Notes on Pleurothallidinae (Orchidaceae) from the Darién Gap[a]

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Abstract

On the basis of Panamanian material, two new species of the orchid subtribe Pleurothallidinae, *Ancipitia dressleri* and *Zosterophyllanthos dariensis*, are described. The taxonomic affinities of the new entities are briefly discussed. Furthermore, the transfer of *Pleurothallis hemileuca* to the genus *Zosterophyllanthos* is proposed.

Résumé

Notes sur des Pleurothallidinae (Orchidaceae) du *Tapón del Darién* – Sur la base de matériel panaméen, deux nouvelles espèces d'orchidées de la sous-tribu Pleurothallidinae, *Ancipitia dressleri* et *Zosterophyllanthos dariensis*, sont décrites et leurs affinités taxinomiques sont brièvement discutées. On propose en outre le transfert dans le genre *Zosterophyllanthos* de *Pleurothallis hemileuca*.

Introduction

With about 4,000 species the Neotropical subtribe Pleurothallidinae is the largest taxon of this rank within the Orchidaceae (Pridgeon *et al*., 2005). Although their classification within the Epidendreae was confirmed in both molecular (Chase *et al*., 2003) and morphological studies (Dressler, 1993; Szlachetko, 1995), the generic delimitations within this group remain

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vividly discussed. The most controversial changes concern *Pleurothallis s.l.*, and various propositions of its splitting into smaller, clearly defined taxa were published (eg. Pridgeon & Chase, 2001; Luer, 2004). The broad concept of the genus was suggested by Lindley (1859) and the first comprehensive division of the genus into morphologically distinct groups was proposed by Luer (1986). Luer recognised 29 subgenera of *Pleurothallis* R.Brown. The high number of the distinguishable subgeneric taxa was related to the large phenotypic variation of its representatives. Among this heterogeneity three common characters: (1) the non-pseudobulbous habit, (2) the unifoliate ramicaul and (3) the persistent pedicel with an abscission layer just below the ovary, allow for an easy identification of any pleurothallid orchid (Luer, 1986). Many of the subgeneric taxa distinguished by Luer were later elevated to the generic rank (eg. Szlachetko & Margońska, 2001; Luer, 2004).

Molecular studies on the subtribe were conducted by Pridgeon & Chase (2001). It does not surprise that *Pleurothallis* was found to be a polyphyletic entity. Pridgeon & Chase proposed over 500 new combinations, revived the genera *Acianthera* Scheidweiler and *Anathallis* Barbosa Rodrigues and proposed three new genera: (1) *Anthereon* Pridgeon & M.W.Chase, (2) *Echinella* Pridgeon & M.W.Chase, *non* Acharius, and (3) *Diodonopsis* Pridgeon & M.W.Chase. Furthermore, they proposed wider concepts for *Phloeophila* Hoehne & Schlechter, *Pleurothallopsis* Porto & Brade, *Stelis* Swartz and *Specklinia* Lindley. On the other hand, Pridgeon & Chase reduced the genera *Acostaea* Schlechter, *Apatostelis* Garay, *Barbrodria* Luer, *Condylago* Luer, *Jostia* Luer, *Luerella* Braas, *Ophidion* Luer, *Restrepiopsis* Luer and *Salpistele* Dressler to synonyms of other genera.

Unfortunately the taxa proposed by Pridgeon & Chase were founded merely on molecular research and were not properly defined morphologically. Because of this the generic delimitation within the Pleurothallidinae is still discussed and so far no generally accepted agreement on the divisions within the *Pleurothallis*-alliance has been reached (Luer, 2002).

During the recent studies on the orchid flora of the Darién Gap, two distinctive species, one belonging to the genus *Ancipitia* (Luer) Luer and the other belonging to the genus *Zosterophyllanthos* Szlachetko & Margońska, were found. In the present study, they are described as new taxa.

Furthermore, the examination of the herbarium material of one of the pleurothallid orchids studied revealed the necessity of its taxonomic transfer to *Zosterophyllanthos*. The corresponding new combination is provided.

Representatives of *Ancipitia* and *Zosterophyllanthos* are included by some authors in *Pleurothallis s.l.* (eg. Pridgeon *et al*., 2001). Plants of *Ancipitia* are characterized by the caespitose habit, long ramicauls which are usually laterally compressed and inflorescence in form of a fascicle of long-pedicellate, single flowers arising from the leaf base. Species of *Zosterophyllanthos* may be distinguished from other Pleurothallidinae genera by the terete ramicauls, cordate leaf bases, apical inflorescence consisting of single flowers, lateral sepals connate forming a synsepal and petals much smaller than sepals. Additionally, the gynostemium morphology of those species is unique amongst Pleurothallidinae. It is short, straight, relatively massive, terete, more or less dorsiventrally compressed with horizontal lateral stigma lobes which are separated by erect, digitate rostellum. The column foot is obscure, if any. Anther is apical, more or less oblong-cordate to oblong-ovate.

Material and methods

The studies on the orchid flora of the Darién Gap were conducted in the herbaria of BM, COL, F, FLAS, HUA, JAUM, K, MO, NY, PMA, UGDA, and W. Standard procedures of preparing the herbarium material to facilitate stereomicroscopic observations were applied. Flowers were softened in boiling water prior to dissection. Both vegetative characters and flower segments were studied. The examined specimens were compared to the type materials, diagnoses and original illustrations.

Taxonomic treatment

***Ancipitia dressleri* Kolanowska & Szlachetko, *sp. nova*.** (Fig. 1)

Type: PANAMA. San Blas/Darién. Mountains between Tubualá (San Blas) and Masargandi (Darién), 400-500 m, 2 Feb 1997. *R.L.Dressler 5591* (holotype: FLAS).

Species similar to *Ancipitia eumecocaulon* Schlechter, distinguished by the glabrous, obliquely ovate petals and lip lacking apical, cellular-papillose callus.

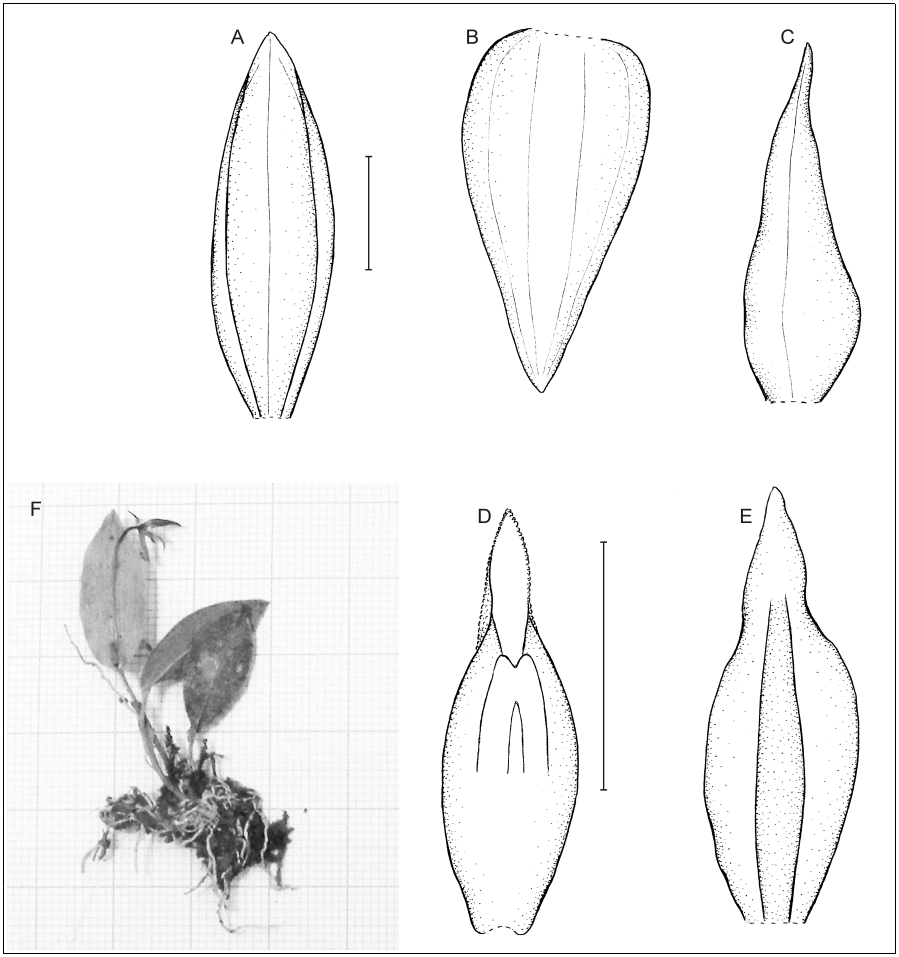

Fig. 1 : *Ancipitia dressleri*
A - dorsal sepal; B - synsepal; C - petal; D-E - lip, various views. Scale bars = 2 mm. F - habit. Drawn by A. Król from the holotype

Plants small, roots slender. Ramicaul erect, slender, 2-3.5 cm long, unifoliate. Leaf coriaceous, narrowly ovate, subobtuse, 2-3.7 cm long, 1-1.3 cm wide. Inflorescence a fascicle of solitary flowers, subtended by a spathe 3-5 mm long. Peduncle up to 15 mm long, pedicel up to 15 mm long, ovary up to 4 mm long. Flowers glabrous, white with violet spot on the lip. Dorsal sepal about 7 mm long, 2 mm wide, oblong-elliptic, obtuse, concave,

3-veined. Lateral sepals completely connate into a synsepal 6.5 mm long, 3 mm wide, ovate, obtuse, 4-veined. Petals about 6.5 mm long, 2 mm wide, obliquely ovate, obtuse, 1-veined. Lip 3.5 mm long, 1 mm wide, narrowly pandurate, with two thickened, elevated ridges running along the disc, apical part obtuse, papillose. Gynostemium about 1 mm long.

Etymology: Dedicated to R.L.Dressler, prominent orchidologist and collector of the type specimen.

Distribution: Endemic to the Darién Gap where it was found growing at the altitude of about 400-500 m. Flowering in February.

Taxonomic notes: The glabrous, obliquely ovate petals of this species and the lack of apical elevated, cellular-papillose callus allow for an easy differentiation between this species and *Ancipitia eumecocaulon* Schlechter. The latter orchid has hitherto been found in Panama and Costa Rica where it grows between 600-1270 m a.s.l.

Zosterophyllanthos dariensis* Kolanowska & Szlachetko, *sp. nova. (Fig. 2) Type: PANAMA. San Blas/Darién. Mountains between Tubualá (San Blas) and Masargandi (Darién), 300-500 m, 2 Feb 1997. *R.L.Dressler 5589* (holotype: FLAS!).

Species similar to *Z. cardiothallis* (Reichenbach f.) Szlachetko & Kulak, and *Z. rhodoglossus* (Schlechter) Szlachetko & Margońska, but distinguished by the basally densely ciliate petals, sparsely ciliate sepals, 3-lobed lip with small, subquadrate lateral lobes and subrectangular, apically bifid middle lobe and transversely elliptic glenion at the lip base.

Plants up to about 24 cm tall. Roots slender. Ramicaul erect, 9-16 cm long, enclosed by three tubular sheaths. Leaf up to 5.7 cm long, 3.5 cm wide, cordate, acuminate. Inflorescence composed of single flowers produced in succession, subtended by an inconspicuous spathe. Peduncles up to 3 mm long, pedicel and ovary about 5 mm long. Flowers brownish yellow. Dorsal sepal 6 mm long, 2.8 mm wide, ovate, obtuse, 3-veined, margins sparsely ciliate. Lateral sepals completely connate into a synsepal 5.2 mm long, 2.7 mm wide, ovate, obtuse, 6-veined, margins sparsely ciliate. Petals 3 mm long, 0.5 mm wide, ligulate, obtuse, 1-veined, basal part densely ciliate.

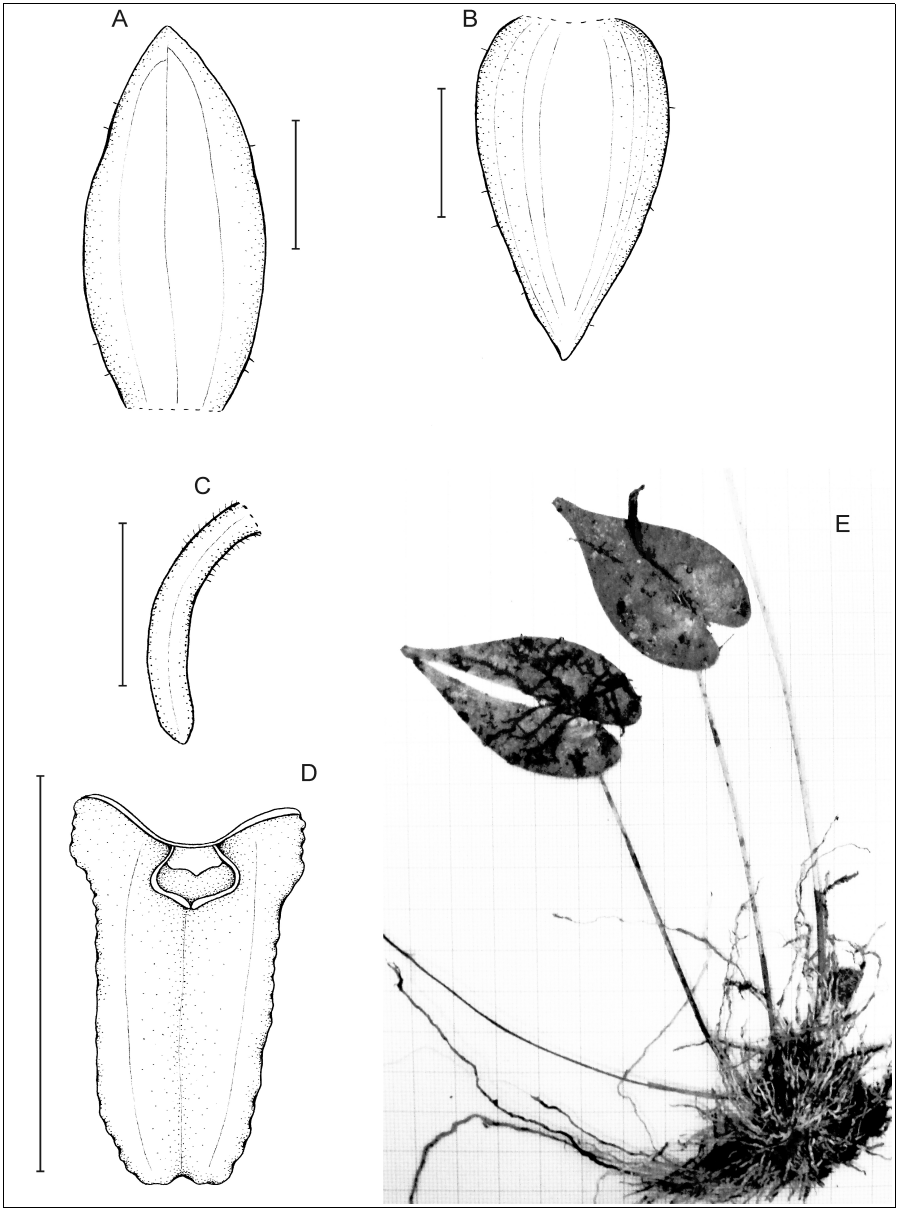

Fig. 2 : ***Zosterophyllanthos dariensis***
A - dorsal sepal; B - synsepal; C - petal; D - lip. Scale bars = 2 mm. E – habit.
Drawn by A. Król from the holotype

Lip 2 mm long, 1.2 mm wide, indistinctly 3-lobed; lateral lobes very small, subquadrate, margins irregular; middle lobe subrectangular, bifid at the apex; disc 3-veined with a transversely elliptic glenion at the lip base. Gynostemium about 0.5 mm long.

Etymology: In reference to the place of collection of the type specimen.

Distribution: Endemic to the Darién Gap where it was found growing at about 300-500 m. Flowering in February.

Taxonomic notes: The ciliate tepals (vs tepals glabrous), 3-lobed lip (vs lip ovate-triangular to obliquely oblong-quadrate) allow for an easy differentiation between this species, *Z. cardiothallis* (Reichenbach f.) Szlachetko & Kulak, and *Z. rhodoglossus* (Schlechter) Szlachetko & Margońska. Moreover, the glenion at the lip base of *Z. dariensis* is transversely elliptic, while in *Z. rhodoglossus* it is reniform in outline. Both *Z. cardiothallis* and *Z. rhodoglossus* are widely distributed from Central America to Ecuador.

Zosterophyllanthos hemileuca* (Luer) Szlachetko & Kolanowska, *comb. nov.
Basionym: *Pleurothallis hemileuca* Luer, *Selbyana* 7: 118. 1982.
Type: PANAMA. Chiriqui. Epiphytic in cloud forest at the Fortuna dam site, 1000 m, Aug 1976, *R.L.Dressler s.n.*, cultivated at SEL, 114-76-11, flowered in cult. 23 Dec 1976, *C.Luer 1274* (holotype: SEL).
Synonym: *Acronia hemileuca* (Luer) Luer, *Monographs in Systematic Botany from the Missouri Botanical Garden* 103: 142. 2005.

Taxonomic notes: This species should be included in *Zosterophyllanthos* based on its inflorescence structure (consisting of a fascicle of single flowers) and distinctly separated lateral lobes of the stigma and digitate, erect and elongate rostellum being placed between receptive surface. Those characters allow to distinguish it from *Acronia* C.Presl. From other genera of Pleurothallidinae it differs by the lack of lepanthiform sheaths on the ramicaul, cordate leaf base, inflorescence subtended by a spathe, gynostemium without wing-like projections, lack of the column foot and presence of two pollinia.

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Avec environ 4 000 espèces, la sous-tribu néo-tropicale Pleurothallidinae est le plus vaste taxon de ce rang chez les Orchidaceae. Bien que leur appartenance à la tribu Epidendreae fût confirmée dans les études tant moléculaires que morphologiques, les délimitations génériques restent vivement discutées. Les changements les plus controversés concernent *Pleurothallis s.l.* et plusieurs propositions pour le découper en taxons plus petits et clairement définis ont été publiées. Lindley fut le premier à proposer un concept large du genre, dont la première organisation complète en groupes morphologiquement distincts fut proposée par Luer en 1986. Ce dernier reconnaissait 29 sous-genres. Ce nombre élevé est lié à la grande variation phénotypique des espèces concernées. Toutefois trois caractères communs permettent l'identification de tout taxon de Pleurothallidinae : absence de pseudobulbe, ramicaule unifolié, pédicelle persistent, avec une couche d'abscission sous l'ovaire. Plusieurs des sous-genres proposés par Luer furent plus tard élevés au rang de genre.

Les études moléculaires menées en 2001 ont confirmé, sans surprise, que *Pleurothallis* était polyphylétique. Pridgeon & Chase ont alors proposé plus de 500 combinaisons nouvelles, ressuscité les genres *Acianthera* et *Anathallis* et proposé trois nouveaux genres : *Anthereon*, *Echinella*, *Diodonopsis*. Ils ont en outre proposé des concepts plus larges de *Phloeophila*, *Pleurothallopsis*, *Stelis* et *Specklinia*. A l'opposé, ils ont réduit les genres *Acostaea, Apatostelis, Barbrodria, Condylago, Jostia, Luerella, Ophidion, Restrepiopsis* et *Salpistele* à des synonymes d'autres genres. Malheureusement les taxons ainsi proposés ne sont fondés que sur la recherche moléculaire et ne sont pas proprement définis sur le plan morphologique. De ce fait les délimitations génériques à l'intérieur de la sous-tribu restent discutées et aucun consensus n'a été trouvé sur ce point.

Au cours de récentes études sur la flore du *Tapón del Darién*, deux espèces différentes ont été trouvées : elles sont décrites ci-dessous dans les genres *Ancipitia* et *Zosterophyllanthos* . En outre le transfert d'une troisième espèce dans le genre *Zosterophyllanthos* est proposé.

Les représentants de *Ancipitia* et de *Zosterophyllanthos* sont inclus dans *Pleurothallis s.l.* par certains auteurs. Les plantes du premier genre sont

caractérisées par un port cespiteux, de longs ramicaules généralement comprimés latéralement et une inflorescence composée d'un faisceau de fleurs uniques, longuement pédicellées, à la base de la feuille. Quant à *Zosterophyllanthos*, il peut être distingué des autres Pleurothallidinae par ses ramicaules cylindriques, ses feuilles à base cordée, son inflorescence apicale à fleur unique, ses sépales latéraux connés en un synsépale et des pétales beaucoup plus petits que les sépales. En outre la morphologie de son gynostème est unique parmi les Pleurothallidinae : il est court, droit, relativement massif, cylindrique plus ou moins comprimé dorsiventralement, avec des lobes stigmatiques latéraux horizontaux séparés par un rostellum dressé, digité ; le pied de colonne, s'il existe, est peu distinct ; l'anthère est apicale, plus ou moins oblongue cordée à oblongue ovale.

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