

## ***EPIDENDRUM LASIOSTACHYUM* (ORCHIDACEAE): A NEW COLOMBIAN SPECIES OF THE *EPIDENDRUM MACROSTACHYUM* GROUP**

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**ABSTRACT:** In *Epidendrum*, considered a monophyletic genus, diverse groups can be recognized by their similar vegetative and floral characteristics. The revision of one of these groups, the *E. macrostachyum* group, recognized by the monopodial habit, with sub-apical branching, apical, erect inflorescence, non-resupinate, fleshy flowers, and entire lip, embracing the column, pubescent at least at the base, has led to the description of several new species, including a new species from Colombia that is here described and illustrated. The species is similar to *Epidendrum microrigidiflorum*, but differs in the inflorescence (distichous, 6 flowered vs. racemose, 8-16 flowered), the shape (trullate vs. widely rhombic) and ornamentation of the lip (sericeous vs. minutely papillose), and the lack of calli on the disc of the lip (ecallose vs. bicallose). In addition, a key to the 41 species of the group is provided.

**RESUMEN:** En *Epidendrum*, siendo considerado un género monofilético, se pueden reconocer diversos grupos de especies con características vegetativas y florales similares. La revisión de uno de estos grupos, el grupo *E. macrostachyum*, el cual se reconoce por su hábito monopodial con ramificaciones subapicales, inflorescencia apical, erecta y flores no resupinadas, carnosas con el labelo entero abrazando la columna y pubescente por lo menos en la base, ha permitido la descripción de varias especies nuevas, entre ellas la nueva especie que se describe y se ilustra aquí. Es una especie colombiana similar a *Epidendrum microrigidiflorum*, sin embargo difiere por la inflorescencia (dística, 6 flores vs. racemosa, 8-16 flores), en la forma (trulado vs. anchamente rómbico) y ornamentación del labelo (densamente seríceo vs. diminutamente papiloso) y en la ausencia de callos en el disco del mismo (ecaloso vs. bicaloso). Se presenta además una clave de las 41 especies del grupo.

**KEY WORDS:** Colombia, Orchidaceae, *Epidendrum*, new species, *Epidendrum macrostachyum* group

**Introduction.** The genus *Epidendrum* L. was described by Linnaeus in 1763. It originally included most of the tropical epiphytic orchids, presently placed in other genera of the Orchidaceae family such as *Arachnis* Blume, *Brassavola* R.Br., *Brassia* R.Br., *Prosthechea* Knowles & Westc., among others. The genus was conserved by the Botanical Congress of 1930 with *Epidendrum nocturnum* Jacq. chosen as the conserved type (Sprague 1929). In 2005 Hágsater and Soto calculated that *Epidendrum* included over 1500 species, distributed from southern United States to northern Argentina. Today we believe that the number is closer to 2400, of which over 1100 having

been recently illustrated and described mostly in the series *Icones Orchidacearum* (Hágsater & Salazar 1993; Hágsater *et. al.* 1999; Hágsater & Sánchez 2001, 2004, 2006, 2007, 2008, 2009, 2010, 2013, 2015). It is considered one of the largest genera of Neotropical orchids, and includes terrestrial, epiphytic or lithophytic plants that grow in different types of vegetation ranging from tropical forest, dunes and scrubs to Andean páramos (Hágsater & Soto 2005; Chase *et al.* 2015). The classification of *Epidendrum* has been a difficult task for numerous authors due to the great variation of floral and vegetative characteristics, as well as the similarity of herbarium specimens. There

have been various attempts throughout the years to separate numerous species included in the genus. Thus various authors have proposed some natural groups in *Epidendrum* as separate genera, as in the case of *Epidanthus* L.O. Williams (Williams 1940), or more recently *Takulumena* Szlach. (Szlachetko *et al.* 2006; Szlachetko *et al.* 2014), based on characteristics that seem simple, but which appear repeatedly in various groups of otherwise not closely related species, such as the number of pollinia, or the position of the inflorescence on the stem. With some 300 species sequenced in its DNA, the genus is monophyletic though diverse groups and sub-groups can be recognized (Hágsater & Soto 2005). Among these groups, the *E. macrostachyum* group with more than 41 recognized species is a difficult one because, the plants and flowers are all very similar at first sight, though careful study of vegetative and floral characteristics, as well as their distributional range, facilitates their identification, some species are sympatric.

They are distributed from Costa Rica to Bolivia and from 670 to 3600 m elevation. It is characterized by having monopodial plants with sub-apical branching from a primary stem, the inflorescence is erect and generally racemose (occasionally distichous), with variously colored, fleshy flowers, of different sizes, and the lip entire and generally more or less pubescent, at least near the base. Due to the lack of understanding of the group, authors such as Dunsterville and Garay (1972) reduced many species (*E. bangii* Rolfe, *E. chondrochilum* F. Lehm. & Kraenzl., *E. coordinatum* Rchb.f., *E. dermatanthum* Kraenzl., *E. magnibracteum* Kraenzl., *E. rigidiflorum* Schltr., *E. rostrigerum* Rchb.f., *E. xylostachyum* Lindl.) from Costa Rica, Colombia, Ecuador, Peru and Bolivia to synonyms of *Epidendrum macrostachyum* Lindl. (non *Epidendrum macrostachya* Thouars = *Beclardia macrostachya* (Thouars) A. Rich).

Detailed revision of numerous herbarium specimens, and photographs of live material, as well as personal field experience of the first author has led us to propose that all these the above mentioned names correspond to discrete entities (Santiago & Hágsater 2013, 2015a, b, c, d, e). In addition, a number of new species from Venezuela, Colombia, Ecuador and Peru have been recently added to the *E. macrostachyum* group: *E. borealistachyum*

Hágsater, E. Santiago & C. Fernández (Hágsater *et al.* 2015) *E. brachyoothistachyum* Hágsater & E. Santiago (Hágsater & Santiago 2015a), *E. brachysteletachyum* Hágsater, E. Santiago & Reina-Rodr., (Hágsater *et al.* 2015), *E. cardiostachyum* Hágsater & E. Santiago (Hágsater & Santiago 2015b), *E. deltastachyum* Hágsater & E. Santiago (Hágsater & Santiago 2015c), *E. erikae* Hágsater & E. Santiago (Hágsater & Santiago 2015d), *E. macphersonii* Hágsater & E. Santiago (Hágsater & Santiago 2015e), *E. munchiquense* Hágsater, E. Santiago & García-Revelo, (Hágsater *et al.* 2015), *E. notostachyum* Hágsater & E. Santiago (Hágsater & Santiago 2015f), *E. odontostachyum* Hágsater & E. Santiago (Hágsater & Santiago, 2015j), *E. porphyrostachyum* Hágsater & E. Santiago (Hágsater & Santiago 2015k), *E. puracestachyum* Hágsater & E. Santiago (Hágsater & Santiago 2015l), *E. recurvitepalostachyum* Hágsater & E. Santiago (Hágsater & Santiago 2015m), *E. sarcostachyum* Hágsater, E. Santiago & E. Becerra, (Hágsater *et al.* 2015), *E. sigmostachyum* Hágsater, E. Santiago & D. Trujillo (Hágsater *et al.* 2015), *E. stenobractistachyum* Hágsater & E. Santiago (Hágsater & Santiago 2015n), and *E. sumacostachyum* Hágsater & E. Santiago (Hágsater & Santiago 2015o). The species described below is another example of such new entities.

**Material and methods.** A revision of nearly 700 herbarium specimens from numerous different collectors, years and countries including Venezuela, Costa Rica, Colombia, Ecuador, Peru and Bolivia was done. The specimens mostly shelved under *Epidendrum macrostachyum* are deposited in herbaria including AAU, AMO, AMES, C, CAUP, COL, CUVC, CUZ, F, G, GB, HPUJ, HUA, JAUM, K, L, LE, LOJA, MO, MOL, QCA, QCNE, RENZ, S, SEL, U, US, USJ, USM, VALLE, VEN, NY and W. For specimens on loan floral segments were drawn using a camera lucida mounted on a dissecting microscope. For selected specimens complete illustrations including vegetative and reproductive traits (e.g. floral segments, lip and nectary ornamentation) were prepared. Numerous photographs taken in the field and provided by numerous photographers and on internet were registered and analyzed. Eric Hágsater has travelled extensively in Ecuador, Colombia and

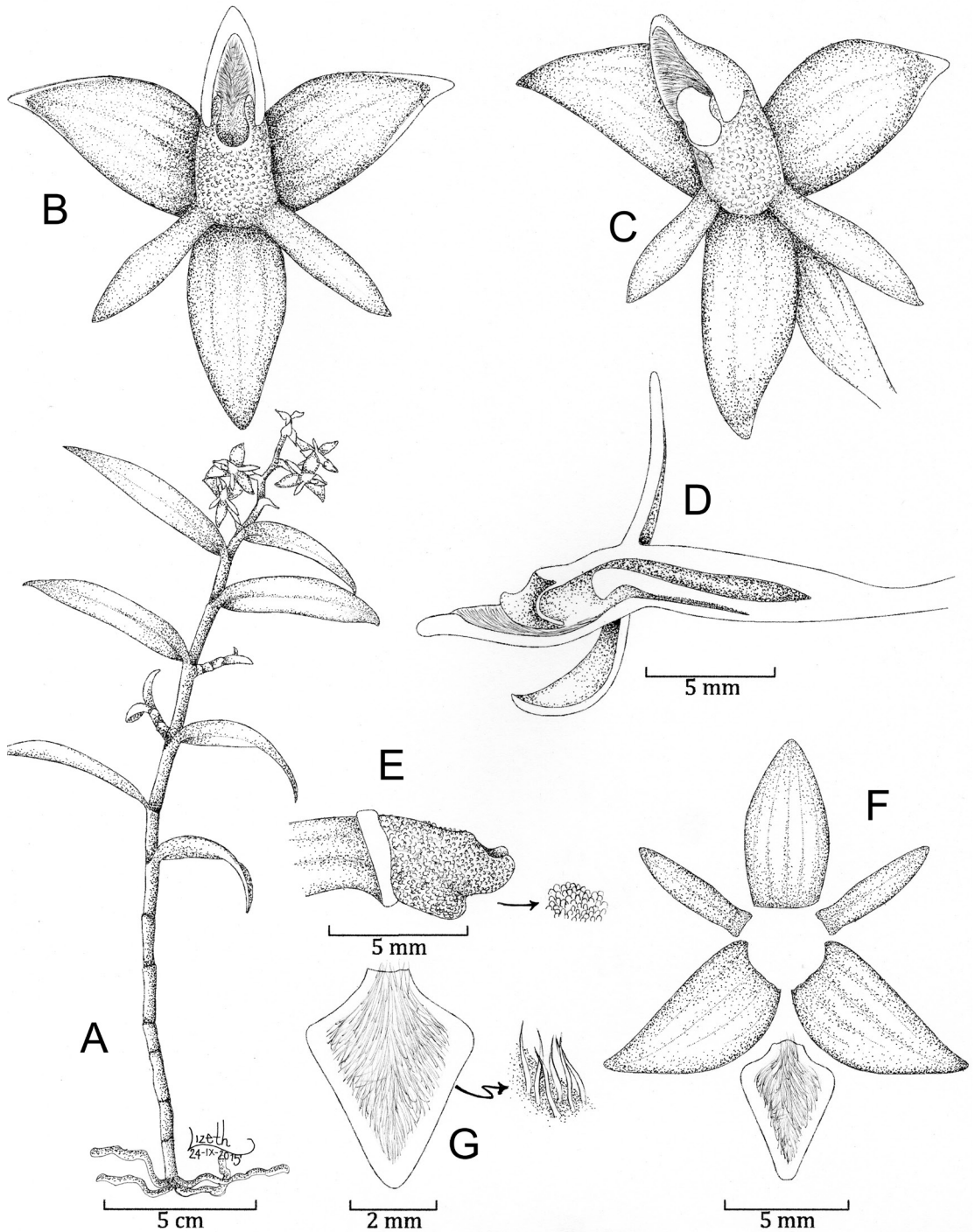


FIGURE 1. *Epidendrum lasiostachyum*. A. Habit. B. Flower, frontal view. C. Flower, lateral view. D. Flower, longitudinal section. E. Column details. F. Dissected perianth. G. Lip details. Drawn by Lizeth Rodríguez M. from the holotype (*L. Rodríguez-Martínez* 254).

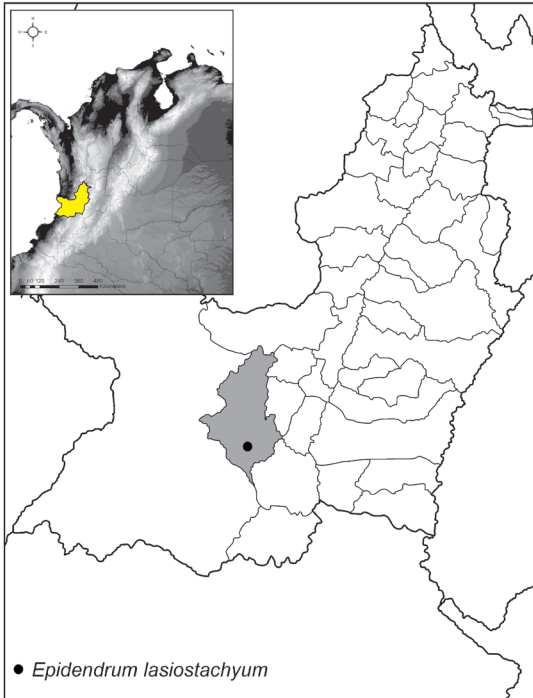


FIGURE 2. Distribution map of the species *Epidendrum lasiostachyum* in Colombia.

Peru between 1970 and 2016, collecting and studying the genus *Epidendrum*, photographing and collecting numerous specimens.

Lizeth Rodríguez Martínez, a student of agronomy at the Universidad Nacional de Colombia, campus Palmira, made several field trips during 2014 in the Department of Valle del Cauca, Colombia, discovering the population of the species here proposed and described. Individual plants were photographed, flowers were preserved in alcohol, and an illustration prepared (Fig. 1), prior to pressing and desiccation of one specimen and deposited at COL (holotype). Phenology data were recorded in the field. Morphological studies were carried out using a Zeiss stemi 2000 stereomicroscope. A distribution map was produced using ArcMAP (Fig. 2).

#### TAXONOMIC TREATMENT

***Epidendrum lasiostachyum*** Rodr.-Martínez, Hágsater & E.Santiago, *sp. nov.* (Fig. 3).

TYPE: Colombia. Valle del Cauca: Municipio Dagua, Corregimiento San José del Salado, relicto de bosque

muy húmedo, epífita de árbol de *Tibouchina* sp., 1800-1900 m, 21 November 2014, Lizeth Rodríguez-Martínez 254 (holotype: COL!).

DIAGNOSIS: The species is similar to *Epidendrum microrigidiflour* Hágsater (Hágsater 2006), but the plants are smaller, 25-30 cm tall (vs. 60-100 cm tall) with a distichous, 6-flowered inflorescence (vs. racemose and 8-16-flowered); petals small, 4-5 mm long (vs. 6.8 mm long), and the lip is trullate, densely sericeous (vs. scarcely papillose), and ecallose (vs. bicallose).

Epiphytic, monopodial, caespitose, erect herb, 25–30 cm tall. *Roots* 1.5–2.0 mm in diameter, filiform. *Stems* 20–25 × 0.3–0.5 cm, cane-like, terete, erect, branching when mature, base covered by sheaths 1.2–1.6 cm long, tubular, non-foliar, scarious. *Leaves* 7, distributed throughout the stems, articulate to the foliar sheath, spreading with respect to the stem, similar in size and shape, green, concolor; sheaths 1.5–2.5 cm long, tubular, minutely striated, rugose, pale green; blade 4.5–6.0 × 0.8–1.0 cm, lanceolate, apex acute, margin minutely serrate. *Inflorescence* 6 cm long, apical, developing from mature stems, distichous, erect, laxly few-flowered; peduncle 5–7 × 1.5–2.0 mm, terete, thin, straight; rachis 5.0–5.5 × 0.1–0.2 cm, slightly flexuous, greenish. *Floral bracts* 5–7 × 2 mm, much shorter than the ovary, triangular-lanceolate, apex acute, margin slightly serrate, embracing, perpendicular to the rachis. *Flowers* 6, simultaneous, non resupinate, distichous, secund, distributed along the rachis; sepals and petals yellow, lip pale yellow, column greenish yellow with the apex purple; without fragrance. *Ovary* 15 × 2 mm, terete, thin, striated, lime green. *Sepals* 7–8 × 3–4 mm, free, spreading, fleshy, narrowly ovate, apex acute, 5-veined, margin entire, spreading; lateral sepals oblique, slightly falcate. *Petals* 4–5 × 1.5 mm, spreading, free, oblong-oblancheolate, apex acute, 1-veined, margin entire, spreading. *Lip* 7 × 4 mm, united to the column, entire, trullate, the base widely cuneate, apex narrowly rounded, embracing the column in natural position without covering it; ecallose, densely sericeous, the trichomes covering the entire surface of the lip except for the margin, and reclining towards the nectary. *Column* 4–5 mm long, short, thick, slightly arched at the base, apex deflexed, the surface minutely papillose. *Clinandrium* reduced,

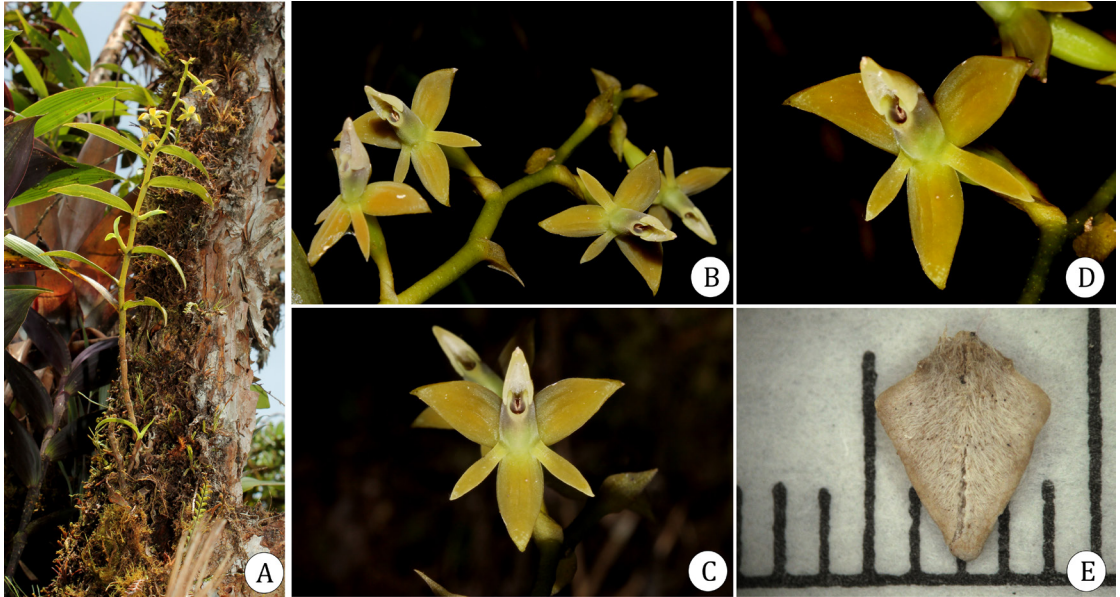


FIGURE 3. *Epidendrum lasiostachyum* photographed *in situ* by L. Rodríguez Martínez (based on the pretype: L. Rodríguez Martínez 254). A. Habit and complete plant. B. Inflorescence details. C & D show different angles of the flower. E. Lip details.

margin entire. *Anther* not seen. *Rostellum* apical, slit. *Nectary* penetrating 2/3 of the ovary, densely sericeous in front of the stigmatic cavity. *Capsule* not seen.

**DISTRIBUTION AND ECOLOGY:** It is known presently from the western slope of the Western Cordillera of the Andes, only from one collection from the mountains of San José del Salado, Municipality of Dagua in the Department of Valle del Cauca, Colombia, at an elevation of 1850 m. It is found as an epiphyte in the cloud forests on the western mountain range. Two specimens were found growing on *Tibouchina* sp. (Melastomataceae). Flowering in November. Growing fully exposed to the sun, along the edge of the forest and pastures, as part of secondary vegetation. Annual mean precipitation is 2000 mm, with constant fog in the early morning and late afternoon. Mean temperature is 17°C, slopes are steep (50-75%). Nearby forests are 25 m tall. The best represented genera were *Palicourea* Aubl., *Psychotria* L., *Miconia* Ruiz & Pav., *Solanum* L., *Cavendishia* Lindl. and *Clusia* L. and the dominant species: *Otoba lehmannii* (A.C. Sm.) A.H. Gentry, *Ladenbergia oblongifolia* (Humb, ex Mutis) L. Andersson, *Myrsine coriacea* (Sw.) R. Br., *Saurauia scabra* (Kunth) D.Dietr., *Alchornea latifolia* Sw.,

*Ficus tonduzii* Standl., *Ficus andicola* Standl., *Meriania nobilis* Triana, *Clausia* sp., *Miconia* sp. and *Schefflera* sp. (Hágsater *et al.*, 2015).

**ETYMOLOGY:** From the Greek *λασιος*, shaggy, woolly, and *σταχυς*, ear of corn; in reference to the lip which is completely (but not the margin) covered by long, straight trichomes reclining towards the nectary that distinguishes this species from others members of the *E. macrostachyum* group.

**Discussion.** The species is similar to *Epidendrum microrigidiflorum* Hágsater but differs mainly in the size of the plant (25-30 cm tall) (Fig. 3A), the few-flowered inflorescence, distichous, with the rachis slightly flexuous (Fig. 3B), the flowers somewhat smaller (Fig. 3C, 3D), and the trullate lip with the base widely cuneate and the apex obtuse, sericeous (Fig. 3E) and the column minutely papillose (Fig. 1E). *Epidendrum microrigidiflorum* has larger plants (60-100 cm tall), the inflorescence secund and many-flowered and the lip is widely rhombic with the apex apiculate, surface scarcely papillose on the disc and the column unornamented (Fig. 4). *Epidendrum notostachyum* Hágsater & E.Santiago (Fig. 5) differs in the color and size of the flowers,

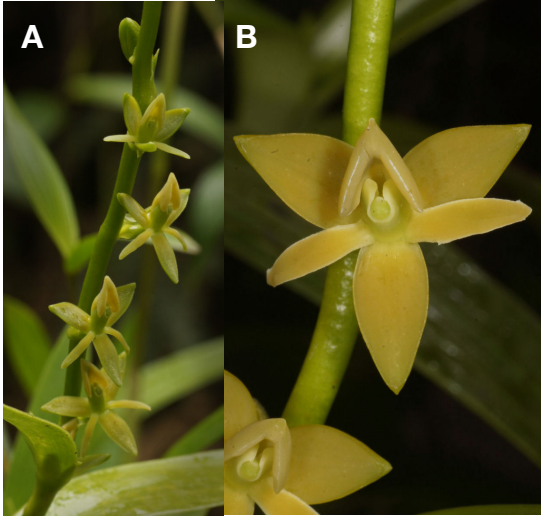


FIGURE 4. Inflorescence (A) and flower (B) of *Epidendrum microrigidiflorum*, photographed by Gary Yong. Panamá, Reserva de la biosfera La Amistad.



FIGURE 6. Plant and inflorescence of *Epidendrum polyanthostachyum*, photographed by Patricia Harding, Colombia, Chocó.



FIGURE 5. Inflorescence of *Epidendrum notostachyum*, photographed by Hugo Medina. Ecuador.



FIGURE 7. Inflorescence of *Epidendrum polyanthostachyum*, photographed by Duván Andrés García Ramírez, Colombia, Valle del Cauca.



FIGURE 8. Inflorescence of *Epidendrum macrostachyum*, photographed by David Haelterman, Colombia, Cauca.

sepals are 9.0-9.5 mm long, dorsally papillose and the lip scarcely pubescent at the base with the base truncate. *Epidendrum polyanthostachyum* Hågsater, E.Santiago & García-Ramírez has a densely cylindrical, many-flowered inflorescence (Fig. 6 and 7), the leaves lanceolate, (3.5-14 × 1.8-4.7 cm), the lip scarcely pubescent at the base, widely deltoid with the base cordate. Finally, *Epidendrum macrostachyum* Lindl. has large, triangular ovate floral bracts (8-18 mm long), with flowers the color of ripe olives or lack-brown and the leaves elliptic (12.5-13 × 3.0-3.5 cm) (Fig. 8).

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#### KEY TO THE SPECIES OF THE MACROSTACHYUM GROUP

1. Floral bracts prominent (never shorter than the ovary to much longer than the flower) 11-40 mm long [the apical ones may diminish to 5-7 mm long] ..... 11
- 1'. Floral bracts small (shorter than the ovary to rarely somewhat longer) 2.5-9[12] mm long ..... 2
- 2(1'). Inflorescence densely flowered (35-70 flowers) ..... 3
- 2'. Inflorescence laxly flowered (8-30 flowers) ..... 4
- 3(2). Flowers small, sepals 5-8 mm long, dorsally muricate ..... *E. palaciosii*
- 3'. Flowers larger, sepals 11-15 mm long, dorsally unornamented ..... *E. polyanthostachyum*
- 4(2'). Flowers green, yellow or orange, inflorescence lax-flowered ..... 5
- 4'. Flowers lilaceous white, rarely deep lilac, inflorescence dense ..... *E. borealistachyum*
- 5(4). Leaves elliptic or narrowly elliptic, 8-18 × [2.2]3-5 cm on the main stem; lip clearly cordiform; sepals 14-18 mm long ..... *E. cardiostachyum*
- 5'. Leaves lanceolate to linear lanceolate, 6-15 × 0.6-1.7 [2.3] cm on the main stem; lip deltoid, sub-deltoid to widely rhombic; sepals 6.5-13 mm long ..... 6
- 6(5'). Inflorescence 20 cm long; sepals 12-13 mm long; lip sub-deltoid with the base cordate ..... *E. odontostachyum*
- 6'. Inflorescence 5-13 [15] cm long; sepals 6-12 mm long; lip deltoid or widely rhombic, base truncate, slightly sub-cordate or cuneate ..... 7
- 7(6'). Lip densely pubescent throughout its ventral surface ..... *E. lasiostachyum*
- 7'. Lip sparsely pubescent on the disc of the lip ..... 8
- 8(7'). Sepals 6-7.5 mm long ..... 9
- 8'. Sepals 9-12 mm long ..... 10
- 9(8). Inflorescence 5 cm long; flowers 8-12; petals 5 × 1 mm, linear, the apex obtuse; column 3 mm long ..... *E. microcarpum*
- 9'. Inflorescence 7-8 cm long; flowers 15-17; petals 6.7 × 1.5 mm, oblong, falcate, the apex acute; column 7 mm long ..... *E. sumacostachyum*
- 10(8'). Sepals 9.0-9.5 mm long, dorsally papillose; petals 8 × 1.5 mm; linear-oblongate; ovary 5-7 mm long ..... *E. notostachyum*
- 10'. Sepals 9-12 mm long, dorsally glabrous; petals 10 × 1.3 mm, linear; ovary 7-10 mm long *E. grammipetalostachyum*

11(1).	Petals obtusate, spatulate or rhombic .....	12
11'.	Petals linear, oblong, elliptic or widely spatulate .....	13
12(11).	Leaves of the main stem 8.5–9.0 × 1.5–1.7 cm; lip 7 × 9 mm, trullate with the apex rounded, ecallose .....	13
	..... <i>E. trulichilum</i>	
12'.	Leaves of the main stem 9–17 × 2.8–4.5 cm; lip 9 × 12 mm, widely triangular cordiform with the apex subacute, bicallose .....	13
	..... <i>E. orthophyllum</i>	
13(11').	Inflorescence short (1.5–3.0 cm long), with 3–4 flowers densely aggregate in a very short rachis; leaves linear-lanceolate .....	13
	..... <i>E. platystachyum</i>	
13'.	Inflorescence long (7–34 cm long), with 5–21 flowers distributed along the rachis; leaves lanceolate, elliptic to oblong-elliptic .....	14
14(13').	Floral bracts proportionately nearly as wide as they are long, the apex acute or short-acuminate .....	15
14'.	Floral bracts proportionately longer than wide, the apex acute or long-acuminate .....	23
15(14).	Leaves narrowly elliptic-lanceolate, elliptic or oblong-lanceolate, 1.4–5 cm wide; lip 10–17 × 11–18 mm .....	16
15'.	Leaves lanceolate, 1.5–2.5 cm wide; lip 6–15 × 9–10 mm .....	21
16(15).	Mature inflorescence much longer than the apical leaf, many-flowered, with 18–20 flowers .....	17
16'.	Mature inflorescence as long or slightly shorter than the apical leaf, few-flowered, with 5–8 flowers .....	20
17(16).	Petals oblanceolate, widely spatulate or obovate-elliptic, flowers colorful, never green; anther with the apex obtuse; ovary 9–19 mm long .....	18
17'.	Petals oblong, flowers green, the lip greenish yellow; anther apically short acuminate; ovary very short 6 mm long .....	18
	..... <i>E. brachyoothistachyum</i>	
18(17).	Flowers white tinged with purple; petals 15 × 5 mm, oblanceolate .....	18
	..... <i>E. obovatipetalum</i>	
18'.	Flowers reddish orange to lilac; petals 13.2–14.0 × 6–8 mm, widely spatulate to obovate-elliptic .....	19
19(18).	Flowers 15–20, lilac; petals obliquely obovate-elliptic with the apex sub-obtuse; lip ecallose .....	19
	..... <i>E. erikae</i>	
19'.	Flowers ca. 45, reddish-orange; petals widely spatulate and the apex rounded; lip bicallose .....	19
	..... <i>E. ariasii</i>	
20(16').	Inflorescence 6.5 cm long; sepals 15 × 9 mm; petals nearly as wide as the sepals; flowers greenish white .....	20
	..... <i>E. xylostachyum</i>	
20'.	Inflorescence 8–13 cm long; sepals 21 × 12.5 mm; petals half as wide as the sepals; flowers yellowish green .....	20
	..... <i>E. humeadorensis</i>	
21(15').	Lateral sepals partly spreading, slightly concave; petals linear-oblanceolate to lanceolate, spreading .....	22
21'.	Lateral sepals reflexed, convex; petals oblanceolate, reflexed .....	22
	..... <i>E. recurvitopalostachyum</i>	
22(21).	Rachis of the inflorescence straight; floral bracts 5–7 mm wide, the apex acute; lateral sepals very fleshy; petals linear-oblanceolate .....	22
	..... <i>E. sarcostachyum</i>	
22'.	Rachis of the inflorescence sinuous; floral bracts 8–12 mm wide, the apex acuminate and uncinata; lateral sepals slightly fleshy; petals lanceolate .....	22
	..... <i>E. chondrochilum</i>	
23(14').	Floral bracts much longer than the total length of the flower .....	24
23'.	Floral bracts never much longer than the flower .....	25
24(23).	Leaf blade of the main stem 18–20 × 2–5 cm, elliptic-lanceolate; inflorescence pyramidal, the rachis straight; flowers successive 21–30; ovary 6–7 mm long; lip widely cordiform (proportionately wider than long); sepals ovate-elliptic, obtuse .....	24
	..... <i>E. magnibracteum</i>	
24'.	Leaf blade of the main stem 15–18 × 2–2.8 cm, narrowly lanceolate; inflorescence distichous with the rachis fractiflex; flowers mostly simultaneous, 11–12; ovary 9–12 mm long; lip cordiform (as wide as it is long); sepals triangular-ovate, acute .....	24
	..... <i>E. bractiacuminatum</i>	
25(23').	Inflorescence of the main stem 2.5–9.0 [13–17] cm long .....	26
25'.	Inflorescence of the main stem 15–40 cm long .....	33
26(25).	Leaves 4.0–10.4 × 1.8–3.3 cm, elliptic to oblong-elliptic .....	27
26'.	Leaves 1.5–11.0 × 0.4–2.3 cm, lanceolate .....	31
27(26).	Anther with the apex acute or truncate, never surpassing the apex of the column; sepals 13.5–17 × 4–7 mm .....	28
27'.	Anther with the apex rostrate, surpassing the apex of the column; sepals 9–12 × 3–5 mm .....	29
28(27).	Flowers peach colored; petals linear-oblong; sepals dorsally glabrous; column sigmoid .....	28
	..... <i>E. sigmostachyum</i>	
28'.	Flowers green tinged brown, turning orange-brown when mature; petals oblong-elliptic; sepals dorsally echinate; column straight .....	28
	..... <i>E. deltastachyum</i>	
29(27').	Lateral sepals with a high, laminar, dorsal keel, the apex erose; petals oblong, apex rounded; anther with a short, incipient apical rostrum shorter than the anther itself; flowers red .....	29
	..... <i>E. macphersonii</i>	
29'.	Lateral sepals with a low, incipient dorsal keel, the margin entire; petals linear, apex acute; anther with an apical rostrum much longer than the body of the anther; flowers green .....	30



- 30(29'). Inflorescence 13 cm long; sepals 9–11 mm long, apex acute; lip 6.5–8.0 × 7–10 mm, semi-circular with the base sub-truncate, without ribs; column 5–6 mm long ..... *E. rostrigerum*
- 30'. Inflorescence 5–8 cm long; sepals 10–13 mm long, apex acute; lip 9–10 × 9–11 mm, deltoid with the base truncate, with a low rib down the middle; column 7–8 mm long ..... *E. probosanthorum*
- 31(26'). Flowers small, sepals 7.5–7.8 mm long; inflorescence secund flowered; lip rhombic, the base cuneate ..... *E. microrigidiflorum*
- 31'. Flowers large, sepals 12–15 mm long; inflorescence distichous; lip deltate to deltate-cordiform ..... 32
- 32(31'). Sepals 14–15 mm long, slightly recurved, the apex minutely apiculate; floral bracts narrowly oblong or triangular-lanceolate ..... *E. stenobractistachyum*
- 32'. Sepals 12.0–13.7 mm long, partly spreading to spreading, the apex uncinat; floral bracts ovate-lanceolate ..... *E. coordinatum*
- 33(25'). Sepals 15–23 mm long ..... 34
- 33'. Sepals 10–12 mm long ..... 38
- 34(33). Rachis of the inflorescence slightly flexuous; flowers 6–15; lip 14.5 × 14.4 mm ..... *E. bangii*
- 34'. Rachis of the inflorescence straight; flowers 15–27; lip 9–12 × 8–12 mm ..... 35
- 35(34'). Sepals and petals long acuminate; sepals 15–23 mm long ..... *E. oxycalyx*
- 35'. Sepals and petals acute; sepals 14–18 mm long ..... 36
- 36(35'). Inflorescence (of the main stem) 24–40 cm long; flowers wine-red ..... 37
- 36'. Inflorescence (of the main stem) 11–14 cm long; flowers reddish brown ..... *E. dermatanthum*
- 37(36). Inflorescence lax flowered, 25–40 cm long; leaves green with the margin reddish; column wide and straight ..... *E. munchiquense*
- 37'. Inflorescence densely flowered, 24 cm long; leaves wine-red; column thin and slightly arched ..... *E. porphyrostachyum*
- 38(33'). Leaves narrowly lanceolate, apex acute to short acuminate, leaves of the main stem 1.6–2.5 cm wide; inflorescence 15–23 cm long, flowers yellow to greenish yellow or wine-red ..... 39
- 38'. Leaves lanceolate elliptic, apex acute; leaves of the main stem 3.0–3.5 cm wide; inflorescence to 31 cm long, flowers the color of ripe black olives ..... 40
- 39(38). Flowers wine-red; leaves 5.3–8.0 cm long, lanceolate, apex acute; petals oblong-triangular, never falcate ..... *E. puracestachyum*
- 39'. Flowers yellow to greenish yellow; leaves 7.5–18.0 cm long, lanceolate, apex acuminate; petals linear and falcate ..... *E. rigidiflorum*
- 40(38'). Petals linear-oblong, apex sub-obtuse; lip widely cordiform, base slightly cordate, column thin ..... *E. macrostachyum*
- 40'. Petals linear-triangular, apex sub-acute; lip triangular, base truncate; column thick ..... *E. brachystelestachyum*

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