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***PORROGLOSSUM* RAOI, A NEW SPECIES OF PLEUROTHALLIDINAE (ORCHIDACEAE) FROM ECUADOR**

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ABSTRACT. A new species of *Porroglossum* (Pleurothallidinae), *Porroglossum raoi* Baquero & Iturralde, apparently endemic to a cloud forest close to Chical, is described here. *Porroglossum raoi* is compared to known species within the genus growing close to the area where it was discovered. The big white flower, the thick, subclavate and brown-purple lateral sepal tails, a single subacute angle on the lower margin of the petals and a strong cinnamon and clove smell, immediately separates this from other species in *Porroglossum*. Taxonomical and ecological notes are given.

KEY WORDS: Pleurothallidinae, *Porroglossum hoijerii*, *Porroglossum* section *Porroglossum*

Introduction. The genus *Porroglossum* Schltr. was proposed by Schlechter in 1920 when some of the species previously placed in *Masdevallia* Ruiz & Pav. did not seem to fit among the rest of species in this genus. 55 species of *Porroglossum* are known at the moment (Luer 1987, Dodson 2003, Merino, Doucette & Pupulin 2010, Chase *et al.* 2015, Karremans 2016), and new taxa continue to be added to the list (Luer 2010, 2011, Luer & Thoele 2012, 2013, Doucette, McDaniel, Merino, Portilla & Cameron 2015). The most remarkable feature of the flowers of *Porroglossum* is the trigger-sensitive lip, something that is otherwise only in *Masdevallia teaguei* Luer, and some species belonging to *Specklinia* Lindl. (ex *Acostaea* Schltr.) and *Stelis* (ex *Condylago* Luer). *Porroglossum* is one of the three genera in the Pleurothallidinae with a lip capable of moving when affected by an external stimulus (Luer 1987). A change in turgor in a layer of cells from a tiny structure of the lip called the claw, causes it to move into a “closed” position on where the callus of the lip presses against the frontal surface of the column-foot (Sweet 1970, Luer 1987). Some species of *Porroglossum*, section *Porroglossum* (Luer 1987), have glabrous peduncles and big, expanded, dorsal sepals, wider than the synsepal formed by the fused lateral sepals, the apex of the dorsal sepal,

with a longer or shorter tail, reflected towards the ovary. Species exhibiting such characteristics include *Porroglossum actrix* Luer & Escobar, *P. amethystinum* (Rehb. f.) Garay, *P. aureum* Luer, *P. hoeijeri* Luer, *P. josei* Luer, *P. marniae* Luer, *P. nutibara* Luer & Escobar, *P. olivaceum* Sweet, *P. rodrigoii* Sweet, *P. sergioi* P. Ortiz and *P. teaguei* Luer. Except for *P. actrix*, from Putumayo department in Colombia, the rest of the species grow on the western slopes of the Andes from Colombia and Ecuador (Luer 1980, 1987, 1988, 1989, 1991, 1994, 1995, 1998, 2006).

The north-western cloud forests of Carchi and Esmeraldas provinces in Ecuador are an area in which some species such as *Porroglossum aureum*, *P. hoeijeri* and *P. josei* have been discovered (Luer 1987, 1995). Before 2008, the only way to reach Maldonado and Chical, in Carchi province, was through Tulcán, the biggest city near the Ecuador-Colombia border. This meant a long trip, first, going north to Tulcán and, from there, driving west until getting to Maldonado and Chical. *Porroglossum aureum* and *P. hoeijeri* were discovered along the Tulcán-Maldonado road. In 2008, the road that connects Chical to el Carmen (E187) was officially opened; this allowed the access to previously unexplored zones. Through the E187 road, not only the possibility to reach certain unexplored areas was

possible, but also, a faster way from Quito and most of Ecuador. *Porroglossum eduardii* (Rchb. f.) Sweet is one of the species which can be found growing along the new road at about 2300 m very close to where populations of *P. hoeijeri* thrive. Both species grow within a private protected area called Dracula Reserve, managed by the Ecominga foundation. A new species of *Porroglossum* has been discovered in this area, near the 14th km in the Chical-El Carmen road; *Porroglossum raoi* Baquero & Iturralde is described below.

***Porroglossum raoi* Baquero & Iturralde, sp. nov.**
(Figs. 1–2).

TYPE: Ecuador. Carchi, El Carmen-Chical road, 0°52'54.5"N 78°13'20.7"W, 1972 m, Luis Baquero 3045 (holotype, QCNE).

Diagnosis. Species similar to *Porroglossum aureum* from which it differs in the proportionally longer inflorescence, the white flowers with brown-purple, sub-clavate tails, a shortly elevated keel in the broadly thickened callus of the lip, the lower margin of the petals with a subacute angle near the middle and a characteristic cinnamon and clove fragrance, not detected in any other species of *Porroglossum*.

Plant caespitose, epiphytic, medium in size 6–13 cm tall. **Roots** slender, flexuous, 1 mm in diameter. **Ramicauls** abbreviated, terete, erect, slender, 10–40 mm long, enclosed by two or three tubular sheaths. **Leaf** erect, coriaceous, minutely verrucose, long petiolate, 5–9 cm long including the petiole; the blade 3–5 × 0.8–1.2 mm, narrowly obovate; the apex subacute, mucronate; the base narrowed into a slender, conduplicate petiole 2.0–4.5 cm long. **Inflorescence** congested, successively few-flowered (three to five flowers) raceme; peduncle 20 cm long, slender, glabrous, erect to suberect, with a few widely spaced, thin, translucent bracts, floral bracts tubular, imbricating, 8–9 mm long; pedicel 10–13 mm long; ovary smooth, sparsely pocked, 4–5 mm long. **Flowers** resupinate, with a detectable cinnamon and clove fragrance. **Sepals** translucent white; the dorsal sepal depressed obovate, bilobed, 3-veined, 5 × 10 mm expanded, spotted with purple subulate short hairs and more densely covered throughout the veins, gradually increasing in density towards the apex and the

tail, connate to the lateral sepals for 3 mm to form a gaping cup; the apex acutely reflexed, obtuse, minutely apiculate, abruptly contracted into a conduplicate tail 3 mm long that does not reach the ovary; the lateral sepals oblong, oblique, glabrous, 3-veined, 6–7 × 4 mm, connate 5 mm to form an acute mentum below the column-foot; the apices oblique, acute, contracted into slender, brownish-purple tails, thickened along the middle, 11 mm long. **Petals** translucent yellow, the color intensity gradually increasing towards the apex, with a red-purple, translucent midvein, ovate-lanceolate, glabrous, 5 × 2 mm narrowed to the slightly dilated, rounded, sub falcate apex; the lower margin with a subacute angle near the middle; the upper margin obtusely angled near the middle. **Lip** white, suffused with dispersed purple dots, sensitive and actively motile; the blade widely obtrullate, 5 × 4 mm; the broadly thickened callus with a shortly elevated keel running longitudinally towards the base; the apex minutely pubescent, acute, with a sulcus running 2 mm from the apex to the center of the blade; the base deflexed and hinged to the free apex of the column-foot by a strap-like claw. **Column** white, stout, semiterete, 3.5 mm long, with two tooth-like processes near the stigma; the column-foot slender, curved, 4 mm long. **Pollinia** 2, droplet shaped, each with a glandular caudicle. **Fruits and seeds** not seen.

EPONYMY: Named in memory of the late Velliur “Malli” Rao and his wife (from Wilmington, Maryland), important donors and promoters of Ecominga Foundation who made possible the purchase and protection of an extensive area of primary forest close to where *Porroglossum raoi* was discovered and other native forests around Ecuador.

DISTRIBUTION: *Porroglossum raoi* is known for several plants found growing in primary cloud forest, at an elevation of ~1900 m, around km 14 of the Chical-El Carmen road in the Province of Carchi, Ecuador.

HABITAT AND ECOLOGY: Several plants of *Porroglossum raoi*, including the type specimen, have been found growing as epiphytic in extremely humid cloud forest between the 1890 m and 1970 m above sea level. Individuals of this species were growing sparsely, between direct sunlight and heavy shade in the understory of the cloud forest. No other *Porroglossum* species were found growing sympatrically with *P. raoi* while

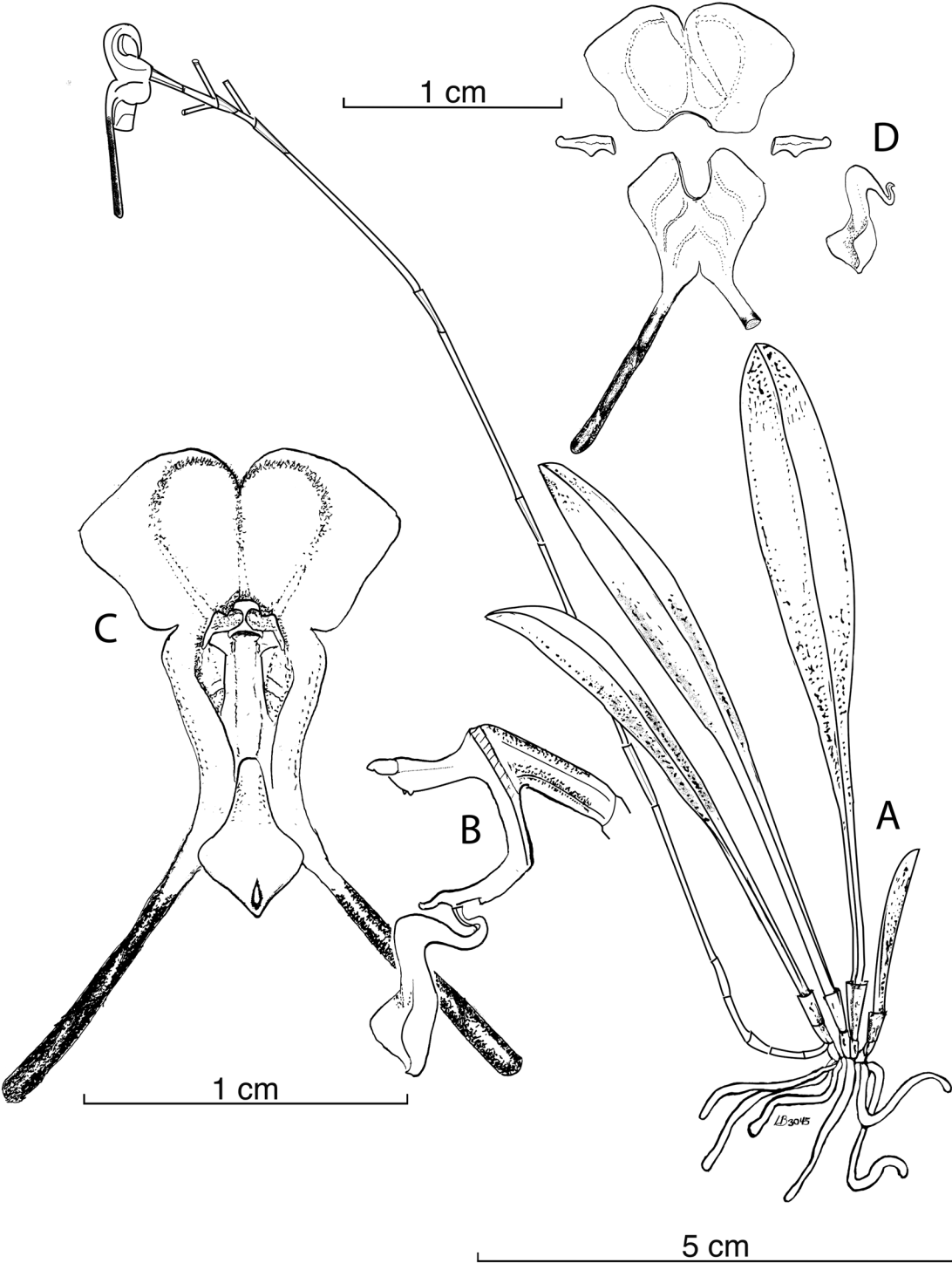


FIGURE 1. *Porroglossum raoi*. A. Habit. B. Column and lip, lateral view. C. Flower, front view. D. Dissected perianth. Drawn by Luis Baquero from the holotype.

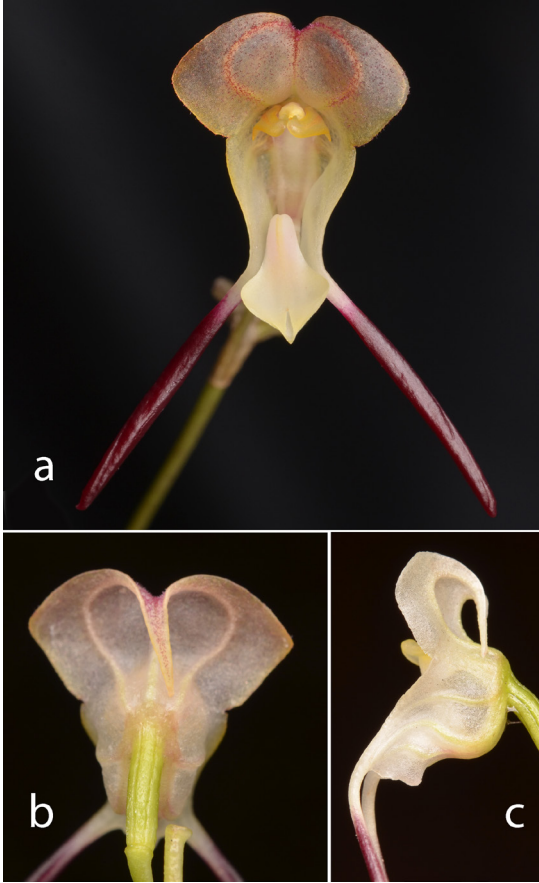


FIGURE 2. Flower of *Porroglossum raoi*. A. Frontal view. B. View from behind. C. Lateral view.

other Pleurothalliinae grow sympatrically: *Dracula trigonopetala* Gary Mey. & Baquero ex A. Doucette, *Scaphosepalum swertiifolium* (Rchb. f.) Rolfe, *Brachionidium imperiale* Luer & R. Escobar, *Lepanthes hexapus* Luer & R. Escobar. *Porroglossum raoi* has not been reported outside its type locality, further field research could result on finding these species in other localities including the neighbor Colombia.

CONSERVATION STATUS: Because of its limited range of distribution and the risk of deforestation in the type locality, *Porroglossum raoi* should be considered as endangered or critically endangered by the IUCN criteria. Although it has not been found elsewhere, hopefully a healthy population of *P. raoi* thrives inside Dracula Reserve of the Ecominga Foundation, which exists close to where this species has been discovered.

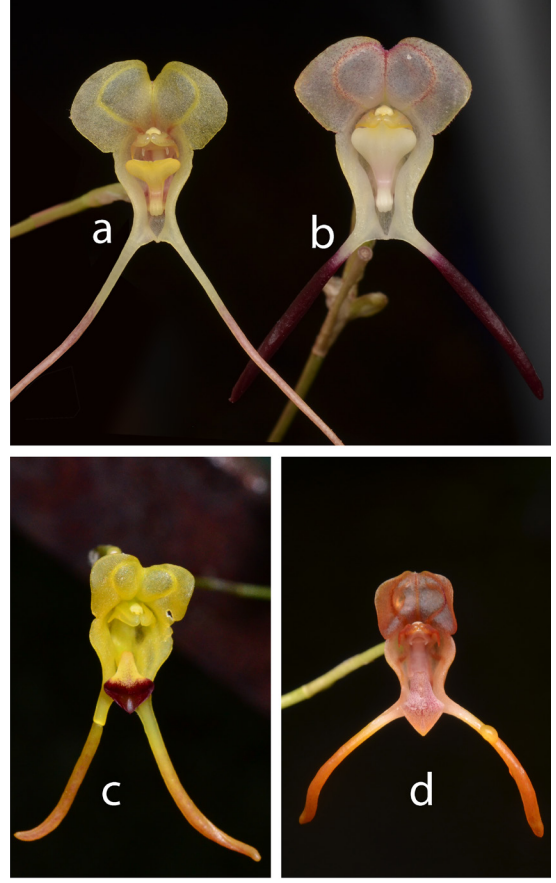


FIGURE 3. Flowers of four species of *Porroglossum*. A. *P. aureum*. B. *P. raoi*. C. *P. marniae*. D. *P. olivaceum*.

Porroglossum raoi is considered as a different species by a unique combinations of features, being the strong cinnamon and clove smell the most notorious characteristic. The most similar and, probably, most closely related species is *P. aureum* which was discovered not too far from where *P. raoi* grows; it also shares similar features with *P. marniae* (Fig. 3). Nonetheless, the white flowers with a short channeled tail of the dorsal sepal, the brownish-purple, thickened along the middle tails of the lateral sepals, the lower margin of the petals with a subacute angle near the middle and the detectable cinnamon and clove fragrance immediately separate it from similar species (Table 1; sources Luer 1980, 1987, 1988, 1989, 1991, 1994, 1995, 1998, 2006, Merino, Doucette & Pupulin 2010, Kolanowska & Szlachetko 2013).

TABLE 1. Comparison between *Porroglossum raoi* and other related species.

Species	Dorsal sepal tail length	Lateral sepals tails	Lip	Lip callus	Petals	Fragrance
<i>P. raoi</i>	3 mm	Thickened, subclavate, brownish- purple	White, obtrullate, suffused with dispersed purple dots	Broadly, thickened, with a shortly elevated keel	Translucent yellow with red-purple midvein, the lower margin with a subacute angle near the middle	Strong cinnamon and clove
<i>P. aureum</i>	2 mm	Slender, thickened along the middle, yellow	Yellow, cuneate, glabrous	Tall, thick	Translucent yellow with a dark yellow midvein, margins obtusely angled near the middle	Not detected
<i>P. hoeijeri</i>	4 mm	Slender, purplish	Rose, cuneate, broadly rounded, shortly pubescent	Tall, rounded	Translucent orange, the margins with acute angles below the middle	Not detected
<i>P. amethystinum</i>	2 mm	Slender, slightly thickened apically, orange	White, subfused and dotted with dark purple, apex purple black, cuneate	Low, smooth	Translucent with brown midvein, margins obtusely angled near the middle	Not detected
<i>P. marniae</i>	2 mm	Thickened, subclavate, white	Dark purple, white at the base, obovate, microscopically pubescent	Low, longitudinal, brown	Translucent white, obtuse angles below the middle	Not detected
<i>P. nutibara</i>	absent	Thickened, subclavate, yellow	White and red minutely pubescent above the middle, obovate	Tall, rounded, longitudinal, glabrous	Translucent white, margins with obtuse angles below the middle	Not detected
<i>P. olivaceum</i>	2–3 mm	Slender, orange–red	Yellow, dark purple and densely short- pubescent on the distal half, cuneate	Tall, rounded, longitudinal	Translucent yellow or light brown, with a darker midvein, lower margins with an acute angle near the middle	Not detected

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