

NOTES ON COSTA RICAN *PTERICHIS* (ORCHIDACEAE) – NEW TAXA AND ADDITIONS TO NATIONAL ORCHID FLORA

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ABSTRACT. A new species of the orchid genus *Pterichis*, *P. herrerae*, and a new variety of *P. habenarioides*, *P. habenarioides* var. *costaricensis*, are described and illustrated based on Costa Rican material. Information about new Costa Rican records of *P. pauciflora* and *P. parvifolia* is provided. An updated key to Costa Rican species of *Pterichis* is presented.

KEY WORDS: Costa Rica, new species, Orchidaceae, *Pterichis*, taxonomy

Introduction. The Neotropical orchid genus *Pterichis* was described by John Lindley (1840) based on Peruvian *P. galeata*. The author considered this species similar to *Sarcoglottis* C. Presl, but subsequent morphological (Pfitzer 1887) and molecular (eg. Salazar *et al.* 2003) studies revealed that the two genera are not closely related. Another orchid genus which Lindley found similar to his newly established *Pterichis* in the gynostemium structure was *Cryptostylis* R. Br., but this genus was classified by Szlachetko & Rutkowski (2000) in different subfamilies based i.a. on their anther form and position. Molecular data (Salazar *et al.* 2009) indicates that *Pterichis* is sister to other Cranichidinae (e.g., *Cranichis* Sw., *Ponthieva* R. Br. and *Baskervillea* Lindl.).

Morphologically representatives of *Pterichis* are easily distinguished from other cranichid orchids based on their floral characters. The abbreviate, massive gynostemium is observed also in *Cranichis*, *Fuertesilla* Schltr., *Pseudocentrum* Lindl. and *Ponthieva*. From the two latter genera *Pterichis* differs in the petals and lip being free from the column part and from other two by the scape developing separately from leaves.

Plants of *Pterichis* produce tuberous, clustered roots. The non-resupinate flowers are arranged into a loosely to subdensely flowered raceme (rarely congested). The tepals of *Pterichis* are subsimilar, with the petals narrower than the dorsal sepal and often adnate to it. The sessile lip is concave, usually with a pubescent disc and ornamented with swollen cells or knob-like projections along the margins. The

gynostemium is short and erect, and the motile anther is much longer than the rest of the column. Four oblong-ovoid pollinia are produced. The rostellum is narrow, delicate, filiform and the hamulus is finger-like (Szlachetko & Rutkowski 2000).

The plants of *Pterichis* grow terrestrially and they are usually found in grassy slopes or shrubby paramo above 2800 m of elevation. Most of the currently recognized 25 species are distributed along the Andes; however, some species occur in Jamaica, Panama and Costa Rica (Cribb 2003, Dueñas Gómez & Fernández Alonso 2009).

Dressler (2003) reported two species of *Pterichis* from Costa Rica: *P. habenarioides* (F. Lehm. & Kraenzl.) Schltr. and *P. galeata* Lindl. considering *P. costaricensis* Ames & C. Schweinf. and *P. leo* L.D. Gómez & Gómez-Laur. as their respective synonyms. The Costa Rican populations are found in the elevations above 2250 m, often in wet montane forest and paramo.

During recent studies of herbarium specimens a new species of *Pterichis* was found and is described here. Moreover, an unusual form of *P. habenarioides* recognized in Costa Rican material is proposed here as a new variety. Two species of *Pterichis*, *P. pauciflora* Schltr. and *P. parvifolia* (Lindl.) Schltr. are reported here for Costa Rica for the first time.

Material and Methods. Dried herbarium specimens of *Pterichis*, over 180 in total, deposited or borrowed from AMES, COL, CUVC, F, FLAS, FMB, HUA, K,

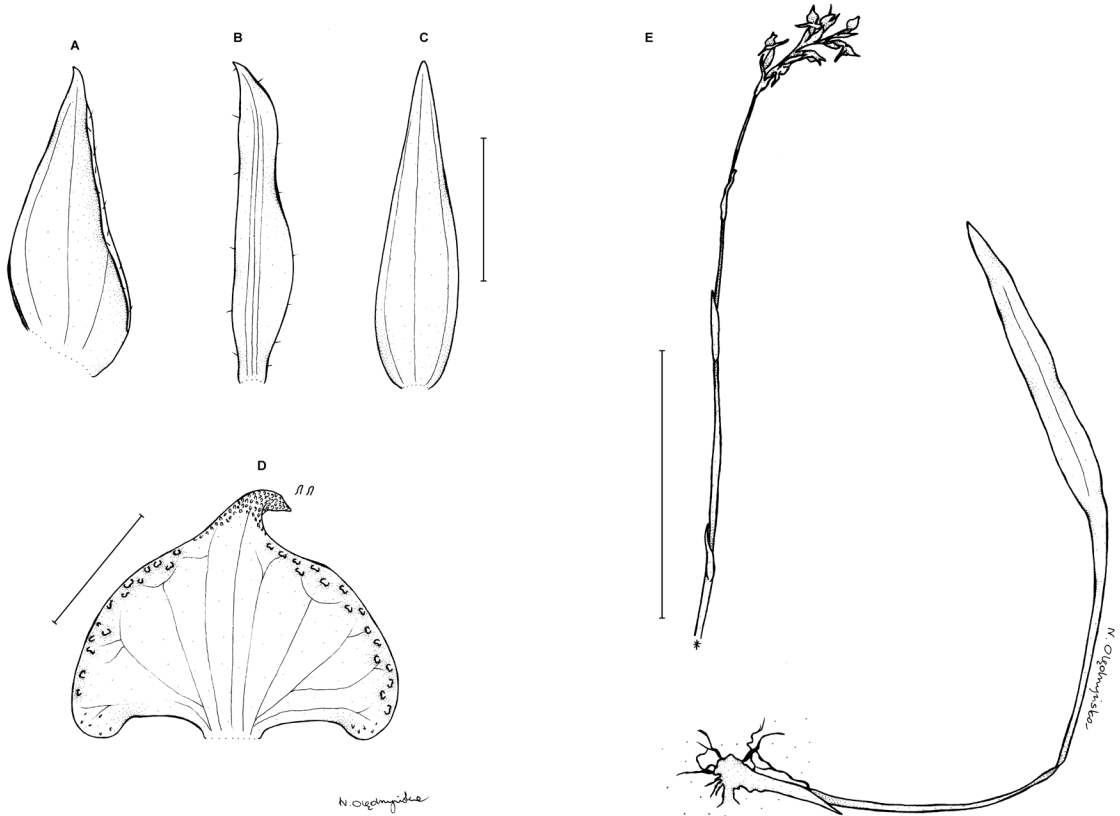


FIGURE 1. *Pterichis herrerae* A. Lateral sepal. B. Petal. C. Dorsal sepal. D. Lip. Scale bars = 3 mm. E. Scape, spike and leaf. Scale bar = 3 cm. Drawn by N. Olędryńska from the holotype.

MO, NY, P, PSO, SEL, VALLE and W were examined. Every studied specimen was photographed and the data from the labels were recorded. The presence and shape of the leaf as well as the length and the surface of the scape were studied. The examination of the vegetative structures included the form and number of the tubular sheaths enveloping the scape and the form of the floral bracts and ovaries. From each specimens 3-5 flowers were examined. The perianth parts were studied after rehydrating flowers in boiling water.

NEW TAXA

Pterichis herrerae Kolan., *sp. nov.*

TYPE: Costa Rica. Puntarenas. Cantón de Buenos Aires, Ujarrás, cumbre y ladera Atlántica de Cerro Dúrika, 9°22'35"N 83°18'24"W, 3280 m, 12 Oct 1989, G. Herrera 3665 (holotype, F!; isotypes, F!, MO, SEL). Fig. 1–2.

DIAGNOSIS. This species resembles *P. habenarioides* and *P. triloba* (Lindl.) Schltr., but it is distinguished by the cordate lip base, obliquely ovate, rounded lip lateral lobes and lip margins ornamented with prominent, knob-like projections.

Plant up to 32 cm tall. *Leaf* basal, long-petiolate; blade 9.5 cm long, linear-lanceolate, acute; petiole 12 cm long. *Scape* up to 27 cm long, with 4 glabrous, tubular sheaths, pubescent in the upper part. *Spike* 2.7–5.0 cm long, pubescent, subdensely 4–10-flowered. *Flowers* green with yellowish-green lip. *Floral bracts* up to 8 mm long, 3 mm wide, pubescent, narrowly ovate, subobtuse. *Ovary* 9 mm long, pubescent. *Dorsal sepal* 7.0 × 1.5 mm, externally sparsely ciliate, lanceolate, obtuse, 3-veined. *Petals* 6.8 × 1.2 mm, adnate to dorsal sepal, sparsely ciliate along margins, linear-lanceolate, unguiculate at the base and constricted in the upper third, acute, 3-veined. *Lateral sepals* 6.5 × 2.5 mm,



FIGURE 2. The holotype of *Pterichis herrerae*. Courtesy of the Field Museum of Natural History.

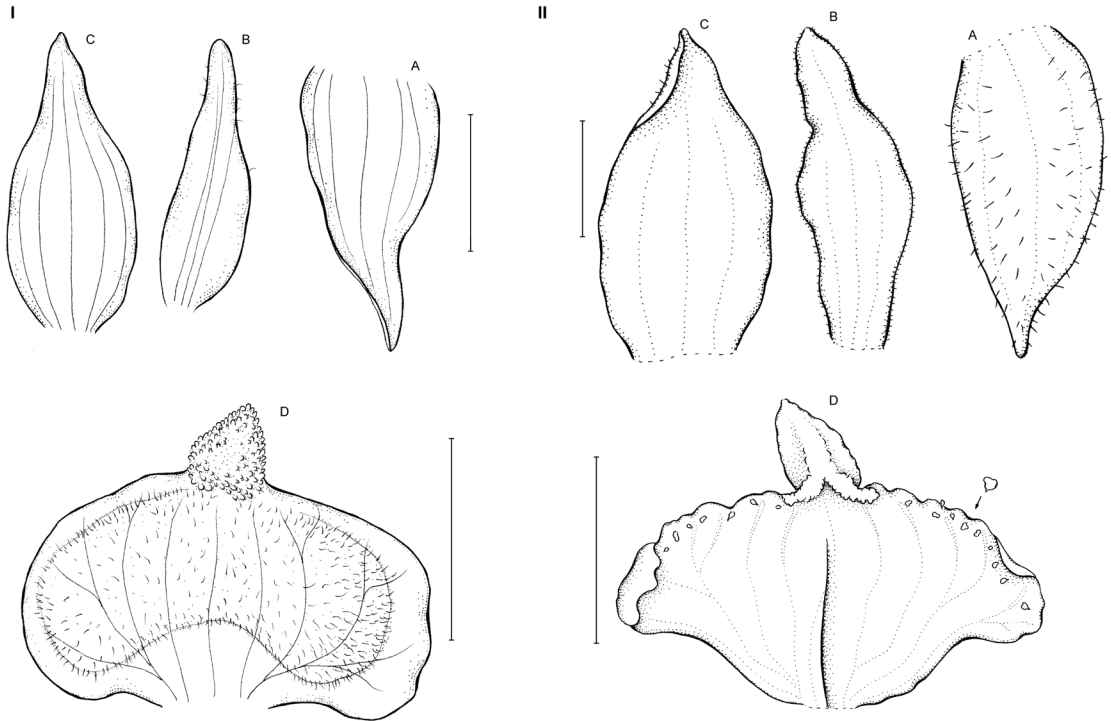


FIGURE 3. Perianth segments of *Pterichis habenarioides* (I, Pedraza & al. 247, COL) and *P. triloba* (II, Jameson s.n., W). A. Dorsal sepal. B. Petal. C. Lateral sepal. D. Lip. Scale bars = 3 mm. Drawn by A. Król and S. Nowak.

externally sparsely ciliate, obliquely ovate, subacute, 2-veined. *Lip* about 5×7 mm, 3-lobed, cordate at the base; middle lobe about $1/4$ of the lip length, reflexed, triangular-ovate, acute, densely glandular-pubescent; lateral lobes obliquely triangular-ovate, rounded; disc 5-veined, veins branching, margins ornamented with knob-like projections and swollen cells in the basal part. *Gynostemium* 2.5 mm long. *Fruit* not seen.

ETYMOLOGY. Dedicated to collector of the type specimen.

DISTRIBUTION AND ECOLOGY. So far this species is known exclusively from Costa Rican province of Puntarenas, where it was found growing terrestrially at the altitude of over 3200 m. Flowering occurs at least in October.

TAXONOMIC NOTES. This species resembles *P. habenarioides* (F.Lehm. & Kraenzl.) Schltr. and *P. triloba* (Lindl.) Schltr. (Fig. 3). From the latter species *P. herrerae* is easily distinguished by the cordate lip base (vs. truncate in *P. triloba*), the 5-veined lip disc (vs. 7-veined) and presence of numerous (over 30 in total) knob-like projections along the lip margins (vs.

8–10 projections on each side). The floral bracts of *P. habenarioides* are glabrous, its dorsal sepal is ovate-lanceolate (vs. lanceolate in *P. herrerae*), the petals are obovate-lanceolate, not unguiculate (vs. linear-lanceolate above, unguiculate basally), and the lip is transversely triangular-elliptic in outline (vs. cordate in *P. herrerae*). Another similar species is the South American *P. diuris* Rehb. f., which has petals free from dorsal sepal, the lip base is truncate and disc lacks any knob-like projections.

Pterichsis habenarioides var. *costaricensis* Kolan., var. nov.

DIAGNOSIS: Distinguished from *P. habenarioides* var. *habenarioides* by the glabrous dorsal sepal and petals, the sparsely ciliate, 2-veined lateral sepals, and the lateral lobes of the lip form auricles.

TYPE: Costa Rica. Limon. Cordillera de Talamanca, Atlantic slope, Kámuk massif, páramo north-east of the main Kámuk peak, $9^{\circ}16'30''\text{N}$ $83^{\circ}01'00''\text{W}$, 3000–3300 m, 17–19 Sep 1984, G. Davidse & G. Herrera 29296 (holotype, F!; isotype: CR). Fig. 4–5.

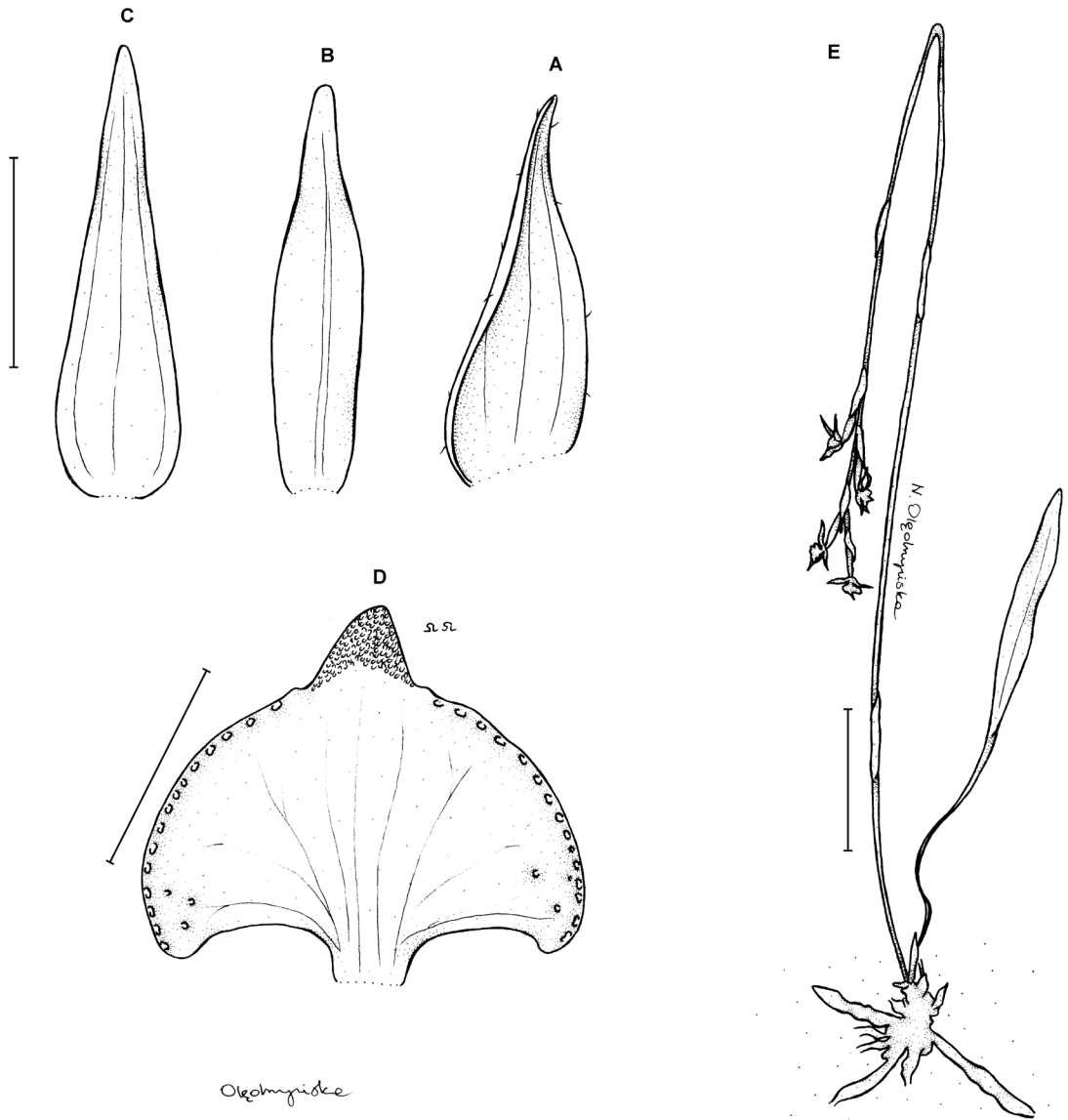


FIGURE 4. *Pterichis habenarioides* var. *costaricensis* A. Lateral sepal. B. Petal. C. Dorsal sepal. D. Lip, flattened. E. Habit. Scale bar = 3 cm. Drawn by N. Olędrzyńska from the holotype.

Plants up to 40 cm tall. *Leaf* basal, petiolate; blade 5.5-6.0 cm long, linear-lanceolate, acute; petiole 4.5-6.5 cm long. *Scape* up to 36 cm long, scape with 3-4 tubular sheaths. *Flower* greenish-yellow, lip yellow with green or brown veins. *Floral bracts* up to 13 mm long, 4 mm wide, pubescent. *Ovary* up to 13 mm long, pubescent. *Dorsal sepal* 6.5 mm long, 1.5 mm wide, glabrous, lanceolate, obtuse, 3-veined. *Petals* 5.9 × 1.2 mm, adnate to dorsal sepal, glabrous, ligulate-

lanceolate, obtuse, 2-veined. *Lateral sepals* 5.5 × 1.8 mm, ovate, obtuse, sparsely ciliate, 2-veined. *Lip* 6 mm long and about the same wide, indistinctly 3-lobed; middle lobe broadly ovate, short, densely glandular-pubescent, obtuse, reflexed; lateral lobes obliquely ovate, rounded; disc 5-veined, lateral veins branching, ornamented with numerous swollen cells along the margins. *Gynostemium* 2.5 mm long. *Fruit* not seen.



FIGURE 5. The holotype of *Pterichis habenarioides* var. *costaricensis*. Courtesy of the Field Museum of Natural History.

ETYMOLOGY: In reference to the origin of the type specimen.

DISTRIBUTION AND ECOLOGY. So far this variety is known exclusively from Cordillera de Talamanca. The population was found growing in *Blechnum*-shrub association in *Chusquea-Hypericum* paramo. Flowering occurs in September.

EXAMINED SPECIMENS OF *P. HABENARIOIDES* VAR. *HABENARIOIDES*: Colombia. Boyacá. Mpio. de Chinavita. Cerro Mamapacha. Vereda Mundo Nuevo, Laguna La Jarilla, paramo, 3300 m, 26 Jul 2001, *H. Duenas, F. Cortes, J. Farfan, E.C. Buitrago, M.F. Rodriguez & J. Puentes 3107* (COL!), CAUCA. Mpio. de Purace. Parque Nacional Natural de Purace. Cercanias de la Laguna San Rafael, 3300 m, 6 Oct 1984, *G. Lozano, O. Rangel, L.F. de Turbay, A. Sanabria & N. Espejo 4654* (COL!), Macizo Colombiano. Paramo de Las Papas. Colinas al SE de la Laguna La Magdalena, vertiente del rio Magdalena, 3350-3450 m, 12 Sep 1958, *Idrobo, Pinto & Bischler 3249* (COL!), Macizo Colombiano. Paramo Las Papas. Filo entre el Boqueron y el cerro de Penas Blancas, 3330 m, 14 Sep 1958, *Idrobo, Pinto & Bischler 3321* (COL!), Macizo Colombiano. Valle del Cauca, cerca de su nacimiento, 3000 m, 19 Sep 1958, *Idrobo, Pinto & Bischler 3460* (COL!), Macizo Colombiano. Valle de Las Papas, alrededores de Valencia, Los Andes. Alt. 3150 m. Wet cienga between scrub patches, an extension of Station 4, approx. 3 km from casa of Hacienda Los Andes, 1 Oct 1958, *Barclay & P. Juajibioy 5892* (COL!), Paramo Guanacas. *Lehmann 6419* (K!), Cundinamarca. D.C., localidad 20, Parque Nacional Natural Sumapaz, vereda Santa Rosa, arriba de la laguna Casa Blanca, 3500 m, 7 Aug 1998, *P. Pedraza, P. Franco, D. Stancik & A. Neira 247 p.p.* (COL!), Bogotá. Paramo de Cruz Verde, 3200 m, 6 Sep 1977, *G. Morales & Flenley 30* (COL!), San Miguel. *Schneider 673* (COL!), Huila. Mpio. de Gigante. Vered Ventanas, Cerro de Miraflores, subida desde el Campamento 1, en bosque andino de *Winmannia*, *Brunellia*, *Clusia* hasta el subparamo (3050 m), con *Dipostephium*, *Brachyotum*, *Gynoxis*, *Weinmannia*, 12-16 Aug 1997, *J.L. Fernandez Alonso, E. Linares, P. Balcazar, R. Vasquez, J. Velez & G. Salazar 14851* (COL!), Meta. Macizo de Sumapaz. Alrededores de la Laguna La Guitarra, alt. 3380-3420 m, 4 Jul 1981, *S. Diaz P. 2404* (COL!), Nariño/Putumayo. Mpio. de

Santiago Vereda. Paramo del Bordoncillo. 1°11'N, 77°06'W, 3200-3400 m, 17 Apr 1993, *A. Munoz & D. Ramirez 414* (COL), Quindio. Pijao. Paramo del Chili, km 28, paramo, 3600 m, 17 Sep 1998, *Gil-Correa 115 & N. Ocampo, M. Piepenbring, C. Velez* (COL!), *Sine loc. Lehmann 6419* (K!).

NEW RECORDS

Pterichis pauciflora Schltr., Repert. Spec. Nov. Regni Veg., Beih. 8: 41. 1921.

TYPE(Garay 1978): Ecuador. Loja, in Andibus orientalibus, 3000–3400 m, *Lehmann 7111* (holotype: B†, lectotype, K!).

Plant 14–62 cm tall, erect. *Leaf* basal, petiolate; petiole 2–3 cm long; blade about 5 × 1–2 cm, linear to oblong-lanceolate, acute. *Scape* up to 58 cm tall, erect, minutely puberulent in the upper part, with 3–6 tubular, pubescent sheaths. *Spike* 2–4 cm long, pubescent, loosely to subdensely 5–10-flowered. *Flowers* yellowish-orange to yellowish-brown according to the herbarium label. *Floral bracts* up to 8 mm long, ovate-lanceolate, glabrous. *Pedicellate ovary* 9–11 mm long, densely glandular. *Dorsal sepal* 6.0–6.8 × 1.7–2.2 mm, ovate-lanceolate to ovate, obtuse, almost glabrous, 3-veined. *Petals* 6.0–6.5 × 1.0–1.2 mm, adnate to dorsal sepal, obliquely linear-lanceolate, acuminate, margin sparsely ciliate, 1-veined. *Lateral sepals* 5.5–6.5 × 1.5–2 mm, obliquely ovate-lanceolate to ovate, concave, acuminate, glabrous or sparsely ciliate externally, 3–4-veined. *Lip* 5,0 × 4.5–7.0 mm, indistinctly 3-lobed; basal part triangular-elliptic; apical lobe triangular, obtuse, reflexed, glandulose-papillose; disc 7-veined, margin ornamented with swollen cells. *Gynostemium* 2.3 mm long. *Fruit* not seen.

REPRESENTATIVE SPECIMENS: Costa Rica. Puntarenas. Cantón de Coto Brus. P.N. La Amistad, Cuenca Terraba-Sierpe, Cerro Echandi, 9°01'57"N 82°49'19"W, 3000–3150 m, 13 Aug 1997, *Gamboia & al. 1718* (FLAS!); Cartago. Carretera Panamericana Sur, 2700 m, 17 Jul 1963, *A. Jimenez 849* (F!, Fig. 6).

DISTRIBUTION AND ECOLOGY. Until now this species was reported from Ecuador and Colombia. In Costa Rica it was found growing terrestrially in paramo, forest edges and vegetation with *Sphagnum* at the altitude

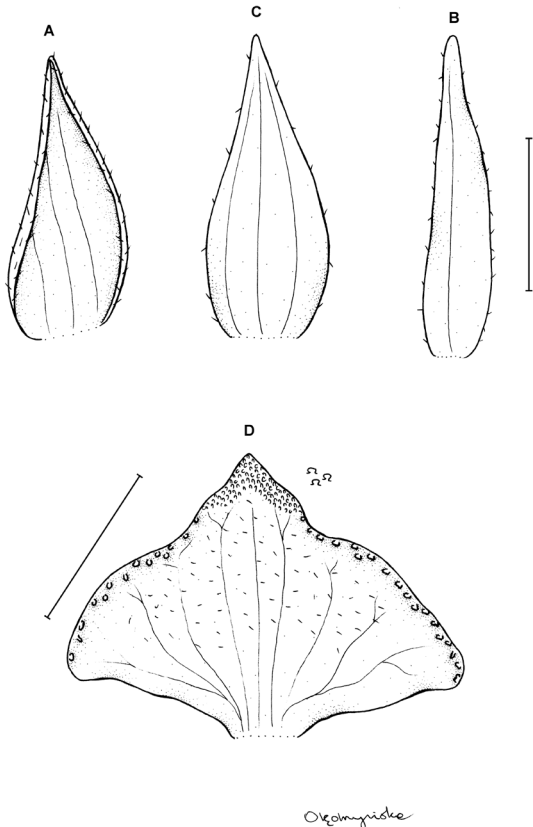


FIGURE 6. *Pterichis pauciflora* A. Lateral sepal. B. Petal. C. Dorsal sepal. D. Lip. Scale bars = 3 mm. Drawn by N. Ołędzińska from Jimenez 849 (F).

above 2700 m. Flowering occurs in July and August. OTHER SPECIMENS EXAMINED: Colombia. Boyacá. Mpio. Arcabuco. Santuario de Flora y Fauna de Igauque. Camino a la Laguna. Paramo dominado por *Espeletia*, *Calamagrostis*, *Hypericum*, *Lupinus*, *Monnina*, *Cavendishia*, *Castilleja*, 3600 m, 24 Sep 2002, H. Duenas, F. Cortes & N. Aranguren 3130 (COL!), Mpio. Villa de Leyva. Parque Nacional Natural santuario de Igauque, 3700 m, 20 Jul 1979, M. Melampy 207 (COL!), Mpio. Pesca. Paramo de la Cortadera. Vereda La Pena, 3600 m, 21 Aug 1982, M. Bejarano B. 245 (COL!), Cundinamarca. D.C., localidad 20, Parque Nacional Natural Sumapaz, vereda Santa Rosa, arriba de la laguna Casa Blanca, 3500 m, 7 Aug 1998, P. Pedraza, P. Franco, D. Stancik & A. Neira 247 p.p. (COL!), Bogotá. Paramo de Monserrate, 3000 m, 26 Jul 1943, Schneider 243 (COL!), Carretera Paramo de Palacio a Rio Chuza, cabeceras Valle Chocolatel.

Vertiente pedregoso con *Calamagrostis effusa* y *Oreobolus obtusangulus*, 3700 m, 9 Sep 1972, A.M. Cleef 5435 (COL!), Paramo entre Cogua y San Cayetano. Laguna Verde y alrededores Paramo seco con *Calamagrostis effusa*, 2 km al NW de la Laguna, 3600 m, 19 Aug 1972, A.M. Cleef, M.T. Murillo & van der Hammen 5164 (COL!), Meta. Macizo de Sumapaz. Alrededores de la Laguna El Sorbedero, 3550 m, 4 Jul 1981, S. Diaz P., A.M. Cleef, van der Hammen, O. Rangel & S. Salamanca 2472 (COL!), Upland E of Sesquile, 3300 m, 5 Jul 1947, Haught 5929 (COL!). Ecuador. Loja. Lehmann 7111 (K!).

Pterichis parvifolia (Lindl.) Schltr., Bot. Jahrb. Syst. 45: 389. 1911. ≡ *Acraea parvifolia* Lindl., Pl. Hartw.: 155. 1845.

TYPE: Ecuador. Loja. Hartweg 50 (K-Lindl!).

Plant about 37 cm tall. Leaf basal, petiolate; petiole 6.5–9 cm long, canaliculated; blade up to 11.0 × 0.6–1.0 cm, linear-lanceolate, subacute. Scape about 25 cm tall, pubescent, with 5 sheaths decreasing in size distally along the scape, pubescent in upper half. Spike 8–9 cm long, pubescent, loosely several-flowered. Flowers greenish with yellow lip with brownish veins. Floral bracts up to 9 mm long, glabrous, ovate-lanceolate, acute. Pedicellate ovary up to 13 mm long, pubescent. Dorsal sepal 7 × 2 mm, ovate-lanceolate, subacuminate, obtuse, glabrous, 3-veined. Petals 7.0 × 1.5 mm, ciliate along margins, unguiculate in lower fifth, obliquely oblong-lanceolate, subacute, 2-veined. Lateral sepals 5.5 × 2.5 mm, glabrous, obliquely ovate, subacuminate, 2-veined. Lip about 5–6 × 7 mm, 3-lobed, base truncate; middle lobe reflexed, densely glandular-pubescent, ovate-triangular, subobtusate; lateral lobes obliquely ovate; disc 5-veined, lateral lobes branching, margin ornamented with a row of prominent papillae. Gynostemium 2 mm long. Fruit not seen.

REPRESENTATIVE SPECIMEN: Costa Rica. San Jose and Cartago. Below the highest point of Interamerican Highway, northwest of La Asuncion, 9°34'N 83°45'W, 3000–3200 m, 27 Oct 1975, W. Burger & R. Baker 9505 (F!, Fig. 7).

DISTRIBUTION AND ECOLOGY. Until now this species was reported from Peru, Ecuador and Colombia. In

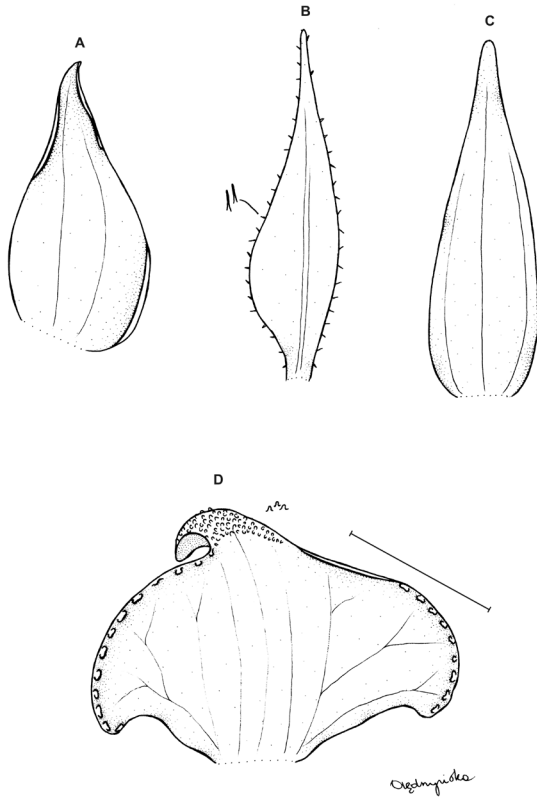


FIGURE 7. *Pterichis parvifolia* A. Lateral sepal. B. Petal. C. Dorsal sepal. D. Lip. Scale bars = 3 mm. Drawn by N. Ołędzińska from Burger & Baker 9505 (F).

Costa Rica it was found in steep wet grassy slope at an altitude of about 3000-3200 m. Flowering occurs at least in October.

OTHER SPECIMENS EXAMINED: Colombia. Nariño. Mpio. Guachucal-Cumbal. Paramo de Infernillo. The ridge in direction to Vulcan Cumbal. Grassy paramo with *Calamagrostis effusa*, *Cortadera*, *Diplostephium*, *Espeletia*, *Puya*. Flowers yellowish, 3700 m, 5-9 Mar 1999, Stancik 2687 (COL!), Mpio. Mallama-Piedrahancha. Vereda Pueblo Viejo. Paramo del Infernillo. Reserve Natural Pueblo Viejo. Km 97 via Pasto-Tumaco, desvio a la izquierda viajando hacia Tumaco y ascenda de 2 km por la carretera via Pueblo Viejo Coleccion entre la Cabana principal de la reserve y el sitio "La Lagunetas", 1°03'02.9"-1°01'16.2"N, 77°46'43.7"-77°47'7.8"W, 3318-3739 m, 8 Jan 2009, L.M. Caballero, O. Rivera Diaz, G. Silva, C. Leguizamo, M. Ayala, J. Gil & M. Rodriguez LMC3 (COL!). Ecuador. Loja. Hartweg 50 (K-Lindl.!).

KEY TO COSTA RICAN SPECIES OF *PTERICHIS*

1. Petals free from dorsal sepal *P. galeata*
- 1a. Petals adnate to dorsal sepal 2
2. Lateral lobes of the lip not forming auricles
..... *P. habenarioides* var. *habenarioides*
- 2a. Lateral lobes of the lip forming auricles 3
3. Petals glabrous
..... *P. habenarioides* var. *costaricensis*
- 3a. Petals ciliate on margins 4
4. Petals sessile, 1-veined *P. pauciflora*
- 4a. Petals unguiculate, 2-veined 5
5. Petals constricted in the upper third,
sepals externally ciliate *P. herrerae*
- 5a. Petals not constricted in the upper
part, sepals glabrous *P. parvifolia*

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