

Lankesteriana Karremans, Gen. Nov.

TYPE: *Pleurothallis barbulata* Lindl. Folia Orch. Pleurothallis 40. 1859. Replaced name for *Pleurothallis barbata* H.Focke, Bot. Zeitung (Berlin) 11(13): 227. 1853 (non *Pleurothallis barbata* Westc., Phytologist 1: 54. 1841).

Species of Lankesteriana are somewhat similar to Anathallis but can be distinguished by the tri-alate ovary (vs. cylindrical), the bilabiate flowers with lateral sepals convergent and usually fused to above the middle (vs. sepals free and spreading), the deeply depressed midline of the lip (vs. not or superficially depressed), the bilobed, helmet-shaped rostellum (vs. ligulate, not bilobed). Additionally, none of the known species of Lankesteriana have: 1) a habit that exceeds 3 cm tall (excluding the inflorescence), 2) ramicauls longer than the leaf, 3) multiple flowers open simultaneously on an inflorescence; 4) whitish to greenish flowers; all of which are commonly found in Anathallis.

DESCRIPTION: *Plants* very small, 0.5-3 cm tall (excluding the inflorescence), epiphytic, caespitose.

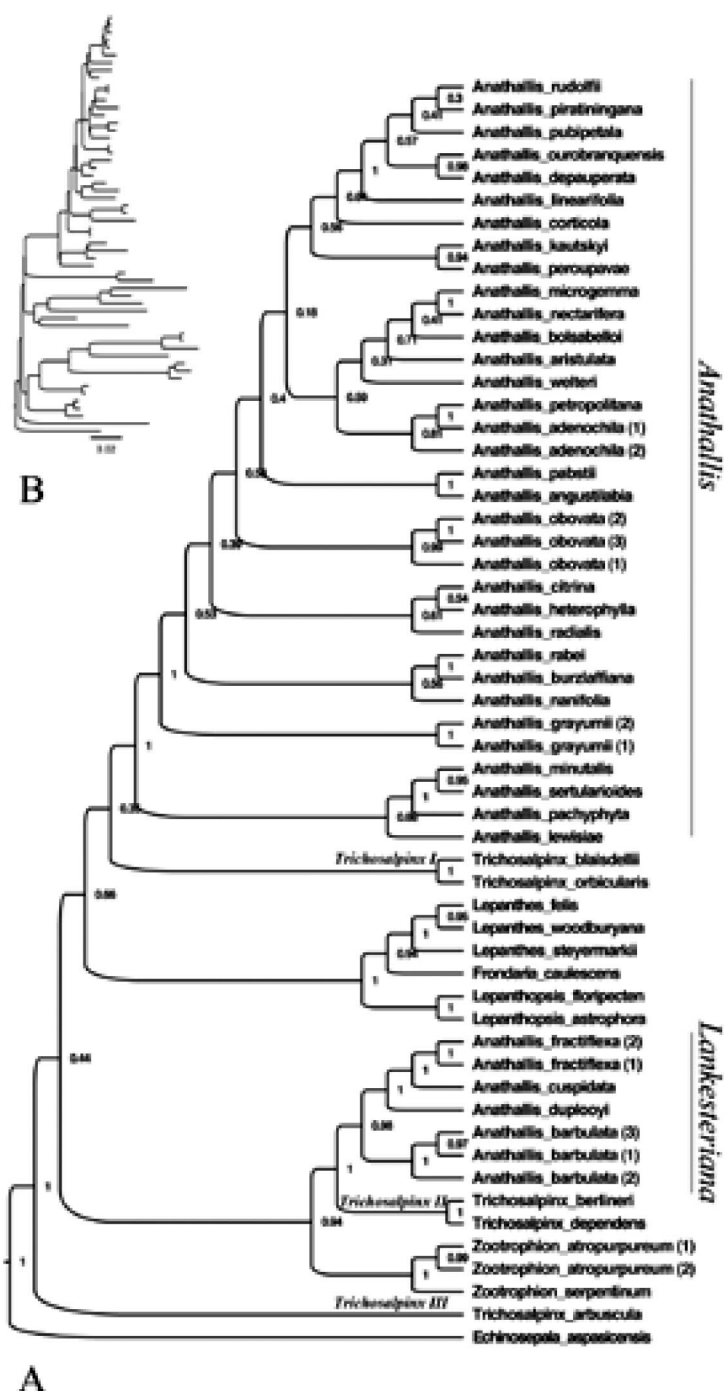


FIGURE 1. Consensus tree from a BEAST analysis of a matrix of 56 ITS sequences. The analysis ran for 20,000,000 generations. A — Branch length transformed to be equal for each species. Values on the nodes are Posterior Probabilities. Species names for each terminal is included. B — Relative branch lengths maintained, showing amount of evolutionary changes. Scale equals a 2% change. Posterior probability values and species names are excluded, but are equal to those of A. Trees edited by A.P. Karremans using FigTree.

Ramicauls ascending, shorter than the leaf, never proliferating, with 1-3 imbricating, tubular, glandular to microscopically glandular sheaths. Leaf erect to prostrate. *Inflorescence* elongate, frequently exceeding the leaves, successive, with one flower open at a time. *Flowers* usually brownish-purple, sepals glabrous to ciliate. *Ovary* tri-lobate. *Sepals* elliptic, acute, the lateral ones fused to above the middle or least convergent, forming a synsepal. *Petals* lanceolate to ovate-elliptic, widest near the middle, obtuse or acute, to acuminate, sometimes caudate. *Lip* oblong, to more or less pandurate, with a pair of basal sub-orbicular lobes, with a deep linear middle depression. *Column* winged, androclinium fimbriate-dentate, rostellum helmet-shaped, with prominent lateral lobes. *Anther* helmet-shaped. *Pollinia* in pairs, with reduced, granulose, whale-tail shaped caudicles (Fig. 2 & 3).

ETYMOLOGY: The name honors both the Lankester Botanical Garden of the University of Costa Rica, which is celebrating 40 years of existence, and also the homonymous scientific journal *Lankesteriana*, *International Journal on Orchidology*.

DISTRIBUTION AND ECOLOGY: Nineteen species of *Lankesteriana* Karremans are recognized here,

however as is frequent with other tiny Pleurothallids, species of this genus tend to be overlooked in the field and lumped together into broad and variable species concepts. Species of *Lankesteriana* are distributed from southern Mexico, through Central America, the Andes, and all the way down to Bolivia and Brazil (Fig. 4). Costa Rica, Ecuador and Colombia contain the largest number of species, whereas Brazil, the center of diversity of sister genus *Anathallis*, has just a few *Lankesteriana*; they are notably absent from the Antilles. They occur between 280 and 2800 m in elevation, but most are found at mid elevations between 600 and 2000 m.

Luer (1986) had noted that flowers of species here treated as *Lankesteriana* were similar to some species of *Trichosalpinx* subgen. *Trichosalpinx* (*Trichosalpinx* I & II in Fig. 1). In fact, they resemble species of *Trichosalpinx* much more than *Anathallis*. *Trichosalpinx* was established by Luer for a group of species which shared the lepanthiform bracts of the stem and which did not fit well in either *Draconanthes* (Luer) Luer, *Lepanthes* or *Lepanthopsis* (Luer 1997), however that meant that they did not share a particular synapomorphy, and may not represent a natural grouping. The inclusion

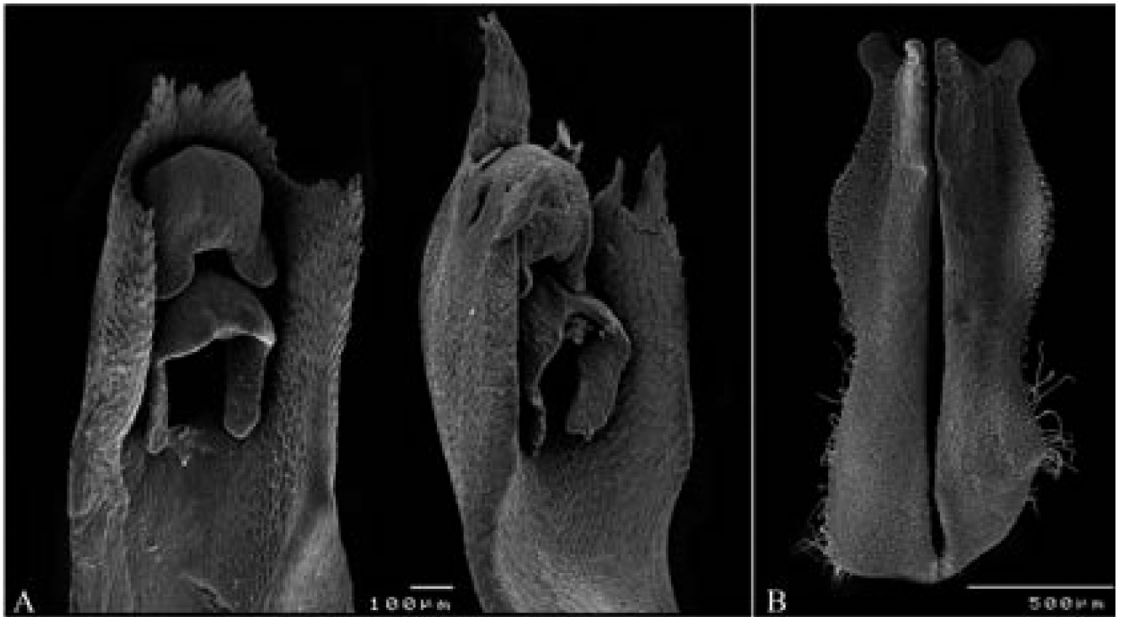
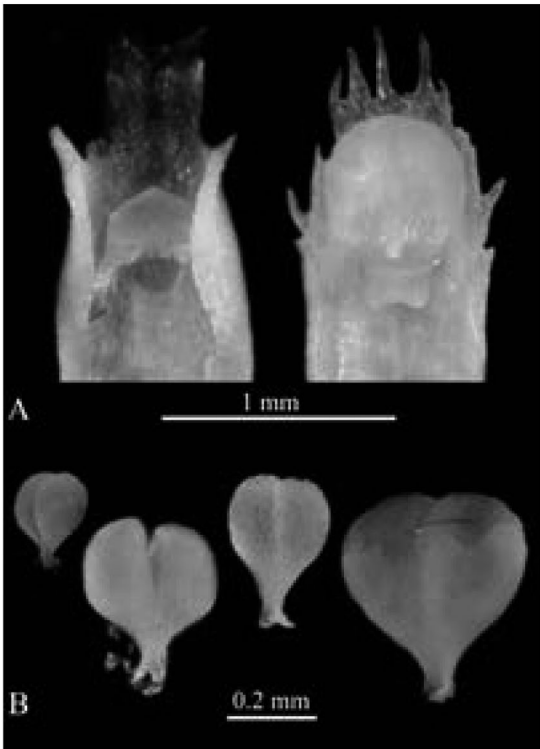


FIGURE 2. SEM images of micromorphology of *Lankesteriana* species. A — Column ventral view showing the androclinium, anther cap, helmet-like rostellum and stigma. B — The flattened lip, showing the midline depression, the basal sub-orbicular lobes and the glandular hairs near the apex. Specimens are *Lankesteriana cuspidata* (A-left & B; Bogarín 9619; JBL-spirit) and *Lankesteriana barbulata* (A-right; Karremans 5444; JBL-spirit). Photographs by A.P. Karremans



of a few species of *Trichosalpinx* in the DNA studies of Pridgeon *et al.* (2001) evidenced the polyphyly of the genus. A phylogenetic analysis of genus *Trichosalpinx*, including many more additional species, further evidences the need for a complete re-circumscription of this highly polyphyletic genus, which is diversely interrelated with all other genera in the clade (Fernández *et al.* unpublished).

Subgenus *Trichosalpinx* is biphyletic in the analysis presented here (Fig. 1), with a clade including the type of the genus (*Trichosalpinx* I), sister to *Anathallis*, and a second clade (*Trichosalpinx* II), sister to *Lankesteriana*. A reconsideration of *Trichosalpinx* will be a hazardous

Left, FIGURE 3. Micrographs taken with the Leica stereo microscope. A. Apex of the column in ventral view, from left to right, of *Lankesteriana cuspidata* (Fernández 695; JBL-spirit) and *Anathallis polygonoides* (JBL-28237; JBL-spirit). B. Pollinaria, from left to right, of *Lankesteriana cuspidata* (Fernández 695; JBL-spirit), *Anathallis polygonoides* (JBL-28237; JBL-spirit), *Anathallis lewisae* (Bogarín 1056; JBL-spirit) and *Trichosalpinx blaisdellii* (Pupulin 1092; JBL-spirit). Photographs by A.P. Karremans.

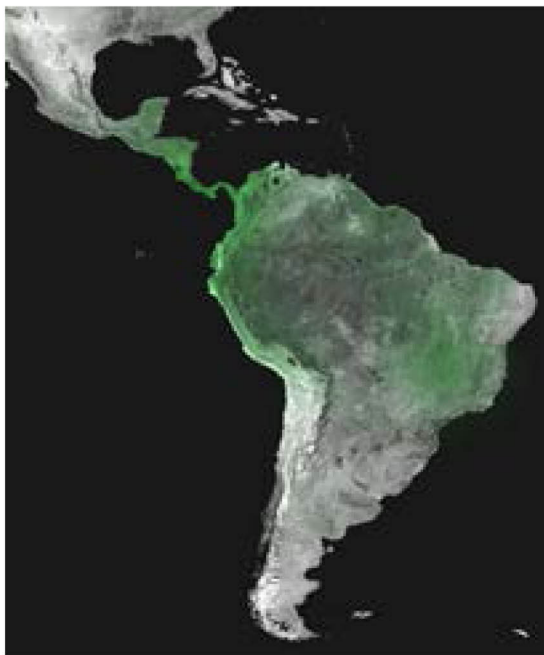


FIGURE 4. Distribution map (in green) of the 19 known species of *Lankesteriana* Karremans. The highest diversity of the genus is found from Costa Rica to Colombia and Ecuador.

task that falls outside of the scope of this study. It suffices to say that we consider sister genera *Anathallis* and *Trichosalpinx* (*Trichosalpinx* I) distinct enough to keep them as separate genera and that the clade which includes *Lankesteriana* and *Trichosalpinx* II was until now unnamed. When revising *Trichosalpinx* in the future it can be re-considered if it is advantageous to include the few species belonging to *Trichosalpinx* II in a broadened *Lankesteriana*, however, based on morphology and genetic distance, such a move is in our view unfavorable.

With species of subgen. *Trichosalpinx* they share the fused sepals (with a few exceptions), the usually purplish-brown flowers, the extremely sensitive linear lip, with a pair of rounded lobes at the base, and a midline depression and the helmet-shaped rostellum. These traits suggest that both groups share a similar pollinator group. Species of subgen. *Trichosalpinx* however can be easily distinguished from those of *Lankesteriana* by the much larger plants, with long ramicauls covered with lepanthiform bracts and the simultaneously multi-flowered inflorescences.

KEY TO THE GENERA WITH *SPECKLINIA*-LIKE HABIT

1. Inflorescence frequently lax-flexuous, sepals usually caudate, petals fimbriate, acute to caudate, column inornate to narrowly winged *Muscarella* (*Specklinia*)
1. Inflorescence mostly congested-straight, sepals usually not caudate, petals entire to minutely denticulate, infrequently caudate, column ornate 2
2. Petals linear to lanceolate, acute to acuminate, column wings quadrate to triangular, androclinium conspicuously fimbriate 3
3. Inflorescence single or simultaneously multi-flowered. Flowers star-shaped, lateral sepals free, flowers mostly white, green or yellow, lip lacking a deep mid-line depression, rostellum ligulate *Anathallis*
3. Inflorescence successively single flowered. Flowers bilabiate, lateral sepals fused, flowers brownish-purple, lip with deep a midline depression, rostellum helmet-like bilobate *Lankesteriana*
2. Petals elliptic to spatulate, obtuse, column wings rounded, androclinium erose or inornate 4
4. Lip mostly linear-ligulate, column wings prominent, pollinia without caudicles *Specklinia*
4. Lip trilobed, with a pair of suborbicular lobes close to the middle, column inconspicuously ornate or inornate, pollinia with caudicles *Pabstiella*

Lankesteriana abbreviata* (Schltr.) Karremans, *comb. nov.

Bas. *Pleurothallis abbreviata* Schltr., Repert. Spec. Nov. Regni Veg. 10: 352. 1912.

Lankesteriana barbulata* (Lindl.) Karremans, *comb. nov.

Bas. *Pleurothallis barbulata* Lindl. Folia Orch. Pleurothallis 40. 1859. Replacement name for *P. barbata* H.Focke, 1853.

Note: *Specklinia pereziana* Kolan. published in 2011 from Colombia, is virtually indistinguishable from *Lankesteriana barbulata*, a common, widely distributed, variable species with several heterotypic synonyms. As *L. barbulata* was not even mentioned by the author there is no evidence to separate the two.

Lankesteriana casualis (Ames) Karremans, **comb. nov.**

Bas. *Pleurothallis casualis* Ames, Sched. Orch. 9: 30, 1925.

Lankesteriana caudatipetala (C.Schweinf.) Karremans, **comb. nov.**

Bas. *Pleurothallis caudatipetala* C.Schweinf. Bot. Mus. Leaflet. 10: 175. 1942.

Lankesteriana comayaguensis (Ames) Karremans, **comb. nov.**

Bas. *Pleurothallis comayaguensis* Ames, Bot. Mus. Leaflet. 4: 31, 1936.

Lankesteriana cuspidata (Luer) Karremans, **comb. nov.**

Bas. *Pleurothallis cuspidata* Luer, Selbyana 3: 282, 1977.

Lankesteriana duplooyi (Luer & Sayers) Karremans, **comb. nov.**

Bas. *Pleurothallis duplooyi* Luer & Sayers. Rev. Soc. Bol. Bot. 3: 48, 2001.

Lankesteriana edmeiae (F.J. de Jesus, Xim. Bols. & Chiron) Karremans, **comb. nov.**

Bas. *Anathallis edmeiae* F.J. de Jesus, Xim. Bols. & Chiron, Richardiana 13: 296. 2013.

Lankesteriana escalarensis (Carnevali & Luer) Karremans, **comb. nov.**

Bas. *Pleurothallis escalarensis* Carnevali & Luer, Novon 13: 414. 2003.

Lankesteriana fractiflexa (Ames & C.Schweinf.) Karremans, **comb. nov.**

Bas. *Pleurothallis fractiflexa* Ames & C.Schweinf., Sched. Orch. 10: 26, 1930.

Lankesteriana haberi (Luer) Karremans, **comb. nov.**

Bas. *Pleurothallis haberi* Luer, Selbyana 23:36. 2002.

Lankesteriana imberbis (Luer & Hirtz) Karremans, **comb. nov.**

Bas. *Pleurothallis imberbis* Luer & Hirtz, Lindleyana 11: 163, 1996.

Lankesteriana inversa (Luer & R.Vásquez) Karremans, **comb. nov.**

Bas. *Pleurothallis inversa* Luer & R.Vásquez, Rev. Soc. Bol. Bot. 3: 50. 2001.

Lankesteriana involuta (L.O.Williams) Karremans, **comb. nov.**

Bas. *Pleurothallis involuta* L.O.Williams, Bot. Mus. Leaflet. 12: 239. 1946.

Lankesteriana millipeda (Luer) Karremans, **comb. nov.**

Bas. *Pleurothallis millipeda* Luer, Orquideología 20: 216. 1996.

Lankesteriana minima (C.Schweinf.) Karremans, **comb. nov.**

Bas. *Pleurothallis minima* C.Schweinf., Bot. Mus. Leaflet. 3: 82. 1935.

Lankesteriana muricaudata (Luer) Karremans, **comb. nov.**

Bas. *Pleurothallis muricaudata* Luer, Selbyana 7: 119. 1982.

Lankesteriana rubidantha (Chiron & Xim.Bols.) Karremans, **comb. nov.**

Bas. *Specklinia rubidantha* Chiron & Xim.Bols., Richardiana 9: 125. 2009.

Lankesteriana steinbuchi (Carnevali & G.A.Romero) Karremans, **comb. nov.**

Bas. *Pleurothallis steinbuchi* Carnevali & G.A.Romero, Novon 4: 90. 1994.