

## Three new spirantheid orchid species from Ecuador

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Three new species in the orchid subfamily Spiranthoideae, *Aa lehmannii* Rchb. f. ex Szlach. & Kolan., *Pterichis meirax* Rchb. f. ex Szlach. & Kolan. and *P. tunguraguona* Rchb. f. ex Szlach. & Kolan., are described and illustrated based on Ecuadorian material from Reichenbach's collection stored in Vienna. The taxonomic affinities of the new taxa are discussed.

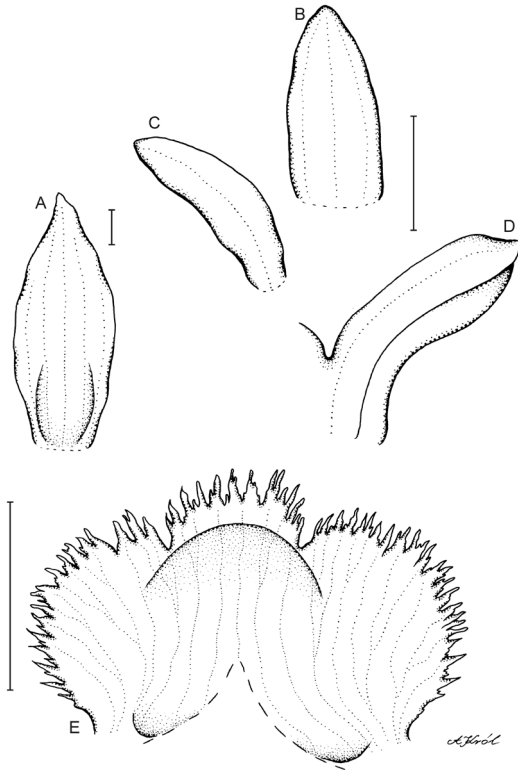
The orchid subfamily Spiranthoideae has been an object of intensive taxonomic studies since Schlechtens' (1920) revision of the subtribe Spiranthinae. Its classification within Orchidaceae remains unsolved despite the numerous morphological and molecular studies. The group was often treated as a separate subfamily (Dressler 1979, Burns-Balogh & Funk 1986, Szlachetko 1995), however the generic composition varies among different classification systems. On the other hand, the results of genetic studies have indicated a position of spirantheid orchids within the tribe Cranichideae of Orchidoideae (Chase *et al.* 2003, Salazar *et al.* 2003).

Despite the unclear relationships of the group within Orchidoideae, the representatives of Spiranthoideae may be rather easily separated from other orchids; they are clearly defined by the absence of root-stem tuberoids, presence of convolute, non-plicate leaves, and by their gynostemium structure. The column part is usually elongated, well-developed, its basal part protruding usually as a prominent column foot. The anther is erect, usually oblong to cordate, and its basal part is situated near or at the stigma base. The receptive surface is usually ventral, and the rostellum

is erect and elongate. The pollinia are soft and mealy, whereby they easily become disintegrated. The caudicles are usually sticky and amorphous. The viscidium is always single and elongate (Szlachetko & Rutkowski 2000).

Representatives of the subfamily are found around the globe, with the highest species diversity in the tropical and subtropical regions of America and Asia. Both areas were intensively explored in the 19th century and plants collected during numerous expeditions were usually shipped to European gardens. At that time, the orchid specimens were studied by very few scientists, mainly by John Lindley, Heinrich Gustav Reichenbach and Robert Rolfe (Reinikka 1972). A personal conflict between the two latter taxonomists was probably the reason for moving Reichenbach's collection after his death to the Natural History Museum in Vienna. In his will, Reichenbach prohibited his collection from being exhibited for 25 years after his death. Independent studies conducted in the Kew Gardens resulted in duplicate description of the same species which were later synonymized.

Examining Reichenbach's collection we came across several specimens of unknown spi-



**Fig. 1.** *Aa lehmannii* (drawn by A. Król from the holotype). — **A:** Floral bract. — **B:** Dorsal sepal. — **C:** Petal. — **D:** Lateral sepal. — **E:** Lip. Scale bars = 2 mm.

ranthoid orchids. Reichenbach's handwritten notes were attached to the herbarium sheets. As he never effectively (McNeill *et al.* 2006: Art. 29.1) published his findings, the complete descriptions, illustrations and notes on the taxonomic affinities of the species are presented in this paper.

***Aa lehmannii* Rchb. f. ex Szlach. & Kolan., sp. nova** (Fig. 1)

TYPE: Ecuador. Páramo del Mojanda, alt. 3300 m, 28 Jan. 1881 *Lehmann 244* (holotype W).

Plants 25–30 cm tall, erect. Scape leafless at flowering, almost completely encloded by imbricating, scarios sheaths, terminating in a dense many-flowered spike. Flowers glabrous. Floral bracts 15 mm long, oblong ovate to elliptic-ovate, acute to subobtuse, scarios, glabrous. Ovary 4 mm long, glabrous. Dorsal

sepal 3.5 mm long, 2 mm wide, ligulate-ovate to elliptic-ovate, obtuse, 3-nerved. Petals 3.8 mm long, 0.9 mm wide, linear-lanceolate, falcate, subobtuse to subacute, 1-nerved. Lateral sepals connate basally in 1.5 mm, free part 5 mm long, 1.2 mm wide, oblong-obovate above, subfalcate, obtuse, concave at apex, 2-nerved. Lip 3 mm long, 5.5 mm wide when spread, sessile, transversely elliptic-reniform in outline, obscurely 3-lobed, concave in center, irregularly fimbriate-lacerate along margins.

DISTRIBUTION AND HABITAT: Known only from Ecuador, where it was found growing terrestrially in páramo at about 3300 m a.s.l.

The hand-written name “*Altensteinia lehmannii*” was on the herbarium sheet with the type specimen, although it is obvious that the material represents Reichenbach's genus *Aa*.

The lip shape of *Aa lehmannii* is similar to that of *Aa matthewsii*. In both species the lip is basally cochleate, and obscurely 3-lobed, with the middle lobe being the largest. The lip margins of *Aa lehmannii*, however, are deeply fimbriate-lacerate, while they are evenly fimbriate in *Aa matthewsii*. The lip of *Aa lehmannii* is devoid of a pair of knob-like, basal projections present in *Aa matthewsii*. Additionally, *Aa lehmannii* is separable by the 3-nerved dorsal sepal (*vs.* 1-nerved in *Aa matthewsii*), the 2-nerved oblong-obovate lateral sepals (*vs.* 1-nerved, oblong-ligulate lateral sepals), and by the petals being slightly longer than the dorsal sepal (*vs.* petals equal in length to the dorsal sepal).

Another species somewhat similar to *Aa lehmannii* is Bolivian *Aa weddeliana*, but it has almost twice smaller flowers, a 1-nerved dorsal sepal and a 3-lobed lip with long, evenly fimbriate margins. *Aa lehmannii* can further be confused with *Aa maderoii*, from which it differs by the 3-nerved dorsal sepal (*vs.* 1-nerved), 2-nerved oblong-obovate lateral sepals (*vs.* 1-nerved, oblong-ligulate) with entire margins (*vs.* margins variously erose), the petals being slightly longer than the dorsal sepal (*vs.* petals shorter than dorsal sepal) and by the lip which is irregularly fimbriate-lacerate along the margins (*vs.* margins fimbriate-lacerate in the upper half only).

From *Aa argyrolepis*, which also has glabrous flowers, *Aa lehmannii* differs by the petal

form. The petals are obliquely elliptic to oblong-elliptic in *Aa argyrolepis*. Also, *Aa lehmannii* lacks papillae in the central part of the obscurely 3-lobed lip (*vs.* lip globose and papillate in the center).

***Pterichis meirax* Rchb. f. ex Szlach. & Kolan., sp. nova (Fig. 2)**

TYPE: Ecuador, Tungurahua, *Jameson s.n.* (holotype W).

Plants to 10 cm tall, delicate. Leaves 2, petiolate; petiole to 2 cm long, narrow; blade 3.5 cm long, 0.9 cm wide, lanceolate to oblong-lanceolate, acute. Inflorescence 3.5 cm long, laxly 5-flowered. Flowers medium-sized, sepals glandular outside. Floral bracts 6 mm long, glandular. Pedicel and ovary 7 mm long, densely glandular. Dorsal sepal 6 mm long, 2 mm wide, ovate-lanceolate, subobtuse, 3-nerved. Petals 7 mm long, 3 mm wide, obliquely oblong-lanceolate to linear-lanceolate, subobtuse, with some hairs on outer margin, 3-nerved. Lateral sepals 6–7 mm long, 2.5 mm wide, obliquely ovate-lanceolate, concave, acute, 3-nerved. Lip 5.5 mm long in total, 8 mm wide when spread, transversely elliptic in outline, relatively thick especially on apical margin, where densely papillate, concave at base, distal margins with some knob-like outgrowths on inner surface, nerves numerous, branching, apex ligulate, fleshy, papillate.

DISTRIBUTION: Known only from the type locality.

Garay (1978), in his treatment on Ecuadorian orchids, placed the Jameson finding from Tungurahua housed in Vienna in *P. acuminata*. In our opinion it differs from the latter in some features, and deserves a specific status. The lip of *P. meirax* is transversely elliptic with sparse, thickened, swollen outgrowths along the distal margins of lateral lobes. In *P. acuminata* the lip is triangular, with truncate to subcordate base and numerous outgrowths along entire lateral margins. The petals are widest below the middle in *P. meirax*, but above the middle in *P. acuminata*.

*Pterichis meirax* is somewhat similar to *P. habenarioides*, from which it differs mainly by its lip shape. The lip of the latter is triangular-

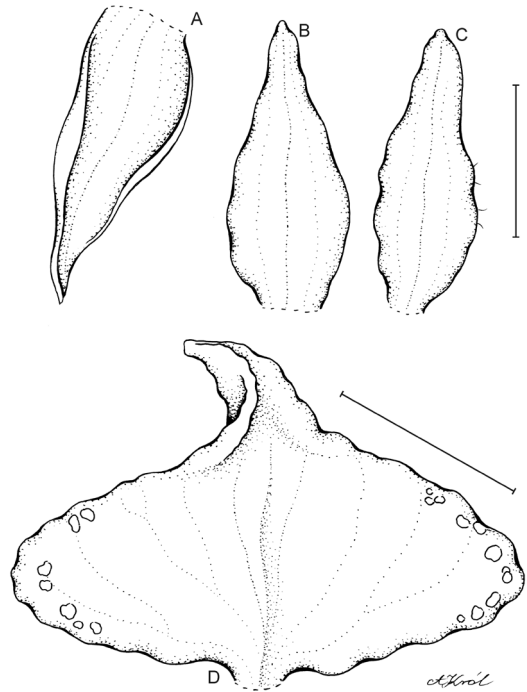


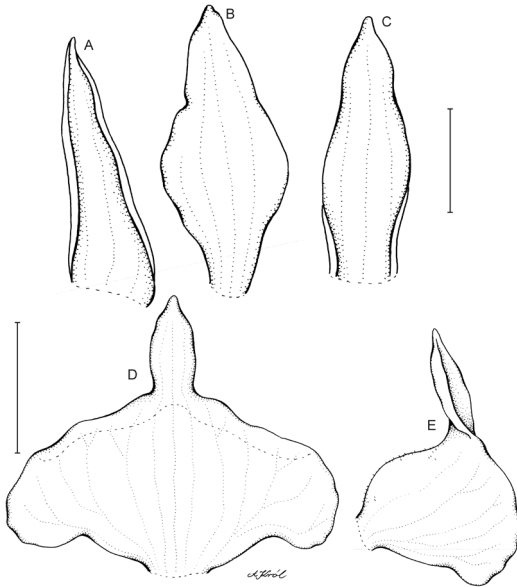
Fig. 2. *Pterichis meirax* (drawn by A. Król from the holotype). — A: Lateral sepal. — B: Dorsal sepal. — C: Petal. — D: Lip. Scale bars = 3 mm.

elliptic in outline, the apical part is subtriangular, pubescent on margins and papillae inside, whereas the papillae on the *P. meirax* lip occur also along the thickened apical margins below the ligulate apex.

***Pterichis tunguraguona* Rchb. f. ex Szlach. & Kolan., sp. nova (Fig. 3)**

TYPE: Ecuador, *Jameson s.n.* (holotype W).

Plant about 40 cm long. Leaf absent in holotype. Scape with several more or less distant, tubular sheaths. Spike about 17 cm long, subax, up to 10-flowered. Floral bracts 7–12 mm long, glandular, lanceolate, shorter than or nearly equaling ovary. Flowers medium-sized, sepals papillate outside. Pedicellate ovary glandular, about 7–10 mm long. Dorsal sepal 8 mm long, 2.5 mm wide, oblong-lanceolate, shortly apiculate, obtuse, 3-veined. Petals 9 mm long, 4 mm wide, narrowly ovate, unguiculate below, apex obtuse, 3-veined. Lateral sepals obliquely ovate-



**Fig. 3.** *Pterichis tunguraguona* (drawn by A. Król from the holotype). — **A:** Lateral sepal. — **B:** Petal. — **C:** Dorsal sepal. — **D:** Lip. — **E:** Lip (side view). Scale bars = 3 mm.

lanceolate, 9.5 mm long, 3 mm wide, obtuse, sides incurved, 3-veined. Lip 6.5 mm long, 9.5 mm wide, sessile; concave-cucullate, apex revolute; basal part 35 mm long, 2.8 mm wide, transversely elliptic, semilunate, papillate along apical margins, 9-veined; apex 1.5 mm long, 0.7 mm wide, ligulate-lanceolate in outline, obtuse, papillate. Gynostemium typical for genus.

**DISTRIBUTION:** Known only from the locality where the type specimen was collected.

*Pterichis tunguraguona* is similar to *P. parviflora*, from which it differs by some features of petals and lip. The petals of *P. tunguraguona* are shortly unguiculate at base, narrowly ovate above, and distinctly wider than the sepals. In *P. parviflora* the petals are narrowly-oblong, and narrower than the sepals. The lip of *P. tunguraguona* is transversely elliptic, semilunate at base, and papillate along the apical margins and on the apex, and the apical part is ligulate-lanceolate. The basal part of the lip is semiorbicular in *P. parviflora*, and its apical part is triangular. The distal margins of the lip of *P. parviflora* are papillate and densely ornamented by numerous, swollen outgrowths, missing in *P. tunguraguona*.

The lip shape of *P. tunguraguona* is similar to *P. fernandezii*, but from that species *P. tunguraguona* is separable by the tepal ratio (petals longer than lateral sepals in *P. fernandezii*) and petal shape (narrowly ovate, shortly unguiculate in *P. tunguraguona* vs. spatulate in *P. fernandezii*).

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