

Cola baldwinii (Malvaceae: Sterculioideae), a new forest tree species from Liberia, Sierra Leone and Guinée

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Background and aims – While working on forest inventories in Guinée and Liberia a fruiting *Cola* tree was collected that initially could not be identified. It proved, however, to be conspecific with *Cola* spec. C of the *Flora of West Tropical Africa* and is described here.

Key results – The new forest tree species *Cola baldwinii* Jongkind is illustrated and described. It resembles *Cola flavo-velutina* K.Schum. and *C. reticulata* A.Chev., but has clearly different fruits.

Conservation Status – Currently it is difficult to assess the rarity of this new species. It is relatively widespread and probably undercollected. Considering the ongoing deforestation in this part of Upper Guinea, however, the species should provisionally be listed as Vulnerable.

Key words – Sterculiaceae, Sterculioideae, *Cola*, Africa, Guinée, Liberia, Sierra Leone.

INTRODUCTION

The genus *Cola* Schott & Endl. (Malvaceae: Sterculioideae) includes more than 100 species and is endemic to continental Africa. Most of the species are shrubs or trees from the tropical forest but a few species are found in southern subtropical Africa. According to Pan & Jacobs (2009), in the past *Cola* extended further to the north-east to what is now northern Ethiopia.

When Hawthorne & Jongkind (2006) published the *Woody Plants of Western African Forests* there was, after almost fifty years, no valid scientific name available for *Cola* spec. C, a taxon first noted in the *Flora of West Tropical Africa* (Keay & Brenan 1958). *Cola* spec. C was based on a single fruiting specimen collected in Liberia, *Baldwin* 10597a (K). Recently I collected several fruiting specimens of what is clearly the same species in Liberia and Guinée, and found two older specimens also matching *Cola* spec. C in the Kew herbarium, one of them from the east of Sierra Leone. The two older specimens, *Baldwin* 14051 and *Unwin & Smythe* 53, had been identified as *Octolobus angustatus* Hutch. (= *O. spectabilis* Welw.), but they belong in *Cola* and not *Octolobus* Welw. because their follicles are all in a single whorl. In the latter genus, the carpels and follicles should be spirally arranged.

The new species, named here *Cola baldwinii* Jongkind, obviously belongs to *Cola* because of its indehiscent follicles, all in one whorl, with sweet pulp surrounding the seeds (the testa), its leaf petiole swollen at base and at the top and the

presence of starshaped hairs. It resembles *C. flavo-velutina* K.Schum. in the shape, variability and texture of the leaves, but its stipitate follicles with easily removed, thin, indumentum at maturity, are clearly different. The mature carpels of *C. flavo-velutina* are almost sessile, have a long beak and are densely hairy. *Cola flavo-velutina* is known from Ghana to Gabon and does not occur in the area of the new species. Another species that greatly resembles *C. baldwinii* but that occurs in the same area is *C. reticulata* A.Chev., which has almost sessile fruits, often with a conspicuous beak, but in this species fruits are completely glabrous (fig. 1F). The leaf blades and petioles of *C. reticulata* are less variable than in the new species. The *Cola* species that more or less resembles the new species and is found in the same area is *C. heterophylla* (P.Beauv.) Schott & Endl., a common species with characteristic fruit different from all other *Cola* species in Upper Guinea (fig. 1G). The leaves of *C. heterophylla* are also thinner than in all the species mentioned above. More to the east in the Guineo-Congolian forests there are no known species that show the combination of fruit and leaf characters of *C. baldwinii*.

It is impossible to insert *Cola baldwinii* in the key to *Cola* in the *Flora of West Tropical Africa* (Keay & Brenan 1958) because this key only works with flowers; the flowers of the new species remain unknown. Likewise, lack of flowers makes it impossible to place *C. baldwinii* in any of the subgenera recognized by Hallé (1961: 40) in his treatment of the genus in the *Flore du Gabon*.

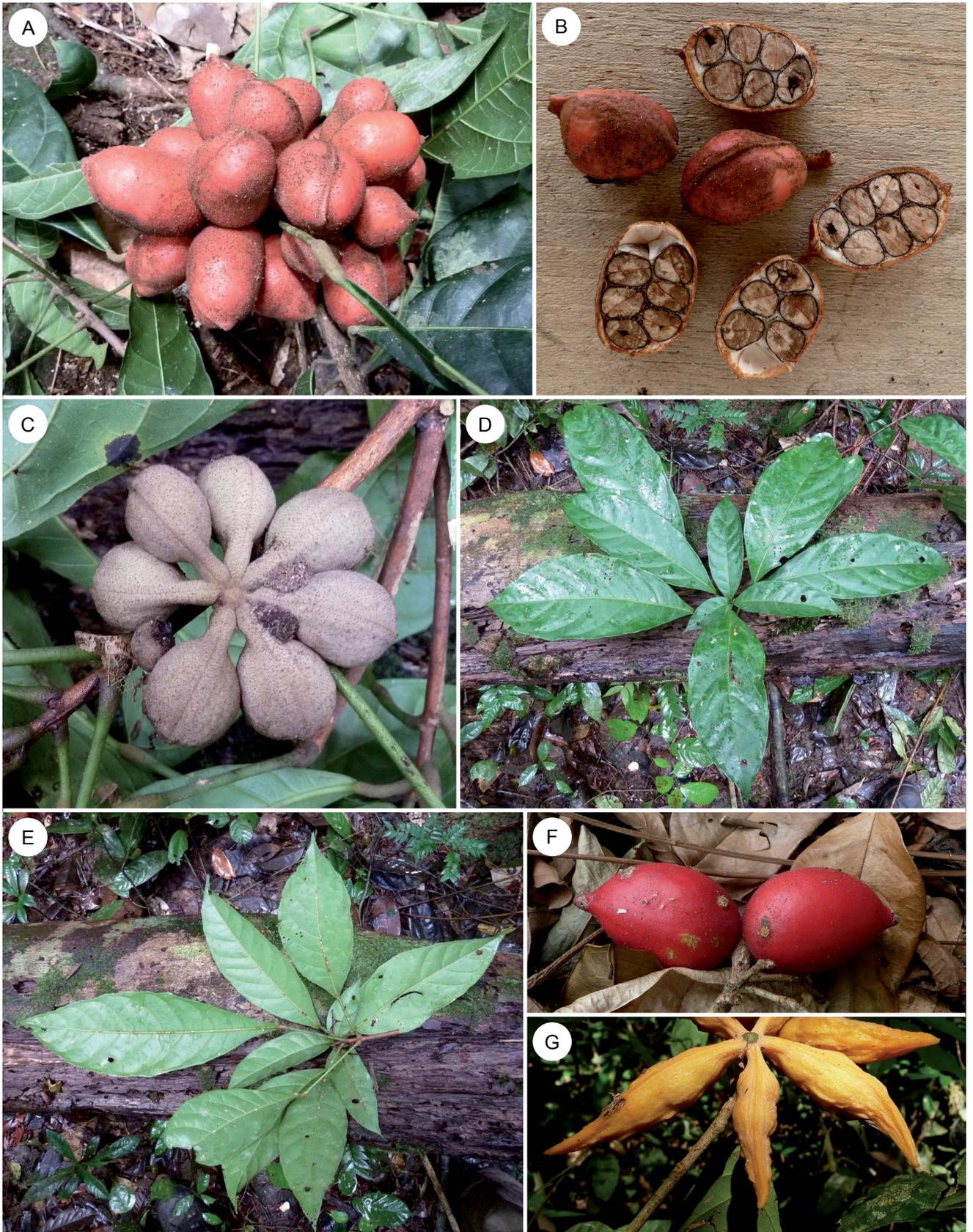


Figure 1 – *Cola baldwinii*: A, mature fruit (from more than one flower); B, mature follicles, cross section; C, immature fruit showing stipitate follicles; D, leaves from above; E, leaves from below. *Cola reticulata*: F, fruit; *Cola heterophylla*: G, fruit. A & B from *Jongkind* 10752; C–E from *Jongkind* 9849; F from *Jongkind* 9503; G from *Jongkind* 9085.

NOTES ON RELATED SPECIES

With the abovementioned re-identification of *Baldwin* 14051 and *Unwin & Smythe* 53, there are now no records of *Octolobus spectabilis*, the only *Octolobus* species known from Upper Guinea, west of Côte d'Ivoire. The specimen of *O. spectabilis* mentioned by Adam (1971: 421) from the Liberian part of the Nimba mountains is reidentified by me as *Cola angustifolia* K.Schum., a species described in the *Flora of West Tropical Africa* (Keay & Brenan 1958) as a Sierra Leonean endemic.

While comparing *Cola baldwinii* with species in the genus *Octolobus* and with *Cola* species such as *C. liberica* Jongkind, it became more and more clear that the only character left to separate *Octolobus* from *Cola* is the large number of spirally arranged carpels. The cylindrical perianth tube thought also to be characteristic of *Octolobus* (Cheek & Frimodt-Møller 1998: 682, Cheek 2007: 46) is present in *C. liberica* as well (Jongkind 2004: 448); only in *C. liberica* it got seven lobes instead of the eight in *Octolobus*. For *C. liberica* still very few complete flowers are at disposal and possible variation in the number of lobes is unknown. *Cola octoloboides* Brenan and *C. ruawaensis* Cheek, however, can have a perianth with eight lobes (Cheek 2007: 2); this means that in the genus *Cola* the number of calyx lobes varies from four to eight. *Cola* species with unifoliate leaves and stipitate follicles, such as *C. baldwinii* and *C. liberica*, superficially resemble *Octolobus* species as is shown by the abovementioned misidentification of *Baldwin* 14051 and *Unwin & Smythe* 53. Another example of the same confusion concerns *Cola octoloboides* as discussed by Brenan (1978). The separation of the two genera on the basis of the arrangement of the carpels does not seem to be a strong case. Uniting *Cola* and *Octolobus* should be seriously considered. Wilkie et al. (2006) show that *Cola* and *Octolobus* could be closely related, together with *Pterygota*, but with data based on only one species of *Cola* out of a genus of more than 100 this phylogenetic investigation represents only a first but interesting step.

TREATMENT OF THE NEW TAXON

Cola baldwinii Jongkind, sp. nov.

A new tree species most resembling *Cola flavo-velutina* K.Schum., but with clearly stipitate follicles with, at maturity, a thin, easily removable indumentum. – Type: Guinea, Guinée Forestière, Forêt Classée de Mt Yonon, alt. 460 m, 11 May 2011, *Jongkind* 10752 (holo-: WAG; iso-: BR, K).

Tree up to 5 m high and 25 cm diameter. **Leaves** alternate, entire, often crowded at the end of a shoot; petiole 0.3–10 cm long, pulvinate at both ends, often with remnants of dense stellate indumentum; leaf blade simple, obovate to elliptic, 2–29 cm long and 1–10 cm wide, coriaceous, glabrous above and below, midrib raised above and below, 6–10 pair of main lateral nerves, tertiary nervation reticulate below; base attenuate to rounded but usually very narrowly so; apex acuminate. Stipules up to 7 mm long, subulate. **Flowers** not seen. **Fruits** ripening amongst the leaves, young fruits with a thin but closed layer of pale hairs, mature fruit indehiscent, red,

with easy to remove, open, dark-brownish, stellate indumentum, 2 to 11 follicles; follicles almost round in cross-section, 3–4 × 2 × 2 cm, with usually inconspicuous beak and slightly ridged suture line; stipe 5–16 mm long, flattened; 5–7 seeds, succulent testa white on the outside and very dark on the inside; embryo close to the hilum between the cotyledons. Fig. 1 A–E.

Habitat and distribution – Understorey of high forest from central Liberia to southeastern Guinée ('Guinée Forestière') and eastern Sierra Leone.

Note – The strong differences in blade size and petiole length within an individual branchlet evidently keep the leaves at the end of a shoot from being shaded by one another.

Additional specimens studied – **Sierra Leone**: Gola Forest Reserve, fr., Jan. 1909, *Unwin & Smythe* 53 (K).

Liberia: Piatah, fr., 9 Dec. 1947, *Baldwin* 10597a (K); Ganta, fr., 26 Jan. 1950, *Baldwin* 14051 (K, US); Sapo National Park, fr., 23 Nov. 2010, *Jongkind* 9849 (WAG); Kpelle Forest, North of Gaiunkpa, fr., 19 Dec. 2010, *Jongkind* 10277 (WAG).

Conservation status – Currently it is difficult to assess the rarity of this new species. For an appropriate IUCN evaluation one would need data that are not available at the moment. An important part of the area between places where the new species is known from is never visited by botanists. For a large part of the same area there are no satellite images showing the condition of the vegetation. We do know *C. baldwinii* is relatively widespread, found in an area c. 350 × 200 km. It is probably undercollected like most small understorey trees. On the other hand, the type specimen comes from a small patch of forest that was only ten years ago still part of a reserve of closed high forest that was recently almost completely burned down. Considering the still ongoing deforestation almost everywhere in this part of Upper Guinea, the species should be listed as Vulnerable (IUCN 2001) until further data on its range and rareness are acquired.

Etymology – The species is named after John Thomas Baldwin (Jr.) (1910–1974), who first collected it and who made important contributions to our knowledge of the Liberian flora. In 1947 and 1949 he crossed on foot through the Liberian forest from one side of the country to the other and collected several thousand specimens on his way. This is something no botanist did before or after him on this scale. His specimens are preserved in the Gray Herbarium and represented in the Kew herbarium by a first duplicate set.

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