply concave at the obtuse,

rounded apex with and apiculum), the free-apical portion of the synsepal, slightly shorter than the cupped-basal portion (vs. the considerably shorter free-apical portion of the synsepal, about one third of the total length of the synsepal) the transversely spatulate petals with similar in shape and size upper and lower lobes (vs. transversely oblong, asymmetric petals with elongated lower lobes) and an oblong, concave lip (vs. broadly ovoid).

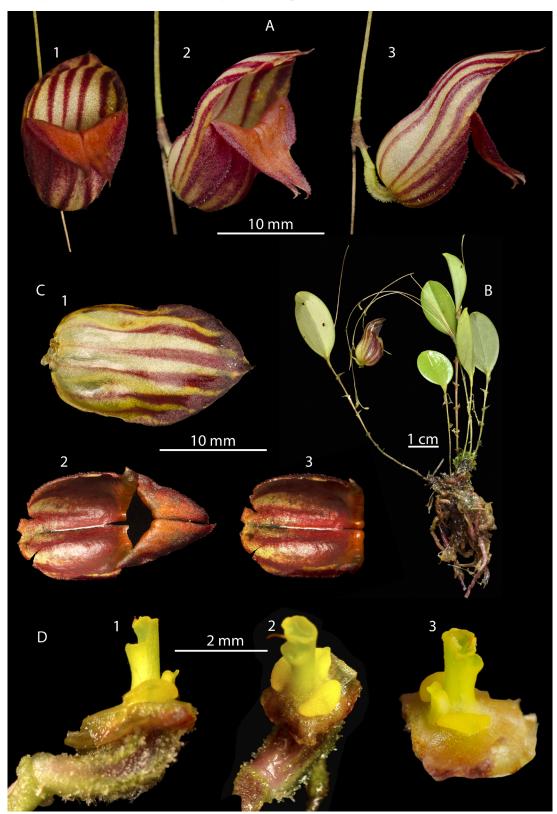


FIGURE 1. Lepanthes attenboroughii Baquero & Yeager. A. Flower in different angles: A1. frontal view, A2: ¾ view A3. lateral view. **B.** Habit. **C.** Dissected sepaline cup: C1. dorsal sepal, C2. extended synsepal, C3. synsepal in natural position (folded). **D.** Petals, lip and column in different angles: D1. lateral view, D2. dorsal view, D3. ventral view. Photos by Luis Baquero from paratype *LB-3141* (QCNE).

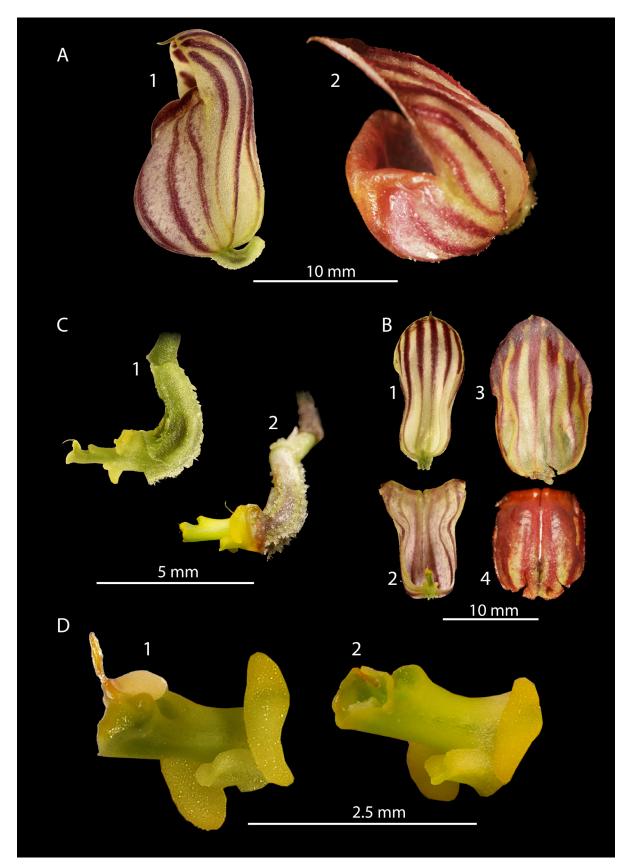


FIGURE 2. Comparison between flowers and floral parts of *Lepanthes attenboroughii* Baquero & Yeager and *Lepanthes caprimulgus* Luer. A. Flowers of *L. caprimulgus* (1) and *L. attenboroughii* (2). B. Dissecteed synsepal of *L. caprimulgus* (1, 2) and *L. attenboroughii* (3, 4). C. Lateral view of column, petals, lip and ovary of *L. caprimulgus* (1) and *L. attenboroughii* (2). D. ³/₄ view of column, petals and lip of *L. caprimulgus* (1) and *L. attenboroughii* (2). Photos: *L. caprimulgus* by Ron Parsons and *L. attenboroughii* by Luis Baquero. *LB-3141* (QCNE).

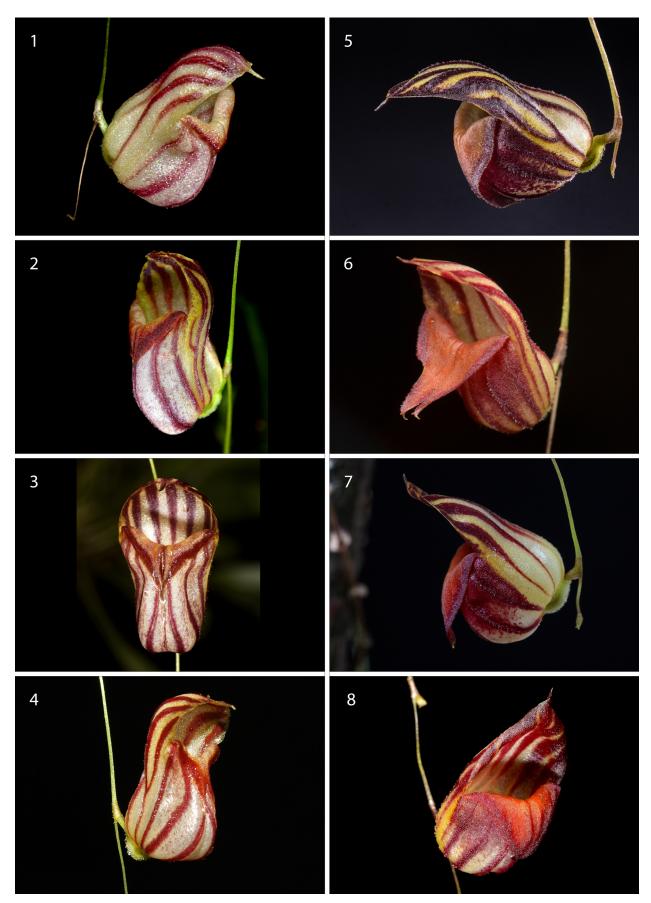


FIGURE 3. Comparison of different individuals and its flowers between *Lepanthes caprimulgus* Luer (1–4) and *Lepanthes attenboroughii* Baquero & Yeager (5–8). Photos: 2, 3 and 8 by Ron Parsons, 1 by Gary Meyer, 4 by Luis Ocupa, 5 by Maria Lesnik, 6 by Luis Baquero and 7 by Thomas Ditlevsen.



FIGURE 4. Comparison of inflorescences and flowers between *Lepanthes caprimulgus* Luer (1) and *Lepanthes attenboroughii* Baquero & Yeager (2). Photos by Ron Parsons.

Description:—Plant epiphytic, caespitose herb up to 9 cm long. Roots slender ca. 1.3 mm in diameter. Ramicauls erect, slender, 3.0-8.0 cm long, enclosed by 5-8 scabrous, lepanthiform sheaths. Leaf green, erect, coriaceous, elliptical, subacute to obtuse, mucronate, 20–28 × 11–13 mm wide, the base cuneate into a petiole 2.0–2.5 mm long. Inflorescence 1 to several few flowered racemes, borne on base of the leaf, with successively and distantly distributed pendant, obliquous-leaning flowers, 1.1–1.5 cm apart, borne far beyond the leaf -the first flower is borne 9 cm beyond the apex of the leaf-, by a slender, glabrous, drooping peduncle 5.0-8.5 cm long, with only one open flower at a time per peduncle. Floral bracts minute muricate, 2 mm long. Pedicel green, glabrous 2.0 mm long. Ovary costate, glandular mainly at the crests 2.5–3.0 mm long. Sepals yellow, with sanguineous-red stripes, carinate and distantly pilose abaxially, the dorsal sepal broadly obovate, shallowly concave longitudinally, acute, acuminate, 19 × 10 mm unexpanded, 7-veined, at the base connate 10 mm to the lateral sepals, to form an inflated, saccate, rounded sepaline cup, the free portion of the sepal with a erose, reflexed margin at the apex. The lateral sepals connate 9.0-10 mm at the base to form a longitudinally concave, bifid lamina 10.5 × 10.5 mm unexpanded, 6 veined, with the deflexed, free for 6.0 mm, orange, triangular, acute, and papillose apices. Petals yellow, transversely, shortly spatulate, minutely papillose, 1.1×0.5 mm, with a round, obtuse tip at the apex. Lip yellow, free, oblong, concave, longitudinally sulcate, the margins thickened, apiculate, 0.7×0.7 expanded. Column yellow, terete, erect, 1.7 mm long. Anther dorsal, anther cup white. Stigma apical, ridged. Pollinia 2, yellow, pyriform. Capsule not observed.

Distribution and Ecology:—Lepanthes attenboroughii has been collected as an epiphyte in cloud forest at around 2000 m elevation in Pasco, central Peru (Figure 5). The authors considered not including Ecuador within the confirmed distribution of L. attenboroughii because the locality of the allegedly found plants of this species by H. Medina (pers. com.) could not be verified before and during this study. With more than 20 years of research in the area where plants of L. attenboroughii were supposedly collected by Hugo Medina of Ecuagenera (even with coordinates provided by him) but lacking a voucher specimen, no fertile or infertile plants have been found by the authors or anyone else. Considering the distribution of the confirmed collections of L. caprimulgus and L. attenborougii from Peru done by

two of the authors, we find it improbable that *L. attenboroughii* could be found growing in north-west Ecuador, close to the border of Colombia. If plants of *L. attenboroughii* would eventually be collected in Ecuador, the most probable locality would be the south-east Andes or the Cordillera del Condor (south-east of Ecuador), both areas close to Peru.

Conservation status:—Because the plants have been observed *in situ* on a few occasions, little information on the real conservation status is currently available. According to IUCN criteria, *L. attenboroughii* should be considered as Data Deficient (DD) until the status of natural populations is assessed. Nevertheless, *L. attenboroughii* has propagated *in vitro* extensively, making it abundant *ex situ* in both private and public collections.

Etymology:—Lepanthes attenboroughii is named in honor of Sir David Attenborough whose life has been dedicated to educating and inspiring generations of naturalists and conservationists, and most recently been a vocal advocate with his fervent call to action in response to global climate change.

Additional specimens examined (paratype):—Flowers in spirits of plant purchased from Ecuagenera. *L. Baquero LB-3141* (QCNE)

Additional studied specimen of *L. caprimulgus*:—PERU. Huánuco: Leoncio Prado Province, Hermilio Valdizan District, from a forest patch near caserío Margarita, 1713 m, *L. Ocupa 281* (USM!).

Taxonomic Discussion:—A long-term cultivated specimen from a private collection closely resembling the type of *L. caprimulgus* and undoubtedly identified as such was studied (Figs. 2–4). Additionally, wild plants from Huanuco, Peru were photographed and studied, and were confirmed to be *L. caprimulgus* when compared with the original description and holotype (Luer 1976) (Figure 5). When all available photographic material was consulted in Google Images and Flickr.com under the search for "*Lepanthes caprimulgus*" about 8 out of 10 photos belonged to *L. attenboroughii* and only 2 out of 10 photos belonged to *L. caprimulgus*. This supports the fact that misidentified *L. attenboroughii* is more common in cultivation and better documented than *L. caprimulgus*. For both species, phenotypic variations of the flowers could be observed nevertheless, no intermediate shaped flowers between *L. caprimulgus* and *L. attenboroughii* were observed.

Lepanthes attenboroughii is most similar to L. caprimulgus with which it shares several features such as the conspicuously cupped, and stripped flowers, with the petals, lip and column hidden inside the sepaline cup. Additionally, both species have five veins on their dorsal sepals, and eight veins in the synsepal, more than most species in the genus. Nevertheless, morphological features readily distinguish both species. Some morphological, consistent features help to immediately distinguish both species like the position of the flowers (with leaning flowers, in more horizontal position of L. attenboroughii compared to the flowers in vertical position of L. caprimulgus) and the rounder flowers of L. attenboroughii compared to the "peanut shaped", tube-like flowers of L. caprimulgus. Nevertheless, other morphological characteristics could have a direct relationship regarding specificity of pollinators with evolutive repercussions (Figures 1–4). In Lepanthes the specificity of pollinators would be one of the most important factors of evolutive divergence between species (Blanco &. Barboza 2005). The petals of L. caprimulgus are substantially wider with a lower elongated lobe that extents below the lip (Figure 2) compared to the symmetric petals with shorter lobes in L. attenboroughii (Figures 1-4, 6). The lip, neverthelss is larger and longer with a marked apiculus at the apex in L. attenboroughii different to the smaller, broadly ovoid lip of L. caprimulgus (Figures 2 and 6). Also, the rounder flowers of L. attenboroughii always bear a longer apical portion of the reflexed lateral sepals which extend far almost reaching the base of the flower. This portion of the synsepal is slightly shorter than the fussed basal portion (Figures 1–4 and 6). In L. caprimulgus, in the other hand, the free, reflexed portion of the lateral sepals barely reach about one fourth of the total length of the sepaline cup (Figures 2–4 and 6). Considering the lack of intermediate shapes between the external and internal structures of the flowers from both species and 180 km between the confirmed populations (with no intermediate populations in between), of L. attenboroughii and L. caprimulgus we consider that these are two lineages with their own population evolving independently. Incidentally, L. attenboroughii was illustrated years ago by Miguel Alcántara in Bennet's Icones Orchidacearum Peruvianum (Bennett & Christenson 1998) (Figure 6). This precise illustration clearly shows the flowers in an almost horizontal position, the synsepal inflated, deeply cupped with the chef's hat-shaped petals and the oblong and concave lip, when compared to Luer's illustration of L. caprimulgus (Luer 1996: permissions granted by Missouri Botanical Garden Press, St. Louis) which features tube-shaped vertically oriented flowers. Both illustrations are well representations of both species when disected flowers and photographs of both species were compared (Figures 2–4 and 6).

Lepanthes caprimulgus although belonging to the subgenus Marsipanthes has recently shown to be genetically related to other Peruvian species like L. martinae or L. nycteris and not closely related to L. ribes (a similar looking species belonging to the subgenus Marsipanthes) which could indicate that the subgenus may be paraphyletic (Bogarín et al. 2019). Further genetic sampling including Lepanthes attenboroughii and more coverage across the genome would be beneficial to further resolve phylogenetic relationships of this group.

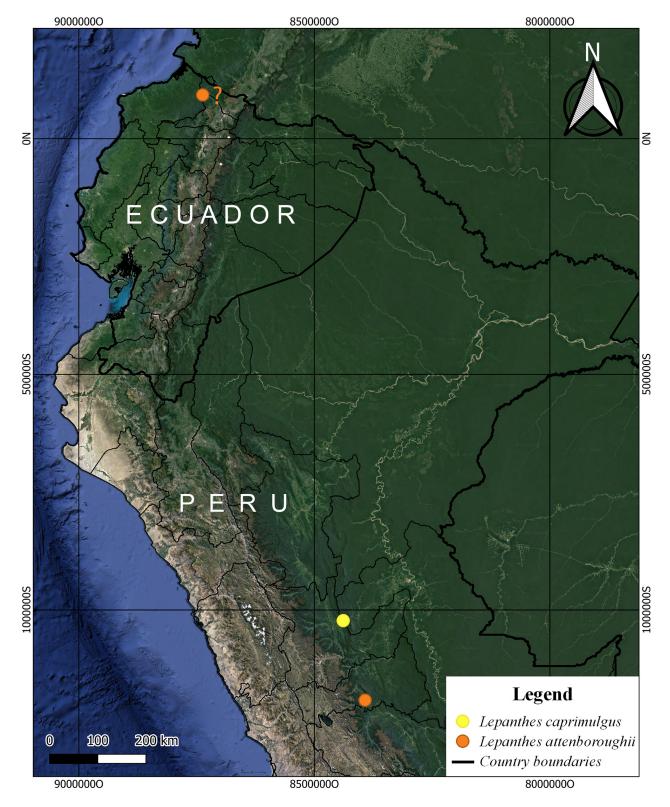


FIGURE 5. Map of localities of *Lepanthes attenboroughii* Baquero & Yeager and *L. caprimulgus* Luer. and the alleged locality of *L. attenboroughii* of Ecuador based on H. Medina (pers. com.). Map: by Luis Ocupa Horna. *L.caprimulgus*, *L. Ocupa 010* (USM!). *L. attenboroughii L. Ocupa & C. Martel 020* (holotype: USM!).

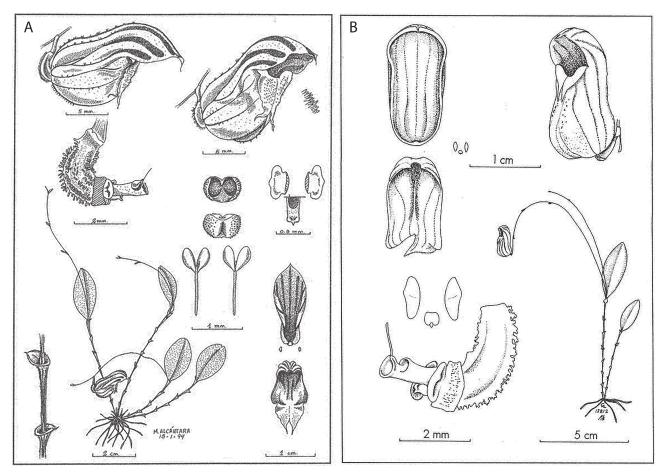


FIGURE 6. Illustrations of: A. Lepanthes attenboroughii Baquero & Yeager (Bennett, D.E., Jr. & Christenson, E.A. 1998. Icones Orchidacearum Peruvianum, Part 3. pl. 483. A. Pastorelli de Bennett, Lima.In: Swiss Orchid Foundation at the Herbarium Jany Renz. Botanical Institute, University of Basel, Switzerland. URL: https://orchid.unibas.ch/phpMyHerbarium/documents/14/317914m. jpg. Retrieved 07.04.2022.); and B. Lepanthes caprimulgus Luer (Luer, C. A. 1996. Icones Pleurothallidinarum XIV: Systematics of Draconanthes, Lepanthes subgenus Marsipanthes, and subgenus Lepanthes of Ecuador. Monographs in Systematic Botany from the Missouri Botanical Garden, 61: pp.10, Fig.1. Reproduced with kind permission of Missouri Botanical Garden Press).

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