

## **Taxonomic revision of the African genus *Orestias* RIDL. (Malaxidinae, Orchidaceae)**

H.B. Margońska\* & D.L. Szlachetko\*

### **Abstract**

A taxonomic revision of the genus *Orestias* RIDL. (Malaxidinae, Orchidaceae) is given. A determination key as well as descriptions and illustrations of each species are provided. The new combination *Orestias cardiophylla* (RCHB.f.) MARG. comb.n. is proposed.

**Key words:** Orchidaceae, Malaxidinae; *Orestias*, *Malaxis*; Africa, taxonomy.

### **Introduction**

While preparing the second volume of Contributions to the Orchid flora of Central West Africa (SZLACHETKO et al. 2006) various materials belonging to the representatives of subtribe Malaxidinae (Orchidaceae) have been examined. Among others the genus *Orestias* RIDL. has been reviewed completely.

### **Materials and methods**

For the investigation materials (herbarium specimens, spirit collections, literature data and iconographies) kept at e.g.: B, BM, BR, G, HBG, K, MO, P, UPS, WAG, W and WU have been used.

### **Results and discussion**

While establishing the genus *Orestias*, RIDLEY (1887) included to it the sole species *Orestias elegans*. He recognized the representatives of this new species amongst materials originally determined as *Microstylis stelidostachya* RCHB.f.

The most important and characteristic features of the new genus given by RIDLEY (1887) were: elongated column with rostellum very large, oblong, triangular to flabellate, distinctly erumpent out of lateral margins of anther and locules opening laterally what is especially unique amongst closely related genera of Malaxidinae. The comparative investigation of the tribe Malaxidinae shows, that these characters mentioned by RIDLEY support the status of a distinct genus.

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SUMMERHAYS (1937) accepted the taxonomic status of *Orestias* as a distinct genus and transferred *Microstylis stelidostachya* RCHB.f. into it. However, he did not agree with the species status of *Orestias elegans* and mentioned the taxon only as synonym of *Orestias stelidostachya* (RCHB.f.) SUMMERH. SZLACHETKO & OLSZEWSKI (2001) followed this opinion in their Flora du Cameroun.

SUMMERHAYS additionally described two new species within the genus: *O. micrantha* from Cameroun (SUMMERHAYS 1937) and *O. foliosa* from Zaire (SUMMERHAYS 1956). All these three species - *O. stelidostachya*, *O. micrantha* and *O. foliosa* were widely acknowledged. Although, different characters have been used to distinguish these species. For example, SUMMERHAYS (1937) emphasized the differences between *O. stelidostachya* and *O. micrantha* mentioning for the first of them: larger flowers, one pubescent cushion, separated by 3 central nerves of the lip lamina, "however sometimes represented by 2 distinct ones, but nearer the lip base and closer together". The presence of two or only one pubescent cushion of lip lamina is an important feature within the genus. However the size and flower colour can be diverse and vary depending on dissimilarities of the plants habitats. Therefore while constructing the keys and preparing the descriptions we used univocally specified and most invariable characters and their combination, both generative and vegetative.

Additionally to the known species, based on the characters of lip and gynostemium *Microstylis cardiophylla* RCHB.f. (1885) from the East Islands of Africa had to be transferred to *Orestias*.

### Taxonomic treatment

***Orestias* RIDL.**, J. Linn. Soc., Bot. 24: 197 (1887).

RIDL., Bolet. Soc. Brot. 5: 201 (1887); WILLIAMSON, Orchid. S. Centr. Afr.: 115 (1977); GEERINCK, Fl. Afr. Centr., Orchid. 1: 281 (1984); SZLACHETKO & OLSZEWSKI, Orchidales, Flora du Cameroun 2: 362 - 365 (2001).

Type: *Orestias elegans* RIDL.

Plants rather small, uniform in habit, few to many gathered in compact clusters. Rhizome between shoots very short. Leafy stem erect, slender, mostly covered by leaf petioles, sheaths and basal scales. Basal scales infundibular, free part attenuate and acute, paler. Leaves 2 - 4; leaf petiole abbreviated; leaf sheath infundibular, loose; leaf blade slightly oblique, broadly ovate, ovate to oblong ovate, older broader, attenuate, (3 -) 5-nerved. Inflorescence erect, terminal; raceme with 20 - 100 flowers, cylindrical, dense, delicate. Sterile bracts several, lanceolate, 1-nerved, deflected. Floral bracts lanceolate, attenuate, acuminate at apex, 1-nerved, deflected. Flowers resupinate, small, often variable in colour, from pale greenish, yellowish to dark red, purple-red, brownish red, with characteristic intense and dark coloured spot at the middle of lip lamina. Sepals 3-nerved, sometimes with 2 quickly vanishing lateral nerves. Dorsal sepal apiculate at apex, slightly cordate at base. Lateral sepals falcate, ovate, apiculate at apex, cordate and connate at base. Petals distinctly falcate, lanceolate, tapering at upper portion, apiculate at apex, broader at basal portion, cordate at base, 1-nerved, often with an additional, lateral, shorter nerve. Lip with well developed obliquely positioned basal

auricles, almost rectangular, thick, with raphide cells; lip lamina with characteristic pubescent cushion(s) in the middle portion of lip lamina, 3 main subparallel nerves, vanishing distinctly before distal margins, external ones with two branches at basal part. Gynostemium (most important distinguishing features for the genus and unique amongst other representatives of the subtribe): column elongate, slender, cylindrical, erect when young, turning to the lip with age, gradually tapering towards the rostellum base; rostellum very large, oblong, triangular to flabellate, distinctly erumpent out of lateral margins of anther, widely spread; throat of stigma pocket only partly overlapping base of the rostellum, just below of it; stigma pocket reaching deeply inside the column; anther only slightly different in shape, firmly attached to the column apex by distinct filament, pale yellow to cream, but always with locules opening laterally, locules large, shallow, usually erumpent out of anther margins; pollinia 4, binate, large, oblong, curved, only at small basal portion hidden in locules, lying transversally, narrower tip gently connate with distal part of rostellum, bright yellow. Fruit oblong obovate, yellowish to fawn.

### Key to the species

- 1 Lip broader than long, reaching at most up to 3/4 length of lateral sepals, lip lamina always with two symmetrical, pubescent convexities..... 2
- 1\* Lip with similar length and width or longer than wide, hidden at least 3/4 length of lateral sepals, lip lamina with one or two pubescent convexity(ies) ..... 4
- 2 Lip with well developed basal auricles and lamina convexities reaching out of down edges of the basal auricles ..... 3
- 2\* Lip up to half of lateral sepals length, broadly cordate, with weakly developed basal auricles, and small lamina convexities positioned just below of lip base .....  
..... *O. cardiophylla*
3. Lateral sepals up to 2/3 of their length hidden by the lip, petals with hairless margins, lip nearly octagonal in outline ..... *O. foliosa*
- 3\* Lateral sepals up to 3/4 of their length hidden by lip, petals with external margin delicately ciliate, lip nearly hexagonal in outline ..... *O. micrantha*
- 4 Lateral sepals always at least slightly longer than lip, lip nearly quadrate in outline, lamina convexity sole, distinctly below of basal auricles ends, distal margin sometimes at most weakly indented ..... *O. elegans*
- 4\* Lateral sepals always shorter than lip, lip peariform in outline, lamina convexity always binate, just below of the lip base, distal margin always deeply clefted .....  
..... *O. stelidostachya*

***Orestias elegans* RIDL.**, J. Linn. Soc., Bot. 24: 197 - 198 (1887) & RIDL., Bolet. Soc. Brot. 5: 201 (1887).

Type: "West Africa, Islands of Principe and Sao Tome, Sao Tome: inter Lagao Amelia et Sao Pedro, 1200 m, 09.1885, A. Moller".

Lectotype (EXELL 1944): A. Moller "no 5" [BM-000082715! iso: BR!, BM-000082717!, COI, G!, K!, WU - sheets I! & II!]

Plants (15 -) 20 - 26 (- 30) cm tall. Rhizome few mm long between shoots, 2 - 3.5 mm Ø, creeping, delicate, sometimes branched, node scales loose. Leafy stem (5 ) 6 - 10

(- 14) cm long, (0.12 -) 0.15 - 0.25 (- 0.32) cm Ø; basal scales 1.5 - 2.5 cm long, 0.2 - 0.5 cm Ø. Leaves 2 - 4; leaf petiole (0.2 -) 0.5 - 1.5 (- 1.8) cm long, (0.28 -) 0.35 - 0.5 (- 0.72) cm wide when spread; leaf sheath (0.6 -) 1 - 2 (- 2.8) cm long, (0.3 -) 0.4 - 0.7 (- 0.8) cm Ø, green, sometime fawn tinged; leaf blade (3 -) 4 - 5.2 cm long, 1.2 - 2.8 cm wide, ovate to oblong ovate, older sometime nearly broadly ovate, distinctly attenuate, apiculate at apex, green above, paler beneath. Inflorescence 10 - 16 cm long; raceme (3 -) 4 - 8 (- 11) cm tall, 10 - 40-flowered, dense; peduncle (4 -) 5 - 8 (- 9) cm long. Sterile bracts about 3 - 5, 4.7 - 6 mm long, 1.8 - 2.5 mm wide. Floral bracts 2 - 4.5 mm long, 0.8 - 1.6 mm wide. Ovary 1.5 - 3 mm long, 0.4 - 0.6 mm Ø; pedicel 2 - 2.5 mm long, 0.3 - 0.4 mm Ø; sinuate, green. Flowers (5.5 -) 6 - 6.5 mm Ø; pale green to yellowish green tinged with red or chocolate, or pale cream-pink to dark red, purple-red, brownish red. Dorsal sepal 3.8 - 4 mm long, (1.8)2 - 2.5 mm wide, erect, oblong ovate. Lateral sepals 2.8 - 3 mm long, (1.8 -) 2 - 2.3 mm wide. Petals (3.3 -) 3.5 - 4 mm long, (1.2 -) 1.4 - 1.5 mm wide. Lip 2.2 - 2.6 mm long, 2 - 2.6 mm wide, reaching up to 3/4 - 5/6 of lateral sepals length; lamina nearly quadrate; basal auricles often with involute edges; the middle part of lamina broadly concave, with characteristic convexity below of basal auricles ends - only 1 pubescent cushion - reniform with deep cleft at down edge, middle part of upper edge dark and intense coloured; lamina truncate at distal margins, sometimes weakly indentate with apiculate apex. Gynostemium 1.6 - 2 mm long, column 0.5 - 0.7 mm wide; rostellum 0.8 - 1 mm long, 0.3 - 0.35 mm wide, transversely oblong, basal edge narrowly incurved; stigma in widely opened, narrow, deep pocket; anther 0.3 - 0.4 mm long, ca. 0.6 mm wide, 0.3 - 0.35 mm high, trapezoid, the distal edge longer; loculi quite separate from each other. Fruit 6 - 8 mm long, 4 - 6 mm Ø.

Specimens: ISLANDS OF PRINCIPE AND SAO TOME: Sao Tome: Le Pic, inter Lagao Amelia, 08 - 09.1905., Chevalier 14528 [P]. - 00° 17' N 06° 35' E, 2.10.1998, T. Stevart TS 210 [BR!, K!]. - Monte Café et Pic de Sao Tome, Chevalier 14528 - B [P!]. - Calvario, 00° 16' N 06° 34' E, 14.08.1997, T. Stevart TS 37 [BR!, K!]. - Vanhulst, Macambrara, 28.10.1932, A.W. Exell 110 [BM!]; 31.10.1932, A.W. Exell 170 [BM!, BR, COI]; 5.11.1932, A.W. Exell 253 [BM!, COI]; 23.11. 1932, A.W. Exell 442 [BM!, COI]. - on the mule-track between St Maria & Jamar, 05.11. 1932, A.W. Exell 258 [BM]. - on the steep path from Vanhulst to Jamar, 23.11.1932, A.W. Exell 435 [BM!, COI]. - flanc W de Pico, 29.8.1956, H. Monod 11988 [BM!].

Specimen without flowers, but probably belonging to this species: ISLANDS OF PRINCIPE AND SAO TOME: Principe Island: flanc W de Pico, 30.8.1956, H. Monod 12159 [BM!].

Ecology: Terrestrial; on yellow clay, in leaf litter, in wet and deeply shaded places, often along streams; in primary, dense, mountain forest; in primary humid and dark lowlands forest, between minute mosses; sometimes noted at secondary forest on ancient plantations. At times described as very common. Alt.: 1050 - 1800 m.

Note: Colour of flowers varies from yellowish green and pale cream-pink to dark red, purple-red, and brownish red. Colour of flower depends probably on quantity of light at locality. Flowers of plants growing in lighter places were noted as darker and more intensively coloured.

SUMMERHAYES (1937) mentioned that the floral structure of *O. elegans* and *O. stelidostachya* is identical, comparing his newly described *O. micrantha* with *O. stelidostachya*, as he understood this species. He recorded for *O. stelidostachya* that there is "usually one large pubescent spot, which is sometimes represented by two distinct ones". However, spots are much nearer the base of the lip and closer together than

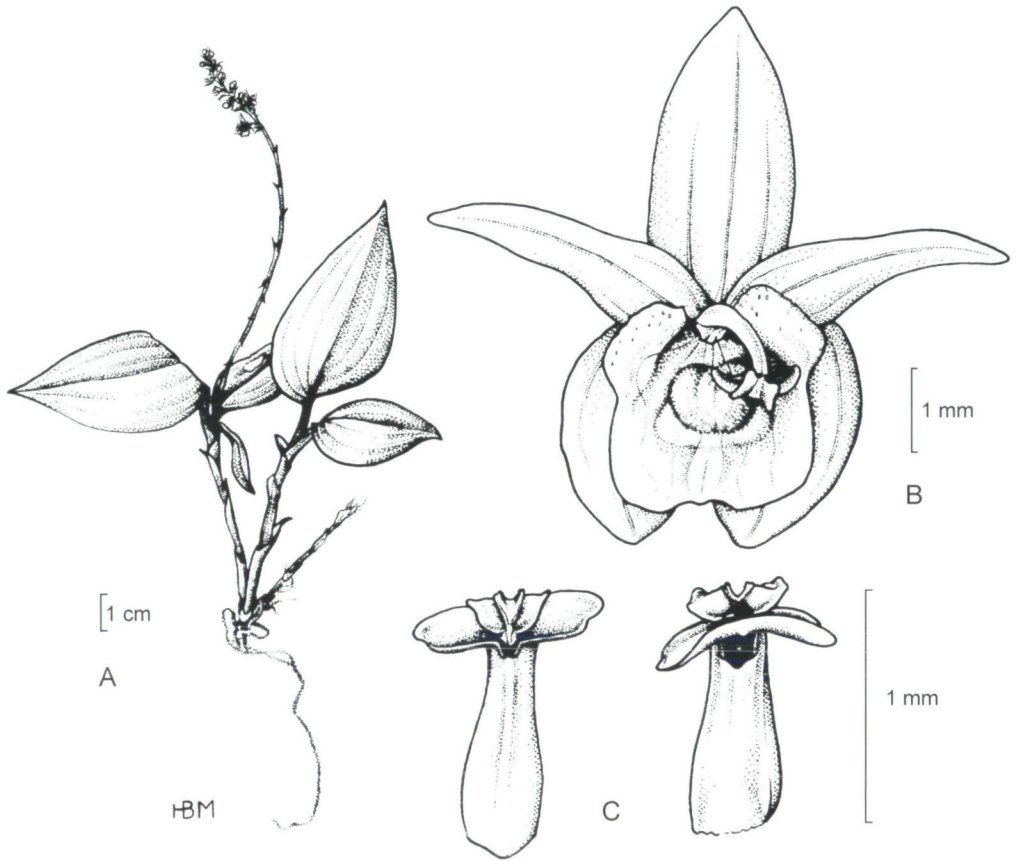


Fig. 1: *O. elegans* RIDL. a: plant. b: flower. c: gynostemium back view. d: gynostemium lateral view (drawn from holotype - BM).

in *O. micrantha*. Exactly these differences of lip convexity, amongst many others are the differentiating characters between *O. elegans* and *O. stolidostachya* (see description of species and the key). Therefore, *O. elegans* cannot be treated as synonym of *O. stolidostachya*.

***Orestias foliosa* SUMMERH.**, in TROUPIN, Fl. Sperm. Parc Nat. Garamba (Explor. Parc Nat. Garamba Miss. H. de Saeger, Fasc. 4.) 1, Gymnosperm. & Monocot.: 258 (1956).

TOURNAY, Bull. Soc. Roy. Bot. Belg. XCI: 300 (1959), descr. ampl; WILLIAMSON, Orchid. S. Centr. Afr.: 115 - 116 (1977); GEERINCK, Fl. Afr. Centr., Orchid. 1: 281 - 282 (1984).

Type: Zaire, National Parc due la Garamba, Ubangi - Uele, Bagbele (Ukwa), River Nalugambala, 2.06.1950., Noifalisse 425 [holo: BR!, iso: K!, spir. coll. K!].

Plants (10 -) 15 - 25 cm tall, few to many compactly clustered. Rhizome few mm long between shoots, 1 - 2.6 mm Ø, sometimes branched, node scales loose. Leafy stem (5 -)

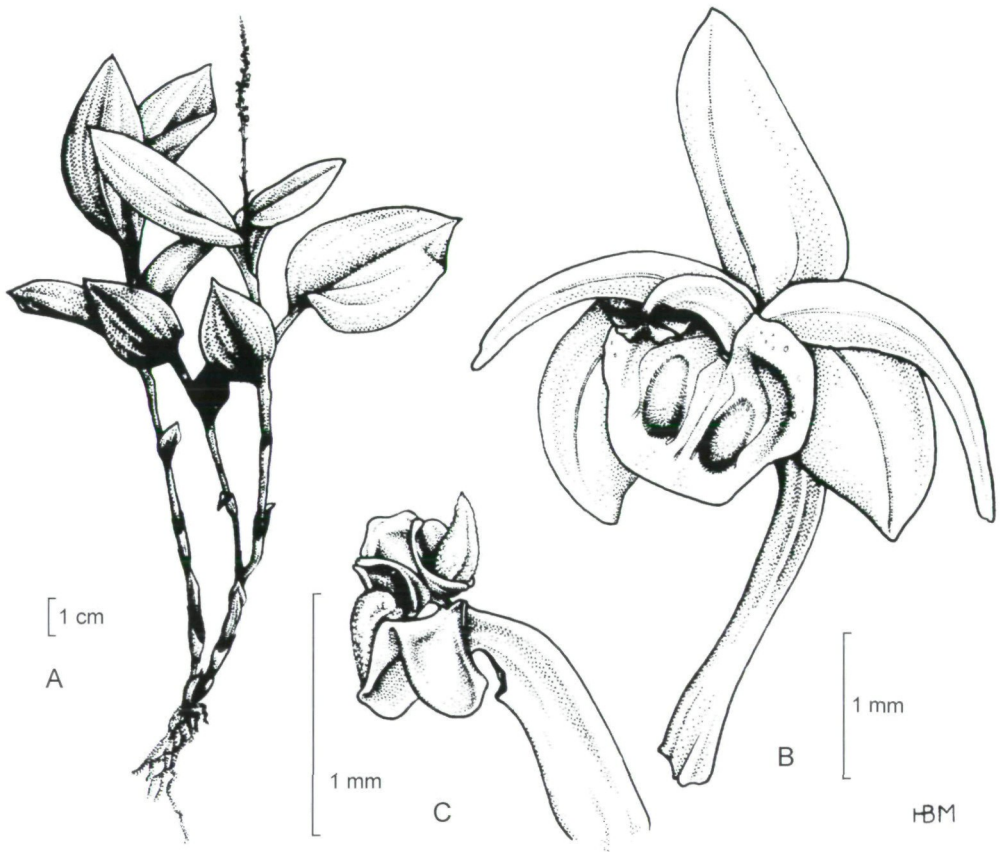


Fig. 2: *O. foliosa* SUMMERH. a: plant. b: flower. c: gynostemium, with deflexed anther (drawn from holotype - BR).

9 - 16 cm long, (0.1 -) 0.15 - 0.25 (- 0.3) cm  $\varnothing$ ; basal scales 1.2 - 2.5 cm long, 0.18 - 0.48 cm  $\varnothing$ . Leaves (2 -) 3 (- 4); leaf petiole (0.16 -) 0.3 - 0.6 (- 0.8) cm long, (0.28 -) 0.35 - 0.45 (- 0.5) cm wide when spread; leaf sheath (0.5 -) 0.8 - 1.4 (- 2) cm long, (0.15 -) 0.22 - 0.45 (- 0.65) cm  $\varnothing$ , green, sometimes paler, fawn tinged; leaf blade (1.5 -) 2.5 - 6 (- 6.5) cm long, (1 -) 2 - 3 (- 3.3) cm wide, ovate to oblong ovate, apiculate at apex, green above, paler beneath. Inflorescence (6 -) 10 - 15 (- 17) cm long; raceme (3 -) 5 - 7 (- 9) cm tall, 20 - 60 (- 80)-flowered; peduncle (3 -) 6 - 8 cm long. Sterile bracts about 3 - 7, 2.5 - 4 mm long, 1.7 - 2.2 mm wide. Floral bracts 1.5 - 3.5 mm long, 0.7 - 1.5 mm wide. Ovary 1.5 - 3.2 mm long, 0.4 - 0.65 mm  $\varnothing$ ; pedicel 1.4 - 2 mm long, 0.3 - 0.5 mm  $\varnothing$ ; sinuate, green. Flowers (4 -) 4.5 - 5 mm long, (3.2 -) 3.5 - 4 mm wide; white and green tinged with red or brown, to dark purple, lip yellowish to whole mauve to purple. Dorsal sepal 1.5 - 2 (- 2.5) mm long, 0.8 - 1 (- 1.2) mm wide, erect, oblong ovate to oblong. Lateral sepals 1.5 - 1.6 (- 1.8) mm long, 1 - 1.3 (- 1.5) mm wide. Petals (1.8 -) 2 (- 2.2) mm long, 0.4 - 0.5 (- 0.65) mm wide. Lip 1.3 - 1.5 (- 1.7) mm long, 1.4 - 1.5 (- 1.8) mm wide, slightly broader than long, reaching out about 2/3 length of lateral

sepals; lamina nearly hexagonal in outline; basal auricles well developed, often with involuted edges; the middle part of lamina broadly depressed, characteristic convexities - 2 pubescent, symmetrical cushions - reaching out of down edges of basal auricles of lip, each of them reniform; lamina at distal margins transversely oblong, sometimes with weak apiculate apex. Gynostemium 1.3 - 1.5 mm long; column 0.35 - 0.5 mm wide at base; rostellum (0.4 -) 0.5 - 0.6 mm long, 0.25 - 0.32 mm wide, transversely flabellate, basal edge narrowly incurved; stigma in widely opened, deep pocket; anther 0.35 - 0.4 mm long, 0.37 - 0.42 mm wide, 0.25 - 0.3 mm high, trapezoid, the distal edge shorter; loculi distinctly separate from each other. Fruit 4.8 - 6.4 mm long, 3 - 5.2 mm Ø.

Specimens: ZAIRE: Bas-Katanga, Katumanga, 09.11.1956., L. Lieben 1855 A [K!]. - S-Reg. Itari, Zone Irumu, Bunia, quartier Mudzi-Pela, Baboa Bokoe, 28.12.1984., F. Szafranski 1135 [BR!, MO!, P!, UPS!, WAG!]. - GABON: Rabi, Shell oil concession, ca. 300 m SW of Rabi 46,1°52' S 9°50' E, J.J. de Wilde, Arends, Louis & Wieringa 9658 [WAG!].

Specimen with fruits only, but probably belonging to this species: ZAIRE: Cie Lunbilach, Selavo Farm at Kisumbo, 06.1931., Quark 2375 B [K!].

Ecology: Terrestrial; in leaf litter; in gallery forest; on very humid sandy soil, in exploited high forest. Alt.: 25 - 800 m.

Note: *O. foliosa* can be easily distinguished by the lip being slightly broader than long, nearly hexagonal in outline; pubescent convexity reaching out of down edges of basal auricles of lip; lip reaching out only about 2/3 length of lateral sepals.

***Orestias micrantha* SUMMERH.**, Kew Bull. 1937: 460 (1937).

Type: Cameroun, Bipinde, Urwaldgebiet, 1897, Zenker 1380 [holo: K!, iso: BM 000082713!, WU!].

Plants (10 -) 15 - 30 cm tall, few to many compactly clustered. Rhizome few mm long between shoots, 1 - 2.4 mm Ø, sometimes branched, node scales loose. Leafy stem (5 -) 8 - 15 cm long, (0.1 -) 0.15 - 0.25 (- 0.3) cm Ø; basal scales 2 - 3, (0.6 -) 1 - 2.5 cm long, 0.18 - 0.45 cm Ø. Leaves 3 - 4; leaf petiole (0.15 -) 0.3 - 0.6 (- 0.8) cm long, (0.28 -) 0.35 - 0.45 (- 0.5) cm wide when spread; leaf sheath (0.5 -) 0.8 - 1.6 (- 2.3) cm long, (0.3 -) 0.4 - 0.6 cm Ø, green, sometimes paler, fawn tinged; leaf blade (1.5 -) 2 - 6 (- 6.5) cm long, (1 -) 1.5 - 3 (- 3.2) cm wide, broadly ovate, ovate to oblong ovate, apiculate at apex, green above, paler beneath. Inflorescence (8 -) 10 - 22 cm long; raceme (3 -) 5 - 14 cm tall, 30 - 50 (- 60)-flowered; peduncle 5 - 8 cm long. Sterile bracts about 3 - 6, 2 - 35 mm long, 1.5 - 2 mm wide. Floral bracts 1.2 - 2 mm long, 0.6 - 1.3 mm wide. Ovary 0.6 - 1.5 mm long, 0.4 - 0.8 mm Ø; pedicel 0.4 - 1 (- 2) mm long, 0.2 - 0.4 mm Ø; sinuate, green. Flowers 5 - 5.2 mm long, ca. 4 mm wide; white and green, tinged with red or brown, to dark purple, lip yellowish to whole mauve to purple. Dorsal sepal 2.5 - 3 mm long, 1.2 - 1.4 mm wide, erect, oblong ovate to oblong. Lateral sepals 2.1 - 2.4 mm long, 1.4 - 1.6 mm wide. Petals 2.6 - 2.8 mm long, 0.7 - 0.8 mm wide, external margin delicately ciliate. Lip (1.5 -) 1.7 - 1.8 mm long, 2.2 - 2.5 mm wide, broader than long, reaching out about 2/3 - 3/4 length of lateral sepals; lamina nearly octagonal in outline; basal auricles well developed, often with involuted edges; the middle part of lamina broadly, slightly depressed, characteristic convexities - 2 pubescent, symmetrical, reniform cushions - reaching out of down edges of basal auricles of lip; distal margins of lamina nearly truncate, with round apex at the middle part. Gynostemium 1.1 - 1.4 mm



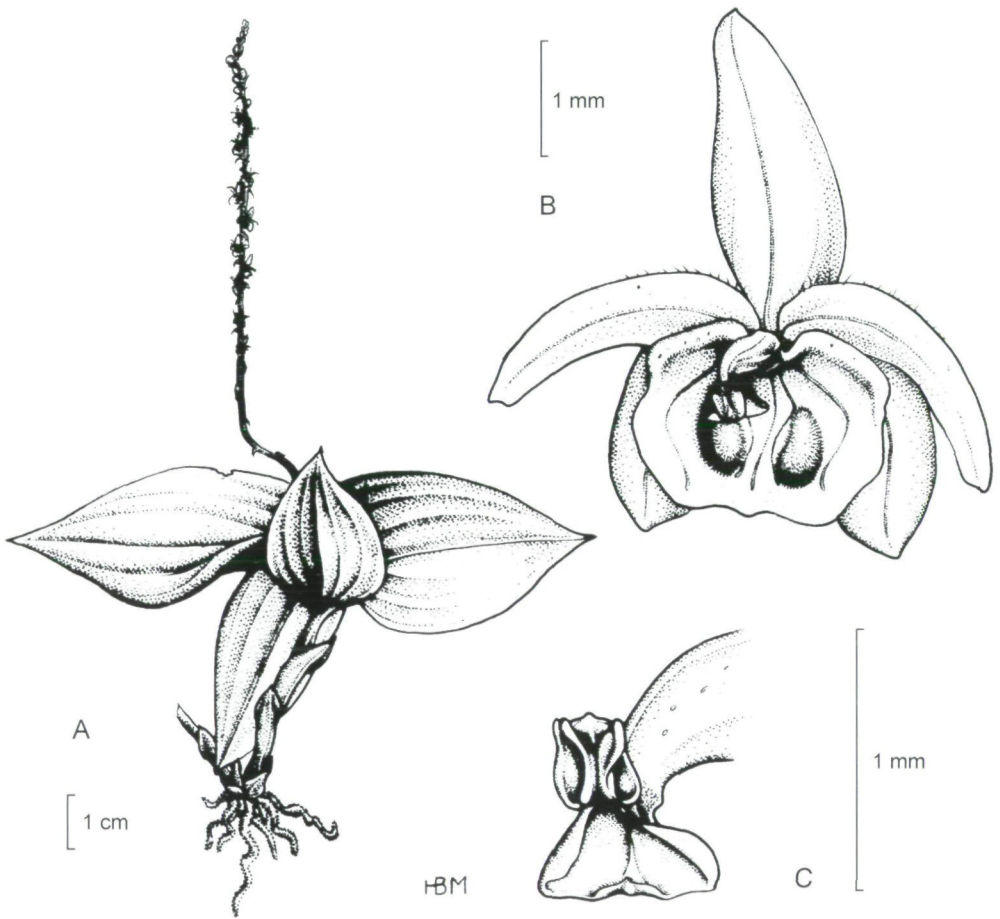


Fig. 3: *O. micrantha* SUMMERH. a: plant. b: flower. c: apical part of gynostemium, with deflexed anther (drawn from isotype - BM).

long; column 0.4 - 0.5 mm wide at base; rostellum 0.7 - 0.8 mm long, 0.4 - 0.5 mm wide, transversely flabellate, basal edge narrowly incurved; stigma in widely opened, deep pocket; anther 0.4 - 0.5 mm long, 0.45 - 0.5 mm wide, 0.25 - 0.3 mm high, slightly hexagonal; loculi well separated from each other. Fruit 4.5 - 6 mm long, 23 - 5 mm Ø.

Specimens: CAMEROUN: Ekuk, Hugelland, 22 km E of Bezurk, Ebolowa, end of 06.1911, Milbred 5733 [K: paratype - icon!]. – Lolodarf, Mt. Finde, 15.06.1918., E. Annet 312 [P!]. – Hermans pres Lolodarf, 15.06.1918., E. Annet 312 [P!]; E. Annet 366 [P!].

Ecology: Terrestrial; in leaf litter, in forests. Alt.: 450 - 1800m.

Note: STANFORD (mscr.) mentioned that petals of the species have ciliolate margins. The cilia are very thin and delicate. Therefore, sometimes in worse preserved (dry or even conserved in liquid) materials ciliation can be hardly visible.



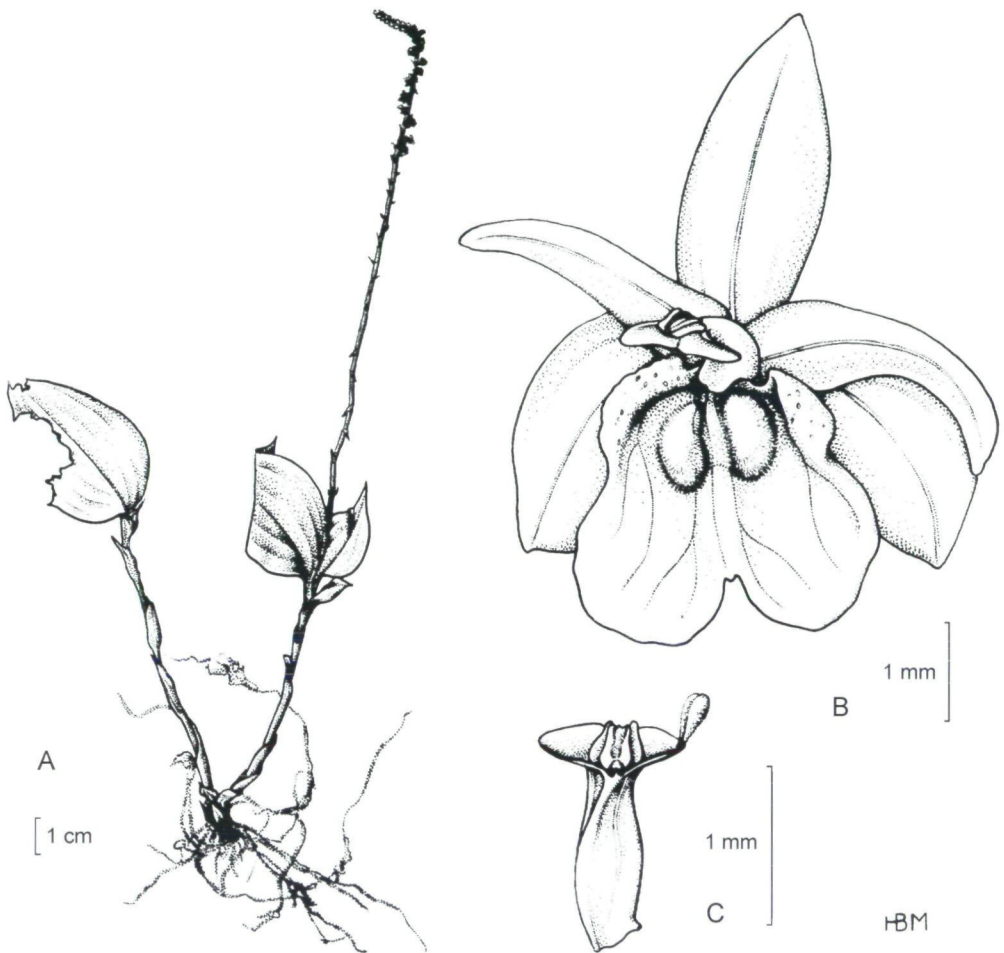


Fig. 4: *O. stelidostachya* (RCHB.f.) SUMMERH. a: plant. b: flower. c: gynostemium back view (drawn from holotype - K).

***Orestias stelidostachya* (RCHB.f.) SUMMERH., Kew Bull. 1937: 460 (1937).**

≡ *Microstylis stelidostachya* RCHB.f., Otia Bot. Hamburg, 2: 118 (1881).

≡ *Malaxis stelidostachya* (RCHB.f.) KUNTZE, Rev. Gen. 673 (1891).

Type: Islands of Principe and Sao Tome, 1861, Mann 1151 [holo: K!, iso: W Rchb. Orch.-26368, icon.!].

Plants (10 -) 15 - 25 (- 28) cm tall, few to many compactly clustered. Rhizome few mm long between shoots, 1.8 - 3.6 mm  $\varnothing$ , sometimes branched, node scales loose. Leafy stem (4 -) 6 - 10 (- 12) cm long, (0.13 -) 0.2 - 0.26 (- 0.3) cm  $\varnothing$ ; basal scales 1.6 - 2.8 cm long, 0.2 - 0.55 cm  $\varnothing$ . Leaves (2 -) 3 (- 4); leaf petiole (0.2 -) 0.4 - 0.8 (- 1.4) cm long, (0.3 -) 0.4 - 0.5 (- 0.65) cm wide when spread; leaf sheath (0.6 -) 1 - 2 (- 2.8) cm

long, (0.15 -) 0.3 - 0.4 (- 0.5) cm Ø, green, sometimes fawn tinged; leaf blade (2.8 -) 5.5 - 6.5 (- 7) cm long, (2.4 -) 3 - 4 (- 5) cm wide, broadly ovate, ovate to oblong ovate, apiculate at apex, green above, paler beneath. Inflorescence (6 -) 9 - 16 cm long; raceme (3 -) 4 - 8 (- 10) cm tall, 10 - 40-flowered; peduncle (3 -) 5 - 6 (- 7) cm long. Sterile bracts about 3 - 6, 4.6 - 6.5 mm long, 1.8 - 2.6 mm wide. Floral bracts 1.8 - 4.5 mm long, 0.8 - 1.7 mm wide. Ovary 1.5 - 3.6 mm long, 0.4 - 0.65 mm Ø; pedicel 2 - 3 mm long, 0.3 - 0.5 mm Ø; sinuate, green. Flowers (5.6 -) 6 - 7.2 mm Ø; white and green tinged with red or brown, to purple-red (particularly lip with intensively coloured spot). Dorsal sepal 3.8 - 4.2 mm long, (1.8 -) 2 - 2.6 mm wide, erect, oblong ovate to oblong. Lateral sepals 2.8 - 3.2 mm long, (1.8 -) 2 - 2.4 mm wide. Petals (3.3 -) 3.5 - 4 mm long, (1.2 -) 1.4 - 1.5 mm wide. Lip 2.7 - 3.3 mm long, 2.4 - 3 mm wide, longer than broader and than lateral sepals length; lamina peariform in outline; basal auricles often with involute edges; the middle part of lamina broadly depressed, just below the lip base with characteristic convexities - 2 pubescent, symmetrical cushions - each of them reniform, with dark and intensively coloured spot; lamina at distal margins deeply cleft, each sublobe obliquely truncate, with minute apiculate apex between them. Gynostemium 1.2 - 1.8 mm long; column 0.4 - 0.6 mm wide at base; rostellum 0.75 - 0.9 mm long, 0.25 - 0.32 mm wide, transversely flabellate to fishfin-like with gently indentation at the middle of distal margin, basal edge narrowly incurved; stigma in widely opened, narrow, deep pocket; anther 0.25 - 0.3 mm long, 0.32 - 0.4 mm wide, 0.25 - 0.3 mm high, trapezoid, the distal edge shorter; loculi distinctly separated from each other. Fruit 5.8 - 7.8 mm long, 3.5 - 5.6 mm Ø.

Specimens: ISLANDS OF PRINCIPE AND SAO TOME: Sao Tome: Vanhulst, Macambrara, 08.11.1932, A.W. Exell 314 [BD, BM!, BR, COI, K!]. – between Macambrara a Zampalma, A. Brune ST 65 [BR!, K!]. – Calvario, 09.11. 1932, A.W. Exell 319 [BM!]; 00° 16' N 06°34' E, 14.08.1997, T. Stevart TS 36, field label 27 [BR!, K!].

Ecology: Terrestrial; in leaf litter; in primary humid lowlands forest, amongst minute mosses; in primary, dense humid, mountain forest; sometimes between *Cyperus papyrus*; also found in secondary forest on ancient plantations. Alt.: 200 - 1550m.

Note: Similarly to *O. elegans* flowers colour probably depends on intensity of light at locality. Flowers of plants growing in lighter places were darker and more intensively coloured.

Amongst all species of the genus *O. stelidostachya* is characterized by the largest lip, longer than wide, peariform in outline, with deep and distinct cleft at distal margin. Pubescent convexities of lip are placed near its base (weakly reaching out of ends of lip lateral auricles), lip usually completely covering the lateral sepals, as well.

### ***Orestias cardiophylla* (RCHB.f.) MARG., comb.n.**

≡ *Microstylis cardiophylla* RCHB.f., Flora 58: 543 (1885).

≡ *Malaxis cardiophylla* (RCHB.f.) KUNTZE, Rev. Gen. 673 (1891).

Type: Mascarenas, Comoro Islands, L. Humblot 437 [holo: W Rchb. Orch. 40906!, iso: BM 000088116!].

Plants (8 -) 10 - 20 cm tall, few compactly clustered. Rhizome few mm long between shoots, 1 - 2 mm Ø, sometimes branched, node scales loose. Leafy stem (4 -) 5 - 10 cm long, (0.1 -) 0.15 - 0.24 (- 0.28) cm Ø; basal scales 0.6 - 1.5 cm long, 0.12 - 0.35 cm Ø.

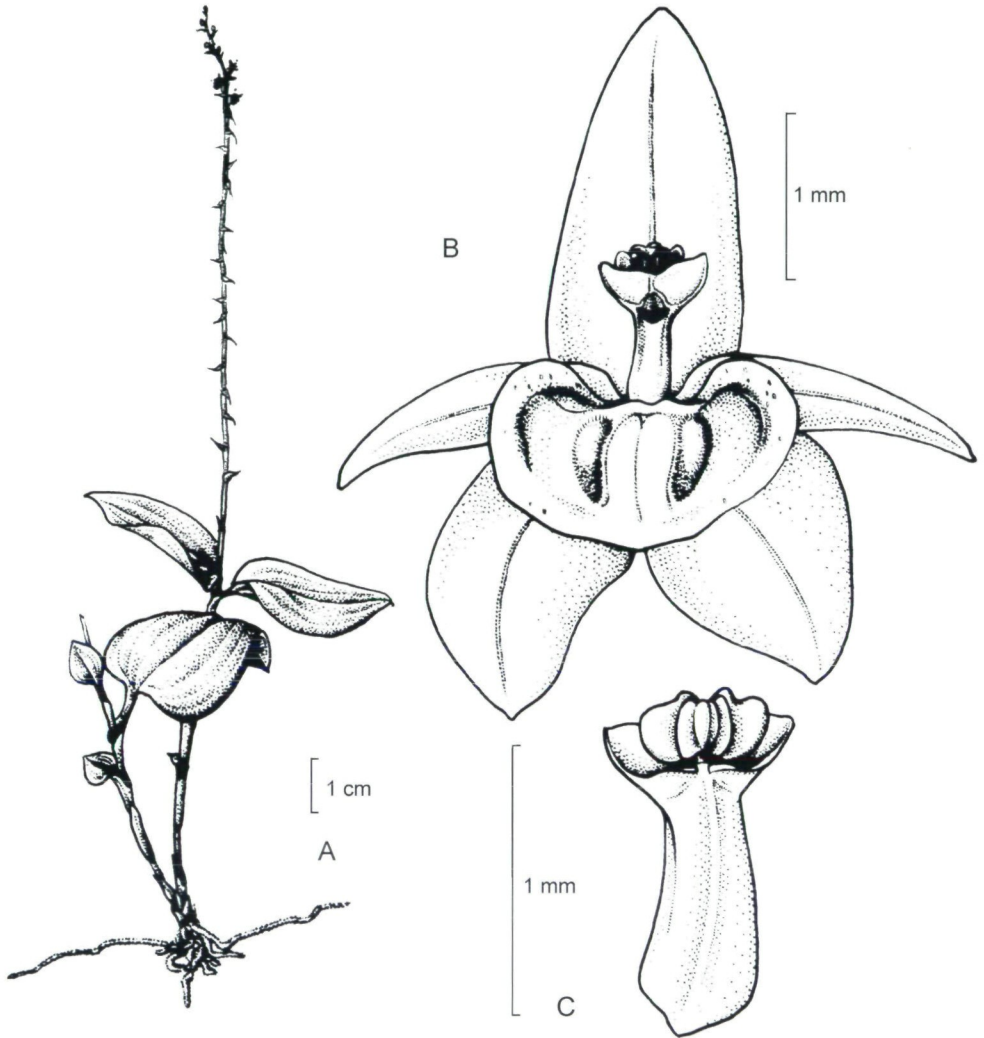


Fig. 5: *O. cardiophylla* (RCHB.f.) MARG. a: plant. b: flower. c: gynostemium back view (drawn from holotype - W).

Leaves 2 - 3 (- 4); leaf petiole (0.15 -) 0.25 - 0.6 (- 0.8) cm long, (0.2 -) 0.35 - 0.45 (- 0.5) cm wide when spread; leaf sheath (0.3 -) 0.5 - 0.8 (- 1) cm long, (0.15 -) 0.25 - 0.3 (- 0.4) cm  $\varnothing$ , green, sometimes paler, fawn tinged; leaf blade (1 -) 2 - 3 (- 3.5) cm long, (0.8 -) 1.8 - 2.7 (- 3) cm wide, cordate, broadly ovate to ovate, apiculate at the apex, green above, paler beneath. Inflorescence (4 -) 5 - 10 (- 12) cm long; raceme (3 -) 5 - 8 (- 9) cm tall, 15 - 25-flowered; peduncle (1 -) 1.2 - 2 cm long. Sterile bracts about 4 - 7, 3.5 - 4.6 mm long, 1.7 - 2.3 mm wide. Floral bracts 1 - 3.5 mm long, 0.6 - 1.4 mm wide. Ovary 1.5 - 2.2 mm long, 0.5 - 0.8 mm  $\varnothing$ ; pedicel 1.5 - 2 mm long, 0.3 - 0.4 mm  $\varnothing$ ; sinuate, green. Flowers 4.5 - 5 mm long, 4 - 4.5 mm wide; white and green, tinged

with red to purple. Dorsal sepal 2.8 - 3 mm long, 0.9 - 1 mm wide, erect, oblong ovate to oblong. Lateral sepals 2.5 - 2.7 mm long, 1 - 1.2 mm wide. Petals 2.8 - 3 mm long, 0.6 - 0.7 mm wide. Lip 1.2 - 1.5 mm long, 1.8 - 2 mm wide, broader than long, reaching out only about 1/2 length of lateral sepals; lamina broadly cordate in outline; basal auricles softly turning into distal margin of lamina, often with slightly involuted edges; the middle part of lamina softly and broadly depressed, just below of the lip base characteristic convexities - 2 pubescent, symmetrical and oblong reniform cushions; lamina at distal margin distinctly connivent into apiculate apex. Gynostemium 1 - 1.2 mm long; column 0.3 - 0.4 mm wide at base; rostellum 0.7 - 0.8 mm long, 0.4 - 0.5 mm wide, fishfin-like with gently indentation at middle of distal margin, basal edge narrowly incurved; stigma in widely opened, deep pocket; anther ca. 0.5 mm long, ca. 0.6 mm wide, ca. 0.2 mm high, broadly trapezoid, the distal edge longer; loculi well separate from each other.

Distribution: Comoro islands - no specimens seen except the type.

Ecology: Terrestrial; in leaf litter, in forest. Alt.: unknown.

Note: With no doubt, the lip and gynostemium structure indicate the close affinity of this species with other members of *Orestias*. *O. cardiophylla* is characterized by lip being relatively small in proportion to the tepals the smallest, pentagonal in outline (nearly broadly cordate), with pubescent convexities placed near its base (weakly reaching out of ends of lip lateral auricles), lip is about twice shorter than lateral lobes.

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