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Illustrations and Studies in Neotropical Orchids. 2. A note on *Pleurothallis luctuosa* (Orchidaceae: Pleurothallidinae), with a new species

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Abstract

The identity of *Pleurothallis luctuosa*, its taxonomic history and geographic distribution are discussed, and the species is described and illustrated. A new species from Costa Rica, *P. neglecta*, is described and illustrated. *Pleurothallis neglecta* is compared with *P. luctuosa*, from which it differs by the distinct conduplicate leaves, different color of the flowers, triangular and smaller lip, falcate, erose petals, and the callus formed by two conspicuous, densely papillose keels.

Key words: Orchidaceae, Pleurothallidinae, *Pleurothallis, Acronia, Pleurothallis luctuosa, Pleurothallis neglecta*, Costa Rica, A.R. Endrés, new species.

Introduction

In 2008, the Lankester Botanical Garden (LBG) at the University of Costa Rica began a large project devoted to the reconstruction of the phylogenetic relationships and the assessment of the taxonomic identity of the species of subtribe Pleurothallidinae LINDL. (Orchidaceae) in Costa Rica. Pleurothallidinae represents the most diverse orchid group in the Neotropics, and the taxonomy of this large assemblage of species has been traditionally problematic, both under the profiles of generic circumscriptions and taxa identification. *Pleurothallis* subgen. *Pleurothallis* sect. *Pleurothallis* subsect. *Acroniae* (PRESL) LUER (= *Acronia* PRESL pro parte, LUER 2005) includes in Costa Rica a relatively small number of species. With some sixty described taxa, the subsect. *Acroniae* (sensu LUER 1998) is predominantly South American in distribution, with only six species recorded from Costa Rica. In revising specimens of this group in the living collection of LBG, we noted that the name *Pleurothallis luctuosa* RCHB.f. was apparently applied to two different taxa, one of which is still undescribed.

Taxonomic history of Pleurothallis luctuosa

The circumstances, under which A.R. Endrés was murdered in Riohacha, Colombia, in the first months of 1875, are still unclear. Endrés left Costa Rica, the country where he

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spent the last eight years of his life, in the course of 1874, when he traveled to Europe and met Heinrich Gustav Reichenbach in Hamburg. According to REICHENBACH (1875), they had good days talking about orchids in the company of Benedikt Roezl (1823–1885), the Czech explorer, gardener and botanist, who was considered the most excessive orchid collector of his time. By the end of the summer, Endrés crossed the Atlantic again, and in late August he was in New York. A few months later, he lost his life in Colombia. The prestigious *Gardener's Chronicle* presented the sad new of Endrés' death on May 8th, 1875, promising an obituary of the great orchidologist by Prof. REICHENBACH (Anonymous 1875), but this text was never published, and likely it was never written.

By the time the destiny was driving Endrés to the date with his murder in Riohacha, a new *Pleurothallis* flowered for the first time in the orchid collection of the Botanical Garden of the University of Hamburg, of which H.G. Reichenbach had been appointed director in 1862. In the original description of the new species published in *Linnaea*, REICHENBACH (1877) made no reference to Endrés and the origin of the plant, nor he gave any reasons to baptize the new *Pleurothallis* as "*luctuosa*", or mournful, just recording that he saw the living plant in the collection of the Hamburg Botanical Garden. Many years later, SCHLECHTER (1923) strongly protested for the lack of information associated with many of the new species that Reichenbach published in *Linnaea*. However, in 1878, Reichenbach augmented the description of *Pleurothallis luctuosa* and illustrated it in *Xenia Orchidacea* (Fig. 1) and here he credited Endrés as the discoverer of the new species, explaining that he was just examining the first opening, black-purple flowers, when he was surprised by the news of the death of his friend. "Hence the name" (REICHENBACH 1878).

According to the manuscript notes by Endrés which are now in Vienna, *P. luctuosa* had been found in Costa Rica ten years before, in 1867. In his meticulous style, Endrés prepared a detailed description and a set of drawings of his finding, including the habit of the plant and floral dissections, as well as a series of duplicate specimens under his number 50. It has to be noted that this number has not to be interpreted as a "collecting number" in the modern sense; instead, Endrés mostly used his numeration system to refer to taxa rather than to individual collections. Actually, only one of the sheets conserved in Vienna is labeled as *P. luctuosa* in Reichenbach's handwriting (W-Rchb. Orch. 53791!), and the mounted specimen was likely prepared from living material cultivated in Hamburg. The holotype sheet includes several inflorescences, ramicauls and detached leaves, all of them apparently prepared in Hamburg from the living collection accession Nº 2537, plus sketches by Reichenbach himself and a pencil drawing by Endrés with a note about the color of the plant and the flowers, and a record of the date and altitude of the original collection (Endrés 50). Technically, there is no way to unequivocally associate the living plant accessed to the Hamburg Botanical Garden collection with Endrés' collection bearing his number 50, and we consider more correct to cite the holotype of *P. luctuosa* as Endrés *sine numero*, even though the plant flowered in Hamburg was likely part of the original collection made by Endrés at San Ramón.

The illustrations sent from Costa Rica (W-Rchb. Orch. 33417!, 36294!) (Fig. 2–3) are a model of the typical "method" by Endrés, who was used to prepare a preliminary sketch,

Fig. 1: Drawing of Pleurothallis luctuosa, from Xenia Orchidacea, 1878.

Fig. 2: Drawing of Pleurothallis luctuosa by A. R. Endrés (W-Rchb. Orch. 33417!).

improving it in terms of composition and amount of details in subsequent versions of the same plate. While in other cases Reichenbach completely relied on Endrés' drawings to illustrate Costa Rican orchids to be published in *Xenia*, the plate of *P. luctuosa* (Fig. 1) was ostensibly prepared from Reichenbach's own sketches, based on the living plant sent by Endrés and flowered in Hamburg.

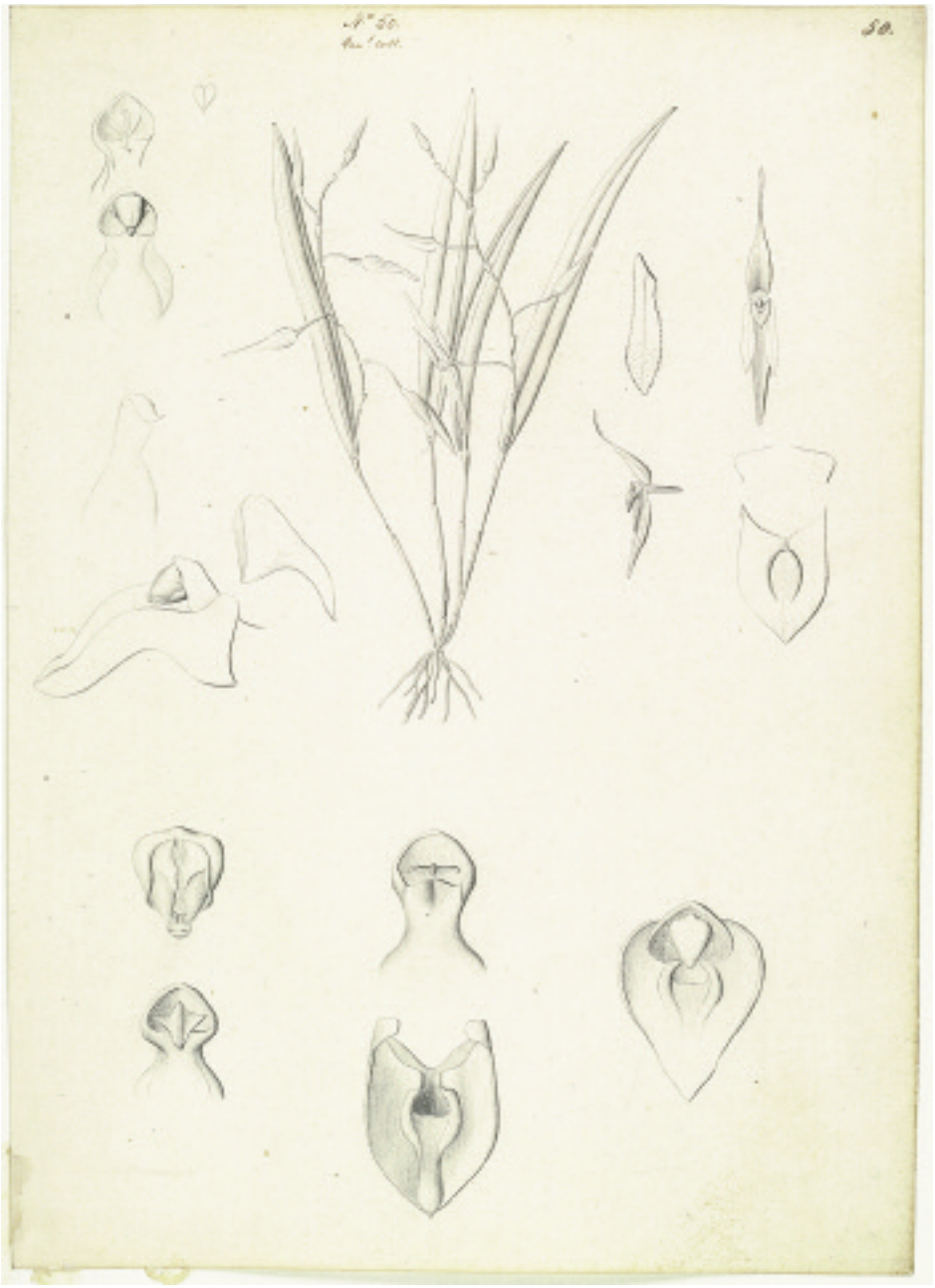


Fig. 3: Drawing of Pleurothallis luctuosa by A. R. Endrés (W-Rchb. Orch. 36294!).

In 1923, in his contributions to the orchidology of Central America, Schlechter – who had examined Endrés' records in Vienna – mentioned two additional collections of *P. luctuosa* by the brothers Alfred and Kurt Brade from La Palma (SCHLECHTER 1923), one of the main passes through the Central Volcanic range connecting the central valley to

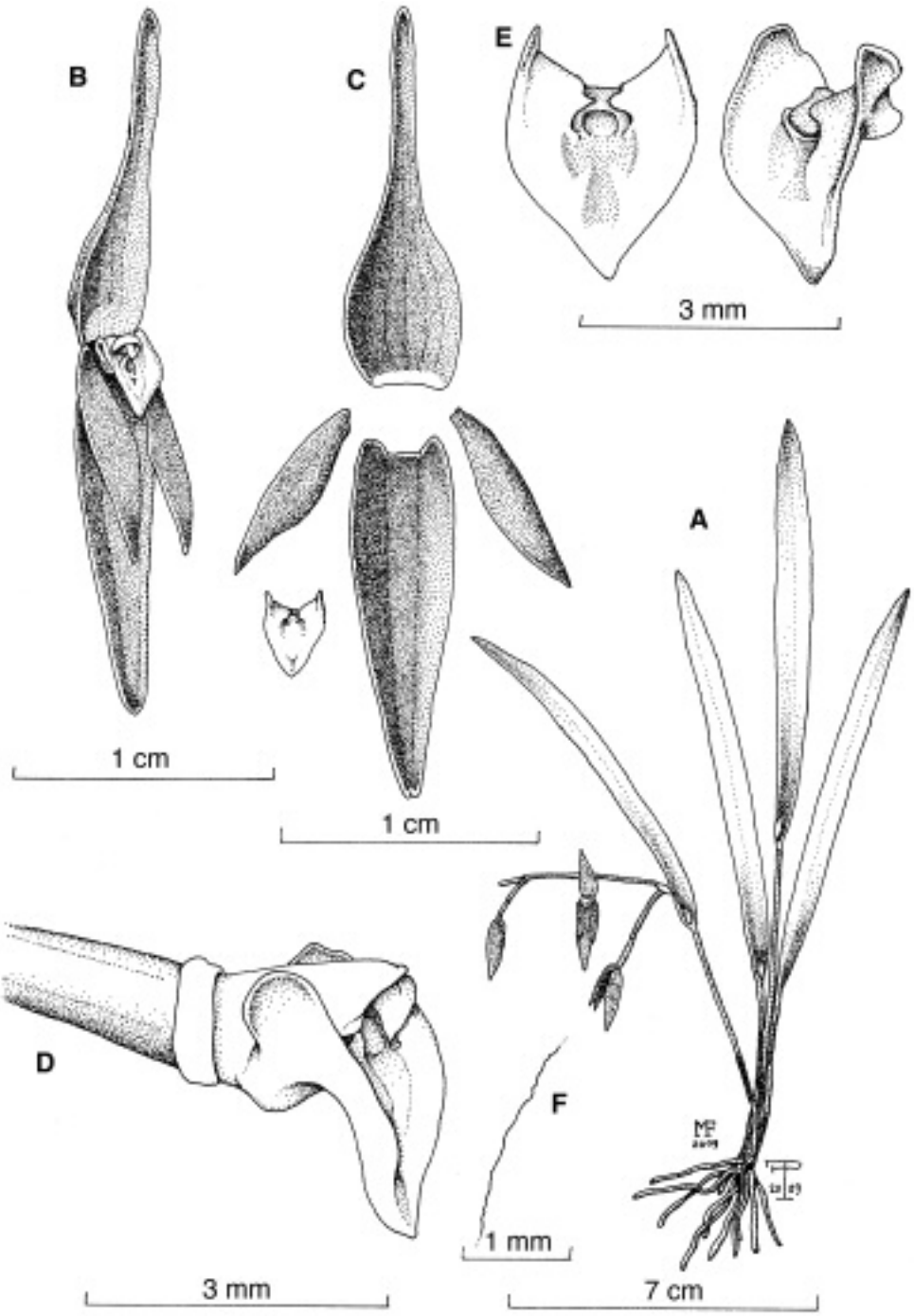


Fig. 4: *Pleurothallis luctuosa* RCHB.F. (from Pupulin 5311). A: Habit; B: Flower; C: Dissected perianth; D: Column and lip, lateral view; E: Lip, spread and in natural position; F: margin of petal. Drawn by D. Bogarín, M. Fernández and F. Pupulin.

the Caribbean in Costa Rica. Unfortunately, the collections examined by Schlechter were eventually lost in Berlin in 1943. By 1937, when Prof. Ames prepared an updated checklist of Costa Rican Orchidaceae for STANDLEY's "Flora of Costa Rica", *P. luctuosa* was still known only from a limited number of specimens. AMES (1937) quoted a Costa Rican collection by C.H. Lankester from the region of Acosta (AMES 1178), and two specimens found by M.A. Brenes around San Ramón, along the Caribbean slopes of the Tilarán mountain range. We were unable to locate the last two collections in AMES' herbarium, but Gustavo A. Romero kindly provided us with a manuscript note by Brenes about a collection made by him in 1925 at "Collines en Piedades, prés S. Ramón, 1025 m" (No. 38/1249 Herb. Brenes, AMES). While Lankester's specimen was recorded having "flowers maroon, lip greenish", the flowers of Brenes 38/1249 were noted as greenish yellow, marked with pale red along the veins. It was not until 1976, when Luer produced the first, modern botanical illustration of *P. luctuosa* for his series on miscellaneous Pleurothallidinae species (LUER 1976), based on an Ecuadorian specimen collected in the province of Pichincha (LUER et al. 528, SEL). In his treatment of the species, LUER quoted collections referable to *P. luctuosa* also from Nicaragua and Colombia (LUER 1976). Luer's interpretation was followed by floristic treatments in the Mesoamerican region (i.e., HAMER 1984, GARCÍA CASTRO et al. 1993, PUPULIN 2002, LUER 2003, CORREA et al. 2004, OSSENBACH et al. 2005) and from South America (i.e., DODSON & DODSON 1980), but it is now quite clear that the specimens quoted in these works are referable to both the true *P. luctuosa* and to its sister, an undescribed species. It is fortunate that at LBG we have plants of both the "morphs" to critically compare them.

Taxonomic treatment

***Pleurothallis luctuosa* RCHB.f., Linnea 41: 48 (1877). – Fig. 4.**

≡ *Humboldtia luctuosa* (RCHB.f.) KUNTZE, Revis. Gen. Pl. 2: 667 (1891).

≡ *Acronia luctuosa* (RCHB.f.) LUER, Monogr. Syst. Bot. Missouri Bot. Gard. 103: 58 (2005).

Type: Costa Rica, Alajuela, San Ramón, 1867, A.R. Endrés s.n. [holotype: W-Rchb. Orch. 53791!].

Herb epiphytic, caespitose, erect, small, up to 18 cm tall. Roots slender, flexuous, to 1 mm in diameter. Ramicauls slender, erect, terete, 2.2–9.0 cm long, enclosed by 1-3 tubular, adpressed, papery, brown bracts, 0.4–3.1 cm long. Leaves erect, fleshy, coriaceous, subsemiterete, linear-lingulate, acute, coarsely 3-dentate, 4.2–12.8 x 0.4–0.7 cm, the cuneate-rounded base narrowing into a petiole up to 0.15 cm long. Inflorescence a lax, distichous, 3–6 simultaneously flowered raceme, 3.8–4.1 cm long including the 2.4 cm long peduncle produced at the base of the leaf from a small, conduplicate, linear, acute spathe. Floral bracts ovate, acute, conduplicate, membranaceous, 10 x 4 mm. Pedicels 9 mm long, persistent. Ovary cylindric, 4 mm long. Flowers with the sepals and the petals purple, the lip green suffused with purple, the column green, the anther greenish white. Dorsal sepal erect, ovate, acuminate, concave, 15 x 4 mm, 5-veined. Lateral sepals connate into an ovate, acuminate, entire or sub-bidentulate, concave synsepal, 14 x 4 m, 3-veined. Petals ovate, acute, falcate, resting on the margins of the

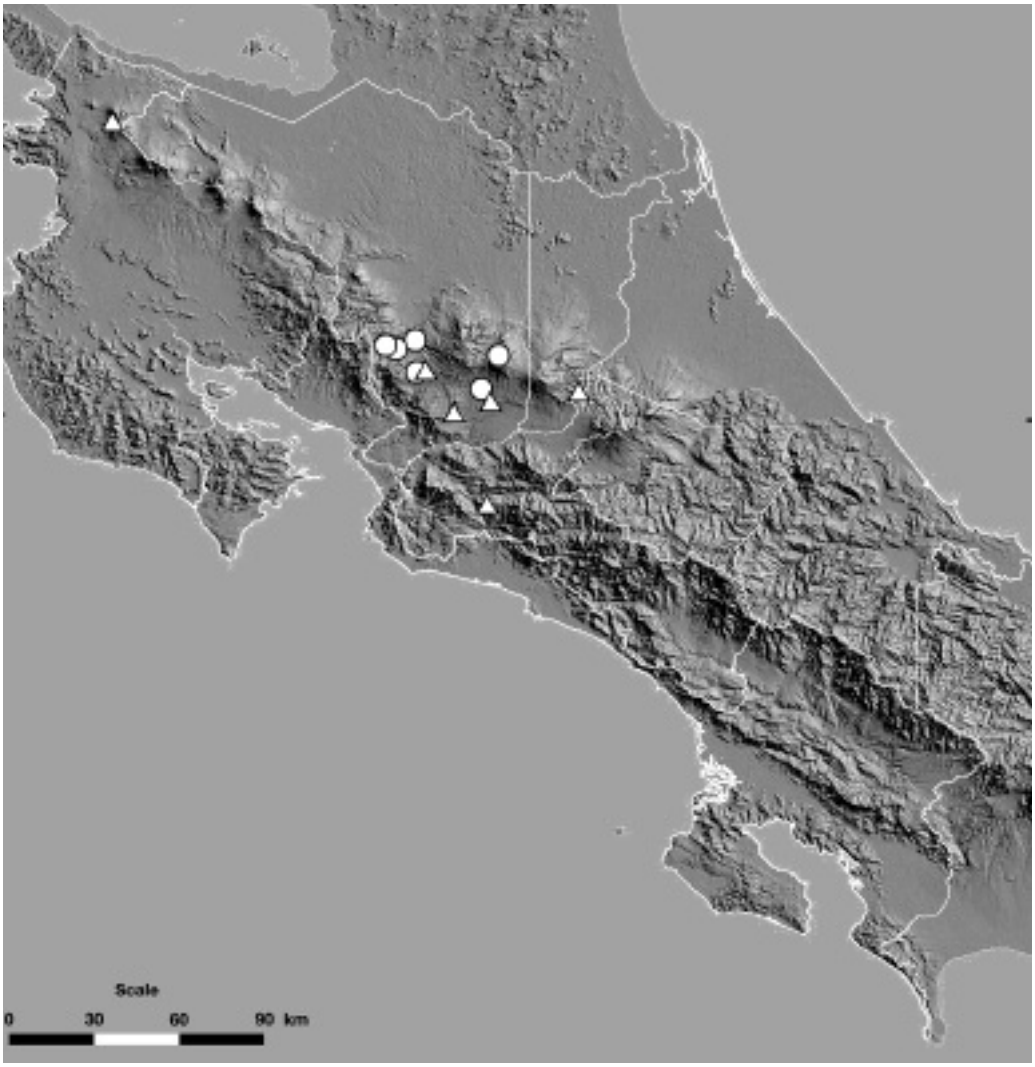
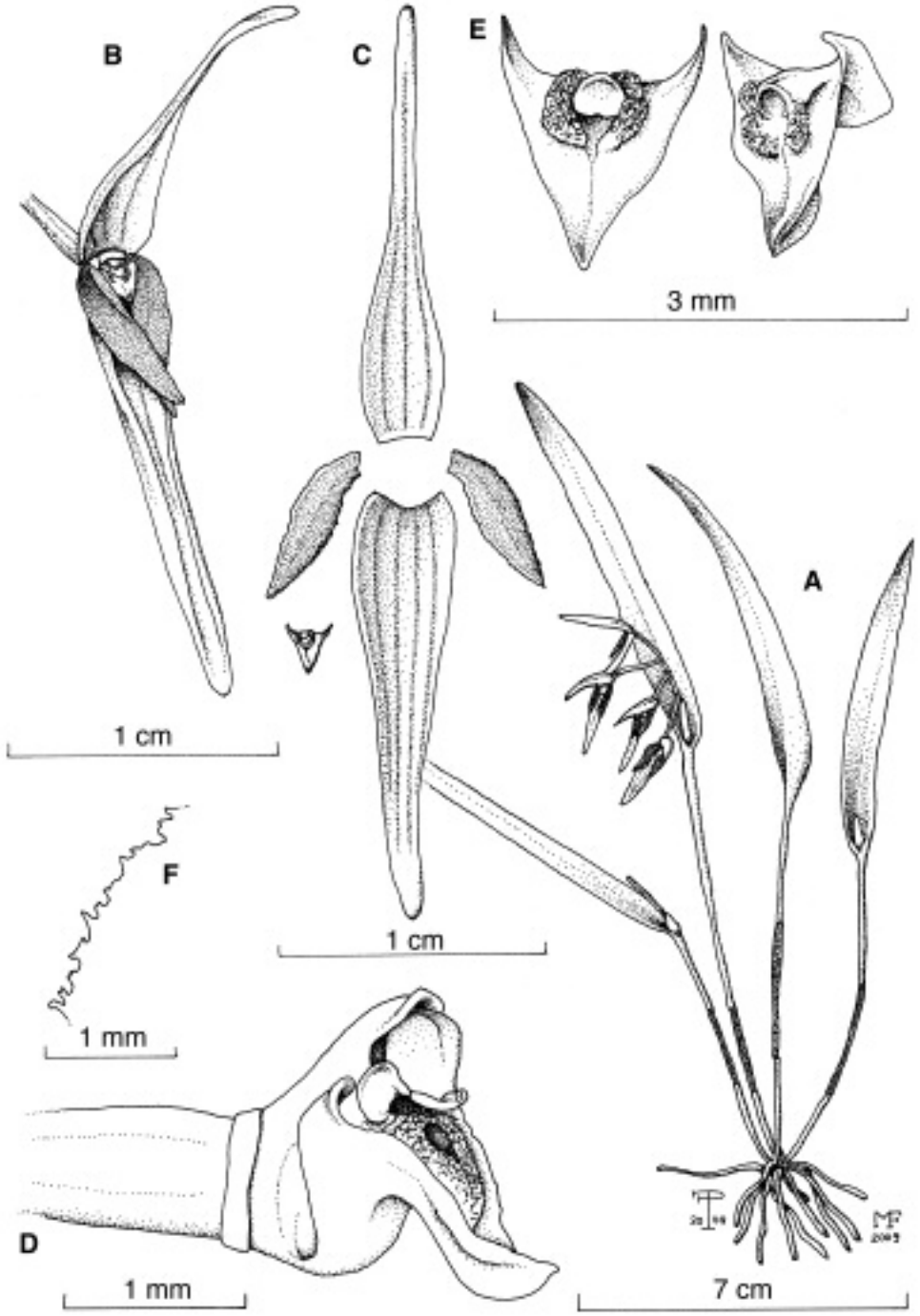


Fig. 5. Distribution map of *Pleurothallis luctuosa* and *P. neglecta* in Costa Rica.

synsepal, the margins obsoletely serrato-denticulate, 8 x 2 mm. Lip triangular-hastate, sigmoid, acute or sub-apiculate, 3.5 x 1.5 mm, hinged to the column foot, the basal lobes erect; disc 2-carinate, the keels subobsolete, incurved, flanking the reniform glenion. Column short, cylindric-subclavate, 1 mm long, the clinandrium entire, the stigma apical, reniform, bilobed. Anther cap incumbent, ovate, emarginate. Pollinia 2, pyriform, on an ovate, retuse viscidium.

Fig. 6: *Pleurothallis neglecta* Pupulin, Bogarín & M. Fernández (from Pupulin 7019). A: Habit; B: Flower; C: Dissected perianth; D: Column and lip, lateral view; E: Lip, spread and in natural position; F: margin of petal. Drawn by D. Bogarín, M. Fernández and F. Pupulin from the holotype.


B
C
E
3 mm
1 cm
A
1 cm
F
1 mm
D
1 mm
7 cm

Derivation of name: From the Latin *luctuosus*, sorrowful, in reference to the death of A. R. Endrés, who collected the type specimen.

Specimens examined: **Costa Rica**, [Alajuela:] San Ramón, **A.R. Endrés s.n.** (W-Rchb. Orch. 53791); **A.R. Endrés 50** (W-Rchb. Orch. 44222; W-Rchb. Orch. 2805; W-Rchb. Orch. 142268; AMES 118528; W-Rchb. Orch. 36294, drawing; W-Rchb. Orch. 36294, drawing; W-Rchb. Orch. 33417, drawing and manuscript description); – San Ramón, Berlín, near the turning of the unpaved road to San Mateo, Cerro Pelón, Pacific watershed of the Cordillera de Tilarán, lower montane rain forest, 10º 00' 52" N 84º 23' 55" W, 1200 m, scrub vegetation with scattered trees on exposed, windy crests, **F. Pupulin 5311 / 5304** & E. Salas-Pupulin (JBL); – San Ramón, Angeles, road from San Ramón to La Fortuna, Ángeles Norte, 10º 08' 29.3" N 84º 28' 51.2" W, 1200 m, on crest of continental divide, premontane wet forest, remnant woods on the right of the road, F. **Pupulin 6322B** & E. Salas-Pupulin (JBL); – [San José:] La Palma, 1400 m, **A. Brade & K. Brade 1104 / 1216**; Sabanillas de Acosta, 06.1928, **C. H. Lankester 1178** (AMES); – [Guanacaste:] Parque Nacional Guanacaste, Estación Biológica Volcán Cacao, Estación Pitilla, 1100 m, 24.10.1990, **C. Chávez 396** (CR, MO); **Costa Rica**, without specific locality, **A.R. Endrés s.n.** (W-Rchb. Orch. 2308); **Costa Rica**, without specific locality, **JBL 11663** (JBL).

Distribution: To assess the real distribution range of *P. luctuosa* is made quite difficult by the persistent confusion with its sister species. Hamer (1984) recorded *P. luctuosa* from Nicaragua and illustrated it on the basis of Heller 8013 (SEL), which corresponds to the species treated hereafter as *P. neglecta*. Even though Hamer (1984) reported the species as variable, it is still known in Nicaragua from a single collection only (Hamer 2001), and we therefore exclude this country from the distribution of *P. luctuosa*. We have not seen actual material of this species from the region of Chiriquí in Panama (D'Arcy 1987, Correa et al. 2004), but on the basis of its morphologic features, the Ecuadorian specimen illustrated by Luer (1976) (Luer et al. 528, SEL) may perhaps correspond to a different and still undescribed species. The clone "Sweet Bay", which received a Certificate of Cultural Merit by the American Orchid Society in November 2008, under the name of *P. luctuosa* (Kersey 2008) is surely misidentified; however, we have no information about the geographic origin of this highly different taxon. On the basis of the available data, *P. luctuosa* must likely be considered endemic to Costa Rica (Fig. 5) and perhaps to western Panama.

Distribution and habitat: Only known from the Tilarán range in northwestern Costa Rica and, possibly, also occuring in western Panama. Plants have been recorded growing epiphytic in premontane wet forest in secondary and primary vegetation.

Phenology: plants flower from May to September.

***Pleurothallis neglecta* Pupulin, Bogarín & M. Fernández, sp.n. (Fig. 6).**

Type: Costa Rica, Alajuela: San Ramón, La Paz, continental divide, 10º08'09.9"N 84º30'48.5"W, 1130 m, premontane wet forest, 19 February 2008, F. Pupulin 7019, R.L. Dressler & A. Karremans [holotype: USJ; isotypes: JBL, CR, W].

Diagnosis: A Pleurothallide luctuosa Rchb.f. foliis latioribus distincte conduplicatis, sepalo postico latiore 3-nervato, petalis falcatis marginibus erosis et labello triangulare multo minore duabus carinis altis dense papillosis in disco ornato recedit.

Herb epiphytic, caespitose, erect, small, up to 16 cm tall. Roots slender, flexuous, to 1 mm in diameter. Ramicauls slender, erect, terete, 4.2–8.0 cm long, enclosed by 1-3

Fig. 7: Comparison of the flowers of (A) *Pleurothallis luctuosa* and of (B) *P. neglecta*. Vouchers: A – Pupulin 5305; B – Pupulin 7019. Scale bar = 1 cm.

tubular, adpressed, papery, brown bracts, 0.2-2.7 cm long. Leaves erect, fleshy, coriaceous, narrowly elliptic-ovate, conduplicate, acute, retuse, 5.3–8.7 x 0.9–1.3 cm, the rounded base narrowing into a petiole up to 0.15 cm long. Inflorescence a lax, distichous, simultaneously 3-flowered raceme, 4.6–5.0 cm long including the 1.4 cm long peduncle produced at the base of the leaf from a small, conduplicate, linear, acute spathe. Floral bracts ovate, acute, conduplicate, papyraceous, 19 x 4 mm. Pedicels 1 mm long, persistent. Ovary cylindric, 1 mm long. Flowers with the sepals greenish yellow with purple veins, the petals brown-purple, the lip light green. Dorsal sepal erect, ovate, acuminate, concave, 19 x 3 mm, 3-veined. Lateral sepals connate into an ovate, acuminate, concave, apically notched synsepal, 18 x 4 mm, 4-veined. Petals ovate, falcate, acute, erose, 7 x 1 mm. Lip triangular, sigmoid, the lateral lobes erect-incurved, 2.5 x 1.5 mm; disc with 2 high, rounded, incurved, densely papillous keels flanking a well developed, obreniform glenion. Column short, cylindric, 1.2 mm long, the clinandrium entire, the stigma subapical, bilobed. Anther cap incumbent, ovate. Pollinia 2, pyriform, on a rounded viscidium.

Derivation of name: From the Latin *neglectus*, neglected, disregarded, alluding to the fact that botanists did not pay proper attention to this species.

Paratypes: **Costa Rica**, Alajuela, [San Carlos] about 7 km east of Ciudad Quesada, Quebrada Marín, 10°22’ N 84°24’ W, 500 m, in shade forested stream edge and cleared slopes below the Methodist Rural Center, epiphyte on horizontal branch 10 cm diameter, 17-18.05.1968, **W. C. Burger 4958** & R. G. Stolze (CR); – Alajuela: San Ramón, Ángeles, Reserva Biológica Alberto Manuel Brenes, 10°13’06” N 84°36’11” W, 800-900 m, 2 km después de la Estación, por el camino de acceso principal, bosque muy húmedo tropical transición a premontano, epífitas en bosque secundario a orillas del camino, 26.05.2006, **D. Bogarín 2859** & Botánica Forestal Avanzada-UCR (JBL); – Alajuela: San Ramón, Ángeles, Reserva Biológica Alberto Manuel Brenes, 10°13’ N 84°35’ W, 950 m, sendero Pájaro Sombrilla, hacia el noroeste de la estación, **M. Blanco 2148** (USJ); – Alajuela: San Ramón, camino a la Reserva Biológica Alberto Manuel Brenes, 600 m, 23.01.2001, **M. Blanco 1817** (USJ); – Alajuela: San Ramón, La Paz, continental divide, 10°08’09.9” N 84°30’48.5” W, 1130 m, premontane wet forest, 19.02.2008, **F. Pupulin 7014**, R. L. Dressler and A. Karremans (JBL); – Alajuela: San Ramón, Piedades, 1025 m, 05.06.1925, **A. M. Brenes 38/1249** (AMES); – without locality data, **JBL 05153** (JBL); – without locality data, **M. Blanco 1690** (USJ). **Nicaragua**, Rivas, 11°27’00”N 85°31’00”W, 1300 m, **Heller 8013** (SEL, drawing seen).

Distribution and habitat: known from Costa Rica and Nicaragua. Plants have been recorded epiphytic in secondary and primary forest in premontane wet forest and tropical wet forest, premontane belt transition in Tilarán range, northwestern Costa Rica (Fig. 5) . In Nicaragua it is known from the Maderas volcano at Ometepe Island, Rivas.

Discussion. *Pleurothallis neglecta* can be distinguished from *P. luctuosa* by the distinct conduplicate leaves (vs. subsemiterete), the flowers with the sepals greenish yellow with purple veins, the petals brown-purple, the lip light green to yellowish (vs. sepals and the petals purple, the lip green suffused with purple), triangular, smaller (2.5 vs. 3.5 mm long), the petals falcate, erose (vs. obsoletely serrato-denticulate) and the callus formed by two conspicuous, densely papillose keels (vs. low, glabrous) (Fig. 7). Also, it resembles the Colombian *Pleurothallis amphygia* Luer & Escobar but differs in the distichous, simultaneously 3-flowered raceme (vs. single flowered), the acuminate sepals (vs. narrowly, long acuminate) and the color of the flowers, which are purple in *P. amphygia*.

Acronia was described by Carl PRESL in 1827, based on the Peruvian *Acronia phalangifera*. In 1861, REICHENBACH reduced *Acronia* to the synonymy of *Pleurothallis*. Within *Pleurothallis* subgen. *Pleurothallis* sect. *Pleurothallis* [typyfied by *Epidendrum ruscifolium* JACQ. ≡ *Pleurothallis ruscifolia* (JACQ.) R.Br.] LUER (1986) created subsection *Acroniae* with *A. phalangifera* as the type, including here *Pleurothallis luctuosa*. In 1998, he divided subsection *Acroniae* into two series, Series *Acroniae* for those species with racemose inflorescences (including *P. luctuosa*) and series *Amphygiae* for those with single-flowered inflorescences (LUER 1998). The sections and subsections of *Pleurothallis* subgen. *Pleurothallis* were not supported as monophyletic groups by the molecular phylogenetic analysis of the Pleurothallidinae published by PRIDGEON et al. (2001). In 2001, species of *Pleurothallis* subgen. *Pleurothallis*, including members of subsections *Acroniae* and *Macrophyllae-Fasciculatae*, were segregated by SZLACHETKO and co-workers (SZLACHETKO & MARGONSKA 2001, SZLACHETKO & KULAK 2006a, 2006b) in the new genus *Zosterophyllanthos* SZLACH & MARG. More recently, LUER (2005) proposed the resurrection of *Acronia*, merging *P.* subsection *Acroniae* (with series *Acroniae* and *Amphygiae*) and *P.* subsection *Macrophyllae-Fasciculatae,* now elevated to the sectional rank, and reducing *Zosterophyllanthos* to the synonymy of *Acronia.* However, recent data based on nuclear ITS and preliminary plastid sequences information (WILSON et al. in press), support the results of PRIDGEON et al. (2001) and provide no support for the creation of segregate genera from within *Pleurothallis sensu stricto* (i.e. the creation of the genera *Acronia* and *Zosterophyllanthos* among others). According to the analysis of WILSON et al. (in press), the genus *Acronia* in particular, created to include subsection *MacrophyllaeFasciculatae* and the subgenus *Acroniae*, is not a viable concept. For this reason we favor here the description of the new species as a member of the genus *Pleurothallis*.

Phenology: plants flower from May to July. A few specimens have been recorded in flower from July to September.

Acknowledgments

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