

# Two new species of the subtribe Cyclopogoninae (Orchidaceae) from Guatemala

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**Abstract:** Two new species of Guatemalan Cyclopogoninae are described and illustrated; one of them represents the Mesoamerican genus *Potosia* (Schltr.) R. Gonzalez & Szlach. ex Mytnik, the other – Neotropical *Pelexia* Poit. ex Rich. They are compared with other Guatemalan members of the genera.

**Key words:** Orchidaceae, Cyclopogoninae, *Pelexia*, *Potosia*, Mesoamerica, Guatemala, new species

## 1. Introduction

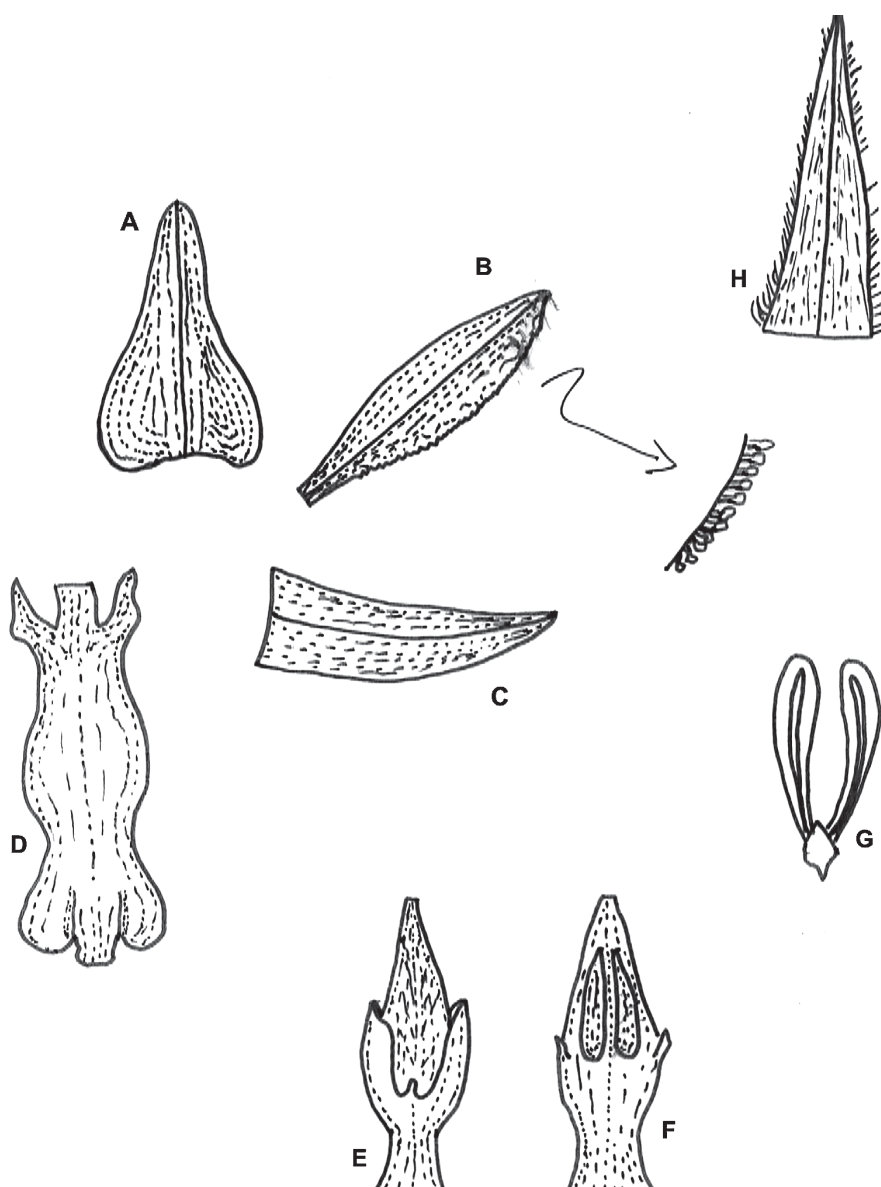
The genus *Potosia* (Schltr.) R. Gonzalez & Szlach. ex Mytnik embraces terrestrial orchids known from the northern part of Mesoamerica. They are very characteristic due to the morphology of vegetative parts and flower architecture. The scape grows from fasciculate, fusiform, fleshy, often relatively long roots. Leaves are produced near the base of scape, and are withered or absent at flowering. The blade is ovate-lanceolate to obovate-oblong, acute to shortly apiculate. Scape is usually stout, erect, more or less glandular in the upper part, covered by cauline sheaths. Raceme is multi-flowered, lax or dense, depending on the species. Flowers are rather small, tubular, more or less glandular outside. Floral bracts are oblong ovate-lanceolate, acute, thin, delicate, herbaceous, densely glandular outside to glabrous. Ovary is rather narrow, obovoid, usually densely glandular, pedicellate to subsessile. Sepals are dissimilar, glandular outside, with reflexed free parts and connate lower parts. Dorsal sepal is more or less concave just above the base. Petals are falcate, agglutinate to the dorsal sepal, with decurrent base. Lateral sepals are also falcate, obliquely at the base. Lip is clawed; claw is adnate to the lateral sepals; lamina is more or less constricted near the apex – hypochile is densely ciliate or papillate in the lower part, auricles are digitate, parallel, touching each other or divergent; epichile is elliptic, rounded, transversely elliptic or

ovate, shortly apiculate to rounded. Spur is completely adnate to the ovary, and the line of adnation between ovary and spur is not visible.

The gynostemium of *Potosia* is similar to that of *Sarcoglottis* C. Presl rather than to *Pelexia* Poit. ex Rich. It is rather short and massive, erect. Column part is shorter than the anther. Column foot is prominent, longer than column part, completely attached to the ovary, forming a kind of cuniculus. Four pollinia are oblong, unequal in size and shape, powdery. Inconspicuous caudiculae are formed from the apical portions of the pollinia. Stigma is ventral, bilobed, lobes are partially confluent. Rostellum is erect, subquadrate, blunt, thin but relatively stout. Viscidium is single, detachable, cellular, multi-layered, produced on the dorsal surface of the rostellum. Rostellum after removal of pollinarium is subquadrate and truncate.

## 2. Description and taxonomic notes

Based on the gynostemium structure, especially the type of viscidium and rostellum, Szlachetko *et al.* (2005) included *Potosia* in the subtribe Cyclopogoninae. In the past, the type species of *Potosia* – *P. schaffneri* (Rchb.f.) R. Gonzalez & Szlach. ex Mytnik – was included in the genus *Pelexia* as *Pelexia schaffneri* (Rchb.f.) Schltr. Both genera differ clearly, however, in their habit. Species of *Potosia* are leafless at anthesis with spur being completely adnate to the ovary, and the line of adnation



**Fig. 1.** *Potosia guatemalensis* Archila & Szlach.

Explanations: A – dorsal sepal, B – petal, C – lateral sepal, D – lip; E & F – gynostemium various views, G – pollinium, H – floral bract (drawn by F. Archila from the holotype, *Alfredo Mo & Jaime Mo FA-1265*, BIGU)

between ovary and spur is not visible. In contrary, all *Pelexia* species are leafy at flowering, spur is partially free from the ovary and the adnation line between spur and ovary is observable.

While studying orchids of Guatemala, senior author (FA) collected plants which fit the description of the genus, but differ from all *Potosia* species known so far. After careful examination and comparing with type materials we decided to describe it below:

***Potosia guatemalensis* Archila & Szlach., sp. nov.** (Figs. 1-3).

*Species unique in the genus Potosia in having green leaves with a few white spots and distinctly 3-lobed lip epichile.*

**Type:** Guatemala. San Francisco. Peten. Alt. 200 m. Mar 2010. *Alfredo Mo & Jaime Mo FA-1265* (Holotype: BIGU! – San Carlos University, Guatemala; Isotype: UGDA-DLSz!).

**Etyymology:** In reference to the country of origin.

Plants terrestrial. Roots several, 4-12 cm long, 1-1.4 cm in diameter, fasciculate, fusiform, fleshy. Leaves 6, present at flowering, rosulate, basal, petiolate; petiole 1 cm long; blade 17-30 cm long 5.2-5.5 cm wide, elliptical with acute apex, green opaque with net-venation, central vein conspicuous, increasing from the center to the base. Scape 40-51 cm tall, pubescent, with foliaceous bracts 1.23 long, 0.37 cm wide. Raceme 15 cm long, laxly, 20-flowered, densely pubescent. Flowers large for the genus with reflexed sepals. Floral bracts 15 mm long,



**Fig. 2.** Part of the inflorescence of *Potosia guatemalensis* Archila & Szlach. (photograph by F. Archila)

lanceolate, somewhat oblique, pubescent in the lower half, brownish. Ovary 17 mm long, green with brown ribs, densely pubescent. Dorsal sepal 9 mm long, 5.5 mm wide, ovate-triangular, with rounded apex, densely glandular-pubescent outside, brownish. Petals 11 mm long, 2.6 mm wide, linear in the lower part, elliptic above with acute apex, basal margin glandular-dentate, whitish. Lateral sepals 10 mm long, 3.5 mm wide at the base, falcate with acuminate apex, densely glandular-pubescent outside, brownish. Lip clawed, 13.5 mm long, 5 mm wide, pandurate, white, with 2 horn-like auricles, oblique and caudate; apically 3-lobed; the middle lobe quadrate, truncate; the lateral lobes obliquely rounded. Gynostemium 11.1 mm long, 3.8 mm wide, clavate. Rostellum triangular, viscidium minute.

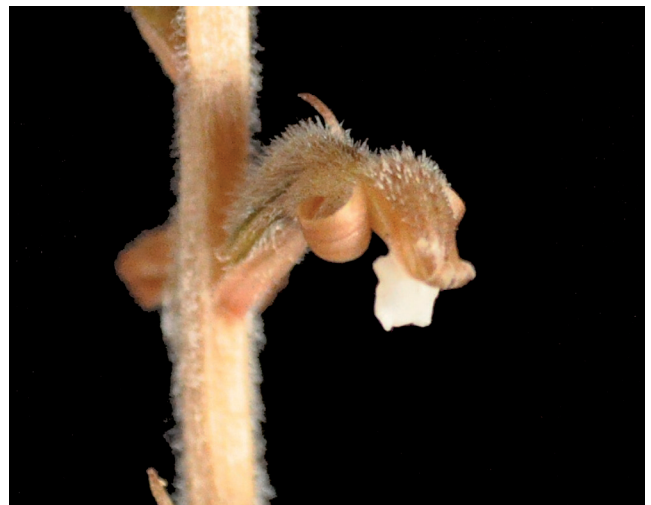
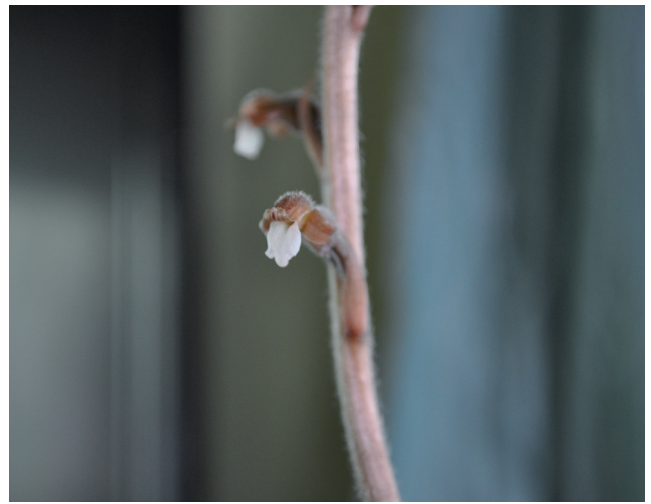
**Notes.** *P. guatemalensis* is the fourth species of this genus collected in Guatemala. It is easily distinguishable from all other *Potosia* by its peculiar, 3-lobed epichile and white-spotted leaves. All Guatemalan species of the genus can be determined as follows:

Key to the Guatemalan species (sterile plants)

- 1. Leaves green brilliant without spots or stripes ..... *P. kusibabiana*
- 1. Leaves with spots or stripes 2
- 2. Leaves deep green with blue-green stripes above, silvery-green beneath ..... *P. schaffneri*
- 2. Leaves green with white stripes or spots ..... 3
- 3. Leaves green with white stripes ..... *P. zamororae*
- 3. Leaves green with a few white spots ..... *P. guatemalensis*

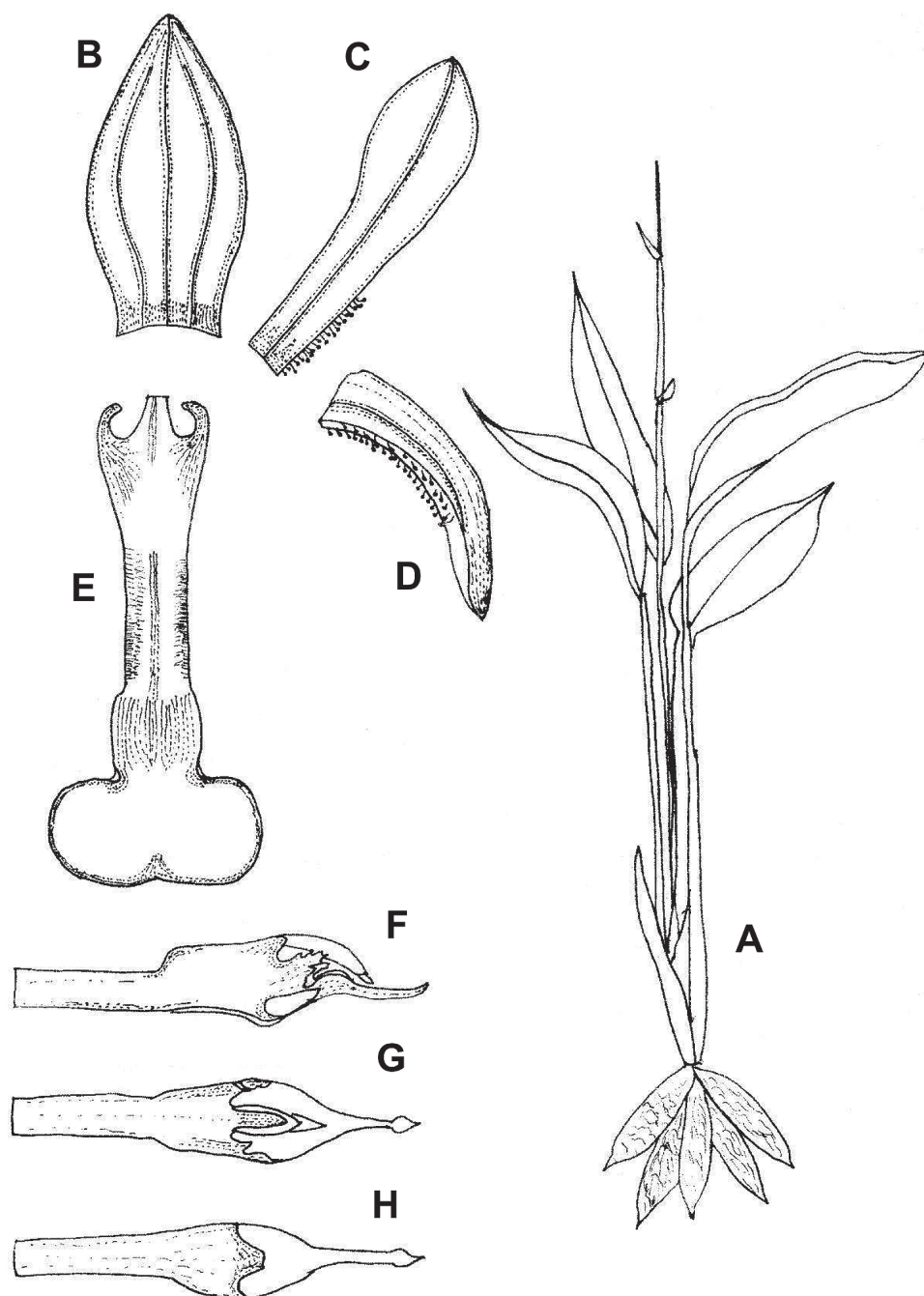
Key to the Guatemalan species (flowers)

- 1. Epichile distinctly 3-lobed ..... *P. guatemalensis*
- 1. Epichile unlobed ..... 2



**Fig. 3.** Various views of the flower of *Potosia guatemalensis* Archila & Szlach. (photograph by F. Archila)

- 2. Hypochile and epichile not separated by sharp constriction, epichile longer than wide ..... *P. kusibabiana*
- 2. Hypochile and epichile separated by sharp constriction, epichile wider than long ..... 3
- 3. Hypochile elliptic-ovate, widest above the middle, ca twice wider than epichile, lip auricles divergent ..... *P. zamororae*



**Fig. 4.** *Pelexia joannae* Archila & Szlach.

Explanations: A – habit, B – dorsal sepal, C – petal, D – lateral sepal, E – lip, F-H – gynostemium, various views (drawn by F. Archila from the holotype)

3. Hypochile oblong-deltoid, widest at the apex, slightly wider than epichile, lip auricles touching each other ..

..... *P. schaffneri*

*Pelexia* Poit. ex Rich. is an orchid genus of mostly terrestrial plants with usually small to medium-sized, unattractive flowers. The genus, as traditionally understood, embraces plants with usually clustered, fusiform, fleshy roots. The leaves are basal, gathered in a rosette, and usually long-petiolate; the petiole is narrow, canaliculated and stout; the blade is often ovate,

oblong-ovate to lanceolate, acute to shortly acuminate, with rounded to cordate base. In some species leaves are variegated and attractive. The scape is erect, stout or delicate, usually densely covered with glandular hairs, especially towards apex. The raceme is many-flowered, usually dense or subdense. Flowers are small to medium-sized, suberect to nodding, tubular, with arcuately pendent lateral sepals. Sepals are dissimilar, usually glandular outside. Dorsal sepal is concave below the apex. Petals are linear in the lower half, variously expanded above, often with ciliate margins, agglutinate





**Fig. 5.** Leaves and the lower part of scape of *Pelexia joannae* Archila & Szlach. (photograph by F. Archila)

to the dorsal sepal, and basally decurrent. Lateral sepals are basally connate together and decurrent on the long column foot, narrowly oblanceolate, falcate above. Lip is prominently clawed, canaliculate with reflexed epichile; lamina is sharply constricted below the apex – hypochile is adorned basally with prominent auricles, either horn-like, acute, apically thickened or ligulate, blunt terminated with small, subglobose thickenings; epichile is usually wider than long, with a pair of small, subglobose callosities at the base or ecallose. Spur in the major part is adnate to the ovary, the line of its adnation to the ovary is well-seen, the free apex is usually acute, erect, incurved or decurved. The structure of spur is one of key characters distinguishing *Pelexia* from closely related *Sarcoglottis* C. Presl. In the latter, the line of adnation between ovary and spur is not seen.

The architecture of *Pelexia gynostemium* is similar to other genera of Cyclopogoninae. It is elongate, slender, slightly arcuate. Column part is more or less ciliate on the ventral surface below the stigma. Column foot in the major part is adnate obliquely to the ovary, free at the apex, of various length. Stigma is always ventral, flat, bilobed, confluent. Rostellum is erect, ribbon-like, narrowly lanceolate or linear, blunt, thin, flat or slightly canaliculate. Viscidium is single, detachable, cellular, multi-layered, obovate, blunt to ovate, acute, produced on the dorsal surface of rostellum.

*Pelexia adnata* (Sw.) Poit. ex Rich. has been selected as the type species of the genus. It is a rather small plant with dull green, inconspicuous flowers. The species is known from Mesoamerica (Guatemala and Belize), northern part of South America (Venezuela), and the Antilles and it appears to be relatively common. At least as it can be suspected based on the herbarium materials preserved in various herbaria. Two species described in the past – *Pelexia spiranthoides* Lindl. and *Pelexia stenorrhynchoides* Griseb. – are conspecific with *P. adnata* as both fit well to its spectrum of variability (Szlachetko *et al.* 2005).

Some months ago, the senior author during field work in Alta Verapaz, Guatemala, collected plants which initially were determined as *P. adnata*. After careful study and comparing with the available type materials of various taxa described in *P. adnata*-group (cf. Szlachetko *et al.* 2005), we came to the conclusion that new finding represents undescribed species. Its most striking character is the lip form, especially transversely elliptic epichile much wider than narrow hypochile. In all specimens of *P. adnata* we examined, hypochile is more or less oblong-lanceolate and epichile is similar in width to the hypochile. The lip details of this species are illustrated in Szlachetko *et al.* (2005). Additionally,



**Fig. 6.** Side view of the flower of *Pelexia joannae* Archila & Szlach. (photograph by F. Archila)



**Fig. 7.** Front view of the flower of *Pelexia joannae* Archila & Szlach. (photograph by F. Archila)

clinandrium of the new entity is fringed on margins, what is rather an unique character in the genus. We decided to describe these Guatemalan plants as a new species:

***Pelexia joannae*** Archila & Szlach., *sp. nov.* (Figs. 4-7).

*Species similar to Pelexia adnata, but hypochile linear-ligulate, basal auricles falcate, curved towards the claw and epichile transversely elliptic, much wider than hypochile, with entire margins, clinandrium fringed on margins.*

**Type:** Guatemala. ALTA VERAPAZ. Cobán. Alt. 300 m. Mar 2012, flowered in cultivation in Apr 2012. *Fredy Archila, Francisco Archila, Luis Francisco Archila & Franja Transversal del Norte FA-s.n.* (H o l o t y p e : BIGU!; I s o t y p e : UGDA-DLSz! – spirit).

**E t y m o l o g y :** Dedicated to Joanna Mytnik-Ejsmont, co-author of Orchids of the subtribes Spiranthinae, Stenorrhynchidinae and Cyclopogoninae (Spirantheae, Orchidaceae) in Guatemala.

Plants small, to 12 cm tall. Roots 2.5-3 cm long, 0.7 cm in diameter, fasciculate, fusiform, tomentose. Leaves 4, basal, erect, petiolate, embraced with 1-2 basal sheaths; petiole up to 7 cm long and 0.28 cm wide, canaliculated, reddish; blade up to 7.3 cm long

and 3.1 cm wide, obliquely elliptic, apex obliquely acuminate, shiny green, with prominent central vein and 8 secondary veins. Scape up to 12 cm long, erect, delicate, reddish, minutely pubescent in the upper part, with few, remote cauline sheaths. Flowers small, ovary, spur and basal part of sepals greenish, apical parts of sepals and petals white, ovary, spur and sepals densely glandular. Floral bracts 15 mm long, obliquely lanceolate, herbaceous, dull reddish, glandular. Pedicellate ovary 13 mm long. Dorsal sepal 7 mm long, 3.1 mm wide, oblong-ovate to elliptic-ovate, concave near the middle, subacute, 3-nerved. Petals 8 mm long, 2.4 mm wide, obliquely linear-spatulate, subobtusate, glandular in the lower part along the lower margin. Lateral sepals free part 6.2 mm long, 3 mm wide, oblong-ligulate, subacute to subobtusate, falcate, glandular in the basal half along the lower margin. Lip up to 10 mm long in total, 4.5 mm wide when spread; hypochile linear-ligulate, basally auriculate, auricles falcate, curved towards the claw, pubescent in the middle; epichile transversely elliptic, margins entire, white with yellow basal part. Spur 8 mm long, oblong-saccate, blunt. Gynostemium 9 mm long, typical for the genus, clinandrium more or less fringed on margins.

## References

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