Acta Botanica Neerlandica **13** (1964) 161–174

PRIMITIAE AFRICANAE V

A REVISION OF THE GENUS *Buchholzia* ENGLER (CAPP.)

MARIJKE RISSEEUW

(Laboratory for Plant Taxonomy and -Geography, University for Agriculture, Wageningen)

(received February 7th, 1964)

ABSTRACT

The genus *Buchholzia* consists of 2 species: *B. coriacea* Engler and *B. tholloniana* Hua. Several proposed species are reduced to synonymy. The species are described and pictured; a key is given.

INTRODUCTION

After the publication of *Buchholzia* by Engler in 1886, which was based on a single species, several new species were proposed. It appeared advisable to investigate their status and distribution.

I wish to express my gratitude to the Directors and Keepers of the following herbaria: Berlin (B), Berkeley (UC), Brussels (BR), Edinburgh (E), Firenze (FI), Göttingen (GOET), Hamburg (HBG), Kew (K), København (C), Leiden (L), London (BM), Munich (M), New York (NY), Paris (P), Stockholm (S) and Wageningen (WAG).

Buchholzia Engler *in* Engl. Bot. Jahrb. 7, 1886, p. 335; Pax *apud* Engl. Pr. Nat. Pflzfam. 1 ed. III 2, 1891, p. 232; Hua *in* Bull. Soc. philom. Paris, 8 sér. VII, 1895, p. 77; Gilg et Benedict *in* Engl. Bot. Jahrb. 53, 1915, p. 213; Engler, Pflzwelt Afr. III 1, 1915, p. 243, 244 fig. 159; Hutchinson et Dalziel, Fl. W. Trop. Afr. I, 1927, p. 89; Pax et Hoffmann *apud* Engl. Pr. Nat. Pflzfam. 2 ed. 17b, 1936, p. 192, 193; Chevalier, Fl. Viv. de l'A.O.F. I, 1938, p. 184, 186; Hauman et Wilczek *in* Fl. Congo Rua.–Ur. II, 1951, p. 504.

Small trees, entirely glabrous. Leaves simple, accompanied by small, triangular stipules.

Inflorescences racemose, (racemes simple) or paniculate (racemes usually branching), borne in the upper part of the branches. The buds at the top of the inflorescence are small, densely arranged; valves imbricate, sometimes gaping; stamens and pistil small, straight, at first equally long as the calyx, later on the flowers increase very much in size, spread, and the sepals finally bend backwards; stamens and pistil lengthening and become widely exserted.

Receptacle in bud swollen to a ring-shaped disc, which increases during flowering and becomes cup-shaped.

Sepals free, imbricate in bud, 4 rarely 5, rather long persistent, sometimes one or more sepals splitting and then seemingly up to 7 sepals, differing in size and length.

Petals absent. Stamens numerous (staminodes absent), not curved in bud, lengthening only after the parting of the sepals. Anthers basifix, recurved, soon dropping. Ovary on a lengthening gynophore, unilocular; two parietal placentas each carrying two rows of ovules; stigma ± capitate, indistinctly lobed.

Fruit a berry with a thick coarsely woody to coriaceous wall. Seeds large, one to four, irregularly shaped, filling the fruit-cavity entirely, being often separated by septs.

Type species. Buchholzia coriacea Engler (in Engl. Bot. Jahrb. 7, 1886, p. 335).

Distribution. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroons, Rep. Centrafricaine (Ubangui Shari), Gabon, Congo Brazzaville (Moyen Congo), Cabinda (Angola), Congo.

Notes. Buchholzia's are small trees in the understory of the rain-forest, often favouring river banks.

If a single seed is present in the fruit, it is nearly perfectly globular; if, however, more seeds are present their shape becomes very irregular, apparently due to mutual pressure when growing in a limited space. The cotyledons are always very irregular in shape (also when a seed developes singly) and may be separate or united and the single cotyledon only partly cleft. It seems highly exceptional that in a single genus, possibly even in a single plant, the cotyledons may be free or united.

Taxonomical Notes. In 1872 Reinhold Buchholz travelled with Reichenov and Lühder to West Africa, the Cameroons, and Gabon. Buchholz secured many new species. Among them, Engler based on Buchholz 10.74 a new genus in the *Capparidaceae*: *Buchholzia*; there was a single species: *Buchholzia coriacea* Engler (Engl. Bot. Jahrb. 7, 1886, p. 335). The number 10.74 was Buchholz's way of indicating that he collected the specimen in October 1874.

In 1892 Pax described *B. macrophylla* Pax (Engl. Bot. Jahrb. 14, p. 300) basing this second species in *Buchholzia* on Soyaux 457 (Sibange Farm, Gabon). In 1904 Gilg based on Zenker 1085, Staudt 764, and Dinklage 1105 (all from the Cameroons) a third species: *B. engleri* Gilg (Engl. Bot. Jahrb. 33, 1904, p. 221).

Pax and Gilg studied insufficient material and were unable to observe the change of a young bud to a fully developed flower.

In 1895 Hua described this development but he suggested in his article (1895) that he did not examine Buchholz's and Soyaux's types. He identified specimens of Thollon and Dybowski as *B. macrophylla* Pax, which I found to be quite different from the type (Soyaux 457) of that species. On another specimen of Thollon, Hua founded a new species: *B. tholloniana* Hua (Bull. Soc. philom. Paris, 8 sér. VII, 1895, p. 77).

In 1915 Gilg reduced *B. engleri* Gilg to synonymy with *B. coriacea* Engler (Engl. Bot. Jahrb. 53, 1915, p. 213), on account of new specimens and Hua's earlier argument. The apparent difference between Buchholz 10.74 and Soyaux 457, which induced Pax to propose *B. macrophylla*, proves to be untenable when a wider range of specimens is examined. After a study of all the type specimens, partly from Berlin and partly from Paris in addition to numerous specimens from other herbaria, I was able to establish synonymy between *B. macrophylla* Pax and *B. coriacea* Engler.

In 1915 Gilg and Benedict based simultaneously on Mildbread 4479 *B. macrothyrsa* Gilg et Benedict and on Ledermann 6106 and 1470 *B. polyantha* Gilg et Benedict (Engl. Bot. Jahrb. 53, 1915, p. 214, 215). Both *B. macrothyrsa* and *B. polyantha* are synonymous with *B. tholloniana* Hua.

Chevalier repeatedly named (in Veg. Util. V: 1, 3, 1909, p. 148, in Expl. Bot. de l'A.O.F., p. 29 and in his Fl. Viv. de l'A.O.F. I., 1938, p. 185) his specimens as *B. macrophylla* Engler *(sic);* but Hutchinson and Dalziel (Fl. W. Trop. Afr. I, 1927, p. 89) provided Chevalier's specimens with the correct name: *B. coriacea* Engler, amending an obvious oversight.

According to Hauman and Wilczek (*l.c.* p. 506) it was generally assumed that *B. coriacea* Pax (*sic*!; *recte*: Engler) occurred in Congo, but now these authors declared that *B. macrophylla* Pax actually was the species native to Congo. It appears, however, that the species of Congo is synonymous with *B. tholloniana* Hua.

In 1953 the Rev. Abbé Walker noted (Bull. Inst. Ét. Centrafr. nouv. sér. 5, p. 26) various uses, names and other information on *B. coriacea* Engler. Part of this information was repeated for that species by Irvine (Woody Plants of Ghana, 1961, p. 44). In "Les Plantes utiles du Gabon", Walker and Sillans (*l.c.* p. 117) quoted Walker's information of 1953, added more facts but referred to "*B. macrophylla* Pax". It would seem that they had decided that the identification of *B. coriacea* in 1953 had been found to be erroneous. As I received Walker's specimens from Paris and found them identical with *B. tholloniana* Hua, Walker's and Sillans's data are cited there.

Finally it may be remarked that the wide range of specimens studied proved that only two natural taxa can be distinguished in the genus, which are so closely related that there remains some doubt whether it will be preferable to unite them in a single species or to maintain them as two species.

KEY TO THE SPECIES:

1. Leaves obovate or more rarely elliptic; up to 10 pairs of primary nerves, clearly impressed in the upper surface; racemes often simple . . . **B. coriacea**
2. Leaves narrowly obovate or narrowly elliptic; 11–16 pairs of primary nerves, slightly prominent on the upper surface; racemes usually branching . . . . . **B. tholloniana**

Buchholzia coriacea Engler *in* Bot. Jahrb. 7, 1886, p. 335, 336; Pax *apud* Engl. Pr. Nat. Pflzfam. 1 ed. III 2, 1891, p. 232; Pax *in*

Engl. Bot. Jahrb. 14, 1892, p. 301, Taf. IV; Th. Dur. et Schinz, Consp. Fl. Afr. I², 1898, p. 173; Gilg et Benedict *in* Engl. Bot. Jahrb. 53, 1915, p. 213; Engler, Pflzwelt Afr. III 1, 1915, p. 243, 244 fig. 159; Hutchinson et Dalziel, Fl. W. Trop. Afr. I, 1927, p. 89; Vigne *in* Trop. Woods 35, 1933, p. 1, 2; Pax et Hoffmann *apud* Engl. Pr. Nat. Pflzfam. 2 ed. 17ᵇ, 1936, p. 192, 193; Aubréville, Fl. for. Côte d'Iv. I, 1936, p. 132; Kennedy, Forest Fl. of S. Nigeria, 1936, p. 23; Chevalier, Fl. Viv. de l'A.O.F. I, 1938, p. 184, 185; Kerharo et Bouquet, Pl. Méd. Tox. Côte d'Iv.–Haute Volta, 1950, p. 28; Normand, Atlas des Bois Côte d'Iv. I, 1950, p. 90, 91, pl. XX; Hutchinson et Dalziel, Fl. W. Trop. Afr., 2 ed. I, 1954, p. 93; Dalziel, Usef. Pl. W. Trop. Afr., 1955, p. 19; Keay, Onochie, Stanfield, Nigerian Trees, I, 1960, p. 79; Emberger, Traité bot. syst. II, fasc. II, 1960, p. 1258, 1259; Irvine, Woody Pl. Ghana, 1961, p. 44.

Buchholzia macrophylla Pax *in* Engl. Bot. Jahrb. 14, 1892, p. 300, 301; Pax *apud* Engl. Pr. Nat. Pflzfam. 1 ed. III 2, 1891, p. 232; Hua *in* Bull. Soc. philom. Paris, 8 sér. VII, 1895, p. 77; Th. Dur. et Schinz, Consp. Fl. Afr. I², 1898, p. 173; Pax et Hoffmann *apud* Engl. Pr. Nat. Pflzfam. 2 ed. 17ᵇ, 1936, p. 193; Chevalier ("*B. macrophylla* Engler"), Veg. Util. de l'A.O.F., V: 1, 3, 1909, p. 148; in Expl. Bot. de l'A.O.F. p. 29; in Fl. Viv. de l'A.O.F. I, 1938, p. 186; Unwin, W. African Forests and Forestry, 1920, p. 84.

Buchholzia engleri Gilg *in* Engl. Bot. Jahrb. 33, 1904, p. 221; Gilg et Benedict *in* Engl. Bot. Jahrb. 53, 1915, p. 213.

Shrub or tree, up tc over 20 m tall. Young twigs when dry brown, blackish on older twigs, angular or subterete, shrunk, wrinkled lengthwise. *Petiole* darker coloured at the top and at the base, 2–15 (–18.5) cm long, upper surface flat to more or less grooved, lower surface rounded, wrinkled lengthwise; when fresh the top of the petiole 1½ times as thick as lower down and on the lower side wrinkled, glassy, the upper side canaliculate, blackish. Stipules triangular, usually caducous, 1–2 mm long. *Blade* obovate or more rarely elliptic, coriaceous, often reddish when dry, upper surface somewhat glossy, lower surface dull, much lighter in colour, 10–24(–40) cm long, 4–10(–13.5) cm wide; acuminate (acumen acute, up to over 3.5 cm long with a small mucro), base obtuse to narrowly cuneate, symmetrical; margin narrowly recurved, very slightly wavy; midrib stout, on the upper surface slightly prominent, wrinkled lengthwise (in dried material), on the lower surface strongly prominent and wrinkled; primary nerves up to 10 on both sides of the midrib (nerves up to 5 cm apart) anastomosing near the margin and forming a distinct, undulating, submarginal nerve, impressed in the upper surface, on the lower surface prominent and wrinkled lengthwise; veins slender, laxly reticulate.

Inflorescence racemose, axillary, racemes simple or paniculate, finally ending the branches (terminal), young up to ± 12 cm long, older 12–26 cm long, the lower inflorescences axillary to small leaves, the upper subtended by c. 2 mm long bracts, which are at base fused with a stipule (half as long) on either side.

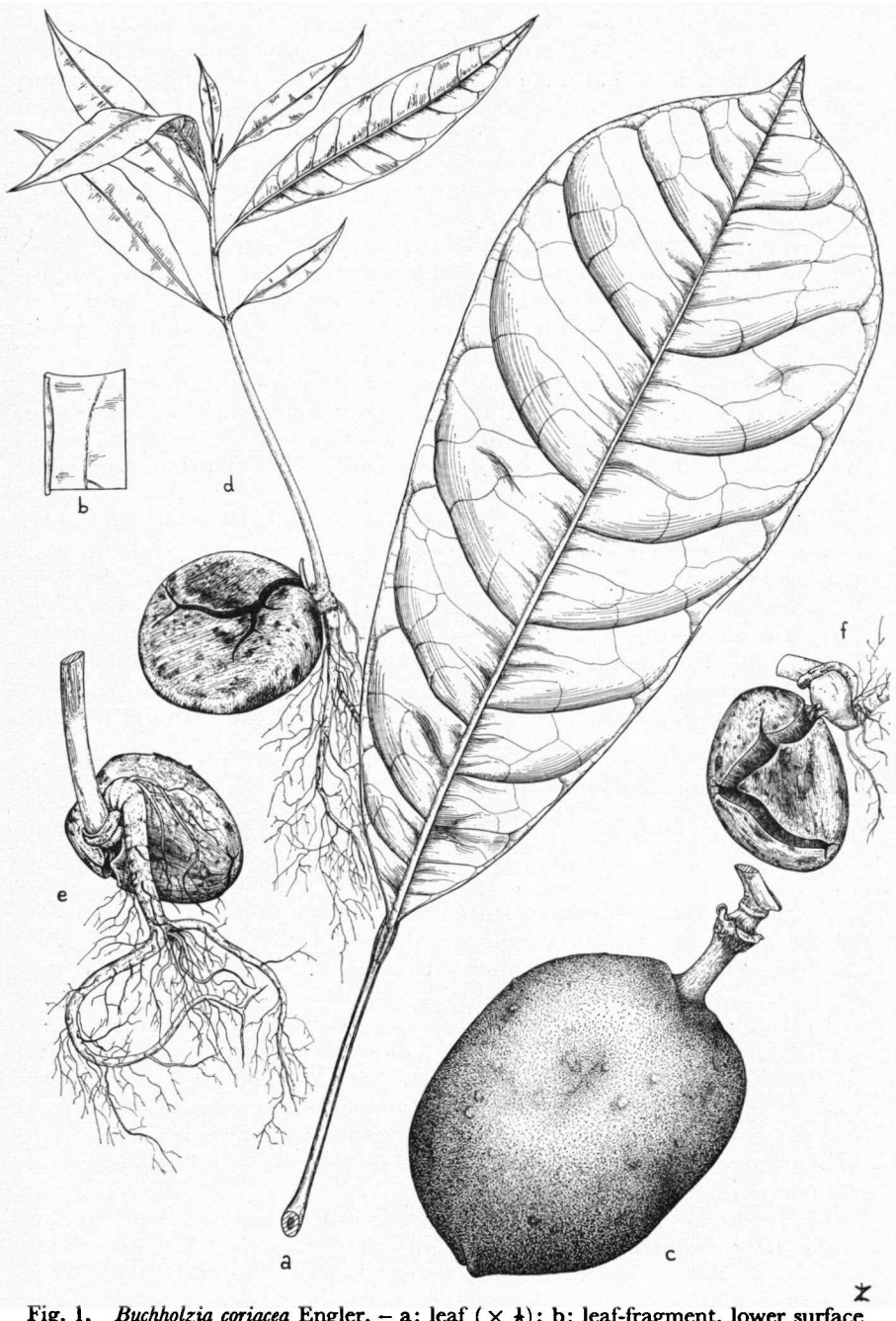


Fig. 1. *Buchholzia coriacea* Engler. – a: leaf (× ½); b: leaf-fragment, lower surface (× 6); c: fruit (× ½); d: seedling (× ½); e-f: cotyledon (× ½); All specimens at Wageningen (WAG), originating from Ivory Coast, Forêt du Banco.

Pedicel up to 1.5 cm long. *Sepals* free, 4 rarely 5, persistent, 4–5 (–6) mm long and 3–5 mm wide, obovate, top rounded; torus in bud disc-shaped, small, inconspicuous, afterwards growing larger and thicker becoming cup-shaped and with numerous vertical grooves and a crenate margin; 1.5–2.5 mm high, 5–8.5 mm wide.

Stamens more than 40, all anther-bearing, soon deciduous. Filaments up to c. 1.5 cm, rather slender, adherent to the base of the gynophore to a column of 1 mm high; anthers strongly curved backwards, c. 2 mm long, 0.9 mm wide; 2 thecas, when closed with a dark longitudinal groove. Gynophore thicker than the filaments, up to c. 2.5 cm long; ovary ovoid c. 5 mm long, unilocular, with two prominent placentas in the chamber, ovules in 4 longitudinal rows; stigma sessile, ± 2–4 lobed.

Fruit yellow when ripe; in dried material roundish or oblong, 6–9 cm long, 6–7 cm wide; stalk c. 20 mm long and c. 6 mm wide, torus still persistent, bent backwards, enlarged, c. 15 mm wide, brown-black; stigma lobes remaining visible, clearly prominent, and the fruit often more or less beaked.

Exocarp granular, somewhat glossy, glabrous, hard, c. 4 mm thick; mesocarp when fresh cream-coloured, in dried material brown-reddish, granular, 0.4–1 cm thick; endocarp woody, glossy, brown, forming the interior wall of the cavity and usually "septs" between the seeds. *Seeds* big 3–4 cm long, 2–3 cm through, filling the cavity completely. Cotyledons very irregularly shaped, swollen, sometimes separate (though pressed together) and sometimes almost entirely fused (pseudo-monocotyledony). Testa purple, glossy, turning brownish when dry.

Type specimen. Buchholz 10.74 (B)

Distribution. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroons, Gabon.

Biological Notes. Chevalier stated in his Flore vivante (transl.): "It flowers in the beginning of the dry season (from Sept. to Jan.) and the fruits ripen a long time afterwards; finally they are shed and the seeds germinate at the first rains".

In Liberia Cooper found it: "Scarce in bush; bark dark green, slightly rough, medium thin". Chevalier (Veg. Util. V and Fl. viv. de l'A.O.F.) described it as one of the characteristic trees (10–20 m high, 0.20–0.40 cm diam.) in the shadow of the dense forest; persistent leaves, united in a tuft at the top of the branches, lauraceous in appearance. Bark greyish, smooth. Wood, D = 0,577, white-yellowish with a peppery smell.

In Ivory Coast common along the railway in the Agniéby, in Attié, in Sassandra and Cavally. Aubréville (Fl. forest. Côte d'Iv.; transl.): "The bark is smooth, brown-black; scratching the bark uncovers a thin pink-red layer. The slash is smooth, rust-coloured. The wood white-yellowish, fine-grained". No colour distinction between sapwood and heartwood (Normand).

In Ghana Vigne described it as a "small tree, occurring in the understory in high closed forest (*Triplochiton scleroxylon, Celtis spp., Sterculia rhinopetala* as the most common constituents of the upper story). The bole is not buttressed, but often irregular and sometimes fluted. The crown is very dense, the bark smoothish, green-black, about 4 mm thick, red-brown within and very bitter. The wood is moderately soft, fine-grained, yellow-white when fresh, no colour distinction between sapwood and heartwood".

Keay noticed in Nigeria a specimen with a "deep red slash"; Benoît noted in Cameroon "a brownish bark, the branches are often tortuous". In Ivory Coast and Ghana this species is occurring as "a shade loving plant in rainforest" (Kennedy, Irvine) but in Cameroon it was observed in (transl.) "a dry shrubby forest" (Dinklage), "in slight brush wood" (Staudt and Zenker 1085) and in "a forest on a river's bank" (Zenker 4725). The flowering season also differs. Chevalier noted for Ivory Coast Sept. to Jan., but de Byans collected a flowering sample in June, and Chevalier himself in Aug. The sepals are greenish, the stamens first greenish and later yellow, the torus and the anthers black-purplish (Aubréville and Chev.). In Ghana the flowering season is from Aug. to Dec., fruit is borne in Nov. (Irvine). In Nigeria Keay collected cream-coloured flowers and described the stamens as the showy part.

In Cameroon Benoît noted a grey-green-yellowish flower. Other flowering samples were collected from Sept. to Jan. One of them (Zenker 4725, GOET) was described as white-green with blueish filaments and anthers. Mature fruit for the whole area from Jan. to March. Fruit obliquely globose-ellipsoid, yellow, slightly shining (immature dark green), 8–15 × 8–10 cm ("as big as a first"—Chev.); pulp with "the odour of fruits of *Rubus idaeus*" (Leeuwenberg, Ivory Coast). Irvine: "long-stalked fruits in Nov. with several irregular knobs; odour disagreeable; seeds large, blackish". Vigne noted immature fruits in Aug. but supposed that they were from the previous years' flowering. Buchholz is speaking about mature fruits in Oct., but as he described them green and with the size of a walnut, they must have been immature.

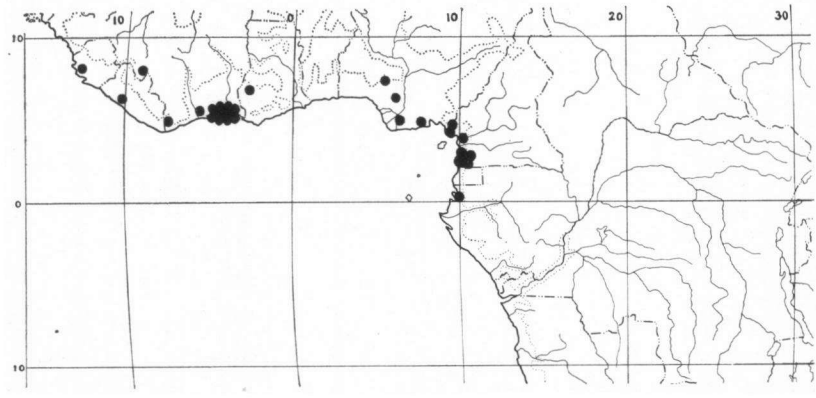
Vern. names. LIBERIA: doe-fiah.
IVORY COAST: abazi (Brignan); abo (Attié); akotompo (Fanti); amizi (Agni); amo, amon (Abé); até (Bonoua); brachi (Soubré); dankou, dantou, douétou (Krou, Kroumen); do (Trépo); Kbonli(?) Jacoba (61 km N. of Sassandra, W. of Niapidou); kola pimenté (by the colonists); lebé (Shien); lébé ourou (Guerzé); loubouye (Bété); mouin oroko (Gagou); saïno, saagnan (Guéré).
GHANA: eson-bossi (Vigne), esono-bise (Irvine), eson-besi (Dalziel, West. Ash. meaning elephant kola); amigi (Anyi).
NIGERIA: owi (Benin).
CAMEROONS: banda (Mungo); mbandi (Bassa); mvan (Yaoundé).

Uses. The wood can be employed for construction but generally the bark is the only part of the tree that is used.

Scratching the bark with a "machete" results in a dust with a peppery smell that makes one sneeze. It is used in the Ivory Coast

as a violent snuff against headache and colds (Aubréville, Kerharo and Bouquet). In Ghana scrapings of the fresh bark are used to cure ear-ache (Vigne). The pulped bark thinned with some water is applied to the chest as a cure for bronchitis, pleurisy and intercostal pains. At the Guerzé's they grease sometimes parts of the body with bruised bark, mixed with Kaolin to soften fatigues and stiffness, completed by massage with pounded fruits (Chevalier, Kerharo and Bouquet). The bark is an ingredient for the arrow poison of the Boos of the Guéré-tribe, famous by the quality of their poisons in the whole area (Kerharo and Bouquet). At the Bété's the roots are regarded as poison (Chevalier). In Sierra Leone Deighton noted: "Leaves applied for a minute or two to bruised limbs etc., as a counterirritant: said to be "hot" and rather like Sloane's liniment in effect". Young leaves are used as a poultice for boils (Dalziel). R. Paris isolated 0.038 per cent of an extract (further properties not stated) with a disagreeable scent, from the leaves. Kennedy described the fruits of this species as edible and noted that they are collected by the Benis of S. Nigeria and stored for about six days before they are boiled and eaten. In Cameroons Benoît found the fruits in use as a native medicine; Buchholz stated that they are used against coughing. Dalziel noted: "the kernel can be used as a condiment or a cough medicine". Cooper noted that in Liberia the seeds are used for skin eruptions or internally for worms and pains. In Ivory Coast Leeuwenberg mentioned that the seeds are chewed like those of *Cola*, and taste like "piment" (*Capsicum*).

GUINEA: Env. of N'Zérékoré, Lébé Ourou-Guerzé: Jacques Félix 1141 (P).
SIERRA LEONE: Magbafti near Newton, between Waterloo and Songo: Deighton 5367 (K).
LIBERIA: Durkwia R.: Cooper 326 (BM, K).
IVORY COAST: Bassin of the Cavally R., land of the Tépos, between Grabo and Taté: Chevalier 19778 (P); 61 km N. of Sassandra, W. of Niapidou, 6° 10′ W. Long. 5° 19′ N. Lat. alt. 100 m, rain forest: Leeuwenberg 2511 (UC, WAG); Banco: Martineau 305 (BR, P); Banco (Forêt-classée) Rond Point: de Wit 9038 (WAG); Forêt d'I.D.E.R.T. Adiopodoumé, 17 km W. of Abidjan: de Wilde 246



Distribution of *B. coriacea* Engler in tropical Africa.

(WAG); Région de Bingerville, Abidjan, Dabou: Chevalier 15253 (P), 15437 (P); Abidjan: Aubréville 162 (BR, K, P); Env. of Bingerville: de Byans 445 (L); Prov. of Attié, Alépé: Chevalier 16238 (P).
GHANA: Western Ashanti, Atroni: Vigne 2439 (BM).
NIGERIA: Ondo, Akure F. R.–Aponmu High forest: Keay FHI 25536 (K, P); S. Nigeria, Benin: Kennedy 1661 (BM, NY); S. Nigeria, Degema Distr.: Talbot 3645 (BM); S. Nigeria, Eket Distr.: Talbot 3368 (BM, K).
CAMEROONS: Mungo: Buchholz 10.74 (B, type of *B. coriacea* Engler); Johann-Albrechtshöhe, Urwaldgebiet: Staudt 764 (B, *lectotype* of *B. engleri* Gilg; BM and E, *isolectotypes* of *B. engleri* Gilg); Edea (Forêt classée): Mpom Benoît (137) 2466/SRFK, (P); near Batanga: Dinklage 1105 (HBG, *isoparatype* of *B. engleri* Gilg); Bipinde, Urwaldgebiet: Zenker 108 (UC), 306 (C, NY, UC, WAG), 1085 (BM, E, GOET, K, L, M, P, *isoparatypes* of *B. engleri* Gilg); Nkuambe: Zenker 421 (C, NY, P, WAG); Bipinde, Lokundje, Uferwald 85 m: Zenker 4725 (BM, E, GOET, K, L, M, S).
GABON: Libreville district, Sibange-Farm: Soyaux 457 (B, *type* of *B. macrophylla* Pax).

Buchholzia tholloniana Hua *in* Bull. Soc. philom. Paris, 8 sér. VII, 1895, p. 78.

"*Buchholzia coriacea* Engler" (misapplied by) De Wildeman, Miss. Laur., 1906, p. 236; De Wildeman, Etudes Fl. Bas- et Moyen Congo I, p. 37; *in* Ann. Mus. Congo Belge, Bot., Sér. V, II, 1908, p. 252; Th. et H. Durand, Syll., 1909, p. 31; *in* Bull. Jard. Bot. Etat Brux., vol II, 1910, p. 31; De Wildeman Etudes Fl. Bas- et Moyen Congo II, p. 252; *in* Ann. Mus. Congo Belge, Bot., Sér. V, III, 1912, p. 395; *in* Bull. Jard. Bot. Etat Brux., IV, 1914, p. 78; ibid. V, 1916, p. 240; Abbé Walker *in* Bull. de l'Inst. d'Etudes Centrafr., No 5, 1953, p. 26.

Buchholzia macrothyrsa Gilg et Benedict *in* Engl. Bot. Jahrb. 53, 1915, p. 214, 215; Tisserant et Sillans, Matériaux pour la flore de l'Oubangui-Chari *in* Not. Syst. 15, 1956, p. 204, 205; Sillans *in* Bull. de l'Inst. d'Etudes Centrafr., No 6, 1953, p. 200.

Buchholzia polyantha Gilg et Benedict *in* Engl. Bot. Jahrb., 53, 1915, p. 215.

Buchholzia macrophylla Pax Hauman et Wilczek in Fl. Congo Rua.–Ur. II, 1951, p. 504, 505, 506; Walker et Sillans, Les Pl. Util. du Gabon, 1961, p. 117.

Shrub or small tree, up to over 20 m tall. Twigs brown or blackish, angular or subterete, when dry wrinkled lengthwise.

Petiole brown-black, darker coloured at base and top 1.5–5(–8) cm long, upper surface flat to slightly caniculate, grooved lengthwise, lower surface rounded, grooved lengthwise. Stipules triangular, 1–3 mm long. *Blade* narrowly obovate or narrowly elliptic, coriaceous, often reddish when dry upper surface glossy, lower dull, 12–24 (–32) cm long, 3–7(–9) cm wide; acute to acuminate (acumen up to over 2 cm long with a small mucro) rarely emarginate (Pobéguin 36), base obtuse to narrowly cuneate, symmetrical; margin not or hardly recurved, slightly wavy; midrib stout, on the upper surface slightly prominent, when dry wrinkled lengthwise, on the lower surface strongly prominent and wrinkled; primary nerves 11–16 on both sides of the midrib (nerves up to 3 cm apart), anastomosing

near the margin and forming a faint, undulating, submarginal nerve, slightly prominent on the upper surface, on the lower prominent and slightly wrinkled; veins slender, laxly reticulate.

Inflorescence paniculate (racemes usually branching), at the end of the branches, 12–29(–35) cm long, 10–20 cm wide, the lower inflorescences axillary to small leaves, the upper subtended by c. 2 mm long bracts which are at the base fused with a stipule (half as long) on either side.

Pedicel up to 2 cm long; sepals imbricate in bud, 4, sometimes 5, 6 or 7, persistent, 2.5–4(–5) mm long, 1–4(–5) mm wide, (narrowly) obovate, rounded at the top; torus in bud disc-shaped, small, inconspicuous, afterwards growing larger and thicker and becoming cup-shaped, often curved inside with numerous vertical grooves; 2–3 mm high, 4–6 mm wide, margin mostly crenate, rarely lobed. *Stamens* 25–40(–75), all provided with a soon deciduous anther, filaments up to 25 mm long, rather slender, adherent to the base of the gynophore to a column of 1 mm high; anthers curved backwards, up to 2 mm long and 1 mm wide; 2 thecas longitudinally dehiscent.

Gynophore three times as thick as the filaments, up to 4 cm long; ovary ovoid, c. 5–7 mm long, unilocular, with two prominent placentas, carrying 4 rows of ovules; stigma sessile 2–4 lobed.

Fruit yellow-greenish, in dried material brown-black, c. 9 cm long and 7 cm wide; stalk c. 25 mm long and c. 6 mm wide; torus still persistent, bent backwards, enlarged, c. 4 mm high and 12 mm wide, brown-black; stigma clearly prominent, and the fruit often more or less beaked.

Exocarp slightly granular, bumpy, somewhat glossy, hard; mesocarp brown-reddish, granular, up to 1 cm thick; endocarp woody, glossy, brown, forming the interior wall of the cavity and usually "septs" between the seeds. *Seeds*, rounded or irregular, 3–4 cm long and wide, containing of two irregular shaped cotyledons.

Type specimen. Thollon *anno* 1887 (P).

Distribution. Cameroons, Rep. Centrafricaine (Ubangui Shari), Gabon, Congo Brazzaville (Moyen Congo), Cabinda (Angola), Congo.

Biological Notes. Large shrub or small tree, suggesting a mango tree (Pobéguin), in the Rep. Centrafricaine occurring in the understory (Tisserant). In Congo it is sometimes planted near the villages for its edible fruits (Germain and Boone) and for its medical qualities (Walker). Branches may appear immediately above the ground (Germain, Lebrun) and spread a right angle and may be drooping; the crown is dense, hemispherical as a dome (Lebrun). The bole is up to 50 cm in diam., ± 17 m high, fluted but not buttressed (Louis); the surface of the thrunk is smooth, dark grey (Lebrun) or black olivaceous (Louis). The bark is 1 cm thick, not fibrous; its exterior

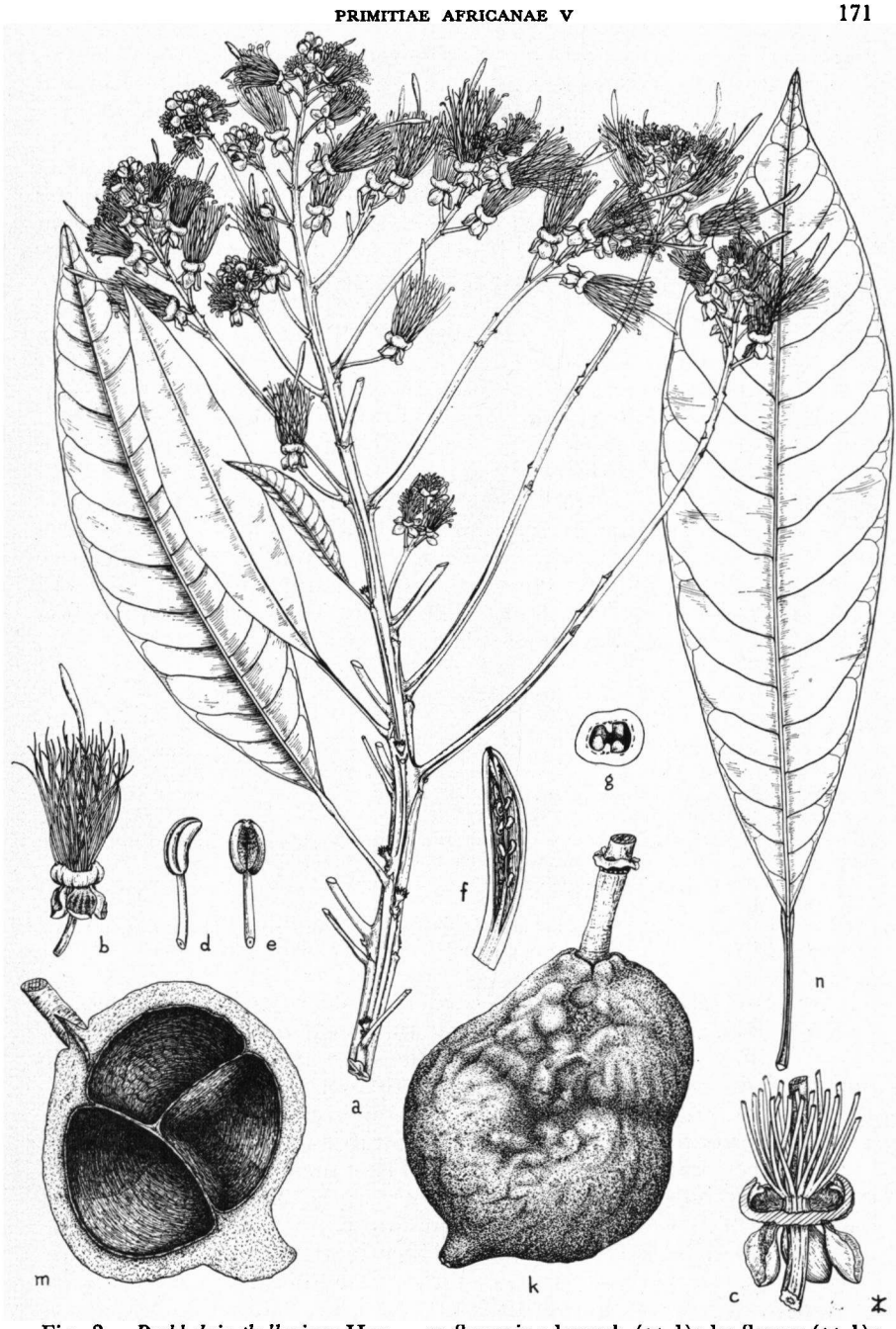


Fig. 2. *Buchholzia tholloniana* Hua. – a: flowering branch (× ½); b: flower (× 1); c: section through flower (× 2); d: anther, laterally (× 4); e: anther, dorsally (× 4); f: length section, ovary (× 3); g: transverse section ovary (× 6); k: fruit (× ½); m: section through fruit (× ½); n: leaf (upper surface; × ½). – a–g: Leontowich 5 (BR); k, m: Louis 10.753 (BR); n: Mildbread 4479 (B; *type* of *B. macrothyrsa* Gilg et Benedict).

part (2/3 of it) is brown-scarlet coloured, the interior part (1/3) is brown-ochrous, laxly adherent to the sapwood by a white and soft layer (Louis). Binuyo and Daramola observed in the Cameroons a very dark brown slash.

The wood is white yellowish (Ghesquière, Walker, Boone) with a peppery smell (Walker), medium hard (Boone). The young branches are thick and greenish (Walker), the older ones brown-black (Tisserant and Sillans). Walker stated that it flowers in the beginning of the dry season, but in Congo flowering and fruit-bearing specimens were collected from June to April.

The flowers (*i.e.* sepals) have been described as white or cream or green-yellowish, with the scent of a ripe peach (Louis). The torus is brown or dark green, when young the stamens are yellow-greenish, mature: white (Louis). In the Rep. Centrafricaine Tisserant collected flowers with violet stamens. The anthers are stated as distinctly brown or brown-greenish. The fruits resemble a mango with the size of an orange or a fist, are greenish when young and yellowish when mature, with an excentric tip (*i.e.* the stigmatic lobes). Louis described the fruits as "irregular, bumpy, covered with knobs; exocarp green, shining with black spots; mesocarp white-cream, soft, 1.5 cm thick; endocarp brownish, 1 mm thick". The cut fruit is scented disagreeably. There are 2–4 big reddish or blackish seeds.

Vern. names. REP. CENTRAFRICAINE: kabo (Lissongo).

GABON: ombéné—ompolo (meaning big *Cola* tree—Walker) or nyóndó-ndjina (meaning onion of the gorilla—Walker) (Mpogwé, Galoa, Nkomi, Orungu); nyóndó (Apindji, Mitsogo, Simba); anvan, anvam (Fang); mumbanda (Eshira, Masangu, Bavili, Baduma, Banzabi, Bavarama, Bavungu, Balumba, Bapunu); mombanda (Ivéa); mbanda (Bavové, Benga); mbandi (Loango); lambanda (Bakélé); dimbando (Béséki); idyali-dinènè (Ngowé); lembana (Mindumu).
CONGO BRAZZAVILLE: zimbonmou (Banks of the Sangha R.).
CONGO LEOPOLDVILLE: mbandi (Mayombe); bokavu (Lokundu); wanga (Eala); kapu (Bundu).
ORIENTALE: bokolo bo ilo (Turumbu); inaolo angongolia (Turumbu); kauw (Topoke); soromama, n'gokelima (Azande); rapu, bankbu (Mayogos).

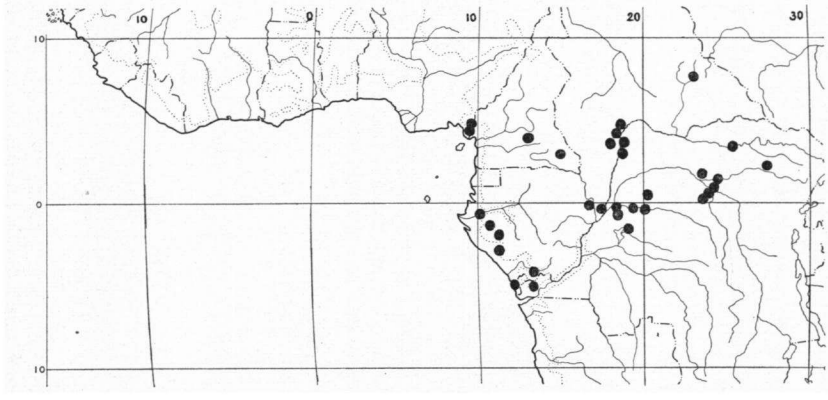
Uses. In Gabon the wood is used for constructions (Walker). In Congo (Lokundu) Ghesquière found the wood not used, but Boone narrates that in Nala they make little sharp pegs of it, which are put around houses to guard against leopards.

In Gabon the roots are regarded as poison (Walker). The bark is used in several ways. In the Rep. Centrafricaine it is put in cassave pulp to accelerate the fermentation (Tisserant). The pounded bark is used in Gabon as a poultice against scabies (Walker), the soaked bark is used in Congo to cure ear-inflammation (Ghesquière). The soured pulped bark is used as a red dye in the Rep. Centrafricaine (Tisserant). In Gabon Walker noted that the fruits were called "onion- or garlic of the gorilla" or "– of the panther" on account of their peppery taste. Local belief has it that both these savage beasts become ferocious by eating these fruits. The seeds are used as a vermifuge and formerly given to chew to the young warriors

to sharpen their taste for battle (Walker). The tree is also a fetish when hunting, by means of harpoons.

In Congo the edible seeds are used as pepper (Leontowich) they taste like "pilipili" (*Capsicum*) and even a tiny piece will start tears in the eyes and cause burns in the whole mouth, Boone stated. From the natives in Nala is mentioned that they ascribe magical properties to trees planted near the villages (Boone). If people pick the fruits, which are supposed lend strength, without paying or without informing the chief to whom the tree belongs, all possible disasters will befall them. The chiefs used to put a guard beneath the tree so that trespassers were not able to gather the fruits. The natives call it Bengdea Copi(?) because just as the leopards it brings big misfortunes about if people don't accomplish the rites (Boone).

CAMEROONS: Station Ndonge, at the foot of the Nlonako, Alt. 700–800 m: Ledermann 6160 (B, *type* of *B. polyantha* Gilg et Benedict); Kumba Distr., Southern Bakundu, Matoko: Binuyo and Daramola FHI 35506 (K); Abong Mbang: Jacques Félix 4846 (P); S. Cameroon, Bezirk Molundo, mouth of the Bange R. in the Bumba R. 15° 4′ E. Long. 3° N. Lat.: Mildbread 4479 (B, *type* of *B. macrothyrsa* Gilg et Benedict).
REP. CENTRAFRICAINE: road Bangui-Bouali: Eaux Forêts et Chasses 2204 (P); Env. of Boukoko, north of Bangui: Tisserant 1249 (P); Env. of Mbaiki: Tisserant 3747 (P); Env. of Jango: Allouette march 1920 (L).
GABON: St. Martin, haute Ngouniè R., 20 km N. of Mouila: Walker *s.n.* (P); bank of the Ngouniè R.: Pobéguin 36 (P); Lambaréne: Guigonis 1277 SRF (P); forest of Mayombe bayaka: Le Testu 1590 (P); Bouali: Le Testu 1671 (BM, K, P).
CONGO BRAZZAVILLE (MOYEN CONGO): banks of the Sangha R.: Pobéguin 44 (P); forest of Baïki—Boubangui and Boganga: Fidao 3 Oct. 1923 (P); *s.l.*: Thollon *anno* 1887 (P, *type* of *B. thollonіana*); *s.l.*: Dybowski 2nd voyage *anno* 1894 (P).
CONGO LEOPOLDVILLE: Mayombe: Bittremieux 290 (BR); Kiri (Lac Léopold II): Em. and M. Laurent 6 Nov. 1903 (BR);
EQUATEUR: Bomputu on the Salonga R.: Ghesquière 2788 (B, BR, S); between Bokotola and Bikoro: Lebrun 1417 (BR); Eala: Corbisier-Baland 1636 (BR); Busira R.—Monene: Seret(?) 1098 (BR); between Libenge and Zongo (near Ubangui R.): Lebrun 1640 (BR, P, UC); Libenge Territory near the Pongo R.: Leontowitch 5 (BR); Mondjo: Pijnaert 340 (BR);



Distribution of *B. thollonіana* Hua in tropical Africa.

ORIENTALE: Limbutu, Lulu R., 27 km NW of Basoko: Laurent 1476 (BR); Yambuya: Laurent 1477 (BR); Yangambi: Louis 10.573 (BR), 16.348 (BR, NY); Yankeleli village, 6 km from Isangi: Germain 990 (BR, FI); Yabahondo village (left bank of the Lomani R., Isangi Territory): Germain 8158 (BR); Bambesa: H. du Bois 987 (BR); Nala: Boone 5 (BR), 29 (BR); Difor: Gilbert 6171 (BR); *s.l.*: van der Gucht 104 (BR); *s.l.*: Laurent *anno* 1906 (BR).
CABINDA: Landana: Duparquet *s.n.* (P).