



# New species and a new record of *Pterichis* sect. *Pterichis* (Orchidaceae) from Bolivia

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## Key words

Andes  
biodiversity  
Neotropics  
new record for Bolivia  
*Pterichis aragogiana*  
*Pterichis fuentesii*  
*Pterichis lunatilabia*  
*Pterichis obcordatilabia*  
*Pterichis vasquezii*

**Abstract** *Pterichis* comprises about 40 species distributed from Costa Rica in the north to Bolivia in the south. The species grow as terrestrial plants usually in paramo and subparamo, but there are also reports of populations in high montane forest. In this paper the complete enumeration of the six Bolivian representatives of the orchid genus *Pterichis* sect. *Pterichis* is presented. A total of four new species are described and one new record, *P. aragogiana*, for the country is reported. An updated key to the species of the nominal section of *Pterichis* from Bolivia is presented.

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## INTRODUCTION

*Pterichis* Lindl. was described almost 180 years ago and classified initially by Lindley (1840) within the *Cranichideae*. This taxonomic position was generally accepted in the classification systems of the *Orchidaceae* and confirmed based on the phylogenetic study results (Salazar et al. 2009). Until now, around 40 species were described within *Pterichis* (e.g., Ames & Schweinfurth 1930, Dunsterville & Garay 1976, Morales 1986, Kolanowska & Olędrzyńska 2015). The plants are characterized by the presence of tuberous roots, rosulate leaves and a loosely sheathed scape. The leaves are often absent during anthesis. The flowers are nonresupinate, arranged in usually loose, racemose inflorescences. Both the floral bracts and ovaries are usually densely ciliate or pubescent. The sessile, concave lip is often furnished with a series of knob-like projections running along its margins.

*Pterichis* representatives are distributed from Costa Rica in the north to Bolivia in the south; however, in Central America only five species were reported so far (Kolanowska 2014). The greatest diversity of the genus was observed in Colombia where around half of the *Pterichis* species are found (Kolanowska & Szlachetko 2017). *Pterichis* representatives grow as terrestrial plants usually in open areas on organic soils, in paramo and subparamo, but there are also reports of populations found in

high montane forest. The altitudinal range of the genus extends from 2600 m up to 4000 m.

The species classified within *Pterichis* can be divided into two groups – one is characterized by petals being adnate to the dorsal sepal, and the other one by petals being free from the dorsal sepal. The first known representatives of the former group were discovered by Lindley (1845), who placed them in a newly created genus named *Acraea* Lindl. This decision was not accepted by other taxonomists and consequently *A. triloba* Lindl. and *A. parvifolia* Lindl. were transferred into *Pterichis* (Schlechter 1911). Recently Kolanowska & Szlachetko (2017) re-established the *Acraea* group by dividing the genus *Pterichis* into two sections according to the abovementioned differences in flower structure – the nominal section is characterized by petals free from the dorsal sepal while sect. *Acraea* (Lindl.) Kolan. & Szlach. groups the species with petals adnate to the dorsal sepal.

Previous authors (e.g., Rolfe 1907, Schlechter 1911, 1922, Vásquez et al. 2003, 2014) reported the occurrence of eight *Pterichis* species in Bolivia. The examination of Bolivian collections allowed us to revise the nominal section of the genus for this country. Only two species representing sect. *Pterichis*, *P. galeata* Lindl. and *P. yungasensis* Schltr., were reported from Bolivia until now (Schlechter 1922, Foster 1958, Vásquez et al. 2003). We did not find any collection of Bolivian plants corresponding to *P. galeata* or species sometimes considered as its synonyms – *P. barbifrons* (Kraenzl.) Schltr. and *P. acuminata* Schltr. among the examined Bolivian material, deposited mostly in LPB (for abbreviation see Thiers 2019), we found six species belonging to the nominal section of *Pterichis*, four of which are described here for the first time and one is a new record for the country.

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## MATERIALS AND METHODS

About 300 specimens of *Pterichis* deposited in the herbaria AAU, AMES, B, BM, C, COL, F, FLAS, HA, K, LPB, MO, NY, PSO, Q, QCNE, QPLS, and W (for abbreviations see Thiers 2019), representing the complete distribution range of the genus, were examined during our research. Every studied sheet was photographed and data from the labels were taken. Both vegetative and generative characters of each plant were examined (leaves, inflorescence architecture, shape and size of the floral bracts, flower morphology and gynostemium structure) and then compared with existing type material, protologues and illustrations as well as with specimens of *Pterichis* examined in other herbaria (see other materials examined and published papers, e.g., Kolanowska & Szlachetko 2017). Illustrations of floral elements were hand-drawn using a stereoscopic microscope.

## RESULTS

### Key to Bolivian *Pterichis* sect. *Pterichis*

1. Petals elliptic above linear claw or widened near the middle . . . . . 5. *P. vasquezii*
1. Petals linear to oblong-lanceolate or oblong-ligulate, not widened near the middle . . . . . 2
2. Sepals caudate with uprolled margins . . . 1. *P. aragogiana*
2. Sepals obtuse, acute or acuminate but never caudate, without uprolled margins . . . . . 3
3. Lip lunate from the base, petals sparsely ciliate . . . . . 3. *P. lunatilabia*
3. Lip reniform, obcordate or transversely elliptic, petals glabrous . . . . . 4
4. Lip base cuneate . . . . . 4. *P. obcordatilabia*
4. Lip base cordate or truncate . . . . . 5
5. Lip apical part constituting almost 1/2 of the total lip length . . . . . 2. *P. fuentesii*
5. Lip apical part constituting c. 1/4 of the total lip length . . . . . 6. *P. yungasensis*

#### 1. *Pterichis aragogiana* Kolan. & Szlach. — Fig. 1

*Pterichis aragogiana* Kolan. & Szlach. (2019) 176. — Type: *L. Holm-Nielsen, J. Jaramillo & F. Coello* 29519 (holo AAU), Ecuador, Azuay, Páramo de Matanga, km 25 on road Sigsig – Gualaquiza (old muletrack), W of the pass, alt. 3150 m, 14 Dec. 1980.

*Plant* c. 55 cm tall, leafless during flowering. *Scape* glandular in upper third, enclothed in 7 tubular, acute sheaths, 25–37 mm long, upper ones glandular-ciliate. *Inflorescence* c. 8.5 cm long, densely ciliate. *Flowers* orange-red, lip with violet in basal part of middle lobe, sepals externally densely glandular-ciliate. *Floral bracts* 14–20 mm long, ovate, cucullate, externally densely ciliate. *Ovary* c. 13 mm long, densely glandular-ciliate. *Dorsal sepal* c. 14.5 by 4.5 mm, ovate in lower half, apical part narrow, rolled up along margins hence appearing acuminate-caudate, 3-veined. *Lateral sepals* c. 15 by 3.5 mm, obliquely ovate in lower half, rolled up along margins above giving an acuminate-caudate appearance, subobtuse, 3-veined. *Petals* free from dorsal sepal, c. 14.5 by 1.4 mm, linear, subobtuse, 3-veined, glabrous. *Lip* c. 12 by 11 mm, hastate, basal part reniform above truncate base; middle lobe ovate, acuminate, fleshy in basal 2/3, delicate in apical part; disc primarily 9-veined, lateral veins branching, ornamented with knob-like projections along margins in upper part of lateral lobes, middle lobe densely glandular in basal 2/3. *Gynostemium* c. 5.5 mm long.

*Distribution* — Ecuador and Bolivia. Here newly recorded for Bolivia (*A.F. Fuentes et al.* 8771, LPB).



**Fig. 1** *Pterichis aragogiana* Kolan. & Szlach. (collection *Fuentes et al.* 8771, LPB). — Plant photographed and collected by Alfredo Fuentes.

**Habitat & Ecology** — Terrestrial in yungas (moist broad-leaf forest transition along Andean slope between Amazonian and highland Puna; Olson et al. 2000, 2001) wet forest at the altitude of c. 2650 m. Flowering in Bolivia: June.

**Additional specimens examined.** BOLIVIA, La Paz, Parque Nacional Madidi, entre Chunkani y Tokoake, alt. 2673 m, 25 June 2005, *A.F. Fuentes et al.* 8771 (LPB!). — ECUADOR, Zamora Chinchipe, Cerro Plateado, *Á.J. Pérez* 1355 (QCA!).

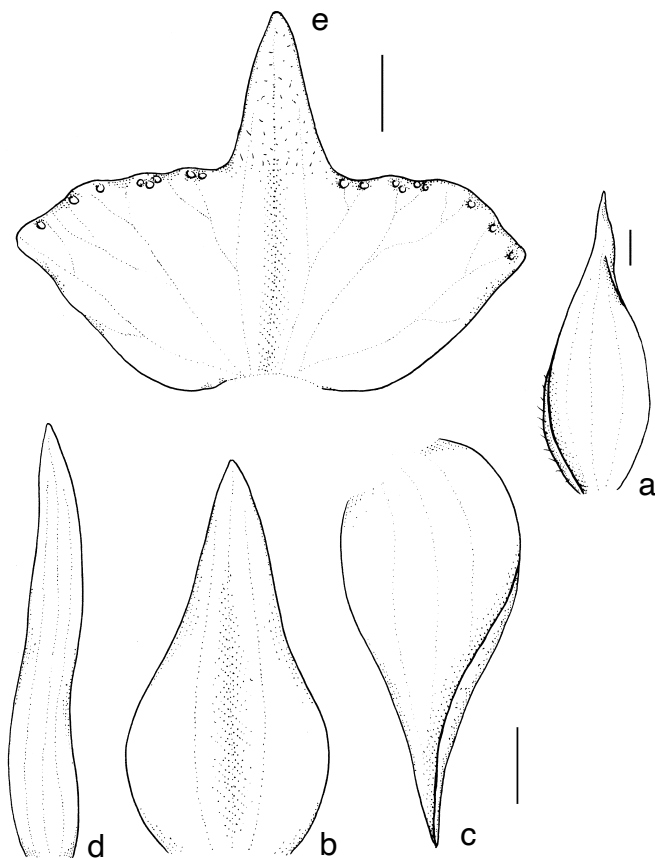
**Note** — Until now this species was known exclusively from the Ecuadorian Andes (Kolanowska & Szlachetko 2019). It is easily distinguished from all other *Pterichis* representatives by the spreading, long-caudate sepals, which give a spider-like appearance to the flower. From the Bolivian representatives of sect. *Pterichis* this species differs also in the long, acuminate lip of the middle lobe that constitutes half of the lip's total length.

#### 2. *Pterichis fuentesii* Kolan., Baranow & S.Nowak, *sp. nov.* — Fig. 2

The species is similar to *P. acuminata*, but distinguished by the oblong-ligulate petals not widened near the middle and the transversely elliptic lip widest well above the base. — Type: *S. Achá et al.* 149 (holo LPB), Bolivia, La Paz, Prov. Bautista Saavedra, Área Natural de Manejo Integrado Apolobamba, Chaka, campamento. alt. 3625 m, 27 Mar. 2009.

**Etymology.** Dedicated to Alfredo Fuentes, collector of the type specimen.

*Plant* c. 19 cm tall, leafless during flowering. *Scape* erect, terete, apically glandular-puberulent, with 5 tubular, acuminate sheaths. *Inflorescence* racemose, 3-flowered, rachis glandular-puberulent. *Flowers* yellowish white. *Floral bracts* c. 8.5 mm long, elliptic, acuminate, externally glandular-puberulent. *Pedicellate ovary* c. 9 mm long, densely glandular-puberulent. *Dorsal sepal* c. 5.5 by 2.8 mm, ovate, subacute, externally densely glandular-ciliate, 3-veined. *Lateral sepals* c. 5.7 by 2.3 mm, obliquely ovate, acuminate, externally densely glandular-puberulent, 3-veined. *Petals* c. 6.2 by 1.2 mm, free, oblong-ligulate, obtuse, glabrous, 3-veined. *Lip* c. 5 by 7 mm, cucullate-concave, transversely elliptic in outline; apical lobe oblong-ovate, papil-



**Fig. 2** *Pterichis fuentesi* Kolan., Baranow & S.Nowak. Dissected perianth. a. Floral bract; b. dorsal sepal; c. lateral sepal; d. petal; e. lip (Achá et al. 149, LPB). — Scale bars = 1 mm. — Drawn by P. Baranow.

lose, recurved; disc almost glabrous, primarily 7-veined, veins branching, ornamented with a few rounded glands along the margin in the upper half. *Gynostemium* c. 3.1 mm long.

Distribution — Endemic to Bolivia.

Habitat & Ecology — Terrestrial at the altitude of 3625 m among shrubs near 'páramo yungueño', which is characterized by the dominance of high grasses. Flowering: March.

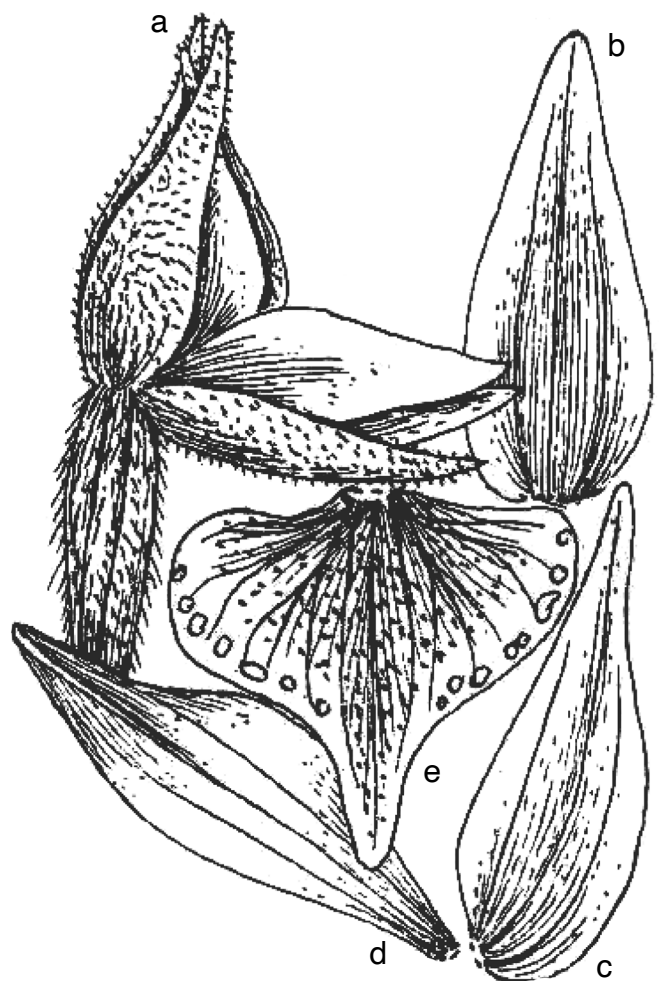
Note — Unlike *P. acuminata* (Fig. 3), the petals of this Bolivian species are not widened near the middle and the lip is transversely elliptic (vs reniform), widest well above the base. In *P. multiflora* (Lindl.) Schltr. (sect. *Acraea*) petals are adnate to the dorsal sepal and ciliate along the margins. Moreover, in the latter species the upper margin of lip's lateral lobes is ornamented with numerous small glands (c. 20–30 on each lobe vs up to 10 on each side). This species is only known from the type.

**3. *Pterichis lunatilabia*** Kolan., Baranow, S.Nowak & A.Fuentes, *sp. nov.* — Fig. 4

The species can easily be distinguished from *P. galeata* and *P. leucoptera* by the oblong-lanceolate, sparsely ciliate petals (see notes). — Type: A.F. Fuentes et al. 16211 (holo LPB), Bolivia, La Paz, Prov. Bautista Saavedra, Área Natural de Manejo Integrado Apolobamba, Paján, sector Cochapata, Pajonal en ceja de monte inferior pluvial, alt. 3093 m, 19 Apr. 2010. Paratype: S.G. Beck 1146 (LPB), Bolivia, La Paz, Prov. Murillo, Valle de Zongo, c. 15 km desde la cumbre, alt. 3150 m, 7 Apr. 1979.

*Etymology.* In reference to the lip shape, which is crescent moon-like in outline – derived from the Latin *lunaris* ('of or pertaining to the moon').

*Plant* 18–35 cm tall. *Leaf* to 28 cm long, less than 1 cm wide, linear-lanceolate, acute. *Scape* erect, terete, apically glandular-puberulent, with 3 or 4 tubular, acuminate sheaths. *Inflorescence* racemose, 7–10-flowered, rachis glandular-puberulent.



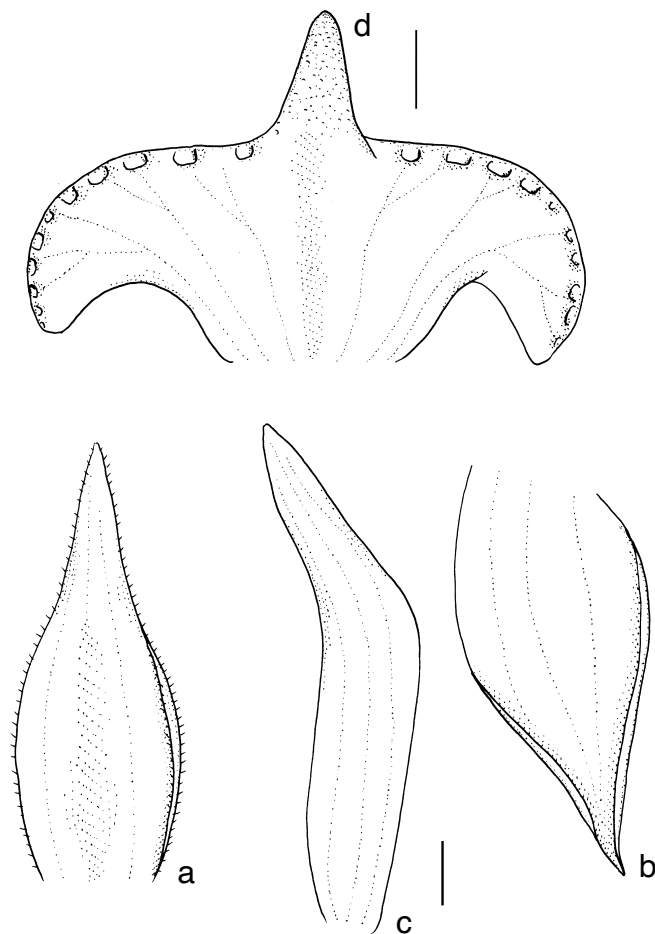
**Fig. 3** Original illustration of *Pterichis acuminata* Schltr. presented by Schlechter (1929a). a. Flower; b. dorsal sepal; c. lateral sepal; d. petal; e. lip.

*Flowers* yellowish or yellowish brown. *Floral bracts* c. 8 mm long, ovate, acuminate, glandular-puberulent. *Pedicellate ovary* c. 11 mm long, densely glandular-puberulent. *Dorsal sepal* 7–8 by 2.5–2.8 mm, ovate, obtuse, externally densely glandular-ciliate, 3-veined. *Lateral sepals* 7–7.4 by 2.8–4 mm, obliquely ovate or broadly ovate, acuminate or acute, externally densely glandular-puberulent, 3-veined. *Petals* 8–8.3 by 1.6–1.8 mm, free, oblong-lanceolate, obtuse, sparsely ciliate, 1- or 3-veined. *Lip* 4.6–5 by 7.5–9 mm, cucullate-concave, base truncate, crescent moon-like in outline; apical lobe oblong-ovate, apiculate, papillose, recurved; disc glandular-ciliate, primarily 7-veined, veins branching, ornamented with numerous rounded glands or knobs along the margin in the upper half. *Gynostemium* c. 3 mm long.

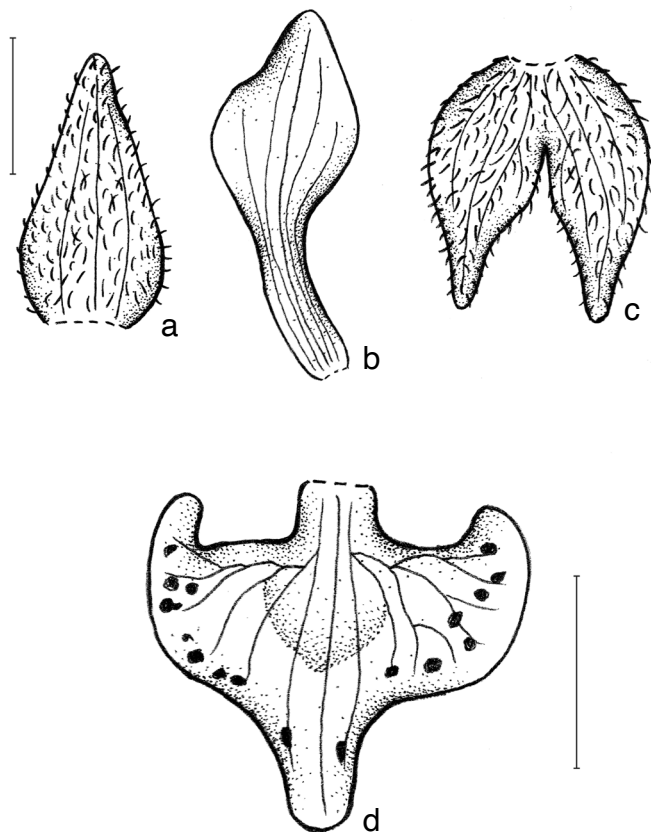
Distribution — Endemic to Bolivia.

Habitat & Ecology — Terrestrial in very wet areas near paramo yungueño as well as on moss-covered rocks at the altitude of 3090–3150 m. Flowering: April.

Note — This species is similar to *P. galeata* (Fig. 5) and *P. leucoptera* Schltr. (Fig. 6), but it can be distinguished by the oblong-lanceolate, sparsely ciliate petals (vs glabrous, elliptic above linear claw). *Pterichis galeata* was the first species described within *Pterichis* and it is broadly distributed in Andean countries (Colombia, Ecuador, Venezuela, Peru, Bolivia) and in Costa Rica. The morphological variation of this species prompted Morales (1986) to divide it into two varieties based on the inflorescence (length, number of flowers), but the general flower characteristics, e.g., unguiculate petals and auriculate lip base are consistent between populations. *Pterichis leucoptera*



**Fig. 4** *Pterichis lunatilabia* Kolan., Baranow, S.Nowak & A.Fuentes. Dissected perianth. a. Dorsal sepal; b. lateral sepal; c. pal; d. lip (Fuentes et al. 16211, LPB). — Scale bars = 1 mm. — Drawn by P. Baranow.



**Fig. 5** *Pterichis galeata* Lindl. Dissected perianth. a. Dorsal sepal; b. petal; c. lateral sepals; d. lip. Redrawn by N. Olędryńska from the original drawing by Garay of the lectotype deposited in K. — Scale bars = 5 mm.

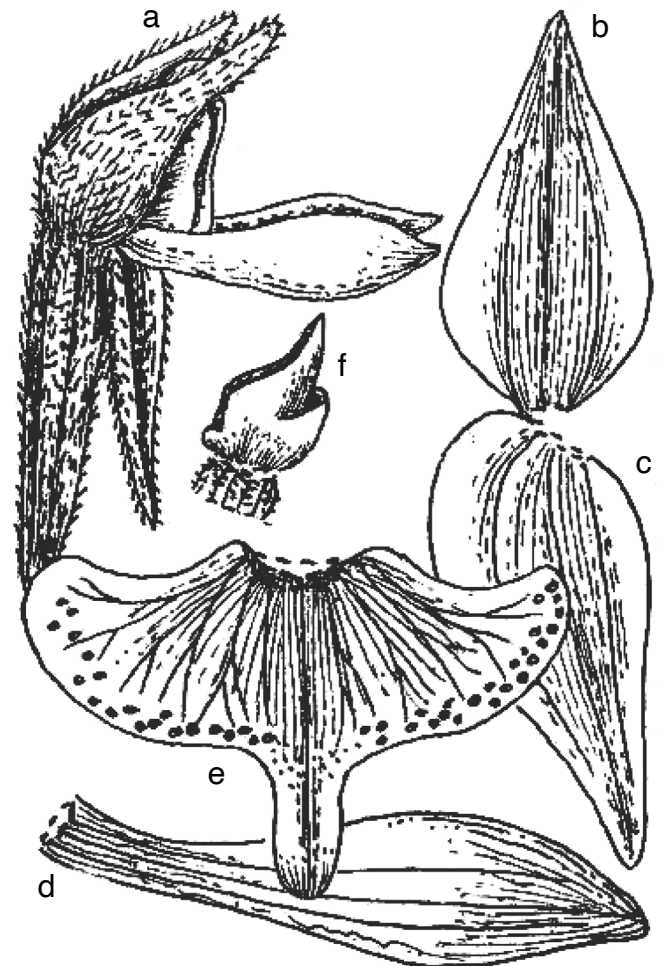
is a somewhat enigmatic species known from very few collections but according to Schlechter (1921) it differs from *P. galeata* mainly in the plant size. Also, the lip auricles in *P. leucoptera* are not conspicuous like in *P. galeata* and petals are subequal in length to the dorsal sepal (vs petals longer than dorsal sepal in *P. galeata*). More Peruvian collections should be made to verify the actual separateness of these two species. In the Bolivian *P. mandonii* (Rchb.f.) Rolfe (sect. *Acraea*), petals are glabrous (vs sparsely ciliate in *P. lunatilabia*) and distinctly widened near the middle (vs oblong-lanceolate in *P. lunatilabia*). In *P. mandonii* the broad middle lobe of the lip only slightly exceeds the lip's lateral lobes (vs much exceeding lateral lobes in *P. lunatilabia*).

**4. *Pterichis obcordatilabia* Kolan., Baranow, S.Nowak & A.Fuentes, sp. nov. — Fig. 7**

The species is similar to *P. acuminata* from which it differs by the whitish petals, lip being yellowish with brown stripes, oblong-ligulate petals which are not widened near the middle and lip being obcordate in outline, widest near the base of the apical lobe (see notes). — Type: S. Achá et al. 213A (holo LPB; iso LPB), Bolivia, La Paz, Prov. Bautista Saavedra, Área Natural de Manejo Integrado Apolobamba, sector Chaka antiguo, camino de herradura entre Laji-Sorapata y Apolo, alt. 3576 m, 1 Apr. 2009. Paratype: I. Jimenez 5559 et al. (LPB), Bolivia, La Paz, Prov. Nor Yungas, PN-ANMI Cotapata, en la estación eléctrica Chuspipata, por el sendero que comunica las torres eléctricas, S16°17'09" W67°50'00", alt. 3130 m, 15 Feb. 2010.

*Etymology.* In reference to the obcordate lip shape – derived from the Latin *ob-* ('towards') -*cordata* ('heart-shaped') and *labium* ('lip').

*Plant* 18–45 cm tall, leafless during flowering. *Scape* erect, terete, apically glandular-puberulent, with 3–5 tubular, acumi-



**Fig. 6** Original illustration of *Pterichis leucoptera* Schltr. presented by Schlechter (1929b). a. Flower; b. dorsal sepal; c. lateral sepal; d. petal; e. lip; f. gynostemium.

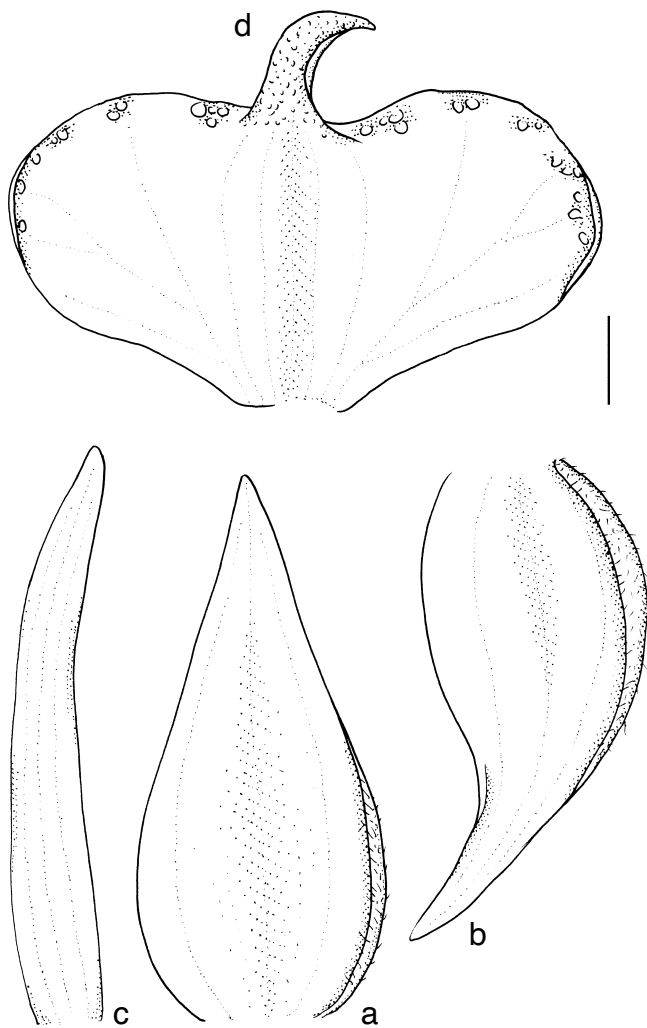


Fig. 7 *Pterichis obcordatilabia* Kolan., Baranow, S.Nowak & A.Fuentes. Dissected perianth. a. Dorsal sepal; b. lateral sepal; c. petal; d. lip (Achá et al. 213A, LPB). — Scale bar = 1 mm. — Drawn by P. Baranow.

nate sheaths. *Inflorescence* racemose, 3–7-flowered, rachis glandular-puberulent. *Flowers* with green sepals, whitish petals with brownish stripes and yellowish lip with brownish stripes. *Floral bracts* 8.5–11 mm long, ovate, acuminate, glandular-puberulent. *Pedicellate ovary* 7.5–12 mm long, densely glandular-puberulent. *Dorsal sepal* 6.2–6.9 by 2.8–3 mm, ovate, obtuse, externally densely glandular-ciliate, 3-veined. *Lateral sepals* 5.5–5.8 by c. 3 mm, obliquely ovate, acuminate, obtuse, externally densely glandular-puberulent, 3-veined. *Petals* 6.5–7.6 by 1.7 mm, free, oblong-ligulate, obtuse, glabrous, 3-veined. *Lip* 4.6–5.2 by 6.5–9.5 mm, cucullate-concave, base cuneate, obcordate in outline; apical lobe oblong-ovate, apiculate, papillose, recurved; disc almost glabrous, primarily 7-veined, veins branching, ornamented with numerous rounded glands along the margin in the upper half. *Gynostemium* 2.8–3 mm long.

*Distribution* — Endemic to Bolivia.

*Habitat & Ecology* — Terrestrial in cloud forest, within shrubs and dispersed young trees and in high montane, wet forest at the altitude of 3100–3580 m. Flowering: February, April.

*Notes* — This species strongly resembles *P. acuminata* (Fig. 3) from which it can easily be distinguished by the oblong-ligulate petals, which are not widened near the middle and the lip being obcordate in outline, widest near the base of the apical lobe (vs lip reniform, widest near the base in *P. acuminata*). Moreover, the flowers of *P. acuminata* are reddish brown or reddish green while in the new species the petals are whitish and the lip is yellowish with brown stripes. In *P. multiflora*

(sect. *Acraea*) petals are adnate to the dorsal sepal and ciliate along margins and the basal part of the lip is reniform in outline. *Pterichis acuminata* was not accepted by some authors (e.g., Schweinfurth 1958) who considered it as a synonym of *P. galeata*. The two species differs in lip form (distinctly auriculate in *P. galeata*, without prominent auricles in *P. acuminata*) and petals size and shape (subequal in length to sepals and not unguiculate, oblong-lanceolate to lanceolate-sagittate in *P. acuminata* vs slightly longer than sepals and unguiculate, lanceolate-elliptic in *P. galeata*). The concept of two separated species was accepted in the more recent publications (e.g., Garay 1978, Kolanowska & Szlachetko 2017).

The type material consists of six plants. During our visit in LPB this material was not yet mounted on herbarium sheaths.

##### 5. *Pterichis vasquezii* Kolan., Baranow, S.Nowak & A.Fuentes, sp. nov. — Fig. 8

Species distinguished from *P. acuminata* and *P. leucoptera* by a prominent, truncate lip base. From the former taxon the new entity differs also by lunate lip and from *P. leucoptera* by oblong-lanceolate petals which are widened near the middle (see notes). — Type: *P. Gutte & B. Herzog G519* (holo LPB; iso LPB), Bolivia, La Paz, Prov. Bautista Saavedra, Charazani, Al este de Chullina, alt. 3400 m, 18 Apr. 1993.

*Eponymy*. Dedicated to Roberto Vásquez Chávez, an eminent Bolivian orchidologist.

*Plant* 17–30 cm tall. *Leaf* up to 16 cm long, less than 1 cm wide, linear-lanceolate, acute. *Scape* erect, terete, apically glandular-puberulent, with 3–5 tubular, acuminate sheaths. *Inflorescence* racemose, 6–12-flowered, rachis glandular-puberulent. *Flowers* yellowish. *Floral bracts* c. 7 mm long, ovate, acuminate, glandular-puberulent. *Pedicellate ovary* c. 10 mm long, densely glandular-puberulent. *Dorsal sepal* c. 7.2 by 1.8 mm, narrowly elliptic, obtuse, externally densely glandular-ciliate, 3-veined. *Lateral sepals* c. 7 by 3 mm, obliquely ovate-acuminate, acute,

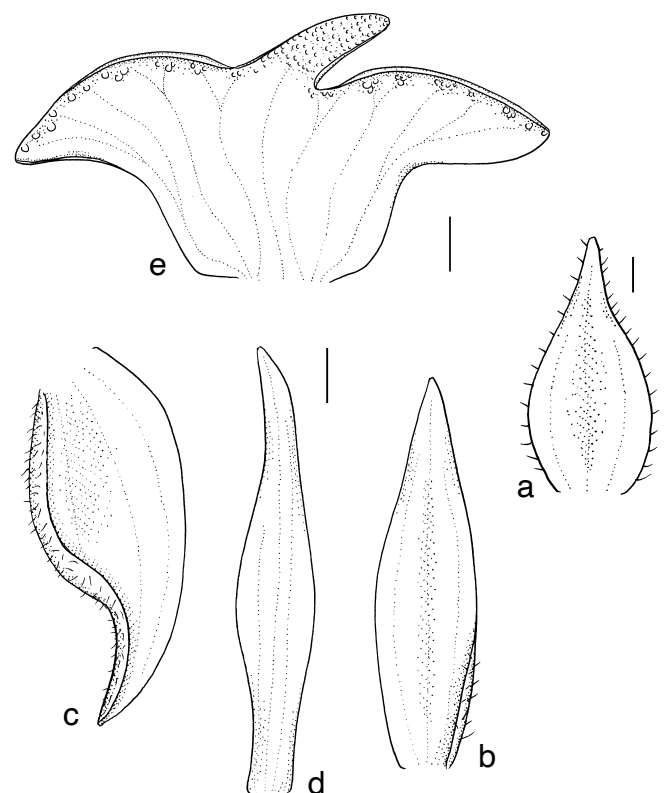


Fig. 8 *Pterichis vasquezii* Kolan., Baranow, S.Nowak & A.Fuentes. Dissected perianth. a. Floral bract; b. dorsal sepal; c. lateral sepal; d. petal; e. lip (Gutte & Briger 519, LPB). — Scale bars = 1 mm. — Drawn by P. Baranow.

externally densely glandular-puberulent, 3-veined. *Petals* c. 8.3 by 1.3 mm, free, oblong-lanceolate, widened near the middle, obtuse, glabrous, 3-veined. *Lip* c. 4.3 by 8.6 mm, cucullate-concave, base truncate, lunate in outline; apical lobe oblong-ovate, obtuse, papillose, recurved; disc almost glabrous-ciliate, primarily 7-veined, veins branching, ornamented with numerous rounded glands along the margin in the upper half. *Gynostemium* c. 3 mm long.

Distribution — Endemic to Bolivia.

Habitat & Ecology — Terrestrial on moss-covered rocks at the altitude of 3400 m. Flowering: April.

Notes — Species similar to *P. acuminata* (Fig. 3), but distinguished by the lip being lunate above the truncate base (vs lip reniform in outline in *P. acuminata*). *Pterichis vasquezii* resembles *P. leucoptera* (Fig. 6) in which petals are widest in the apical third (vs oblong-lanceolate, widened near the middle in *P. vasquezii*). Moreover, the novelty differs from the latter species also in the prominent truncate base of the lip. A similar, broad-truncate lip base is observed in the Bolivian representative of sect. *Acraea*, *P. mandonii*, which differs from *P. vasquezii* by the petals being adnate to the dorsal sepal (vs free in *P. vasquezii*) and a broad, short middle lobe of the lip that only slightly exceeds the lip's lateral lobes (vs much exceeding lateral lobes in *P. vasquezii*).

The type material consists of four plants, one of which has a leaf.

## 6. *Pterichis yungasensis* Schltr. — Fig. 9

*Pterichis yungasensis* Schltr. (1922) 37. — Type: *O. Buchtien* s.n. (US? – not localized), Bolivia, La Paz, Unduavi, July 1907.

*Plant* about 40 cm tall, leafless during flowering. *Scape* erect, terete, apically glandular-puberulent, with 5 tubular, acuminate sheaths. *Inflorescence* racemose, laxly few-flowered, rachis glandular-puberulent. *Floral bracts* c. 13 mm long, elliptic,

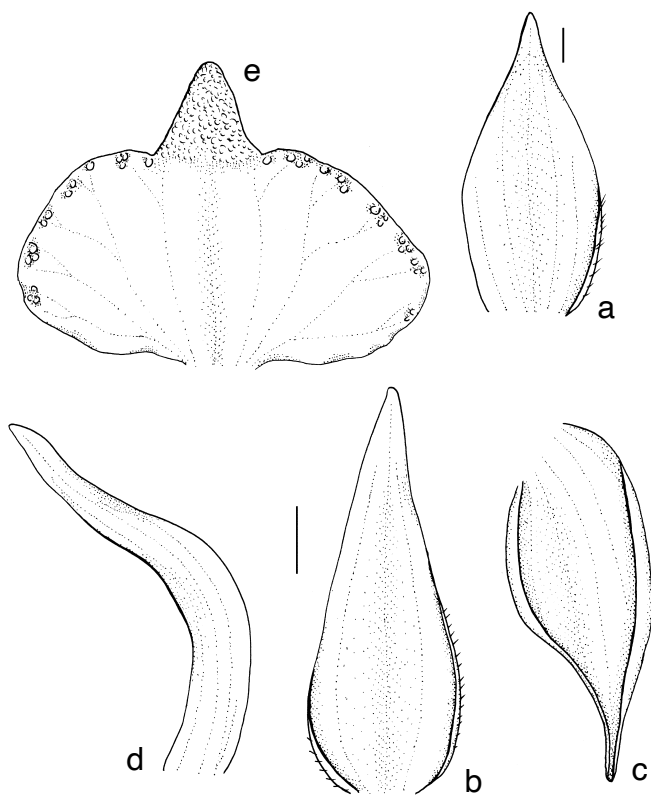


Fig. 9 *Pterichis yungasensis* Schltr. Dissected perianth. a. Floral bract; b. dorsal sepal; c. lateral sepal; d. petal; e. lip (Kromer 1820, LPB). — Scale bars = 1 mm. — Drawn by P. Baranow.

acuminate. *Pedicellate ovary* c. 13 mm long, densely glandular-puberulent. *Dorsal sepal* c. 9 by 4.5 mm, ovate, obtuse, externally densely glandular-puberulent, 3-veined. *Lateral sepals* c. 9 by 4.9 mm, obliquely ovate, obtuse, externally densely glandular-puberulent, 3-veined. *Petals* c. 13 by 4 mm, free, basally ligulate, apical half elliptic to lanceolate, obtuse, glabrous, 3-veined. *Lip* c. 7 by 12–14 mm, cucullate-concave, reniform in outline, base truncate; apical lobe oblong-triangular, papillose, recurved; disc minutely papillose, 13–15-veined, ornamented with numerous rounded glands along the margin. *Gynostemium* c. 3.5 mm long.

Distribution — Endemic to Bolivia.

Habitat & Ecology — No data.

Notes — When Schlechter (1922) described the Bolivian endemic *P. yungasensis*, he compared it to Peruvian *P. leucoptera* (Fig. 6). The latter species is characterized by a sublunate lip produced into an oblong apical lobule. Other similar species are *P. acuminata* and *P. galeata*. However, unlike in *P. yungasensis*, the petals of *P. acuminata* (Fig. 3) are widened near the middle (subrhombic in outline). *Pterichis yungasensis* can be distinguished from *P. galeata* (Fig. 5) by the lack of prominent lip auricles (such auricles are observed in *P. galeata*).

Vásquez et al. (2014) referred to the specimen *Vásquez C. 2491* as representative of Bolivian *P. yungasensis*, which should be deposited in herb. Vásquez, but we did not find this plant in the collection.

The type specimen collected by Buchtien has been not localized in US or any other visited herbarium. In the course of the study we found some unnumbered collections made by Buchtien but none of these was collected in the area where the type of *P. yungasensis* was found. Also none of Buchtien's examined specimens did fit the morphological characteristic of this species. For that reason here we refer to Schlechter's illustration and description of *P. leucoptera*.

## Additional specimens examined in this study

### *Pterichis acuminata* Schltr.

*Selected specimens*. COLOMBIA, Antioquia, alt. 3200 m, *M. Madero* 27 (B†; lectotype: AMES! – drawing). — ECUADOR, Prov. Azuay, Parque Nacional Cajas, Km 33 Cuenca-Molleturo, sendero alrededor de Laguna Cucheros, alt. 3820–3870 m, 17 Jan. 2003, *C. Ulloa et al.* 1260 (HA!); Prov. Morona-Santiago, Cantón Gualaquiza, Area de Bosque Vegetación Protectora Tambillo, alt. 2900 m, 26 June 2001, *L. Suin & J. Guartán* 1014 (QCNE!, HA!); Prov. Napo, road Quito to Baeza, above Papallacta, on lava flow at Lago Papallacta, alt. 3100 m, 22 June 1987, *C.H. Dodson & M. Chase* 17200 (RPSCI!); Prov. Sucumbíos, El Mirador, Playon de San Francisco-Julio Andrade, km 12, alt. 3200–3400 m, 11 July 1991, *C.H. Dodson, N. Williams & M. Whitten* 18781 (RPSCI!, UGDA-DLSz! – drawing). — VENEZUELA, Táchira, swampy meadow in Paramito between Quebrada de Palmar and Quebrada de Paramito, alt. 2500 m, 14 July 1944, *J.A. Steyermark* 57214 (F).

### *Pterichis galeata* Lindl.

*Selected specimens*. COLOMBIA, Cauca, El Tambo, La Romelia, Parque Nacional Muniche, alt. 2600 m, 24 Apr. 1979, *G. Morales et al.* 134 (COL!); Cundinamarca, Bogotá, Parque Nacional Natural Sumapz, vereda Las Sopas, alt. 3535 m, 2 Feb. 2002, *J. Betancur & A. Neira* 9584 (COL!); Huila, Mpio. Gigante, subida desde Vereda Ventanas al paramo de Moraflores, alt. 2970 m, 12–16 Aug. 1997, *J.L. Fernandez et al.* 14867 (COL!); Nariño, Mpio. San Francisco, Carretra San Francisco-Mocoa, alt. 2700–2800 m, 16 Nov. 1967, *L.E. Mora* 4387 (COL!); Putumayo, Tabanel above La Cocha, alt. 3300 m, 31 Oct. 1946, *M.B. Foster & R. Foster* 2020 (COL!); Valle del Cauca, Mpio. Cali, Cordillera Occidental, Los Farallones de Cali, alt. 3000 m, 25 Jan. 1976, *D. Hartman* 277 (CUVC!). — ECUADOR, Prov. Carchi, Julio Andrade-El Carmelo, turn off towards El Ajún, km 0-3, alt. 3050–3100 m, 10 Aug. 1990, *C. Ulloa et al.* 92355 (AAU!). — PERU, Amazonas, Chachapoyas, upper slopes and summit of Cerro Yama, above Taulia, alt. 3200–3450 m, 11 Aug. 1962, *J.J. Wurdack* 1673 (F); Huari, Huascarán National Park, Quebrada Pachachaca, alt. 3700–3860 m, 12 June 1986, *D.N. Smith et al.* 12570 (F).

*Pterichis multiflora* (Lindl.) Schltr.

**Selected specimens.** COLOMBIA, Cauca, Cordillera Central, vertiente occidental, Cabeceras del río Palo, quebrada del Río Lopez, alt. 3300–3350 m, 1 Dec. 1944, *J. Cuatrecasas 188800* (VALLE!); Huila, Alto de la Linea, 6 Dec. 1993, *B. Cesar 9472* (COL!); Nariño, Bei Pasto, alt. 3600 m, Nov 1878, *F. Lehmann 2* (W!); Norte de Santander, Cordillera Oriental, Paramo de Tama, arriba de la Cueva, alt. 3100–3200 m, 27 Oct. 1941, *J. Cuatrecasas et al. 12632* (COL!). – ECUADOR, Prov. Azuay, Páramo de Tinajillas, km 23–28 from Cumbe on road to Loja, alt. 3200–3300 m, 16 June 1979, *B. Løjtnant et al. 14951* (AAU!); Prov. Cotopaxi, Latacunga-Quevedo road, 3–5 km above Pilaló, alt. 2700–2800 m, 28 May 1979, *B. Løjtnant & Molau 13910* (AAU!); Prov. Morona-Santiago, along road from Cuenca to Limon, alt. 3000 m, Jan. 1989, *C. Luer et al. sub A. Hirtz 4171* (RPSC!, UGDA-DLSz! – drawing); Prov. Pichincha, Mt Pichincha, above Quito along road to the crest, alt. 3100 m, Aug. 1985, *A. Hirtz & W. Flores 2614* (RPSC!).

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## REFERENCES

- Ames O, Schweinfurth C. 1930. New or noteworthy orchids. *Schedulae Orchidiana* 10: 1–112.
- Dunsterville GCK, Garay LA. 1976. Venezuelan orchids illustrated 6. Andre Deutsch, London.
- Foster RC. 1958. A catalogue of the ferns and flowering plants of Bolivia. *Contributions from the Gray Herbarium of Harvard University* 184: 1–223.
- Garay LA. 1978. Orchidaceae (Cypripedioideae, Orchidoideae, Neottioideae). In: Harling GW, Sparre BB (eds), *Flora of Ecuador* 9: 1–305. University of Göteborg, Göteborg & Swedish Museum of Natural History, Stockholm.
- Kolanowska M. 2014. Notes on Costa Rican *Pterichis* (Orchidaceae) – new taxa and additions to national orchid flora. *Lenkesteriana* 14 (2): 99–108.
- Kolanowska M, Olędrzyńska N. 2015. Notes on Peruvian *Pterichis* (Orchidaceae) – two new species and an addition to the flora. *Annales Botanici Fennici* 52 (1): 41–45.
- Kolanowska M, Szlachetko DL. 2017. Synopsis of the genus *Pterichis* (Orchidaceae) in Colombia. *Annals of the Missouri Botanical Garden* 102: 87–124.
- Kolanowska M, Szlachetko DL. 2019. *Pterichis aragogiana* (Orchidaceae), a new species from Ecuador. *Annales Botanici Fennici* 56: 175–179.
- Lindley J. 1840. The genera and species of Orchidaceous plants 7. Ridgways, London.
- Lindley J. 1845. Orchidaceae Loxenses. In: Bentham G (ed), *Plantas Hartwegianas imprimis Mexicanas adjectis nunnulis Grahamianis enumerat novisque describit* 2, *Plantarum Hartwegianarum*: 149–156. Bentham, London.
- Morales G. 1986. El genero *Pterichis* en Colombia. *Orquideologia* 16 (3): 53–79.
- Olson D, Dinerstein E, Hedao P, et al. 2000. Terrestrial ecoregions of the neotropical realm (map). Conservation Science program, WWF-US, DC.
- Olson DM, Dinerstein E, Wikramanayake ED, et al. 2001. Terrestrial ecoregions of the world: A new map of life on Earth. *BioScience* 51 (11): 933–938.
- Roife RA. 1907. Enumeration of the plants collected in Bolivia by Miguel Bang, Part 4, with descriptions of new genera and species (Orchidaceae). *Bulletin of the New York Botanical Garden* 4 (14): 448–454.
- Salazar GA, Cabrera LI, Madriñán S, et al. 2009. Phylogenetic relationships of Cranichidinae and Prescottiinae (Orchidaceae, Cranichideae) inferred from plastid and nuclear DNA sequences. *Annals of Botany* 104: 403–416.
- Schlechter R. 1911. *Orchidaceae novae et criticae, Decas XXIV. Feddes Repertorium* 9: 428–439.
- Schlechter R. 1921. Orchideenfloren der Suedamerikanischen Kordillerenstaaten, IV. Peru. *Feddes Repertorium Beihefte* 9: 1–182.
- Schlechter R. 1922. Orchideenfloren der Suedamerikanischen Kordillerenstaaten, V. Bolivia. *Feddes Repertorium Beihefte* 10: 1–80.
- Schlechter R. 1929a. *Pterichis acuminata*. In: Mansfield R (ed), *Figuren Atlas zu den Orchideenfloren der südamerikanischen Kordillerenstaaten*: plate 61. Selbstverlag, Berlin.
- Schlechter R. 1929b. *Pterichis leucoptera*. In: Mansfield R (ed), *Figuren Atlas zu den Orchideenfloren der südamerikanischen Kordillerenstaaten*: plate 414. Selbstverlag, Berlin.
- Schweinfurth C. 1958. Orchidaceae, Orchids of Peru. *Fieldiana, Botany* 30 (1): 1–260.
- Thiers B. 2019. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. <http://sweetgum.nybg.org/science/ih/>. Last accessed 30 December 2019.
- Vásquez R, Ibsch PL, Gerkmann B. 2003. Diversity of Bolivian Orchidaceae – a challenge for taxonomic, floristic and conservation research. *Organisms Diversity & Evolution* 3 (2): 93–102.
- Vásquez R, Ibsch PL, Jiménez Pérez I. 2014. Orchidaceae. In: Jørgensen PM, Nee MH, Beck SG (eds), *Catálogo de las Plantas Vasculares de Bolivia*: 894–989. Missouri Botanical Garden Press, St. Louis.