



# Novitates Gabonenses 73. A new species of *Anthocleista* (Gentianaceae) from Gabon

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## Key words

Africa  
*Anthocleista*  
Gabon  
Gentianaceae  
Neotropics  
*Potalia*  
*Potalieae*  
taxonomy

**Abstract** *Anthocleista potalioides*, a new narrowly endemic species of the Chaillu Mountains in Gabon is described and illustrated. Its taxonomic position among the known African species is discussed. It stands apart by a small 8-merous corolla and a 2-locular ovary. Remarks on the affinities of the African genus *Anthocleista* and *Potalia* from tropical America are presented.

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## INTRODUCTION

Fieldwork carried out by me in 1991 in the Chaillu Massif in Gabon yielded a species of *Anthocleista* R.Br. that did not match any species included in Leeuwenberg's (1961) authoritative monograph dealing with the 14 known species of the genus distributed in tropical Africa, Madagascar and the Comores. The collected material, thereupon, was handed to Dr. A.J.M. Leeuwenberg, who confirmed that it was a new species and he would willingly describe it. Next, Ms Yuen Fang Tan prepared a drawing of it, with details of the flowers. However, after Leeuwenberg's retirement in 1995 the species still had to be published.

Eventually I decided to publish the new species myself. After careful examination the ovaries turned out to be 2-celled, a character state not fitting Leeuwenberg's (1961) and Leeuwenberg & Leenhouts' (1980) 4-celled concept of *Anthocleista*. Furthermore, the dimensions of the small flowers of the new species, with corollas not exceeding 15 mm long, did not fit Leeuwenberg's (1961) descriptions of existing African species, since such small corollas have until now been characteristic only for the species confined to Madagascar.

**Table 1** Additional *Potalia* and *Anthocleista* species of which flowers were analyzed.

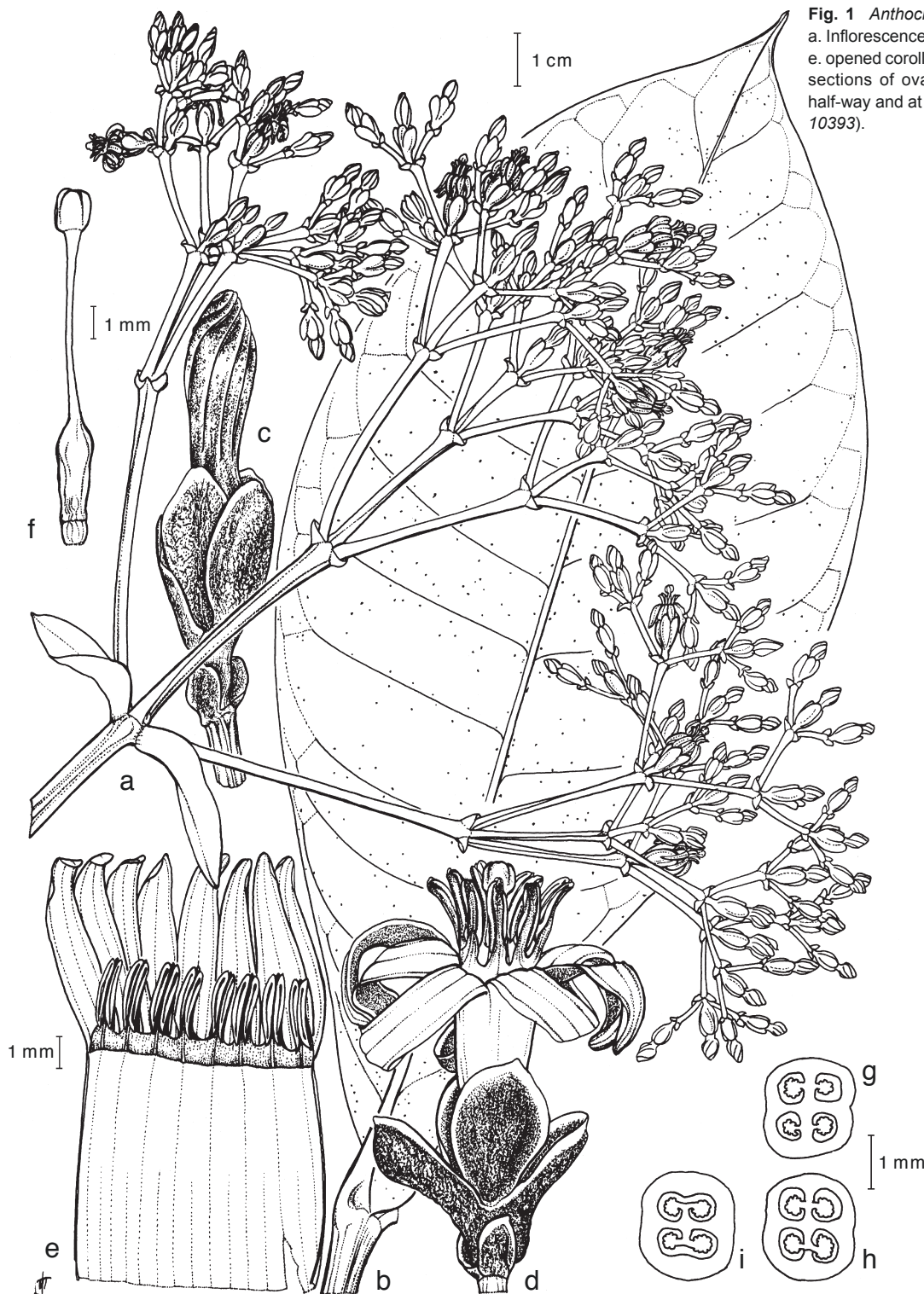
Species	Collector and number
<i>P. amara</i> Aubl.	<i>C. Feuillet</i> 10.090 (WAG) <i>Granville et al.</i> 6226 (U) <i>P. Maas et al.</i> 2186 (U)
<i>P. coronata</i> Struwe & V.A.Albert	<i>Prance et al.</i> 24.099 (WAG)
<i>P. resinifera</i> Mart.	<i>Palacios &amp; Neill</i> 745 (MO, WAG)
<i>A. djalensis</i> A.Chev.	<i>Aké Assi</i> 5412 (WAG) <i>Leeuwenberg</i> 3316 (WAG)
<i>A. microphylla</i> Wernham	<i>J.J. de Wilde et al.</i> 21 (WAG)
<i>A. nobilis</i> G.Don	<i>Oldeman</i> 992 (WAG)
<i>A. obanensis</i> Wernham	<i>Bos</i> 5800 (WAG)

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At this point it was questioned if, indeed, the new species belonged to *Anthocleista* or if it would be better accommodated in the neotropical genus *Potalia* Aubl., which is characterized by predominantly 2-celled ovaries. Fortunately, Struwe & Albert (2004) monographed *Potalia*. Moreover, these authors also considered combining the two taxa, but found morphological and molecular evidence for keeping the two sister genera separate. A recent study of phylogenetic patterns in *Potalia* supported this notion (Frasier et al. 2008).

In quest for the correct taxonomic position of the new species the following observations and considerations were evaluated:

1. The partition of the ovary, viz. completely 4-celled in *Anthocleista* as mentioned by Leeuwenberg (1961, 1972) and Leeuwenberg & Leenhouts (1980) and 2-celled (indistinctly 4-celled at the base) in *Potalia* as noticed by Struwe & Albert (2004) is not a reliable character to segregate these taxa. As in all gentians both genera are bicarpellate, their ovaries as a rule bilocular. They differ, however, in the amount of fusion of the carpels and in the development of the placental tissue. Examination of transverse sections of ovaries of flowers at anthesis of *Potalia* species (Table 1) showed they are bilocular with a thin septum and apparently axile placentation. The septum here seems spurious, the partition formed by basically parietal placentas that develop septiform, fuse in the centre and are not much developed otherwise, thin, simple, not inrolled and each bearing relatively few (c. 10) ovules. This is in conformity to the findings of, among others, Van Raalte (1932) and Struwe & Albert (2004). The last authors already hinted at a parietal origin of this septum. In contrast, *Anthocleista* species (Table 1) show a much more robust dissepiment, pointing to a carpellary origin, and in each of the two locules a well developed extended placenta sprouts from the central axis. In most *Anthocleista* species this placenta is bifurcating before reaching the ovary-wall, with the branches usually elongating and sometimes even bifurcating again, coiled and on the outside covered with a multitude of ovules. At the first bifurcation, where the placenta branches separate, often secondarily some tissue is produced which fuses the placenta to the ovary wall, giving



**Fig. 1** *Anthocleista potalioides* J.J.de Wilde. a. Inflorescence; b. leaf; c. flower bud; d. flower; e. opened corolla; f. gynoecium; g–i. transverse sections of ovary, respectively near the top, half-way and at the base (all: De Wilde & Sosef 10393).

rise to a secondarily derived 4-celled ovary. This probably led the authors, mentioned above, to the opinion that the ovary in *Anthocleista* is 4-celled. The new species, considered here, shows this secondary fusion only at the bottom of the ovary, leaving a major part of the ovary-cavity 2-locular. Otherwise, however, the characters of the ovary and the placentation are those of *Anthocleista*.

2. In *Anthocleista* (including the new species) the flowers have, without exception, patent and often even recurved corolla lobes at anthesis. As a consequence, the stamens, and in particular the anthers, are exserted from the corolla mouth. In *Potalia* on the other hand, the corolla lobes are erect or at most slightly spreading at anthesis, the stamens included in the corolla mouth, and their anthers are less exserted from the mouth.

3. In flowers of *Potalia* species the gynoecium presents itself like a broadly stalked globule or cylinder topped by a thread-like style with capitate stigma. Surprisingly, upon examination the swollen globose part consists of solid sterile tissue and only the stalk underneath contains the 2-celled ovary. This phenomenon is, among others, already noticed by Van Raalte (1932), Bruce (1955) and Leeuwenberg & Leenhouts (1980) who respectively describe the style: “at its base enlarged into a globe”, “with a large, sterile, globular structure between the style-base and the ovary” and “ventricose at the base”. Struwe & Albert (2004) merely mention the ovary has a sterile upper part. The thickened, sterile ovary apex is never found in *Anthocleista* species, where the most expanded part of the gynoecium always represents the true ovary with its locules.

Summarizing: the orientation of the corolla lobes is spreading to reflexed in *Anthocleista* and erect in *Potalia*; in *Anthocleista* the most expanded part of the gynoecium always contains the loculed ovary, while in *Potalia* a similar globose or cylindrical structure consists of solid sterile tissue on top of the narrower ovary; the origin of the locular septum is carpellary in *Anthocleista* while in *Potalia* the septum is placental and secondarily derived.

The observations agree with a sister group relationship between a monophyletic African-Malagasy genus *Anthocleista* and a neotropical genus *Potalia* as recently reconfirmed by Frasier et al. (2008). In view of this the new species described hereafter unambiguously should be accommodated in the genus *Anthocleista*.

## DESCRIPTION

### *Anthocleista potalioides* J.J.de Wilde, sp. nov. — Fig. 1

Species unica inter species continentale-africanas *Anthocleista* combinatione habitus fruticosi cum floribus parvis corolla 8-mera ad 15 mm longa et ovario perspicue 2-loculari. — Typus: J.J. de Wilde & Sosef 10393 (holo WAG; iso LBV), Gabon, Ngounié Prov., Chaillu massif, 46 km on the road Mouila–Yéno, c. 1°43'S, 11°22'E, 6 Feb. 1991.

Shrub, up to 3 m high, glabrous and without spines, stems quadrangular when young, terete later, below inflorescences 3–5 mm diam. Leaves not crowded at the apex of the twigs, those of a pair subequal, sessile; blade thick leathery, soft, in vivo bright green above, much paler green, almost whitish beneath, obovate, 26–35 by 11–15 cm; apex shortly acuminate to apiculate; lower part of the blade attenuate, the base auriculate, amplexicaul; margin entire, narrowly revolute; costa shallowly impressed above, very prominent and acutely triangular beneath, in sicco dark brown, contrasting with the pale lamina; main secondary nerves 9–12 on either side, (sub)opposite or not, arcuate to almost straight in the lower part of the blade, distinct especially on lower surface; tertiary venation inconspicuous. Inflorescences terminal, more or less erect, dichasial, usually 5× branched and with many opened flowers at a time, 15–20 cm long, up to 25 cm wide, usually broader than long; branches straight, those of the first order elongated, 5.5–9 cm long, branches of higher order becoming shorter, all branches and also the pedicels very gradually thickening upwards; lower bracts sometimes markedly leafy, oblong, up to 10 by 4 cm, bracts of higher orders much smaller, broadly triangular to ovate, c. 2 by 1.8 mm. Flowers subtended by a pair of bracteoles, in shape and dimensions comparable to the higher bracts. Sepals 4, green, paler at edge, connate at the base, concave, decussate, the 2 outer ones oblong to obovate, obtuse at the apex, 6–7 by 3–4.5 mm, the inner ones slightly smaller, c. 5.5 by 3.5 mm. Corolla actinomorphic, tubular, 8-, exceptionally 7-merous, in bud tapering towards the apex; at anthesis pale yellowish green to white; the tube cylindrical, slightly widened towards the throat, 6–8 mm long, 3–4 mm wide at the base and 4–5 mm where the lobes become free at the throat; lobes (7–)8, contorted and narrowly overlapping in bud, reflexed at anthesis, narrowly ovate to elliptic, 6–7 by 1.8–2 mm. Stamens (7–)8, alternating with the corolla lobes, exerted from the corolla mouth; the filaments short and completely connate into a c. 1 mm long tube inserted near the apex of the corolla tube; anthers exposed, narrowly oblong, c. 2 by 0.8 mm, blunt at apex, devoid of a sterile apical appendage, shortly sagittate at the base, the 2 cells parallel, only divergent at the base, each cell longitudinally dehiscent by a split. Gynoecium cream, bicarpellate; ovary obovoid-cylindrical, 3–4 by 1–1.5

mm, narrowing towards the base and sitting on a longitudinally shallowly grooved c. 1 mm long massive gynophore, 2-celled; placentation axile with in each cell from the centre of the septum a bilobed placenta with the lobes inrolled and multi-ovulate; style 4–7 mm long, filiform; stigma capitate, globose, shallowly bilobed at apex, c. 1–1.5 mm diam. Fruit not known.

Distribution — Only known from the Chaillu Massif in southern Gabon.

Habitat & Ecology — The type specimen was found growing in half-shade, on a large decaying log jammed among boulders in a fast streaming rather narrow creek in closed high forest. The collector expressed the possibility of an epiphytic origin. Also reported from marshland along small river. Altitude 450 m. Flowering: February.

*Additional material.* GABON, Ngounié Prov., Chaillu Massif, along road Mouila–Yéno, 1°43'S, 11°19'E, Dessein, Janssens, Lachenaud, Nzabi & Issembe 2020 (BR!), 20 Feb. 2008.

## KEY TO ACCOMMODATE ANTHOCLEISTA POTALIOIDES AMONG ITS CONTINENTAL CONGENERS

The new taxon can be included in Leeuwenberg's (1961) key to the species of African *Anthocleista* by changing the second couplet and by inserting an additional couplet 2bis. The key then runs as follows:

1. Sepals acuminate and keeled. Equatorial Guinea . . . . . *A. laxiflora*
1. Sepals rounded, not keeled . . . . . 2
2. Corolla violet or violet-blue; lobes in mature corolla bud broadly overlapping. — Madagascar . . . . . 3
2. Corolla creamy or white; lobes in mature corolla bud narrowly overlapping. — African continent and Comores, not on Madagascar . . . . . 2bis
- 2bis. Total length of corolla up to 15 mm long *A. potalioides*
- 2bis. Corolla larger, usually more than 25 mm long . . . . . 5

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