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Abstract: A new species of Violaceae, Decorsella arborea Jongkind, is described and illustrated. The new species differs from the only other species in the genus, D. paradoxa A. Chev., by the larger size of the plants, smaller leaves, more slender flowers, and stamen filaments that are free for a much larger part. Both species are from the Guineo-Congolian forest of tropical Africa. The differences between Decorsella and Rinorea are discussed. Confirming recent reports, some species of Rinorea can have zygomorphic flowers and some of these can be almost equal in shape to Decorsella flowers.

Key words: Violaceae, Decorsella, Rinorea, Africa, tropical forest

Introduction

The genus Decorsella A. Chev. (Violaceae) is restricted to the Guineo-Congolian region in tropical Africa and was, until now, represented only by D. paradoxa A. Chev. When flowering, Decorsella at first sight resembles Rinorea Aubl., a genus with many species in the Guineo-Congolian forests, because several Rinorea species have almost similar zygomorphic flowers. However, the fruit of Decorsella is not a capsule as in Rinorea. Instead, the ovary of Decorsella dehisces shortly after fertilization, with each seed developing a fleshy testa and resembling an orange berry at maturity (Fig. 1). Keay (1953: 75–77) tried to capture this character in the genus name Gymnorinorea Keay, a name that became a synonym of the earlier-published Decorsella. According to Ballard & al. (2014: 304), the ovary wall of Decorsella disintegrates shortly after fertilization, leaving the placental traces behind. The status of Decorsella as a distinct genus was recently confirmed when many genera and species in the Violaceae worldwide were compared in molecular phylogenetic studies (Tokuoka 2008; Wahlert & al. 2014).

At first, Decorsella paradoxa was known only from Liberia, Ivory Coast and Ghana (Keay 1953: 76). Later, a comparatively small number of plants from Lower Guinea (sensu White 1979) were also identified as belonging to this species (Sosef & al. 2006). While these Upper and Lower Guinean plants all undoubtedly represent Decorsella, there are also conspicuous differences between them. The Lower Guinean plants are larger, the flowers are more slender, the sepals are smaller, also compared to the petals, and the free part of the stamen filament is longer (Table 1, Fig. 2). In this publication, these differences are illustrated and the plants from Lower Guinea are described as D. arborea Jongkind, sp. nov. After this, D. paradoxa will again be endemic to Upper Guinea (sensu White 1979).
Material and methods

The comparison of the two Decorsella species was based on dried and pickled herbarium specimens kept at the BR, P and WAG herbaria (herbarium codes according to Thiers 2017+). Decorsella paradoxa was studied and collected by the author in the forest in Liberia.

Results and Discussion

Decorsella versus Rinorea

When flowering it is difficult to separate Decorsella from Rinorea. In several earlier publications all Rinorea species are said to have actinomorphic flowers (Munzinger & Ballard 2003: 346, 350; Tokuoka 2008: 258). Most illustrations and photographs from Rinorea indeed show more or less actinomorphic flowers. This character would make it easy to separate this genus from the zygomorphic-flowered Decorsella. However, more recent reports have documented a zygomorphic corolla in the Latin American Rinorea zygomorpha H. E. Ballard & Wahlert (Wahlert & Ballard 2009) and also in a few African species of Rinorea (Wahlert & Ballard 2012). The zygomorphic corollas of R. longicuspis Engl. and of R. gabonensis Engl. (Fig. 4 & 5) also show without doubt that Rinorea flowers can in some species be conspicuously zygomorphic and, in the case of R. longicuspis, almost equal to Decorsella. With its diadelphous stamens, R. calcicola Velzen & Wieringa shows that the androecium in certain species of Rinorea can also be zygomorphic (van Velzen & Wieringa 2014). Decorsella still differs in flower bud from all African Rinorea species in the shape of the anterior petal. While in the bud stage, the anterior petal in Decorsella is hooded at the apex and covers the tips of the other petals. However, this character is shared by the Latin American R. zygomorpha (Ballard, pers. comm.). The number of ovules in Decorsella is much larger than in Rinorea, especially compared to Rinorea from Africa. African Rinorea species have, as far as known, 3 or 6 ovules per ovary (Wahlert & Ballard 2012; van Velzen & al. 2015).

Decorsella arborea Jongkind, sp. nov. – Fig. 2A–N. Holotype: Gabon, Ngounié, Missionary Station at Mouya-nama, waterfall above the Missionary station, 610 m, fl., 9 Feb 1983, de Wilde, Arens, Louis, Karper & Bouman 469 (WAG + in alcohol!; isotypes: AAU, BR!, C, K!, LBV, MA, MO, P!, PRE, SRGH).

Diagnosis — Decorsella arborea differs from D. paradoxa by its larger size, smaller leaves and more slender flowers with smaller sepals and with a longer free part of the stamen filaments (Table 1).

Description — Large shrub or tree (5–)12–25 m tall; trunk to 30 cm in diam.; twigs smooth, glabrous. Leaves alternate; stipules early caducous; petiole 6–9 mm long, channelled adaxially; leaf blade elliptic, 8–17 × 3–6 cm, smooth, glabrous, base cuneate, margin bearing lignified teeth, apex acuminate; midrib prominent on both surfaces; lateral veins in 4–10 pairs. Inflorescence axillary, thyrsoid, to 3 cm long, glabrous, with up to 17 flowers; bracts ovate, c. 1 mm long. Flowers yellow and reddish; pedicel above joint 3–7 mm long. Sepals 5, orbicular to ovate, concave, c. 3 mm in diam., glabrous. Corolla zygomorphic, glabrous; 2 upper and 2 lateral petals c. 10 × 2.5 mm, lower (anterior) petal c. 12 × 2.5–4 mm, widening distally and emarginate at apex, in bud apex of lower petal covers apexes of other petals. Stamens 5; staminal tube undulate, with a few small trichomes on edge; fila-

Table 1. Morphological differences between Decorsella arborea and D. paradoxa.

| Plant height | Leaf blade dimensions | Sepals diameter | Lateral petals dimensions | Stamens          |
|--------------|-----------------------|-----------------|---------------------------|------------------|
| **Decorsella arborea** | (5–)12–25 m | 8–17 × 3–6 cm | c. 3 mm | c. 10 × 2 mm | free part of filaments c. 1.5 mm long |
| **Decorsella paradoxa** | 1.5–6 m | 11–23 × 3–8.5 cm | c. 5 mm | c. 10 × 3.5–4 mm | anthers almost sessile on staminal tube |
Fig. 2. Decorsella arborea (A–N) and D. paradoxa (O–W). – A: branch with inflorescences; B: leaf base and petiole; C: leaf margin from below with lignified tooth; D, E, F: flower from different sides; G: sepals from inside; H: lateral petals, inside; I: upper petals, inside; J: lower (anterior) petal, inside; K: lower (anterior) petal, outside; L: androecium, showing staminal tube with free, undulate edge; M: androecium, inside; N: ovary and style. – O, P: flowers from different sides; Q: sepals from inside; R: lateral petals, inside; S: upper petals, inside; T: lower (anterior) petal, inside; U: androecium; V: androecium from inside; W: ovary and style. – A–N from de Wilde & al. 469 (WAG); O–W from Jongkind & al. 6270 (WAG). – Drawing by Hans de Vries.
ments c. 3 mm long, fused for c. ½ their length, free part inserted high on inner side of staminal tube, flattened, c. 1.5 mm long, glabrous; anthers 1.5–2 mm long, thecae vertical; connective scales ovate, c. 3.5 × 2.5 mm. Gynoecium flask-shaped, glabrous; ovary superior, 1-locular, dehiscing after fertilization, dividing into 3 rounded lobes; placenta parietal; ovules numerous per carpel; style single, c. 4 mm long. Fruit and seeds known only in immature, green state.

**Distribution and ecology** — Undergrowth of lowland forest in Lower Guinea (sensu White 1979) (Fig. 3).

**Conservation status** — Data deficient (DD). The new species is (or was) clearly relatively widespread and, being an understorey tree, it is probably undercollected. It could be threatened if the forest where it grows is disappearing on a large scale, but I have not enough data to support this.

**Etymology** — The specific epithet *arborea* refers to the more robust habit of the new species compared to *Decorsella paradoxa*.

**Remarks** — Between the two species of *Decorsella* there is a gap of c. 1500 km. The *Decorsella* specimen that was sampled as representative of the genus by Tokuoka (2008) and later used also by Wahlert & al. (2014) was *de Wilde & al. 495* (MO), a specimen here included in *D. arborea*. In the line drawing with the two *Decorsella* species (Fig. 2), only the lower petal of *D. arborea* shows an emarginate apex. The illustration of *D. paradoxa* published by Key (1953: 77) suggests that the lower petal of the other *Decorsella* species can also be emarginate.

**Additional specimens examined** — CAMEROON: SOUTH PROVINCE: Campo-Ma’an area, Eladianeyong, fr., 24 May 2002, Elad, Tchouto Mbatchou, Ekwdi & Nnangah 1564 (WAG); ibid., fr., 16 Jan 2002, Tchouto Mbatchou, Elad & Nnangah 5a (WAG). — GABON: NGOUNIE: Mimongo, fl., 4 Jul 1926, Le Testu 5985 (BR, P, WAG); Région de Mouila, Pongui Essouma, fl., 16 Mar 1927, Le Testu 6419 (BR, P, WAG); 13 km along road from Mimongo to Koualamoutou, fl., 10 Feb 1983, de Wilde, Arends, Louis, Karper & Bouman 495 (BR, WAG).

**Fig. 3.** Distribution map of *Decorsella paradoxa* (circles) and *D. arborea* (triangles).

**Fig. 4.** *Rinorea longicuspis* showing zygomorphic flowers with longest (anterior) petal ending straight and flat. — Photographed by Carel Jongkind in Liberia from Jongkind & al. 9192.

**Fig. 5.** *Rinorea gabonensis* with four petals reflexed and anterior petal erect. — Photographed by Ehoarn Bidault in Gabon from Bidault 784.
C, MO, P, WAG). Ogooué-Lolo: Région de Lastoursville, fl., 17 Feb 1930, Le Testu 7925 (BR, P); Région de Lastoursville, Bangoussou, fl., 31 Mar 1931, Le Testu 8714 (P); Région de Lastoursville, Poupa, fl., 27 May 1931, Le Testu 8832 (BR, P, WAG).

Nyanga: Doudou Mountains Reserve, c. 20 km à O.S.O. de Dousala, 655 m, fr., 30 May 2000, Sosef 1586 (LBV).

Congo Brazzaville: Mayombe, Kouilou, chantier forestier S.B.B. Makaba, fl., 11 Jun 1971, Sita 3129 (BR, P); District de Mayoko, Niari, versant Est du Mont Likoumou, fl., 8 Mar 1973, Sita 3497 (P, WAG); Région de Mayombe, chantier forestier Aubreville, fl., 15 Mar 1973, Sita 3540 (P).

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