

**PRIMITIAE AFRICANAE IV\*)**  
**REVISION OF DIDELOTIA BAILL. (CAESALPINIACEAE)**

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SUMMARY

1. The genus *Didelotia* Baill. occurs in W. and Central Africa (Sierra Leone to Congo). Here 8 species are recognized.
2. The monotypic genera *Toubaouate* Aubrev. et Pellegr. and *Zingania* Chev. remain incorporated in *Didelotia*.
3. A new species, *D. idae* Leon., Old. & de Wit is described.
4. A key to the species is given; they are described, annotated, and illustrated.

INTRODUCTION

The genus *Didelotia* is still insufficiently known. The number of available herbarium specimens is surprisingly low and several of the larger Herbaria appeared to contain not a single specimen of this genus.

Mr. Voorhoeve's fine collections from Liberia proved to contain some very interesting material, both as regards flowering (adult) specimens and seedlings. These added considerably to our factual knowledge and made it possible and desirable to revise the genus. Fortunately, previous research by Aubréville, Léonard, Letouzey, Normand, and Pellegrin provided most useful information.

I acknowledge my best thanks to the Directors and Keepers of the following Herbaria for allowing specimens to be examined and to be sent on loan: Jardin Bot. de l'État, Bruxelles (BR); Lab. Bot. Syst. Phyt. Univ. Libre, Bruxelles (BRLU); British Museum,

\* In the Laboratory of Plant Taxonomy and -Geography advanced students who elect plants systematics as a special subject for study in fulfilment of the requirements for final examination, often carry out taxonomic research in tropical botany under my supervision. This leads, occasionally, to revisional work deserving to be published. It is obvious that the specialist skill required for present-day taxonomic revisions is not at the command of a beginning worker in natural sciences; guidance and advice are given by me. The outcome of the work is published, eventually, under the student's name and authorship. This practice has elicited some comment because it was felt that a joint authorship might more correctly indicate the actual source of the work. I prefer, however, that beginning botanists enter publicity in their own name.

In order to avoid all future ambiguity or misunderstanding I now state that the first fruits on African botanical taxonomy, prepared under supervision and with a varying amount of co-operation by me according to the subject and the worker, shall be published under the general heading *Primitiae Africanae*, and be consecutively numbered. So far appeared:

*Primitiae Africanae* I. J. J. F. E. de Wilde, A delimitation of *Mammea* L. — *Acta Bot. Neerl.* 5 (1956) 171—178.

*Primitiae Africanae* II. F. J. Breteler, Revision of *Abrus* Adanson (*Pap.*) with special reference to Africa — *Blumea* 10 (1960) 607—624.

*Primitiae Africanae* III. T. H. Hagos, A revision of the genus *Parkia* R. Br. (*Mim.*) in Africa—*Acta Bot. Neerl.* 11 (1962) 231—265.

H. C. D. de Wit

Nat. Hist. London (BM); Cons. et Jardin botan. Genève (G); Staatsinst. Allg. Bot., Hamburg (HBG); Royal Gard. Kew (K); Harley Herb., Monrovia, Liberia (LIB); Forest Herbarium, Imp. For. Inst., Oxford (FHO); Lab. Phan. Mus. Nat. Hist. Nat., Paris (P); Bot. Dep. Nat. Riksmus., Stockholm (S); Inst. Syst. Bot., Uppsala (UPS); Lab. Pl. Tax. Univ. Agric., Wageningen (WAG).

#### DIDELOTIA

Baillon, *Adansonia* 5 (1865) 367, pl. 8; *Adansonia* 6, (1866) 176; Bentham & Hooker *f.*, *Gen. Pl.* 1 (1867) 1003; Baillon, *Hist. Pl.* 2 (1870) 113; Taubert *apud* Engl. & Pr., *Nat. Pfl. Fam.* 3, 3 (1894) 387; De Wildeman, *Ann. Mus. Congo, Sér. IV* (1902) 42; Engler, *Veget. Erde* 9, 4, *Afr.* 3, 1 (1915) 481; Pellegrin, *Bull. Soc. Bot. France* 69 (1922) 786; Hutch. & Dalz., *Fl. W. Tr. Afr.* 1, 2 (1927) 348; Baker *f.*, *Leg. Trop. Afr.* (1930) 736—737; Hedin, *Étude For. Bois Cameroun* (1930) 112; Aubréville, *Fl. For. Côte Iv.* 1 (1936) 240; 2nd ed. 1 (1959) 247, 294, tab. 98 (7, 8, 9); Pellegrin, *Lég. Gabon* (1947) 77; Léonard, in *Fl. Congo Ruan. Ur.* 3 (1952) 494; *Bull. Jard. Bot. Brux.* 22 (1952) 206; Letouzey & Mouranche, *Ekop du Cameroun*, publ. 4, *Centre Techn. For. Trop.* (1952) 7, p. suppl., pl. 2 & 12; Roberty, *Petit Fl. Ouest. Afr.* (1954) 206; Léonard, *Mém. Acad. Belg. Sc.* 30, 2 (1957) 265; Aubréville & Pellegrin, *Bull. Soc. Bot. France* 104, (1957) 490; Keay *apud* Hutch. & Dalz., *Fl. W. Tr. Afr.* ed. 2, 1, 2 (1958) 480—481; Walker & Sillans, *Pl. Ut. Gabon* (1961) 225. — *Zingania* A. Chevalier, *Rev. Bot. Appl.* 26 (1946) 601, pl. 22, *C. R. Ac. Sci.* 22 (1946) 1152—1153; Pellegrin, *Lég. Gabon* (1948) 19; Léonard, *Bull. Jard. Bot. Brux.* 22 (1952) 206, 208; Aubréville, *Fl. For. Côte Iv.* 2nd ed., 1 (1959) 247. — *Toubaouate* Aubréville et Pellegrin, *Bull. Soc. Bot. France* 104, (1958) 490; *Fl. For. Cote Ic.* 2nd ed. 1 (1959) 247, 296, tab. 98 (1—6); Anonymous, *Fiche Forest., Centre Techn. For. Trop. Libreville* (Gabon), no date, 'Touwe', 2 p. *cum* 2 tab.

Medium-sized or small trees; young shoots developing from oblong buds covered by 2 rows of (distichously) imbricate brown bud-scales. *Leaves* unifoliate to even pinnate with one or many pairs of sessile leaflets. *Stipules* united, intrapetiolar, in seedlings or also in older plants bifid, bilobed or notched apically, the fused lower part somewhat fleshier than the upper part which breaks off and drops while the fused lower part is persistent, often only as an intrapetiolar rim, sometimes extending laterally on the branchlet. Upper, caducous part of the stipule with numerous, equally slender, longitudinal nerves (resembling the bud-scales). *Inflorescence* racemose, if branched with short lateral racemes along a slender main rachis; lateral racemes axillary from a bract, flowers axillary from a bractella. Receptacle short-turbinate, with a swollen disc-shaped top; disc entire or wavy-edged. Bracteoles much enlarged, with numerous, slender, parallel nerves, simulating a perianth, valvate when enveloping the bud. *Sepals* (4—)5(—6) minute lobes. *Petals* 5, sometimes 4 or 3, rarely absent, linear-lanceolate, at the insertion sometimes more or less overgrown by the disc. *Stamens* 5 (rarely 4 or 6), inserted on the disc (rising from between the disc-lobes). Anthers versatile. *Staminodes* absent or 1—5, filiform, opposite the petals. *Ovary* sessile or nearly so. *Style* filiform, stigma capitate or not. *Ovules* (2—)3—8. *Pods* breaking from above the base (and the insertion of the stalk), dehiscent (in dry air); valves thin, woody, 3-layered, curling when dehiscing, with one or two, often rather vague and more or less branching, longitudinal nerves. *Seeds* broadly oval, laterally much compressed; testa thin, not wrinkled when wet. *Cotyledons* flat, greenish, bifid at base as far as the embryo is long. *Albumen* present (always?) but only very little, near the hilum.

*Type species: Didelotia africana* Baillon.

*Distribution:* Sierra Leone, Liberia, Ivory Coast, Nigeria, Cameroon, Gabon, rép. du Congo, Congo.

*Historical notes.* *Didelotia* was described by Baillon (*Adansonia* 5, 1865, 367) as a genus in *Leguminosae* (c. q. *Caesalpinaceae*). It contained a single species, *D. africana* Baill. The genus was named 'in hon. clariss. navarchi Didelot, cujus sub auspiciis res herbariae apud Musaeum Coloniarum gallicarum primum vigerunt'. In his notes on *Leguminosae* Baillon further stated: '... , le nouveau genre que nous dédions au contre-amiral baron Didelot, n'est pas un des moins remarquables, ...'.

Afterwards, however, the genus was repeatedly misunderstood and its delimitation suffered from various errors (see notes on *D. appendiculata* (Bth.) Taub., *sub species rejiciendae*, and on *D. africana*).

*Zingania* is the latinized form of 'Zing', the vernacular name for the single species, for which the rank of a genus was proposed by Chevalier (l.c.).

The vernacular name 'Toubaoute' (Tabou tribe) served as a base for the generic name *Toubaouate* proposed by Aubréville and Pellegrin (l.c.). The protologue suffers from several misprints which make it doubtful which spelling is correct, *Toubaouate* or *Toubaoute*, and whether the gender of *T.* is female or neuter.

*Taxonomical notes:* The systematy of *Didelotia* is another illustrative example of the phenomenon of progressive reduction in floral organs (and leaves) occurring in *Caesalpinaceae*, a point already stressed by Baillon (*Adansonia* 5, 1865, 367; *Adansonia* 6, 1866, 176; *Hist. Pl.* 2, 1870, 113). It is interesting to note that the extreme reduction of the perianth is counteracted by the size of a pair of 'sepaloid' bracteoles. Among related genera *Didelotia* Baill. is readily distinguishable by the presence of 5 fertile stamens.

Aubréville and Pellegrin proposed (*Bull. Soc. Bot. France* 104 (1957) 490) to distinguish 3 closely related genera: *Didelotia* Baill., *Zingania* Chev., and *Toubaouate* Aubr. & Pellegr. These 3 genera ought to be considered first of all when delimiting *Didelotia*.

*Zingania* was published by Aug. Chevalier (*Rev. Int. Bot. Appl. Agric. Trop.* 26, 1946, 601—603, t. 22; ; cf. *C. R. Ac. Sci.* 222, 1946, 1152—1153) and based on a single species: *Z. minutiflora* Chev. (type: Gabon, Lagune du Fernan-Vaz, leg. A. Walker, s.n.; and — paratype — *Fleury* in *Herb. Chev.* 26.679). He declared (l.c., p. 601) that he had described the same taxon previously (*C. R. Ac. Sci.* 22, 1946, 1152) under the name *Brachystegia fleuryana*; but *Br. fleuryana* was only partly the same, he said. The type of *Zingania* was collected by Abbé Walker, who sent flowering branches, the material on which the amended description of *Zingania* is now based (Gabon, Lagune du Fernan-Vaz, in 1945) by Chevalier (l.c. p. 601—603) (see further *sub D. minutiflora*). Chevalier does not seem to have considered a possible relation between *Zingania* and *Didelotia*.

Pellegrin (*Lég. Gabon*, 1948, 77 & 91) gave descriptions of both *Zingania* Chev. and *Didelotia* Baill. He distinguished these genera by the following differences:

1. *Didelotia* has 'sepaloid' bracteoles and *Zingania* 'petaloid' bracteoles (Pellegrin). — This difference is not clear to me.
2. *Didelotia* has no petals; *Zingania* has 5 filiform petals (Pellegrin). — This statement is an error. An examination of the syntypes of *Didelotia africana* Baill. and of *Zingania minutiflora* Chev. proves that both *Didelotia* and *Zingania* possess 5 subulate-lanceolate petals (see also *Adansonia* 5, 1865, tab. VIII).
3. *Didelotia* has 1—7-jugate leaves with fairly large leaflets; *Zingania* possesses 10—12—

jugate leaves with small leaflets (Pellegrin). — This difference is present and was discussed by Léonard.

Léonard (Bull. Jard. Bot. Brux. 22, 1952, 206) declared that from Chevalier's description of *Zingania* only one difference with *Didelotia* Baill. could be derived: *Zingania*-leaves have 10—12 pairs of (small) leaflets, *Didelotia*-leaves up to 7 pairs of (fairly large) leaflets. This, Léonard judged to be insufficient as a base for a new genus. He therefore united *Zingania* with *Didelotia* and coined *Didelotia minutiflora* (Chev.) Léon. (l.c.) as a new combination. I was able to examine Walker's type (P, BR) and I can support Léonard's conclusion. On the other hand, Aubréville & Pellegrin (Bull. Soc. Bot. France 104, 1957, 490 & 791) proposed to reinstate *Zingania* Chev. as a distinct genus. They advanced the following distinguishing characters:

1. *Didelotia* has a much reduced perianth which is sometimes absent; *Zingania* has a reduced perianth which is clearly perceptible (Aubr. et Pell.). — This difference seems slight and, moreover, type specimens of *Didelotia* [*Griffon du Bellay* 235 (P, BR)] and of *Zingania* [*Walker s.n.* (P, BR)] show an equally reduced perianth.

2. *Didelotia*'s perianth is inserted *under* the disc of a small cupuliform receptacle; *Zingania*'s perianth is inserted *on the rim* of a  $\pm$  swollen receptacle (Aubr. et Pell.). — The type specimens (cited above) did not clearly show this distinction (see also below, morphological notes to the genus).

3. *Didelotia* has one intrapetiolar stipule (two fused stipules) and *Zingania* has free (lateral) stipules (Aubr. et Pell.). — Examination of both types, cited above, shows that both have intrapetiolar stipules. The outcome of an examination of the stipules in *Didelotia*, *Zingania*, and *Toubaouate* is discussed below (see also fig. 1).

4. *Didelotia* has less jugae to the leaf than *Zingania* (Aubr. et Pell.). — This difference has been discussed above.

5. The species of *Didelotia* possessing unifoliolate or one-jugate leaves have stipelliform appendices on the leaf-rachis; *Zingania* lacks these appendices (Aubr. et Pell.). — Some species of *Didelotia* (unifoliolate, uni-jugate but also with more jugae) have stipellae in the leaf, others have not (including *Zingania*).

Reinstating the genus *Zingania* Chev. on this evidence does not seem justified and *Didelotia* Baill. and *Zingania* Chev. ought to be considered congeneric.

In 1957, Léonard [Mém. Ac. Belg. Sc. 30, 2 (1957) 267] described *Didelotia brevipaniculata* Léon. In the same year Aubréville and Pellegrin (Bull. Soc. Bot. France 104, 1958, 490 & 491) proposed to base on this species a new genus named *Toubaouate* Aubr. & Pellegr. According to Aubréville and Pellegrin, *Didelotia* and *Toubaouate* differ as follows:

1. *Didelotia* has a much reduced perianth, which may be absent; *Toubaouate* possesses a reduced perianth which is easily perceptible (Aubr. & Pell.). — Examination of the types of *Didelotia* Baill. [*Griffon du Bellay* 235 (BRP)] and of *Toubaouate* Aubr. & Pellegr. [*Medou* 1826 (BRP.)] and a range of other specimens proves that *Toubaouate*'s perianth may be larger or smaller than that of *Didelotia africana*.

2. *Didelotia* has its perianth inserted under the disc of a small cupuliform receptacle; *Toubaouate* has its perianth inserted on the rim of a receptacle (Aubr. & Pell.). — Comparison of flowers the types (cited above) shows that the receptacle of *Didelotia africana* is crenate, swollen, and its stamens are inserted between the lobes. The edge of the receptacle of *Toubaouate* is more shallowly lobed, less swollen and the stamens are inserted on the edge. The insertion of the perianth is essentially the same; a more swollen disc naturally may cause a slightly more inferior position of the perianth and the stamens (cf. also fig. 2—8).

3. *Didelotia* has intrapetiolar stipules, *Toubaouate* has its (lateral) stipules not fused (Aubr. & Pell.). — This difference does not exist. There is a single, at base exceptionally broad stipule. This breaks just above the base and soon only a rim — the persistent base of the stipule — indicates the presence and actual position of the stipule (see fig. 1, 1).

This rim extends laterally, at both sides from the insertion of the petiole nearly half encircling the branch. Because the rim is continuous, and runs transversely through the leaf-axil, it can be established, even after the larger of the stipule has been shed, that

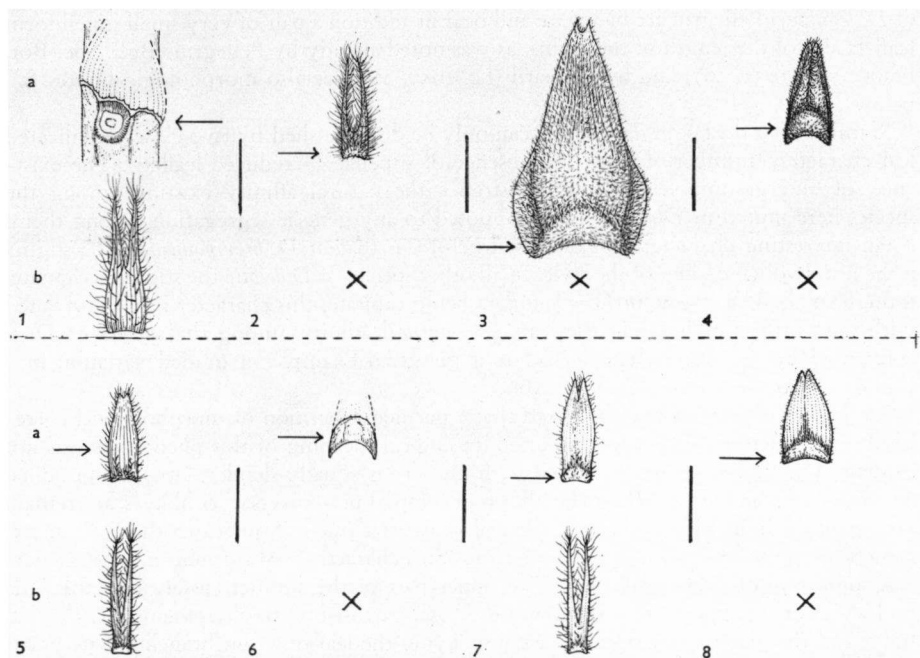


Fig. 1. Stipules in *Didelotia*. a: in adult plants, b: in seedlings. Arrow directed to persistent, fleshier basal part; X indicates that no material is known. — 1. *D. brevipaniculata* Léon. — a: lateral and intrapetiolar persistent rim, upper edge minutely toothed, the teeth being the remnants of the caducous, multi-nerved upper part (indicated by dotted lines) ( $\times 3$ , Médou 1826, BR, isotype); b: stipule of seedling ( $\times 3$ ; Voorhoeve 1208, WAG). — 2. *D. minutiflora* (Chev.) Léon. — a: deeply notched stipule on young branchlet ( $\times 3$ , Abbé Walker, WAG, isotype). — 3. *D. engleri* Dinkl. & Harms. — a: slightly notched stipule on young branchlet ( $\times 3$ , Dinklage 2033, S. isotype). — 4. *D. afzelii* Taub. — a.: slightly incised stipule on young branchlet ( $\times 3$ , Afzelius, UPS, isolectotype). — 5. *D. letouzeyi* Pellegr. — a: slightly notched stipule on young branchlet ( $\times 3$ , D. Normand 55-68-63, P); b: stipule of seedling ( $\times 3$ , Letouzey MPB 118, BR). — 6. *D. africana* Baill. — a: stipule remnant on mature branch ( $\times 3$ , Talbot 1461, K). — 7. *D. idae* Léon. Old. et De Wit. — a: stipule on young branchlet ( $\times 3$ , Voorhoeve 911, WAG), b: stipule on seedling ( $\times 3$ , Voorhoeve 938, WAG). — 8. *D. unifoliolata* Léon. — a: stipule on young branchlet ( $\times 3$ , Jans 855 bis, BR, holotype).

there is only one single (fused) stipule. On close inspection the upper edge of the rim still bears traces of numerous longitudinal veins, similar to those seen e.g. in the bracts and in bud-scales, or in the upper part of the stipule of e.g. *D. engleri*, or in the stipellae in the seedling-leaves of *D. letouzeyi*.

4. *Didelotia* has uni- to pauci-foliolate leaves. *Toubaouate* has multijugate leaves with very small leaflets (Aubr. & Pell.). — Actually, this cannot be accepted as a generic

distinction between *Didelotia* and *Toubaouate*, as one species of *Didelotia* [*D. minutiflora* (Chev.) Léon., type *Walker s.n.* (BR, P)] has essentially similar leaves though with fewer jugae than *Toubaouate* (see above, remarks concerning *Zingania*). The number of leaflets changes according to the species.

5. The species of *Didelotia* possessing one- or bi-foliolate leaves have stipelliform appendices on the rachis; *Toubaouate* lacks these (Aubr. & Pell.). — As stated above, this difference can only be used to distinguish between some species of *Didelotia* and some other species of *Didelotia* including *Toubaouate*. It is to be noted that the leaves on a seedling of *D. letouzeyi* Pellegrin are bi-jugate and bear in addition a pair of very small stipelliform leaflets at  $\frac{2}{3}$  of the length of the rachis, as was noted already by Pellegrin (Bull. Soc. Bot. France 100, 1953, 267) and by Léonard (l.c. 1957, 269; see also morphological notes (2), below).

Summarizing the taxon *Toubaouate* can only be distinguished by two closely connected leaf characters (number of jugae and absence of stipellae = reduced leaflets). The existence of intergrading leaf-characters stresses the natural affinity existing among the species here united in *Didelotia* and is opposed to any generic segregation among them.

An interesting character, not discussed before, is that in *D. brevipaniculata* the stigma is the not-swollen ending of the style. In all other species of *Didelotia* the stigma is capitate, though small. The stigma in *D. minutiflora* being capitate, this character is not correlated with the number of jugae in the leaf. The natural affinity among the species of *D.* is confirmed by the floral characters. The is genus an example of graded variation in a character-pattern within a natural taxon.

*Morphological notes.* It may be noted that a peculiar repetition of morphological correlated with functional characters occurs; a biological meaning of this phenomenon is not evident. The bud-scales are provided with numerous equally slender, close, longitudinal nerves. The scales drop when the shoot develops but transverse rimlike scars remain visible on the branchlets, indicating their place of attachment. Sometimes there are many, sometimes only few and more remote rims. This character is also found in other genera e.g. some *spp.* of *Monopetalanthus*. The upper part of the stipules closely resembles the bud-scales. This upper part is shed, and the basal part of the stipule remains as a rim (cf. fig. 1 and the generic description), accompanying the leaf on adult branches. The bracts and bractellas behave (and are veined) similarly. The breaking above the base (or zone of attachment) is repeated by the pods, which become detached when ripe, above the insertion of the stalk, which bears a more or less persistent triangular fragment of the pod after it has dropped.

Unifoliolate and bifoliolate leaves are provided with one pair of caducous 'stipellae' on the foot of the rachis (*D. unifoliolata*, *D. africana*, *D. letouzeyi*). Plurijugate leaves are sometimes with (*D. engleri*) and sometimes without 'stipellae'. *D. letouzeyi* forms an important link between pauci- and pluri-foliolate leaves. Its seedling has bijugate leaves and in addition a lowermost pair of 'stipellae'. In fully grown specimens, the leaves are monojugate but leaves just emerging from the bud have a much reduced lowermost pair of leaflets. The range of transitions is further completed by the 5—7-jugate 'juvenile' leaves appearing among the inflorescences of *D. engleri*, which bear a lowermost pair of much reduced, stipellar leaflets.

In the descriptions the term 'bractella' is used for bracts subtending a flower (from the axil of the bractella rises a pedicel). The term 'bract' is restricted to bracts subtending an inflorescence (of the first order (peduncle, primary rachis), and the second order (sideraceme, secondary rachis)).

## KEY TO THE SPECIES

1. Leaves unifoliolate.
  2. Ovary glabrous. Calyx nearly absent, one sepal 1 mm long, larger than others, nearly entire, glabrous . . . . . **D. unifoliolata**
  2. Ovary pubescent on edge and on its base. Sepals 5, about equal, 1—2 mm long. Disc deeply lobed, usually hairy . . . . . **D. idae**
1. Leaves bi- to plurifoliolate.
  3. Leaves bifoliolate on adult branches.
    4. Leaflets  $3\frac{1}{2}$ —7 cm long,  $1\frac{1}{2}$ —4 cm wide. Sepals and petals absent (rarely one petal and one or two sepals present. Ovary glabrous . . . . . **D. letouzeyi**
    4. Leaflets 6—15 cm long,  $2\frac{1}{2}$ — $7\frac{1}{2}$  cm wide. Sepals and petals present. Ovary pubescent on edge. . . . . **D. africana**
  3. Leaves with 3 or more jugae.
    5. Leaflets more than 1 cm wide.
      6. Leaves 3—4 (—5)-jugate; leaflets  $3\frac{1}{2}$ —10 cm long. Ovary pubescent on edge and on the base. Stipule subpersistent,  $3\frac{1}{2}$ —4 mm long. . . . . **D. afzelii**
      6. Leaves 5—7-jugate; leaflets 2—3 cm long. Ovary densely woolly tomentose. Stipule persistent, large (7—8 mm) . . . . . **D. engleri**
    5. Leaflets at most  $\frac{1}{2}$  cm wide, usually narrower.
      7. Leaves 8—12-jugate. Ovary densely tomentose. Pedicels glabrous . . . . . **D. minutiflora**
      7. Leaves 15—23-jugate. Ovary pubescent on the margins. Pedicels pubescent. . . . . **D. brevipaniciolata**

*Didelotia africana* H. Baillon, *Adansonia* 5 (1865) 367, tab. 8; Benthams & Hooker *f. Gen. Pl.* 1 (1867) 1003; Oliver, *Fl. Trop. Afr.* 2 (1871) 307; Taubert *apud* Engl. & Pr., *Nat. Pfl. Fam.* 3, 3 (1894) 387; Dinklage, *Bot. Jahrb.* 30 (1901) 80; Engler, *Veg. Erde*, 9, 4, *Afr.* 3, 1 (1915) 481, Chevalier, *For. & Bois Gabon* (= *Vég. Ut. Afr. Trop. Fr.* 9) (1916) 177 (misidentification, see notes); Bertin, *Bois Gabon* (1918) 146 (misidentification, see notes); Pellegrin, *Bull. Soc. Bot. France* 69 (1922) 786; Hutch. & Dalz., *Fl. W. Trop. Afr.* 1, 2 (1928) 348; Pellegrin, *Lég. Gabon* (1930) 77; Baker *f.*, *Leg. Trop. Afr.* 3 (1930) 736 (possibly misidentification); Hédin, *Rev. Bot. Appl. Agric. Trop.* (1929) 45; Etude *For. Bois Cameroun* (1930) 116 (misidentification, see notes); Aubréville, *Fl. or. Côte Iv.* 1 (1936) 240; Dalziel, *Usef. Pl. W. Trop. Afr.* (1937) 191 (see notes below); Jentsch, *Ko. Förstl. Mitt.* 2 (1939/40) 329 (misidentification, see notes); Guinea Lopez, *Ens. Geobot. Guin. Cont. Esp.* (1946) 294; Pellegrin, *Bull. Soc. Bot. France*, 100 (1953) 266; Léonard, *Mém. Ac. Belg. Sc.* 30, 2 (1957) 265, 266; Aubréville & Pellegrin, *Bull. Soc. Bot. France*, 104 (1958) 491, 492; Keay *apud* Hutch. & Dalz., *Fl. W. Trop. Afr.*, 2 nd ed. 1, 2 (1958) 481. — **Fig. 2.**

An evergreen, up to 35 m tall, sometimes giant forest tree; clear trunk c. 25 m. Branchlets glabrous, dark brown, with few irregularly scattered, orbicular, raised, brown lenticels. Stipule not known entire. *Leaves* 1-jugate; petiole sturdy, glabrous, c. 1 cm long. Leaflets very asymmetrical, often subfalcate, outer half broadly rounded, inner narrowly oblong, (6—)7—9(—15) cm long, 3—5( $2\frac{1}{2}$ — $7\frac{1}{2}$ ) cm wide, dull on both reticulate surfaces, darker on the upper, entirely glabrous; top (sub) acuminate, acute; base unequal, the broader half provided with 3 subpalmate closely approximate side-nerves, deviating at a smaller angle than the higher side-nerves. Midrib slightly prominent above in the lower half, strongly prominent on the lower surface. *Inflorescences* axillary, pendent along the branchlets, racemose (a slender raceme with occasional short side-racemes), 12—18 cm long (side-racemes c. 3 cm), rachis puberulous, angular; side-racemes subtended by caducous bracts, breaking from the persistent base. *Flower* on a slender, puberulous, 2—3 mm long pedicel, axillary from an subpersistent, broadly rounded, ciliolate, 1 mm long, 2 mm wide bractella. Bracteoles  $\pm$  4 mm long,  $2\frac{1}{2}$  mm wide, broadly ovate

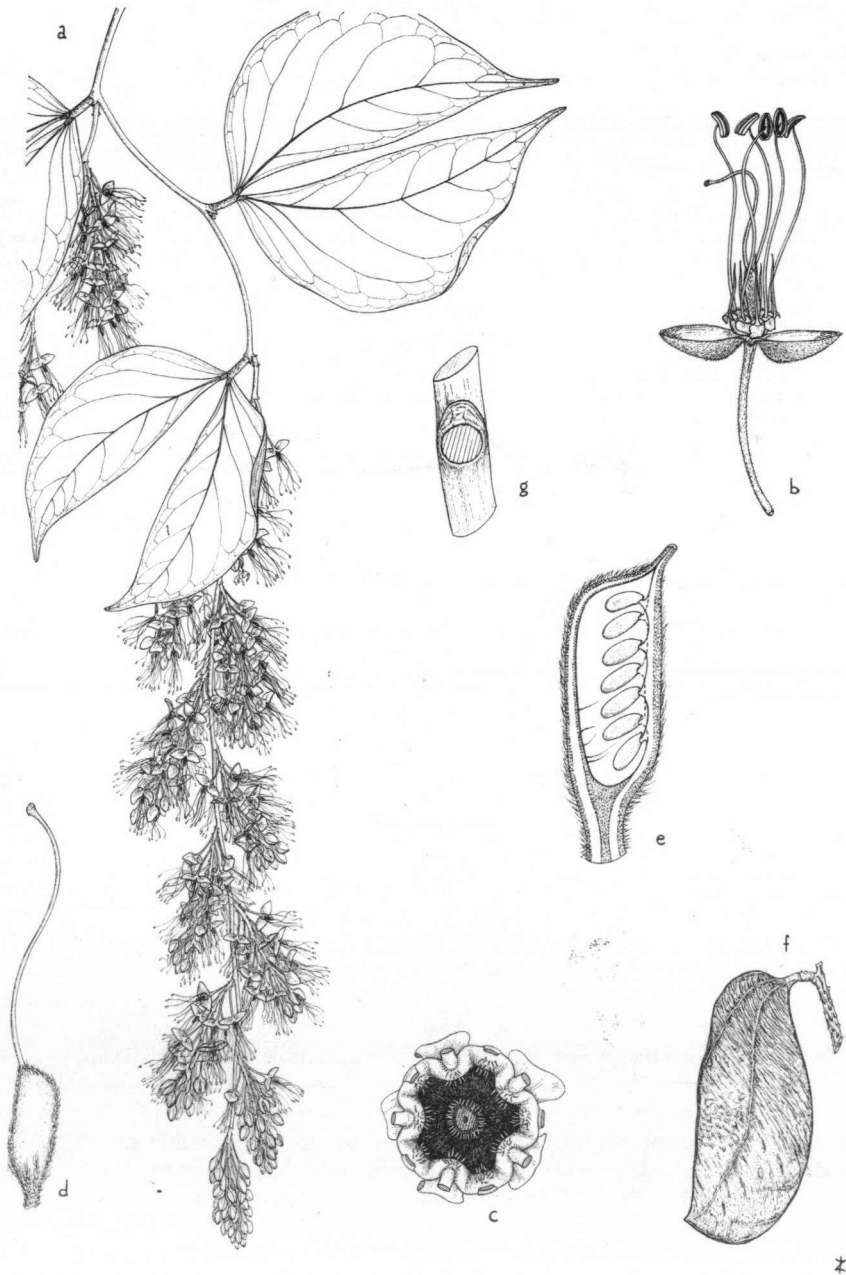


Fig. 2. *Didelotia africana* Baill. — a. leaves and inflorescence; b. flower ( $\times 3$ ); c. receptacular disc, surface view, petals, stamens, and ovary removed, sepals recurved ( $\times 10$ ); d. pistil ( $\times 6$ ); e. ovary, length section ( $\times 12$ ); f. young pod ( $\times \frac{1}{2}$ ); g. intrapetiolar stipular remnant above leaf-axil (a — c, g Talbot 1461 bis, K; f Normand 258, P).



and rounded, outside densely but minutely puberulous, inside sparsely puberulous in the upper half. Receptacle fleshy, disc undulate lighter coloured, with patches of minute bristles. Sepals less than 1 mm long, recurved ovate scales at the base of the filaments. Petals linear, long tapering to a slender point, 2—3 mm long. Stamens marginal, glabrous, 6—8 mm long. Anthers  $1\frac{1}{2}$  mm long. Staminodes absent. Ovary  $\pm$  rectangular, flat, pubescent along the edge and on the base, a few bristles on the interior dorsal nerve, c. 7-ovulate. Style glabrous, slender, 6 mm long. Stigma capitate. Pods with 2 (indistinct) curved nerves rising from the base, glabrous, elliptic, c. 10 cm long, 3—4 cm wide; valves dehiscent, involute; persistent style-base laterally on top. Seeds broadly ovate, flat,  $1\frac{1}{2}$  cm long, endosperm very little, near the hilum.

*Type specimen: Griffon du Bellay 235* (holotype P, isotype BR)

*Distribution:* Nigeria, Gabon.

NIGERIA. S. region, Oban District, *Mr. & Mrs. Talbot 1461* and *1461 bis* (BM, K); Eket District, *Mr. & Mrs. Talbot 3344* (BM, K); Calabar, Dukwet Div. felling area, Akampka Rubber Estate, Latilo *FHI 41337* (BRLU).

GABON. Libreville, Route d'Idokogo, Res. Mondah, *Normand 258* (BR, P), *258b* (P); s.l., *Griffon du Bellay 235* (P, isotype BR); Jardin de Kirelli, *Griffon du Bellay 307* (P); Libreville, *Fleury in herb. Chevalier 33593* (P).

*Vern. names:* Gabon: *Eko andung*.

*Taxonomical notes:* Pellegrin (Bull. Soc. Bot. France 69, 1922, 786) reported on the identity 'Kevasingo' or 'Bois de Rose' of Gabon. He found as follows:

Pierre had identified *Klaine 3444* and *3073* (P) which represented 'Bois de Rose', as *Didelotia africana*. Chevalier (l.c., 1916, 177) and Bertin (l.c. 1918, 146) accepted Pierre's identifications, although Chevalier expressed some doubt. The botanical description of 'Bois de Rose' by Chevalier and Bertin therefore rested on Klaine's specimens. Hédin (l.c., 1930, 116) and Jentsch (l.c. 1939/40, 329) copied Chevalier's and Bertin's data: Dalziel (l.c. 1937, 191) reported Hédin's data.

Now, Pellegrin found Pierre had erroneously identified *Klaine 3444* and *3073* which actually represent *Copaifera* (*Guibourtia*) *demeusei* Harms [*Klaine 3444* (P, G, BR, E)] and possibly still another species [*Klaine 3073* (P, BR)]. Among the carpological collection at Paris I found that leaflets accompanying old pods (*Klaine 3073*) might represent *C. demeusei*, but the pods were certainly not that species and strongly resembled *D. africana* pods. It follows that Chevalier and Bertin probably described the wood of *Copaifera demeusei* Harms, and again probably, not that of *Didelotia africana* Baill. This confusion is reflected in the citation by Chevalier, Bertin, Hédin, and Jentsch: *Didelotia africana* 'Pierre'. Further research in Chevalier's herbarium by Pellegrin revealed that some specimens named as *Didelotia africana* [leg. *Fleury in herb. Chevalier 26529, 26660*, and leg. *Fleury in herb. Chev. 26671*] are *Copaifera demeusei* Harms; Pellegrin's identification is confirmed here, but it is evident that the published data concerning the word by Chevalier, Bertin, Hédin, and Jentsch need to be checked.

The specimens *Griffon du Bellay 235* et *307* are the same collection; the part of it lent for exhibition was numbered '235'.

*Biological notes:* The majority of herbarium specimens of *D. africana* appear to have been found near or on the banks of lakes or small rivers. This suggests that the species requires a large supply of moisture in the soil. More field-data are needed to confirm this view, but in connection with the high moisture-demand of other *Didelotia*-species

which seems to be firmly established (see also notes on *D. brevipaniculata* Léon., *D. unifoliolata* Léon., and *D. engleri* Dinkl. & Harms), it seems likely that *D. africana* also favours moist localities. Latilo (*FHI 41337*) found the tree on damp soil in 'high forest, with *Parkia bicolor*, *Garcinia*, *Pycnanthus angolense* and *Uapaca*'. It was a 'tall tree, up to 120 ft high and about 8—9 ft in girth. Bole straight, greenish brown in colour. Slash brown, soft and deep. Flower buds greyish-green'.

*Economical notes:* No economical use is mentioned in the publications cited above. All commercial data on record rest on the erroneous identification by Pierre (see above), and so concern *Guibourtia demusei* (Harms) J. Léon.

***Didelotia afzelii*** Taubert *apud* Engl. & Pr., Nat. Pfl. Fam. 3, 3 (1894) 387; Harms, Bot. Jahrb. 26 (1899) 266; *ibid.* 30 (1907) 81; Engler in Veg. Erde 9, 4, Afr. 3, 1 (1915) 481; Hutch. & Dalz., Fl. W. Trop. Afr. 1, 2 (1928) 348.; Baker *f.*, Leg. Trop. Afr. 3 (1930) 736; Dalziel, Usef. Pl. Trop. W. Afr. (1937) 191; Léonard, Mém. Ac. Belg. Sc. 30, 2 (1957) 266, 269; — Keay *apud* Hutch. & Dalz., Fl. W. Trop. Afr. 2nd ed., 1, 2 (1958) 480—481; Aubréville, Fl. For. Côte Iv. 1 (1959) 294. — **Fig. 3.**

An evergreen, big. tree 25 m tall. Branchlets glabrous, dark brown, with irregularly scattered, orbicular, raised, light brown lenticels (of young leaf-flushes ferruginous pubescent). Stipule triangularovate, tip short-bifid,  $3\frac{1}{2}$ —4 mm long, outside puberulous. *Leaves* 3—4(—5)-jugate, jugae increasing towards the uppermost, largest pair, petiole *c.* 5 mm, rachis 4—9 cm long. Leaflets distinctly asymmetrical, elliptic-(ob)ovate, coriaceous, glossy on the upper, dull on the lower surface, distinctly veined (veins more prominent on the lower surface), glabrous (except on the midrib, upper surface); top blunt, emarginate, base unequal, the outer half lower inserted and there the two strongest side-nerves arise (subpalmately, at a smaller angle than the higher side-nerves) and ascend to about half the length of the leaflet or even further. Leaflets of lowermost pair  $3\frac{1}{2}$ —4 cm long and 2—2 $\frac{1}{2}$  cm wide, of uppermost pair 7—9(—10) cm long and 3—5 cm wide. Midrib slightly prominent and minutely puberulous on the upper surface, glabrous and bluntly prominent on the lower surface. *Inflorescence* pendent from the twig, axillary, racemose (a long slender raceme with occasional short side-racemes), 12—18(—22) cm long (side-racemes 2—4 cm), rachis puberulous, angular, side-racemes axillary from broadly ovate, blunt, caducous, small bracts, breaking above the base. *Flowers* on slender, puberulous, *c.* 4—7 mm long pedicels, axillary from caducous bractellae. Bracteoles 4 mm long, 3 mm wide, broadly rounded, many-nerved, densely puberulous. Receptacle cup-shaped, fleshy, the top surface covered by a glabrous, light coloured, deeply lobed disc. Calyx tiny bilobed scales (often absent) at the base of the filaments. Petals subulate, long tapering to a slender point, 2—4 mm long. Stamens rising from the sinus between the lobes, glabrous, 11—13 mm long. Anthers 1 mm long, elliptic, recurved. Staminodes absent, rarely 1 present. Ovary  $\pm$  rectangular, pubescent along the edges and on the base, 3—6-ovulate, a series of small bristles inside on the axial suture. Style glabrous or almost so, slender, 7 mm long. Stigma small, capitate. *Pods* indistinctly veined or with one somewhat more distinct nerve, nearly smooth, glabrous,  $\pm$  elliptic, 10—14 cm long,  $3\frac{1}{2}$ —4 cm wide; valves dehiscent, involute. Seeds ovate, nearly smooth, flat, 1 $\frac{1}{2}$ —2 cm long, over 1 cm wide, containing a small quantity of endosperm at the base of the  $\frac{1}{2}$  bifid cotyledons.

*Type specimen:* Herb. Afzelius, *s.l.*, Sierra Leone 'Eperuoides' (lectotype, UPS).

*Distribution:* Sierra Leone.

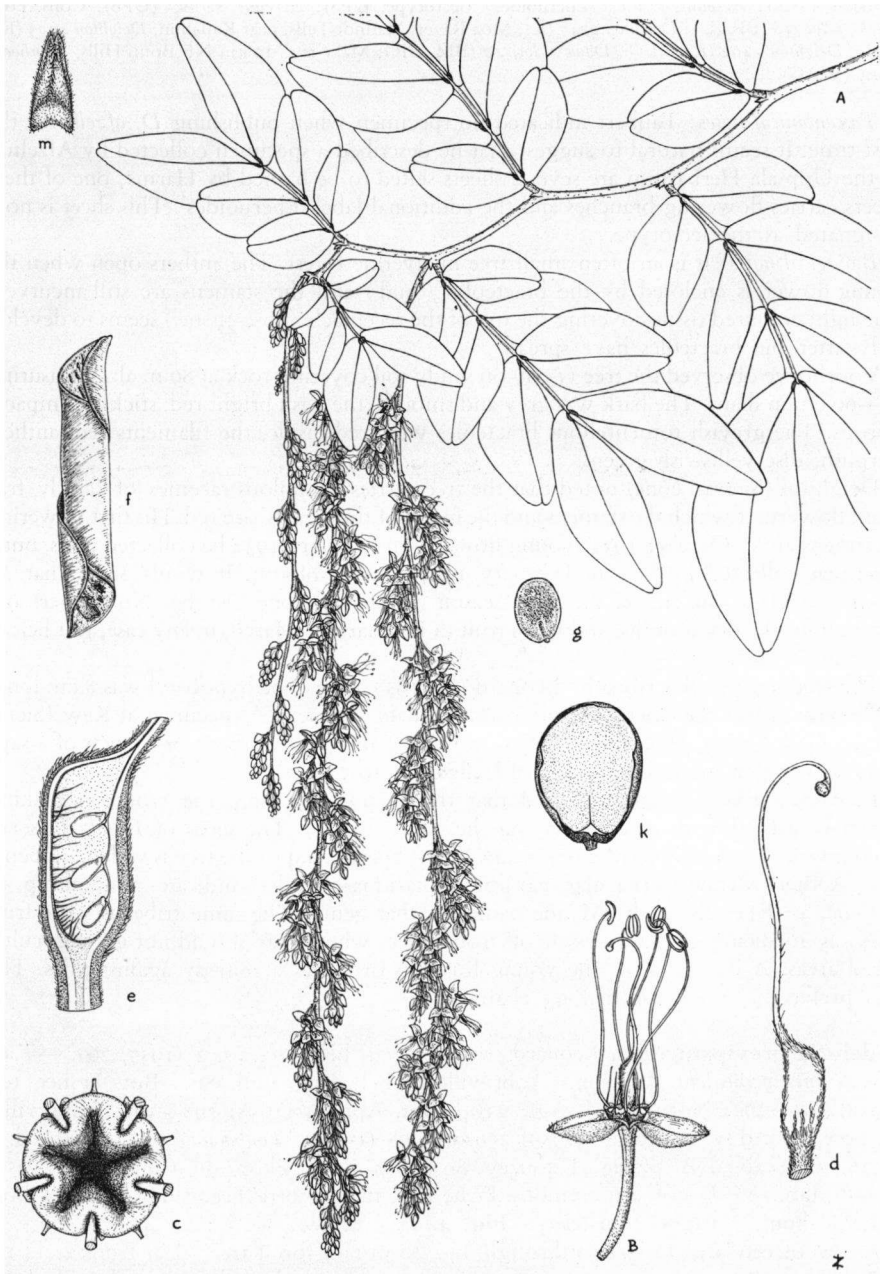


Fig. 3. - *Didelotia afzelii* Taub. — a. flowering branch ( $\times \frac{1}{2}$ ); b. flower ( $\times 6$ ); c. disc, stamens and petals removed ( $\times 10$ ); d. ovary ( $\times 6$ ); e. length section of ovary ( $\times 12$ ); f. pod ( $\times \frac{1}{2}$ ); g. seed ( $\times \frac{1}{2}$ ); h. seed, testa removed, showing cotyledon and endosperm below ( $\times 1$ ); i. intrapetiolar stipule on young branch ( $\times 3$ ) (a, m *Afzelius s.n.*, UPS, a. lectotype; b-k *Deighton 2462*, K).

SIERRA LEONE. *Afzelius*, s. loc. "Eperuoides" (lectotype, UPS); *Afzelius*, s. loc. (UPS); Cons. For., Hoyle, s. loc. 38 (BRLU); Deighton 2247 (K); Moa River, Mafindo Falls, near Kailahun, Deighton 4003 (K); Njala, Deighton 2462 (K); M. T. Dawe s. loc. 29 (BM, BR); Make riv., 12 km NE Bomi Hills, Voorhoeve 1300 (WAG).

*Taxonomical notes:* Taubert indicated no specimen when publishing *D. afzelii* for the first time. It seems natural to suggest that he described a specimen collected by Afzelius. In the Uppsala Herbarium are several sheets stated to be named by Harms; one of these sheets carries flowering branches and the additional label 'Eperuoides'. This sheet is now designated as the lectotype.

*Biological notes:* It is an often small tree in riverine forest. The anthers open when the young flower is enclosed by the bracteoles ('bud') and the stamens are still incurved. The light coloured tissue covering the top of the receptacle ('disc-tissue') seems to develop only after the bracteoles have spread.

Voorhoeve observed the tree (1300) on sandy soil covering rock at 80 m alt., measuring 50—60 cm in diam. The bark was grey and smooth, the slash bright red, sticky, compact-fibrous. The greyish tomentellous bracteoles were red inside, the filaments red, anthers purplish, disc yellowish green.

Deighton (Sierra Leone) noted that the tree carries pendulous racemes of faintly fragrant flowers, of which the stamens and the inside of the 'bracts' are red. His first flowering specimens are of October 1931 (young flowers), in February 1932 he collected pods, but a specimen collected by him in February 1944, was in bloom. It would seem that *D. afzelii* flowers at the end of the rainy season (in Sierra Leone October November) and throughout the dry months, and bears fruit in February or March, in any case, just before the rains return.

The seedling was described by Léonard (l.c. 1957, 269). The hypocotyl was 8 cm long, pubescent, as was the epicotyl. Cotyledons cordate, epigaecic. A specimen at Kew (Sierra Leone, Gola North, H. C. King 138) is most probably a watershoot or branch of a sapling, showing an increased number of leaflets (up to 7 pairs).

*Economical notes:* Deighton noted that the Mende are using the wood in making 'warri-boards' (boards used in playing the game 'warri'). The seeds of *D. afzelii* serve as counters. 'Gbembili', in Mende, means 'warri board', and so the tree is valued 'sagbembili'. Other Mende vernacular names: 'Kpia-kpia-gbendei' indicate relationship to *Berlinia*, as 'Kpendei' is the Mende name for that genus. The same tribe uses the fruit husks as 'medicine' to warn people off from places where they should not go, e.g. cultivated areas. A decoction of the young leaves is drunk as a remedy against piles. The Kisi prefer the wood for making charcoal.

***Didelotia brevipaniculata*** Léonard, Mém. Acad. belg. Sc. 30, 2 (1957) 267. — *Toubaouate brevipaniculata* (J. Léon.) Aubréville & Pellegrin, Bull. Soc. Bot. France 104 (1958) 491—492; Normand, J. Agr. Trop. Bot. Appl. 5 (1958) 298—301; Aubréville, Fl. For. Côte d'Iv., 2nd ed. 1 (1959) 296, tab. 98 (1—6); 'Toubaouaté' cf. l.c. 1st. ed. 1 (1936) 242, tab. 95A. 'Zing' Letouzey & Mouranche, Ekop du Cameroun (1952) 54—57, tab. 12. 'Touwé' Anonymous, Fiche Forestière Centre Techn. For. Trop. Libreville (Gabon), 2 pages, 2 plates. — Fig. 4.

An evergreen large (1—1½ m through, 14—20 m tall) forest tree; clear trunk c. 14 m. Stipules broadly ovate, 17—20 mm long, glabrous, partly laterally inserted, and partly intrapetiolar, early breaking and leaving a rimlike scar on the branch. Branchlets glabrous (when young pubescent), at base marked by numerous rimlike scars (the bases of the shed, imbricate, large bud-scales), blackish brown, with orbicular or elliptic brown

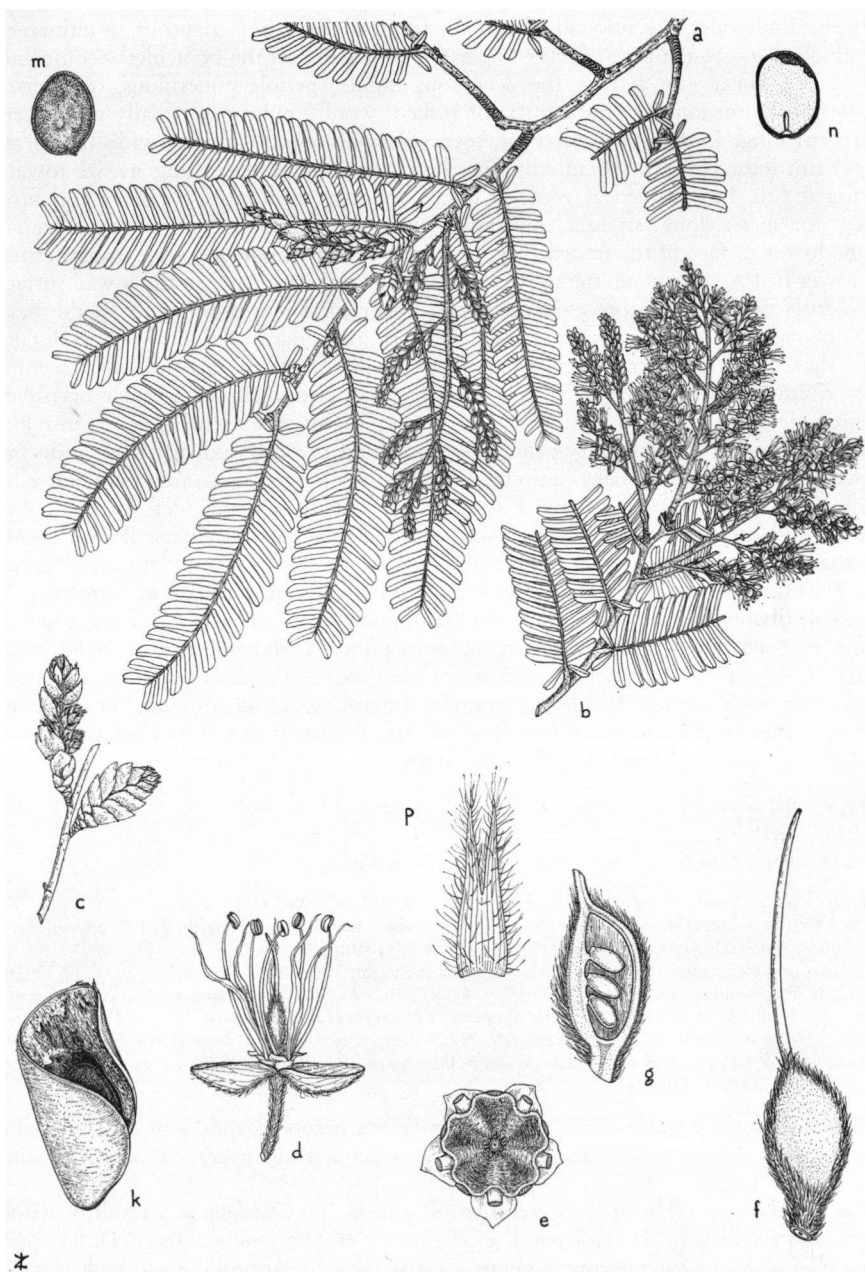


Fig. 4. *Didelotia brevipaniculata* (Aubr. et Pell.) Léon. — a. branch carrying inflorescence ( $\times \frac{1}{2}$ ); b. flowering branch ( $\times \frac{1}{2}$ ); c. budding inflorescence ( $\times \frac{1}{2}$ ); d. flower ( $\times 4$ ); e. disc from above ( $\times 10$ ); f. ovary ( $\times 12$ ); g. length section ovary ( $\times 12$ ); h. stipule ( $\times 4$ ); i. pod, open ( $\times \frac{1}{2}$ ); j. seed ( $\times \frac{1}{2}$ ); k. seedling ( $\times 4$ ); l. seed, testa removed ( $\times \frac{1}{2}$ ); m. seed ( $\times \frac{1}{2}$ ); n. seed, testa removed ( $\times \frac{1}{2}$ ); p. stipule of seedling ( $\times 4$ ); (a Medou 1707, 1826, P; b, d — de Saint-Aubin 2061, P; c Aubréville 4053, P; p Voorhoeve 1208, WAG).

lenticels, Bud-scales exceptionally large on terminal branches, glabrous, multinerved, top notched, 1—1½ cm long. *Leaves* 15—23 (—35)-jugate, on the branchlet accompanied by a raised linear scar, left by the deciduous stipule; petiole puberulous, transversely rugose, 3—4 mm long; rachis angular or ribbed, woolly pubescent, finally glabrescent, 6—10 cm long. Leaflets asymmetrical, rectangular-oblong, ± 3 mm wide (2—4) and ± 11 mm long (5—22), the middle ones largest, gradually decreasing in size towards the top and the base of the leaf, more or less glossy on both surfaces, coriaceous, glabrous except for sparse, long, straight, appressed, somewhat fugacious hairs on the edge and on the lower surface of the midrib; top obliquely rounded, notched; base asymmetrical, the lower half ± auriculate, the upper cuneate. Midrib prominent on the lower surface; side-nerves numerous, more evident on the lower surface and especially in the basal, auriculate part of the leaflet, anastomosing and forming a marginal vein at a short distance from the edge. *Inflorescences* axillary, perhaps finally more or less pendent, racemose (a 4—6 cm long raceme with 1—2 cm long side-racemes), rachis angular or ribbed, hirsute, side-racemes from broadly ovate, scarioso, slightly pilose, brown, ± 7 mm long bracts. *Flowers* on slender, pubescent, 2—3 mm long pedicels, axillary from caducous, brown, glabrous, on edge hairy (especially on top tufted), ovate, 3—4 mm long bractellae. Bracteoles 3—4 mm long, 2½—3 mm wide, broad-ovate to sub-orbicular, sparsely pubescent to ± glabrous outside, glabrous inside, on edge pruinose. Receptacle fleshy, broadly cup-shaped, disc-bearing. Calyx up to 1 mm long, 4—6 broadly triangular scales (varying in size) at the base of the filaments. Petals 2—5, almost linear, 4 mm long. Stamens 4—6, marginal, filaments 4 mm long, glabrous. Staminodes 0—2, up to 1 mm long, subulate, at the base of the petals. Ovary flat, oblong, pubescent-hirsute at base and on the suture, 2—3 (—4)-ovulate. Style glabrous, 1½ mm long. Stigma not capitate, inconspicuous. *Pods* with a single slender longitudinal nerve, glabrous, oblong, sub-apiculate, 6—8 cm long, 3—4 cm wide; valves thin, woody; persistent style-base centrally on top. Seed flat, dix-shaped, containing a little endosperm near the hilum.

*Type specimen*: Medou 1826 SRFK (= 7392 CTFT; holotype P; isotype BR, BRLU, K, P).

*Distribution*: Liberia, Ivory Coast, Cameroon, Gabon.

**LIBERIA.** Scino, Voorhoeve 1208 (seedling; WAG), J. A. White 1 (WAG).

**IVORY COAST.** s. loc. Aubréville 2801 (P); region de Grabo, Aubréville 1291 (seedling; P), Aubréville 4053 (P); Tabou, Aubréville 4167 (watershoot, P); Aubréville 1674 (P).

**CAMEROON.** Kribi, about 1½ km of the sawmill Sieba at Zingui, Medou 1826 SRFK (= 7392 CTFT) (BR, BRLU, K, P); Mondoh, Estasse 594 SRF (P), 596 SRF (P), 661 SRF (P); Zingui près Kribi, Medou 1707 SRFK (P); Kribi-Zingui, Km 47, chantier Restany, Letouzey 1414 SRFK (BR).

**GABON.** Majenne Mbei, Morel 129 SRF (P); Nkay distr., Coco-beach (Noya-Noya Adukke), Morel, 23 Nov. 1947 (P); 24 km SE Coco-beach, de Saint-Aubin 1936 SRF (P. Bois CTFT 11291); N'Koulourgo, de Saint-Aubin 2061 CTFT (P).

*Vernacular names*: *Evele-abai* (Boukribi tribe, Cameroon); *Imbounba* (Eschira tribe, Cameroon); *Ngang*; *Ngal-ngang*; *Eko-andoung* (Gabon, Fang tribe); *Ngangui* (Masango tribe, Gabon).

*Taxonomical notes*: This species was first recognized as a *Didelotia* as a result of wood-anatomical research by D. Normand (cf. Letouzey et Mouranche, 1952). *D. brevipaniculata* was made the type of a new genus, *Touabouate*, by Aubréville and Pellegrin (l.c. 1958). The reasons for not accepting *Touabouate* Aubréville & Pellegrin have been given above (see notes to *Didelotia*). *Touabouate* is linked by many characters to the other species in *Didelotia*. The now demonstrated presence of a small amount of endosperm in the seed at the base of the cotyledons is another characteristic link.

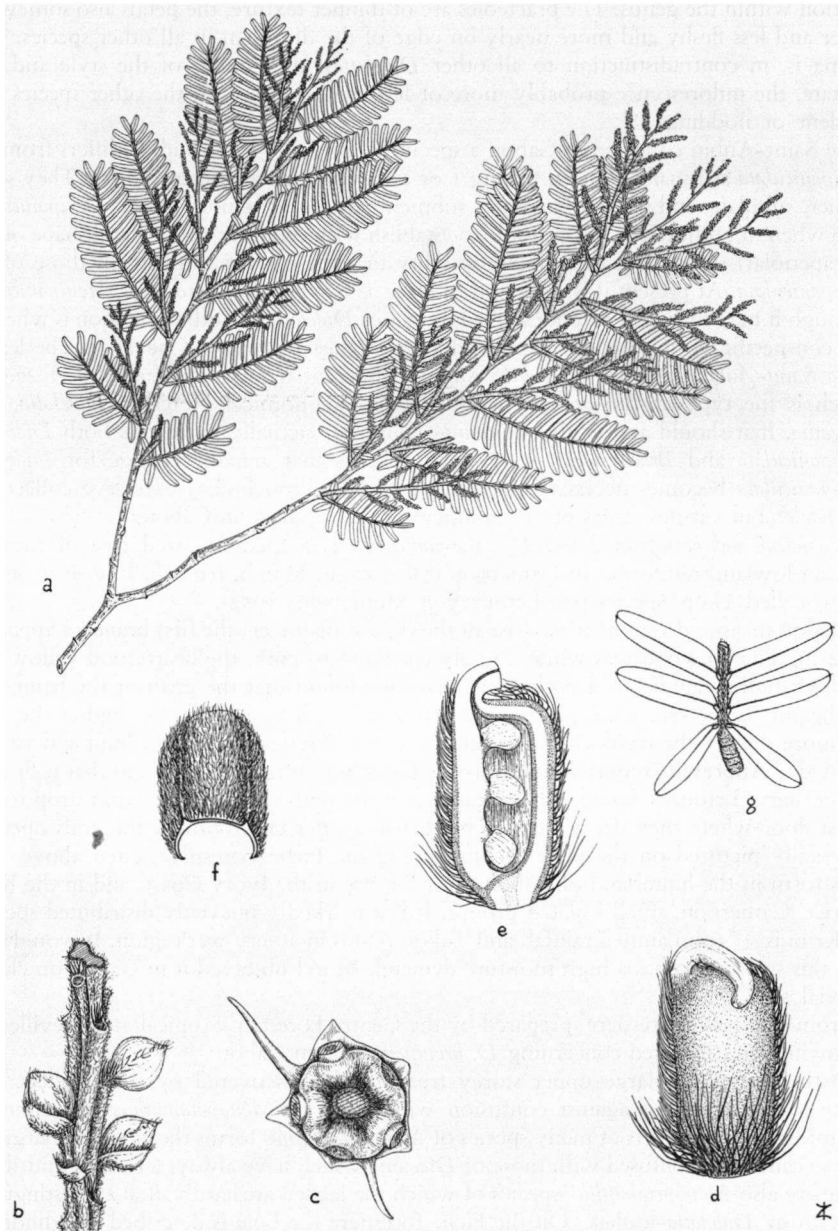


Fig. 5. *Didelotia brevipaniculata* (Aubr. et Pell.) Léon. — a. branch bearing flower buds ( $\times \frac{1}{2}$ ); b. buds ( $\times 5$ ); c. disc seen from above ( $\times 30$ ); d. ovary (from bud) ( $\times 30$ ); e. length section of ovary (bud) ( $\times 30$ ); f. intrapetiolar stipule (perhaps only basal part,  $\times 10$ ); lower part of leaf ( $\times 2$ ) (All from *de Saint-Aubin 2010*, P see notes).

It ought to be realized, however, that *D. brevipaniculata* occupies a somewhat isolated position within the genus. The bracteoles are of thinner texture, the petals also somewhat flatter and less fleshy and more nearly on edge of the disc than in all other species. The stigma is, in contradistinction to all other *Didelotias*, the ending of the style and not capitate, the inflorescence probably more or less erect, whereas in the other species it is pendent or nodding.

De Saint-Aubin collected in Gabon a specimen (no 2010, P) in bud. It differs from *D. brevipaniculata* as usually seen, in having 1 or 2, rarely 3, petals (instead of 5). They seem fleshier, subulate, and not flattened and submembranous as is usual in *D. brevipaniculata* (also when in bud). It was not possible to establish with certainty the size and shape of the (intrapetiolar) stipule but there is a possibility that the stipules differ from those of *D. brevipaniculata*. At present it is preferred to place *de Saint-Aubin 2010* in *D. brevipaniculata* although it may represent an undescribed species of *Didelotia*. Another question is whether it is conspecific with what was described as *Brachystegia fleuryana* Chevalier. The leaves of *de Saint-Aubin 2010* are only very slightly different from Chevalier (*Fleury*) 26.679, which is the type of *Brachystegia fleuryana* (see Taxonomical Notes to *Didelotia*, sub *Zingania*). If it should appear that *de Saint-Aubin 2010* actually represents both *Didelotia brevipaniculata* and *Brachystegia fleuryana*, it follows that a name change for *Didelotia brevipaniculata* becomes necessary. In order to reach a conclusion, extensive collections of *Didelotia* in various stages of development are to be made in Gabon.

*Biological and ecological notes:* *D. brevipaniculata* is a medium-sized tree of the W. African lowland rainforest. In Cameroon it flowers in March, fruits in July. It is one of the so-called 'ekop' species (see Letouzey et Mouranche, 1952).

Medou measured 1.20 m at the base of the type as diameter; the first branches appeared at 14 m. The sapwood was white, rapidly changing to pink, the heartwood yellow and hard, changing rapidly to deep brown. Letouzey found that the girth of the trunk and the height of the tree were more or less inversely proportioned; the higher the tree, the more slender the trunk. It has generally 3—6 buttresses, up to 1 m high and 10—30 cm wide. Aubréville reported that in Ivory Coast no buttresses occur and that it flowers in February. Letouzey stated that in Cameroon the pods remain closed and drop to the forest floor where they decay. It may be that in a drier environment the pods open, as is actually pictured on the plate accompanying the Fiche Forestière, cited above. The trees form in the hinterland of Tabou (near Grabo) in the Ivory Coast, and in the Kribi district, Cameroon, small isolated groups. It is a markedly unevenly distributed species. At Kribi is  $\pm$  10 m annual rainfall and Tabou is also in a very wet region. It would seem that this species too has a high moisture demand. Morel observed it in Gabon on clayey alluvial soil.

From the 'Fiche forestière' prepared by the Centre Forestier Tropical at Libreville, the following data are cited concerning *D. brevipaniculata* in Gabon:

In the forest, this large upper storey tree may be discovered by shed leaflets. The Fiche forestière warns against confusion with those of *Monopetalanthus* and although the midrib of the leaflets of many species of *Monopetalanthus* forms the anterior margin — and so cannot be confused with those of *Didelotia* which have always a central midrib —, there are also *Monopetalanthus*-species of which the leaflets are hardly, if at all, distinguishable from *Didelotia*-leaflets. On the Fiche forestière the bole is described as cylindrical, not or little buttressed, straight or nearly so. The smooth bark is reddish, irregularly dotted by numerous corky lenticels. Animals frequently rub themselves against the trunk and so heighten its reddish hue. The bark is about 15 mm thick (c.  $\frac{1}{2}$  in.). Under the outermost skin is a thin brown-green layer. In transverse section the bark is fibrous,



tinged wine-red. The inner bark is pinkish; the sapwood is white after removal of the bark. The crown is rather open, umbrella-shaped. Some heavy arms ascend, curve in many directions and divide into increasingly smaller branches becoming more and more directed horizontally. Fresh heartwood is pink to red, later changing to reddish-brown, indistinctly marbled by grey-green veins. The fresh sapwood is whitish-pink, later light-brown, 5—7 cm thick.

The Centre forestier added the following technical data on wood specimens from Cameroon:

Weight: 900—1100 kg/m<sup>3</sup>. Wood: semi-hard and semi-heavy. Specific gravity (moisture 12 %): 0.65—0.75, but Morel noted (in Gabon) that freshly felled wood did not float. Though coarsely grained the wood is generally elastic and supple and is both transversely and axially reasonably coherent and resistant to mechanical stress. In general it satisfies the usual technical demands. It may be used with advantage for turnery (furniture) and for veneer (practised in Spain).

Seedlings appeared in the Seino Forest (Liberia) in April abundantly; about the same time they are found in Ivory Coast (Tabou, Grabo). Hypocotyl brown, scurfy, glabrous, less than 1 cm long. Epicotyl woolly hirsute, yellowish-brown,  $\pm$  15 cm long. Stipule deeply bilobed (see fig. 1 and fig. 4). First leaves opposite, rachis slender, yellow-brown hirsute.

**Didelotia engleri** Dinklage & Harms, Bot. Jahrb. 30 (1901) 80; Johnston, Liberia 2 (1906) 600; Harms, Bot. Jahrb. 45 (1910) 298; Engler Veg. Erde 9, 4, Afr. 3, 1, (1915) 481; Hutchinson & Dalziel, Fl. W. Tr. Afr. 1, 2 (1928) 348; Guinea Lopez, Ens. Geobot. Guin. Cont. Esp. (1946) 295; Léonard, Mém. Ac. Belg. Sc. 30, 2 (1957) 267; Keay *apud* Hutch. & Dalz., Fl. W. Tr. Afr. ed. 2 1, 2 (1958) 481; Aubréville, Fl. For. Côte Iv. 1 (1959) 295. — *Didelotia ledermannii* Harms, Bot. Jahrb. 45 (1910) 298; Engler Veg. Erde 9, 4, Afr. 3, 1 (1915) 481; Guinea Lopez, Ens. Geobot. Guin. Cont. Esp. (1946) 295; Léonard, Mém. Ac. Belg. Sc. 30, 2 (1957) 266. — Fig. 6.

An evergreen shrub or small tree, possibly attaining eventually a large size. Branchlets puberulous, ashy brown, with few, scattered, orbicular to oblong, light brown lenticels. Stipule persistent, large (7—8 mm long), the tip notched, outside puberulous, inside puberulous below the line of breakage, in the upper part with many longitudinal nerves. *Leaves* 5—7-jugate, jugae gradually increasing towards the top, rachis 5—7 cm long. Leaflets asymmetrical, especially near the base, elliptic- or oblong-rhomboid to elliptic-oblong, often slightly wider in the upper half, 2—3 cm long, 9—12 mm wide, subcoriaceous, more or less dull on the upper and on the much lighter coloured lower surface, laxly reticulate on the lower surface, minutely puberulent on the very narrow,  $\pm$  grooved midrib on the upper surface, less puberulent on the prominent, rounded midrib on the lower surface, otherwise glabrous (except when very young); top rounded or blunt, notched; base very unequal-sided, the lower half subauriculate, the upper narrowly cuneate. Side-nerves slender; anastomosing, from the broader half of the base arise subpalmately 3(—4) side nerves, at a smaller angle than the upper, and ascend to about the middle of the leaflet. *Inflorescence* pendent from the twig, seemingly terminal (branching racemes from the axils of very small and young leaves with on the lower surface fugaciously woolly pubescent, acute-topped leaflets), length (all-over) 20—25 cm (side-racemes 2—3 cm long), rachis tomentose or densely pubescent, ribbed to angular, bracts broadly ovate, acute, outside pubescent, inside puberulous especially on the numerous longitudinal veins, 5—7 mm long, caducous *Flower* on a slender, densely pubescent, 6—9 mm long pedicel, axillary from a caducous, 3—4 mm long, tomen-

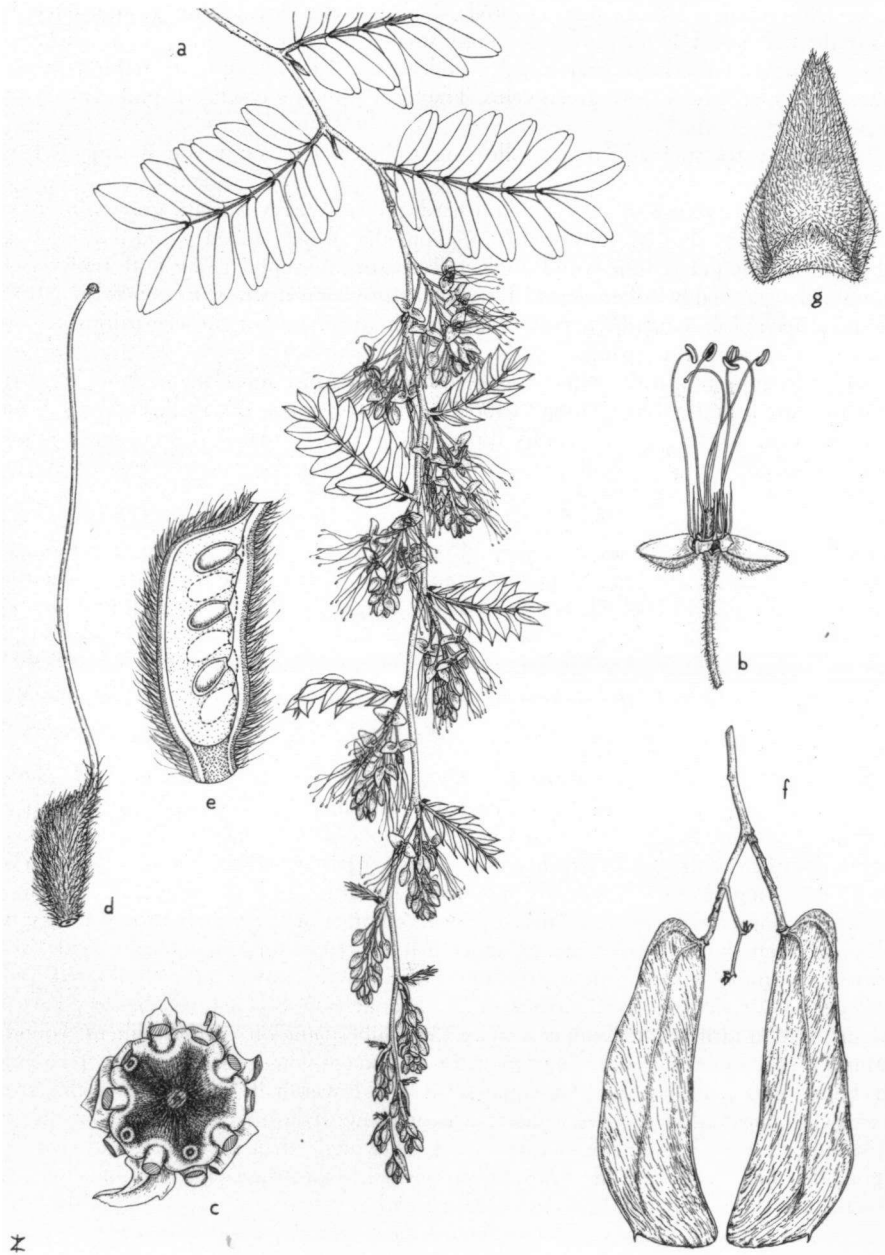


Fig. 6. *Didelotia engleri* Dinklage et Harms. — a. flowering branch, the reduced lowermost pair of leaflets (stipellae) of the juvenile leaves shown in black ( $\times \frac{1}{2}$ ); b. flower ( $\times 2$ ); c. disc seen from above ( $\times 10$ ); d. ovary ( $\times 6$ ); e. length section ovary ( $\times 12$ ); f. young fruits ( $\times \frac{1}{2}$ ); g. intrapetiolar stipule on young branch ( $\times 3$ ) (All Dinklage 2033, K, S).

tellous bractella. Bracteoles 5—6 mm long, 4 mm wide, broadly rounded, many-nerved, tomentellous-pubescent outside, glabrous inside. Receptacle saucer- or cup-shaped, fleshy, deeply lobed, glabrous. Calyx: more or less triangular, broad, bidentate or lobed, 1—1½ mm long scales at the base of the filaments. Petals linear-ligulate, long tapering, 2—5 mm long. Stamens rising from the disc, glabrous, 12—18 mm long. Staminodes 3—5, subulate, short. Anthers 1½ mm long, elliptic, recurved. Staminodes sometimes present, and sometimes nearly as long as the petals. Ovary ± rectangular, densely woolly tomentose, 6—7 ovulate. Style, glabrous, slender, 15—18 mm long. Stigma well-developed, globular-capitate. Pods rhomboid-oblong, with two rather distinct longitudinal veins, base saccate, top laterally apiculate, ± 10 cm long, 2½ cm wide (only young pods seen).

*Type specimen: Dinklage 2033* (holotype lost at Berlin; lectotype, K).

*Distribution:* Liberia, Guinea española, Gabon (Haut-Obangué, Cocobeach).

LIBERIA. Grand Bassa, *Dinklage 2033* (isotype, K, S.)

*Notes:* The type specimen was a small tree, flowering Sept. 4, 1898, with fragrant dark-red flowers, in rather moist forest on sandy soils near the coast. The species is, it would seem, rare. The flowers and leaves may appear together in flushes and the inflorescence may be interspersed by leaves of a seemingly juvenile nature; these may bear — like very young 'adult' leaves — a lowermost pair of reduced leaflets, like a pair of fleshy stipellae (see fig. 6).

A specimen collected by GSA (*Saint-Aubin 2032*, Herbarium du Gabon, Haut-Obangué) consists of leaves and branchlets. They are similar to *D. engleri* and if this actually represents this species it would mean a very considerable extension of its area of distribution. A minute thin puberulosity is on both surfaces of the leaflet which either may be without significance, or may mean that another species is represented. Further information is badly needed. Mr. Normand suggested that the material belongs at any rate in *Didelotia*, and so it either represents *D. engleri* or an undescribed species.

The record from 'Guinea española' (Guinea Lopez, *Ens. Geobot. Guin. Cont. Esp.*, 1946, p. 295) needs further confirmation (see under *D. duparquetiana*).

*Didelotia idae* Léonard, Oldeman et De Wit, *species nova*. — *Broutou* Aubréville, *Fl. For. Côt. Iv.* 1, (1936) 250, tab. 96, 3—5; 2nd ed. 1 (1959) 295—296, tab. 98, 7—9; Normand, *Atlas Bois Côte d'Iv.* 1 (1950) 129; Léonard, *Mém. Ac. Belg. Sc.* 30, 2 (1957) 266—267.

An evergreen, 15—30(—50) m tall tree (trunk up to 1 m in diam.). Branchlets dark-brown, with numerous more or less concolorous, later light brown lenticels. Stipule 4—5 mm long, narrowly ovate, pubescent on edge and on the base, top bifid, with numerous longitudinal veins. *Leaves* 1-foliolate; rachis 3—6 mm long; glabrous, wrinkled. Leaflet slightly asymmetrical, ovate to ovate-oblong (or oblong), 6½—9(—22) cm long, 4—6(—11) cm wide, more or less glossy on the upper, dull on the lower surface, the lower laxly reticulate surface somewhat lighter coloured, glabrous; top subacuminate, tip blunt; base somewhat unequal-sided, cuneate to rounded. Midrib slightly prominent on the upper surface, on top often with a shallow groove, on the lower surface prominent and angular, side-nerves branching and anastomosing, 6—8 on either side of the midrib, of these 3—4 in close proximity emerging from the base of the leaflet (subpalmate). *Inflorescence* axillary, pendent, racemose (a slender raceme with short side-racemes),



Fig. 7. — *Didelotia idae* Léon., Old. et De Wit spec. nov. — a. flowering branch ( $\times \frac{1}{2}$ ); b. flower ( $\times 3$ ); c. disc seen from above ( $\times 10$ ); d. ovary ( $\times 10$ ); e. length section ovary ( $\times 12$ ); f. seed ( $\times \frac{1}{2}$ ); g. cotyledon (inner view) ( $\times 1$ ); k. embryo ( $\times 4$ ); m. young pod ( $\times \frac{1}{2}$ ); n. dehiscent pod ( $\times \frac{1}{2}$ ); p. young branchlet ( $\times \frac{1}{2}$ ); r. top of seedling ( $\times 2$ ); s. intrapetiolar stipule of seedling ( $\times 4$ ); t. intrapetiolar stipule of young branchlet ( $\times 4$ ); v. intrapetiolar stipule (basal part) on old branch ( $\times 4$ ) (a—e. v Voorhoeve 1060; f, g, k, n Voorhoeve 531; m. Voorhoeve 585; n, t Voorhoeve 411; r, s Voorhoeve 938; all at WAG).

up to 15(—20) cm long (side-racemes  $1\frac{1}{2}$ — $2\frac{1}{2}$  cm long), rachis slender, minutely puberulous,  $\pm$  terete, side-rachises angular to ribbed, axillary from caducous bracts (their base a persistent rim). *Flowers* on slender, minutely puberulous, up to 5 mm long pedicels, axillary from caducous, ovate, 1 mm long, outside minutely puberulous bractellae. Bracteoles  $\pm$   $3\frac{1}{2}$  mm long,  $2\frac{1}{2}$  mm wide, broadly ovate and rounded, outside densely minutely puberulous, inside minutely puberulous in the upper part. Receptacle fleshy, disc-bearing, disc strigulose, deeply undulate (lobed). Sepals broadly ovate,  $\pm$  1 mm long, top often notched, glabrous, ciliolate on edge. Petals 1—2 mm long, linear, long tapering from a widened base. Stamens rising from between the disc-lobes, glabrous, (6—)8—10 mm long. Anther broadly elliptical, flat, recurved,  $\pm$  1 mm long. Staminodes absent. Ovary  $\pm$  rectangular, pubescent on edge on the base, with some occasional lines of hairs laterally, 6—7-ovulate, in side with coarse cilia along the suture. Style glabrous, slender, 6 mm long. Stigma widened, flattened on top, subpeltate or indistinctly bilobed. *Pod* with 1 or 2, sometimes very indistinct, longitudinal nerves rising from the base, glabrous, light brown, oblong, more or less truncate, 8—12 cm long,  $2\frac{1}{2}$ — $3\frac{1}{2}$ (—5) cm wide; valves dehiscent, involute, thin-woody; style-base laterally on top. Seeds flat, ovate,  $\pm$  1 cm across, striate near the hilum and there containing a little endosperm.

*Didelotia idae* Léonard, Oldeman et De Wit species nova generis Didelotiae, unifoliolata. Ex affinitate *D. unifoliolatae* Léonard tamen differt inflorescentia breviori et bracteolis similiter puberula; bractellis mox deciduis, calyce maiore, disco striguloso, profunde lobato, ovario per suturas ad basinque pubescente.

*Type specimen:* Voorhoeve 1060 (holotype WAG; isotype BR, K. P).

*Distribution:* Sierra Leone, Liberia, Ivory Coast.

SIERRA LEONE. Gola North, *Sheldrake* "o"1, 2, 3, 4 (FHO); Gola North Res. Salvage area No. 5, *Sheldrake* 6A, 6B, 7 (FHO).

LIBERIA. s.l. Voorhoeve, sample G (BRLU); Bong Range, Voorhoeve 1060 (type; BR, LIB, P, WAG), Voorhoeve 33 (WAG), Voorhoeve 1182 (large-leaved sapling, LIB); Totota range, Voorhoeve 411 (WAG); Bomi Hills, Gola Forest, van Dillewijn 57 (LIB, WAG); Gbi Nat. Forest, Voorhoeve 583 (LIB); Putu, East Asiatic Lumber Co, Voorhoeve 12108 (LIB); Voorhoeve 938 (seedlings: BR, P, WAG);? Central Prov., Gbarnga Distr., Baldwin 10517 (K).

IVORY COAST. B. J. Rendle A92/35 (BRLU, OXF); between Niobe (= Patokla, ferry over the Hana) and Béoué (on the Cavalry), J. Jangoux 407 (BRLU).

*Notes:* This new species is named after Mrs. Voorhoeve, according to the wish of the collector.

*D. idae* is evidently closely allied to *D. unifoliolata*, but is distinguished by a generally smaller leaflet (greatest width about the middle), a larger calyx, a deeply lobed, strigulose disc, pubescent sutures and base of the ovary, with numerous cilia inside of the ovary on the dorsal suture. The bractellae drop earlier and the bracteoles are puberulous.

Germination (fig. 8) epigeaic. A brown woolly-pubescent hypocotyl, 7—10 cm long, bears the flat (wrinkling) cotyledons. The epicotyl is shorter, 4—6 cm long, less densely and shorter pubescent. The first leaflets are opposite, ovate-elliptic,  $\pm$  7 cm long, gradually acuminate, glabrous except the puberulent midrib; rachis pubescent, carrying a pair of linear-triangular, 4 mm long stipellae below the leaflet. Stipules intrapetiolar,  $\frac{3}{4}$  bifid, ciliate, 4—5 mm long, with many longitudinal nerves (cf. fig. 1 and 7). The following leaflets are alternate, sometimes preceded by one or more scales or stipules.

Sheldrake observed in Sierra Leone bright pink young leaves in December-January. Sheldrake found *D. idae* in Sierra Leone (Gola North For. Res., and Salvage Area No 5) on granite rocky slopes and hollows in High Forest (not under swampy conditions). The trees were straight, clean stemmed, with heights up to 35 m, or even 50 m. Branches not

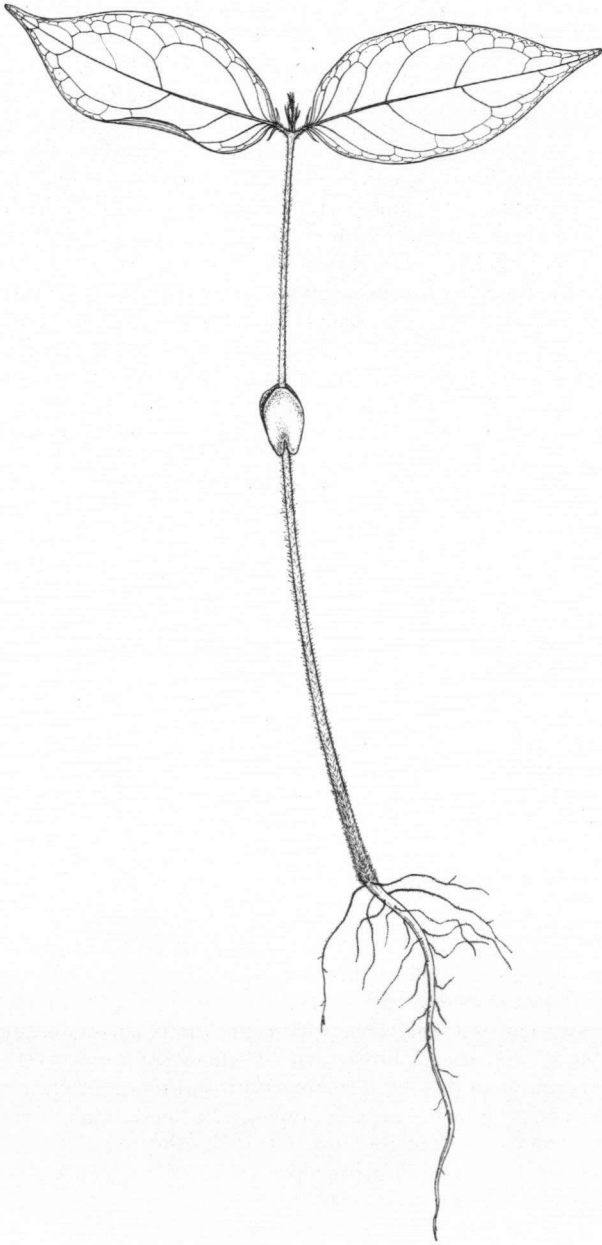


Fig. 8. *Didelotia idae* Léon. Old. et De Wit. — Seedling ( $\times \frac{1}{2}$ ).

heavy (like of *Brachystegia leonensis*, judged Sheldrake); no marked buttresses. Girth up to 4½ m. Sheldrake further described its habitat in Sierra Leone as: tropical semi-evergreen rainforest, not peculiar to any topographic feature. Associated species were *Tarrietia utilis*, *Lophira alata*, *Parinari excelsa*, and *Brachystegia leonensis*.

The smooth greyish bark becomes fissured when very old. As the tree gets older, the slash changes from light pink to dark red.

A sticky, light pink to dark red resinous juice can with difficulty be squeezed from the inner bark. The sapwood was found to be cream coloured, becoming light brown on drying. The heartwood pinkish red (fresh) to reddish brown when dry.

Voorhoeve found the tree (Bong Range), at 80 m altitude, as a big tree, in high forest, without buttresses, with straight or swollen base. Slash red-pink, sticky, fibrous. Bark smooth, grey-greenish. Wood red, very hard. In Liberia it has almost ripe pods in July. It was also found at 350 m alt. (Bong Range). Voorhoeve described the type: 'Tree, h. 15 m. diam. 30, branchlets hanging, inflorescence hanging, reddish-brown; bracteoles reddish-brown; 'sepals' purplish-red, stamens purplish; disc yellow; ovary light-green'. It flowered on May 5th (Liberia). Sheldrake described the flowers in June, (Sierra Leone): 'pedicel pinkish. Bracteoles green, inside with maroon spots at base becoming sparse near tip. Sepals maroon, occasionally one larger. Filaments maroon. Anthers dark red, almost black. Disc cream. Ovary green. Style maroon. Scent like hay.'

In Bong Range, Voorhoeve collected a seedling on top of an iron ore hill. Branchlets of old trees are glabrous; of seedlings and suckers (watershoots) brown pubescent.

Jangoux (Ivory Coast) saw in the forest 2 trees, 30 m tall, and shrubs measuring 1½—4 m. Young branchlets drooping, the young leaves grey or pinkish grey. Aubréville collected in Tabou several specimens (leaves only) which probably belong here (Necadinié distr. 1309, 1561, P). The inflorescences are sometimes completely galled. The valves of the ripe pod consist of layers, an outer, thin, brown rind, an intermediate woody layer (consisting of 2 layers, the fibres of the outer layer transverse to the fibres of the second more interior layer) and an inner more or less pulpy layer (surrounding the seeds) which is pock-marked.

*Didelotia letouzeyi* Pellegrin, Bull. Soc. Bot. France 100 (1953) 266; Léonard, Mém. Ac. Belg. Sc. 30, 2 (1937) 266, 269. — 'Gombe' Letouzey et Mouranche, Ekop du Cameroun (1952) 21, tab. II. — Fig. 9.

A tree, up to 25 m tall, up to 1 m in diam., free trunk up to 16 m. Branchlets glabrous, grey-green. Stipules 3—4 mm long, glabrous, bifid on top, ciliolate on edge, with numerous longitudinal veins. *Leaves* 1-jugate; rachis stout, glabrous, c. 5 mm long, flattened above. Leaflets asymmetrical, outer half broadly rounded, inner narrowly oblong, (4—)5—7(—11) cm long, 2—4 cm wide, subcoriaceous, entirely glabrous on both surfaces, slightly glossy on the upper and dull but lighter coloured on the laxly reticulate lower surface, top (sub)acuminate, base unequal, the broader half cuneate and provided with 3 closely approximate side-nerves, emerging palmately and continuing to about half the leaflet, anastomosing with higher, pinnately arranged side-nerves. Midrib equal or slightly sunk on the upper surface, curved, prominent on the lower surface. *Inflorescence* axillary, pendent, a compound raceme (a slender raceme with short side-racemes) 10—20 cm long, puberulous. *Flowers* on slender, 3—4 mm long pedicels, axillary from ovate bractellae. Bracteoles 5—6 mm long, 3—4 mm wide, ovate-oblong, outside pubescent. Receptacle fleshy, cup-shaped, disc glabrous, undulately lobed. Sepals absent (or one minute scale present), petals absent. Stamens 5, marginal, glabrous, 8—9 mm long. Anthers c. 1 mm long. Staminodes absent. Ovary truncate, glabrous, c. 4-ovulate; style

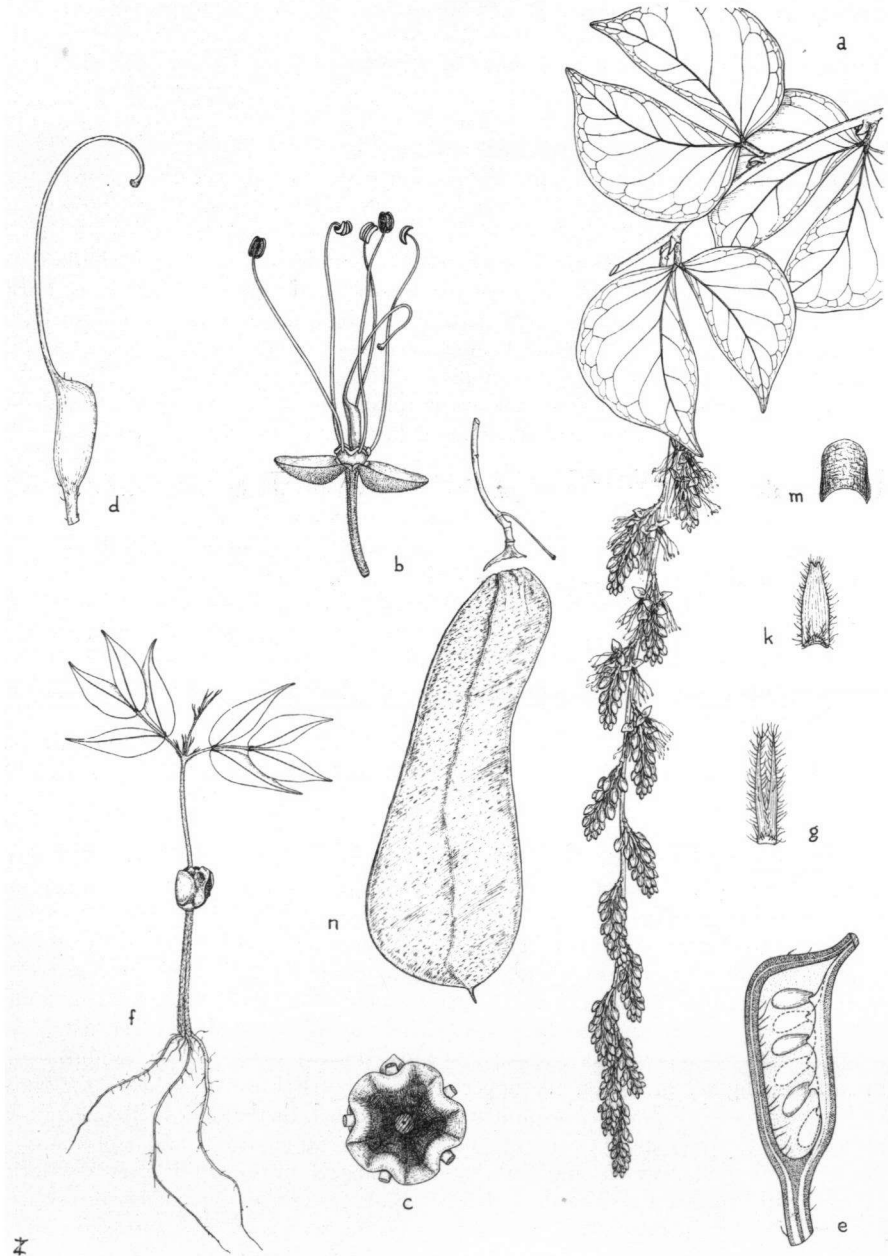


Fig. 9. *Didelotia letouzeyi* Pell. — a. flowering branch ( $\times \frac{1}{2}$ ); b. flower ( $\times 3$ ); c. disc seen above ( $\times 10$ ); d. ovary ( $\times 6$ ); e. length section of ovary ( $\times 12$ ); f. seedling ( $\times \frac{1}{2}$ ); g. intrapetiolar stipule of seedling ( $\times 3$ ); k. intrapet. stipule of young branch ( $\times 3$ ); m. intrap. stipule of old branch ( $\times 3$ ); n. pod ( $\times \frac{1}{2}$ ) (a—e, m *Letouzey 1413*, type, P, f, g *Letouzey MPB 118*, BRLU; k, n *D. Normand s. n.*, P).



glabrous, slender, 4—5 mm long. Stigma capitate. *Pods* with 1 of 2 (in)distinct longitudinal nerves rising from the base, glabrous, oblong, with a slender longitudinal nerve, widening in the upper part, otherwise smooth, 6—8 cm long, 4 cm wide, 1—2 seeded, dehiscent, short beaked; valves greyish-brown. Seeds ovate.

*Type specimen:* Letouzey 1413 (holotype, P).

*Distribution:* Cameroun, Gabon, Rép. Congo.

CAMEROUN. Makouré, Kribi-Lolodorf 31 Km, Comp. Ind. For. Afr. Letouzey SRFK 1513 (holotype P, isotype BR); Kribi-Adjab 41 km (Chantier CIFA), Letouzey SRFK 1788 (BR, P); Edea, Mongabe Forest (Chantier SAFA), Letouzey SRFK 1419 1<sup>st</sup> (P), SRFK 1198 (P), Ass. Adj. Mpom Benoit 1788 SRF (P); (Chantier Vetter), Aubréville SRFK 1344 (P); Medou SRFK 1801 (P); Bonepoupa (Chantier CFC, Km 12), Letouzey SRFK 1437 (P); Badjob, Letouzey SRFK 1788 (BR, P).

GABON. Ikoy Arboretum Km 18, Bernard 1390 SRF (P); 1382 SRF (P); Cap. Esterias on Kongoleu, Bernard et Durand 938 SRF (P); Ndjolé, Bernard et Durand 1372 SRF (P); Oguéoué, Gauchotte et Guillery 983 SRF (P), 1222 SRF (P); Zonangué, Corbet 1080 SRF (P); Liby, Bernard et Duboislouveau 922 SRF (P); Environs Libreville, res. de Mongoh, Normand 260 (P); Environs Lambarene, rés. de Zili, Normand 231 (BR, P); Okoumé plantation, Morel Avril 1951 (P); Valley of Atia Riv. (sideriver of Mumi Riv. Morel 56 SRF (P).

RÉP. DU CONGO. Mayombe, 4°40' lat., 12°30' long., Fourastié s.n. (P).

*Vern. names:* *Kakaka* (Gabon, Fang); *n'Sira* (Gabon, Fang); *Angok* (Gabon, Fang); *Ekop (dur)* (Cameroun); *Gombe* (Cameroun).

*Notes:* Seedlings from seeds sown by Letouzey at Yaoundé (Cameroun) were collected after 15 and 23 days (MPB 118 Ekop Ngombe, BRLU) and described by Léonard (l.c., p. 269). Germination epigeaic. Hypocotyl tomentose, 2—4 cm long. Cotyledons notched at base. Epicotyl 3—4 cm long, pubescent. First leaves opposed, 2-jugate. Stipules profoundly bifid; one pair of stipellae on top of the petiole, which is half as long as the rachis. First stem pubescent, 'without scales', carrying alternate 1—2-jugate leaves.

It is interesting to note that in the seedling of *D. idae* (an unifoliolate species) the first leaves are opposed, similar to *D. letouzeyi* (a bifoliolate species). Léonard stated that the first stem is without scales, but SRFK 1221 (Letouzey, forêt de Mangambe près Edea, naer the nursery of Bekondo, P) has some scales. Seedlings or saplings may carry bijugate leaves, the rachis being up to 2 cm long, pubescent. Normand found on sapling twings near Lambarene bijugate and monojugate leaves on one branch (Normand 231).

Letouzey and Mouranche found the tree in rainforests, not rare, but isolated specimens only, never gregarious. It is before July in flower, and bears pods from July to October. The branchlets are sometimes transversely marked (scar-rims) at base, more or less approaching the marking of *D. brevipaniculata*. Morel observed the tree in a moist depression in the forest; it belonged to the dominating tree storey (Gabon, no 56). Fourastié (rép. du Congo, Mayombe) observed it in small open groups (up to 50 trees) as a straight cylindrical tree in the dominant tree storey.

The wood is one of the 'ekop'-kinds of Cameroon. It is not marketed so far. The colour is salmon pink, sometimes more or less brownishgreen marbled, soft and light, coarsely grained, rather transversely fibrous.

***Didelotia minutiflora*** (Chev.) Léonard, Bull. Jard. Bot. Brux. 22 (1952) 206; Mém. Ac. Belg. Sc. 30, 2 (1957) 267; Walker & Sillans, Pl. Ut. Gabon (1961) 225. — *Zingania minutiflora* Chevalier Rev. Bot. Appl. Agr. Trop. 26 (1946) 601—603, tab. 22; Aubréville, Fl. For. Côte Iv. 1 (1959) 247. — Fig. 10.

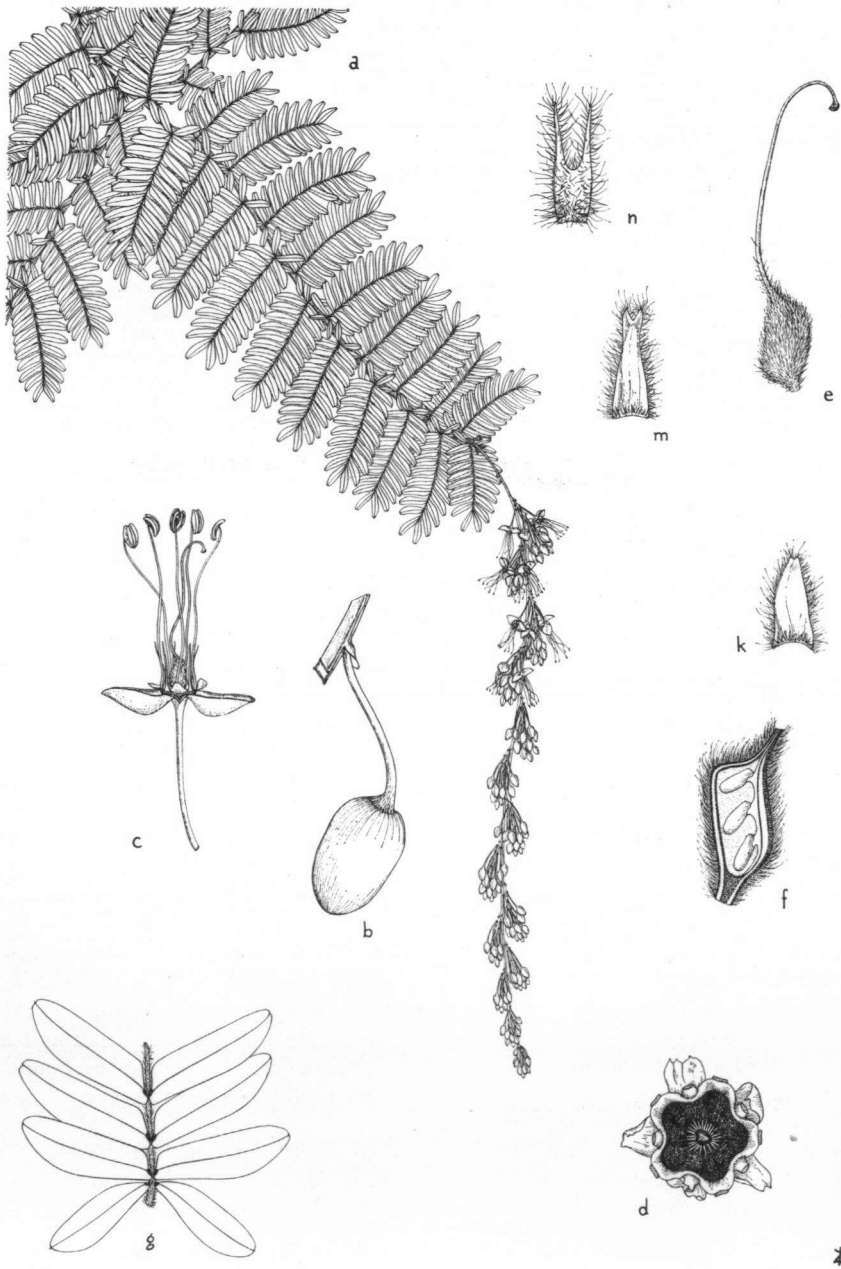


Fig. 10. *Didelotia minutiflora* (Chev.) Léon. — a. flowering branch ( $\times \frac{1}{2}$ ); b. bud ( $\times 10$ ); c. flower ( $\times 3$ ); d. disc seen from above ( $\times 10$ ); e. ovary ( $\times 6$ ); f. length section of ovary ( $\times 12$ ); g. basal part of leaf ( $\times 2$ ); h, i, j, k, m, n. intrapetiolar stipules ( $\times 4$ ); o, p, q. old, medium aged, and young branchlet. (All drawings from the holotype, *Abbé Walker* 18, P, 55-75-63).

A deciduous, 30—35 m tall forest tree, 1—1½ m in diam. Branchlets brown, in young shoots densely hirsute. Stipule 4 mm long, more than half bifid when on young branchlets, triangular-oblong and top slightly emarginate when on older branches, hirsute (on edge). *Leaves* (8—)10—12-jugate; petiole transversely rugose, 2—3 mm long, densely woolly pubescent like the 2—3 cm long rachis. Leaflets asymmetrical, rectangular-oblong, subcoriaceous, 6—10 mm long, 2—2½ mm wide, gradually smaller from leaf-base to top, more or less dull on both entirely glabrous surfaces; top notched, base unequal, the narrower half subauriculate, the broader half cuneate, provided with 1—3 indistinct, palmately emerging side-nerve, sideneurves slightly prominent on the lower surface only and anastomosing to an undulate submarginal nerve; midrib slender, slightly sunken in the upper surface, slightly prominent on the lower. *Inflorescence* axillary, racemose (a slender raceme with occasional side-racemes), 6—15 cm long, rachis glabrous (a few sparse hairlets), terete, side-racemes axillary from broadly ovate, bifid, on the tops ciliolate, ± 1 mm long bracts (with many equal longitudinal veins). *Flower* on a slender, glabrous, 6—8 mm long pedicel, axillary from a minute, caducous, scale-like bractella. Bracteoles glabrous, c. 3 mm long, c. 2 mm wide, broadly ovate and rounded. Receptacle fleshy, disc undulating, glabrous. Sepals glabrous, truncate or dentate, ½—¾ mm long. Petals subulate or linear, long-tapering, 1—2 mm long. Stamens glabrous, c. 5 mm long. Staminodes absent or 1—2 present. Ovary densely tomentose, 4—5 ovulate. Style laterally on top, glabrous. Stigma capitate. *Pods* unknown.

*Type specimen*: Abbé Walker 18 (Jan. 1946, P).

*Distribution*: Gabon.

GABON. Lagune du Fernan-Vaz, Abbé Walker 18 (holotype P; isotype BR).

*Vern. name*: Izingana (Nkoini).

*Notes*: The lower pairs of leaflets suggest by their habit an incipient reduction, as may be seen completed in the stipelloid leaflets of *D. engleri* (see there). Chevalier repeatedly stated that the inflorescence is borne erect, which is in contrast to the majority or perhaps all other species of *Didelotia*. It may be supposed that in *D. unifoliolata* the young inflorescence is erect but that it becomes pendent or nodding later on. It seems that the bearing of the inflorescence among the species of *Didelotia* may vary between erect and pendent.

The Rev. Abbé Walker declared that the trunk had no plank-roots; his specimens were flowering in January.

The leaves are said to be dark-green, but the young leaves (which appear as flushes in March-April) are red. Soon after the very small white flowers with red stamens develop on erect inflorescences. The pods mature July-August, and after that period the tree sheds its leaves. The numerous close scar-rims, found in *D. brevipaniculata*, are absent here. Walker and Sillans stated that the tree occurred not far from the ocean, on sandy soils in lowland forest. They found the tree slightly buttressed in the forests bordering the lagoons Fernan-Vaz, Iguela, and Sette-Cama (between the delta of the Ogowe and the mouth of the Nyanga). The wood is used as fuel or also for turnery.

It ought to be stressed, however, that Mr. D. Normand (Paris and Nogent-sur-Marne) casts a severe doubt as to the data concerning the habit of *D. minutiflora*. Mr. Normand, who worked several years with Chevalier, thinks it possible that Abbé Walker never saw the plant alive but that children brought him the leaves and flowers, of a climber or straggler, saying that it originated from a tree (an error easily made by inexperienced collectors in the forest). A wood-sample the children might have obtained, Normand

suggests, at a sawmill. Normand pointed out what caused his doubts. The only herbarium specimen ever secured seems to belong to a liana; the habit of the curving branchlets suggests a climbing or straggling plant. It must be admitted that to all appearances, Mr. Normand may be right. The fact that a 'useless' liana would prove to be a species of *Didelotia* might explain why an allegedly not rare tree was collected only once, nearly 20 years ago and never after, in a region where deforestation is making rapid progress. The possibility exists, therefore, that the first sentence (habit) of the description is erroneous.

***Didelotia unifoliolata*** Léonard, Bull. Jard. Bot. Brux. 22 (1952) 205—206, fig. 24, 25; Fl. Congo Rua.-Ur. 3 (1952) 495, fig. 43; Mém. Ac. Belg. Sc. 30, 2 (1957) 266—267; Normand, J. Agric. Trop. Appl. V. 4—5 (1958) 298—301. — **Fig. II.**

Usually a small tree, sometimes up to 20 m tall, nearly 1 m in diam. Branchlets glabrous, blackish to brown, with very few, rounded or elliptic, light brown lenticels; bark somewhat peeling (always?). Stipule ovate, shortly bifid, glabrous except on the ciliolate edge, 4 mm long. *Leaves* unifoliolate; petiole *c.*  $\frac{1}{2}$  cm long. Leaflet rather varying in size, broadly ovate to ovate (or  $\pm$  elliptic to oblong), symmetrical or nearly so, (sub) coriaceous, glossy on the upper, dull on the lower surface, distinctly veined especially on the lower surface, lower side-nerves closer, glabrous; top gradually acuminate, base equilateral or not, especially in the large leaflets very broadly rounded; (6—)10—16 cm long and (3—)4—8 cm wide. Midrib slightly prominent in the lower half on the upper surface, bluntly prominent on the lower surface. *Inflorescence* pendent from the twigs, axillary, racemose (a long slender raceme with occasional short side-racemes) 15—50 cm long (side-racemes 1—3 $\frac{1}{2}$  cm long), rachis glabrous, terete (or more or less angular; the side-rachises acutely angular). Bracts and bractellae rather long persistent, ovate, acute, light coloured; bracts 3 mm long, 1 $\frac{1}{2}$  mm wide, ciliolate on edge, bractellae 1 mm long,  $\frac{1}{2}$  cm wide, ciliolate on edge at the top. *Flowers* on slender, glabrous, 7—9 mm long pedicels, axillary from persistent bractellae. Bracteoles 5 mm long, 3 mm wide, many-nerved, glabrous. Receptacle cup-shaped, fleshy, light-coloured when dry, disc glabrous, with an indistinctly undulate edge. Calyx (4)5 tiny, acute scales, one of which larger than the others and up to 1 mm long. Petals subulate, long tapering to a slender point, up to 1 mm long. Petals subulate, long tapering to a slender point, up to 2 mm long. Stamens rising from the edge of the disc, glabrous, 12—15 mm long. Anthers 1 mm long, elliptic,  $\pm$  recurved. Staminodes generally absent. Ovary  $\pm$  rectangular, glabrous, 6—8 ovulate, a series of small bristles inside on the axial suture. Style glabrous, slender,  $\pm$  7 mm long. Stigma small, subcapitate. *Pod* 10 cm long, 2—4 cm wide, with two longitudinal nerves (one short, one long), rectangular-oblong and beaked laterally (only young pods seen).

*Type specimen:* Jans 855 bis (holotype, BR; isotype K).

*Distribution:* Congo, Gabon.

CONGO. Nsemampoi, Jans 855 (paratype, BR), 855 bis (holotype, BR; isotype, K); Equateur, Monkoto, Nat. Park, Salonga Riv., near trading post Illongi, Evrard 4691 (BR, K); left bank Salonga, Botoka-Ndjoku, Evrard 4558 (BR, K); Lac Léo, Gilbert 14364 (BR), 14019 (BR); Léopoldville, Kutu, Pompé-Nioko, Flamigni 10288 (BM, BR, K).

GABON. Libreville, 18 km east, de St. Aubin SRF 1918 (= CTFT 11, P); Mondah, Estasse SRF 619 (P); Liby, Bernard-Duboislouveau SRF 924 (P).

*Taxonomical notes:* Léonard (1952, p. 495) pointed out that the leaves resemble those of *Pynaertiodendron congolanum* De Wild., but the latter, he declared, can be distinguished by the presence of two small black glands at the top of the 'petiole'. This character de-

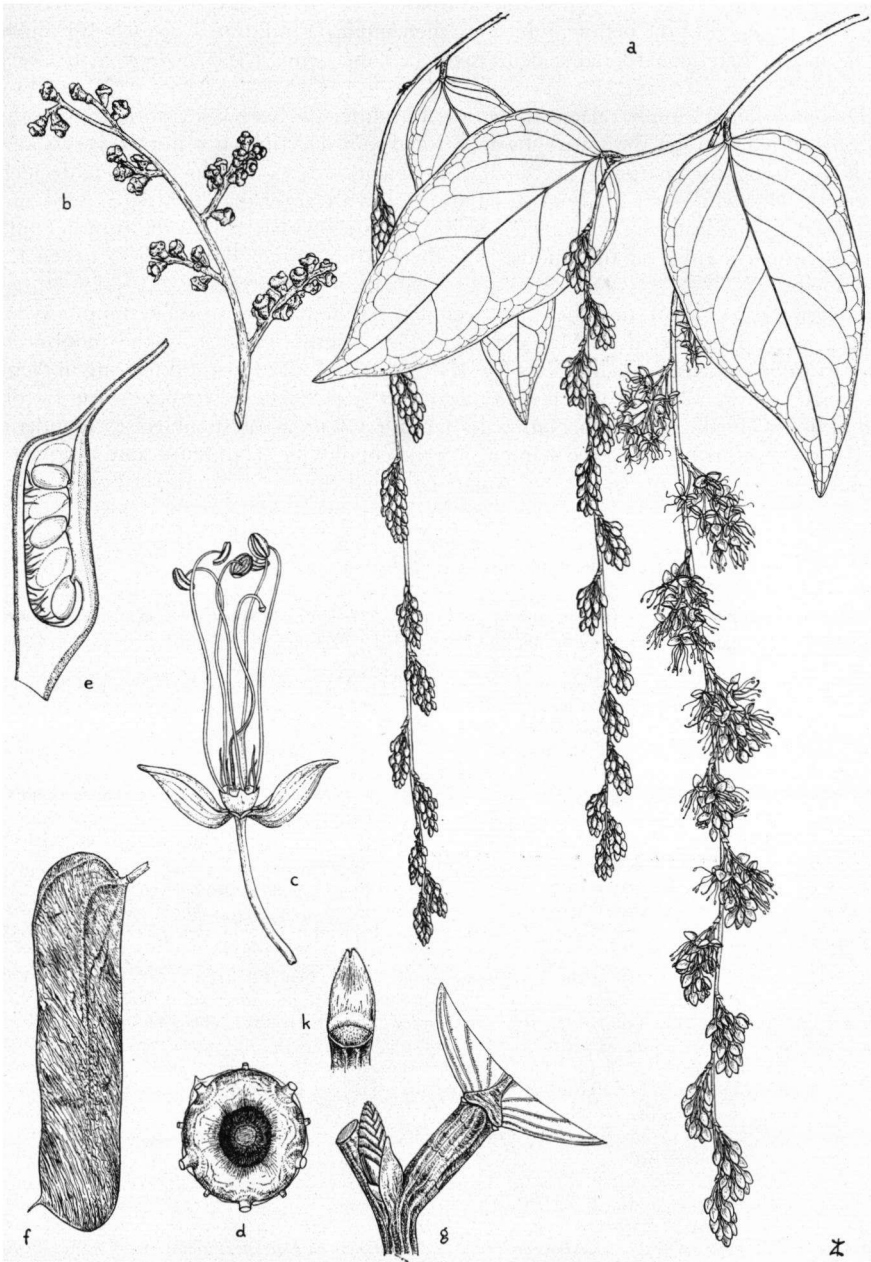


Fig. 11. *Didelotia unifoliolata* Léon. — a. inflorescence ( $\times \frac{1}{2}$ ); b. galled flowers ( $\times \frac{1}{2}$ ); c. flower ( $\times 3$ ); d. disc, seen from above ( $\times 10$ ); e. length section of ovary ( $\times 12$ ); f. young pod ( $\times \frac{1}{2}$ ); g. branch, rachis, and bud ( $\times 3$ ); k. stipule (abaxially) ( $\times 3$ ) (All from *Jans 855 bis*, BR, young pod (f) from *Jans 855 BR*).

mands careful observation because the unifoliolate *Didelotia's* have in young leaves two stipellae at the top of the petiole, which are shed and leave a minute scar each. It is further to be noted that Léonard reduced in 1957 (l.c.) the genus *Pynaertiodendron* to *Cryptosepalum* (l.c. p. 11, 25, 271).

*D. unifoliolata* is closely related to *D. idae* but differs in having a glabrous ovary (not or very little ciliate on the suture inside), a glabrous disc, which is not or very slightly undulate along the margin, very small ( $\pm$  absent) sepals, of which one is decidedly larger (in *D. idae* all 5 sepals about equal in size, and all larger than the largest sepal in *D. unifoliolata*). The leaflet of *D. unifoliolata* is sometimes widest below the middle and of *D. idae* usually widest at the middle, but there is no certain distinction between leaf-specimens.

*Biological notes:* Jans found the type specimens on the bank of a brook and in a swamp near a river. It flowered in Mai and fruited in August. Frequently the inflorescence appears to be attacked by gall-insects (see also fig. 9, b). Evrard met it flowering in August on 'terre ferme', near the water (Salonga River), an 8 m tall tree, and near Botoka-Ndjoku, also in the Monkoto National Park in *Guibourtia*-forest subject to inundation. The green flowers had deep red stamens. Near Léopoldville, Flamigni found it flowering in July: yellowish flowers. De St. Aubin collected flowers in June (Gabon).

#### SPECIES REIICIENDAE VEL MINUS COGNITAE

*Didelotia appendiculata* (Bth.) Taubert in Engl. & Pr., Nat. Pfl. Fam. 3, 3 (1894) 138, 387 = *Brachystegia appendiculata* Benth., Trans. Linn. Soc. 25 (1866) 313; De Wildeman, Ann. Mus. Congo, IV, 1 (1901) 44, t. 12.

In 1862 Bentham described the genus *Brachystegia* (B. & H., Gen. Pl. p. 582). No specimens were cited. Probably this description was based upon the specimens of *B. spicaeformis* Bth. and *B. appendiculata* Bth. as described by the same author in Trans. Linn. Soc. 25 (1866) 313; (Kirk s.n., K).

In 1865 Baillon described *Didelotia* as a monotypic new genus (*Didelotia africana* BAILL., *Adansonia*, p. 367). This description was based upon *Griffon du Bellay 235*, collected in Gabon (P).

In 1870 Baillon (Hist. Pl. 2 (1870) 113) mentions the genus *Didelotia* again. He noted that the genus has 10 stamens, of which sometimes 5 are reduced to staminodes (L'androcée est formée de dix étamines, pérygynes, libres. Tantôt elles sont toutes fertiles . . . ; tantôt, au contraire, cinq d'entre elles, celles qui seraient superposées aux pétales, sont réduites à des filets stériles").

Now the main difference between the genera *Didelotia* Baill. (1865) and *Brachystegia* Bth. (1862) is, that *Didelotia* has 5 (4) well-developed stamens (and, sometimes, also some staminodes), whereas *Brachystegia* Bth. possesses 10 fertile stamens (according to Bentham's description and the two published species cited above).

Taubert, making his revision of the *Leguminosae* (Engl. & Pr., Nat. Pfl. Fam. 3, 3 1891, p. 387) presumably concluded from Baillon's note (Hist. Pl., l.c.), that there were no important differences between the genera *Didelotia* Baill. and *Brachystegia* Bth., and united them under the name *Didelotia* Baill. Taubert further proposed two sections in *Didelotia* in this enlarged circumscription: *Eudidelotia* and *Brachystegia*. Of course: the name *Brachystegia* should have been maintained for the genus but Taubert adopted *Didelotia*. To the section *Brachystegia* he referred *Didelotia appendiculata* (Bth.) Taubert.

In 1894 the Corrections to part III, 3 of Engl. & Prantl. Nat. Pflanzenfam. include Taubert's correction of his earlier revision. Now he returned to separate genera, *Didelotia* Baill. and *Brachystegia* Bth., mentioning *Brachystegia appendiculata* Bth.

*Didelotia duparquetiana* Autran, Bull. Jard. Col. 1 (1901/02) 592; Chevalier, For. Bois Gabon (1916) 177; Baker, Leg. Trop. Afr. (1930) 736—737.

Baker (l.c., p. 736) stated: ". . . Another species, *D. duparquetiana* Autran, is mentioned by Dr. Chevalier (Veg. Ut. Afr. Trop. Fr. 9, p. 177 = For. Bois Gabon, 1916, p. 177) but we have seen no material and cannot find a description of it." Chevalier (l.c.), Baker's source of information, declared: "Autran énumère aussi un *D. duparquetiana*, dont les noms vernaculaires seraient: M'PANDYA (Gabonais), N. VANA (Pahouin)". In his first chapter, containing short biographies of important botanists, he gave some notes on Autran and cited Autran's "Etude sur les bois du Congo" (erroneously as "Etude sur les bois du Gabon")

Autran (l.c., 1901/02) described *D. duparquetiana* as follows: "*Didelotia duparquetiana*. Légumineuse caesalpiniée. M'PANDYA des Gabonais, N'VANA des Pahouins. Arbre de 10 à 12 mètres de haut, donnant un bois rose excellent et facile à travailler". No type material appears to be available. Among the specimens of Duparquet at Paris no *Didelotia* is found and repeated requests to the Lyon Herbarium remained unanswered. Guinea Lopez may be referring to it. He stated (Ens. Geobot. Guin. Cont. Esp., 1946, p. 295): "*Didelotia engleri*. Guinea continental española. Liberia. Nombre pàmue, N'BANA". The coincidence in vernacular names (Pahouin-N'VANA and Pàmue-N'BANA) might be an indication that *D. duparquetiana* is a synonym of *D. engleri*. Index Kewensis does not mention *Didelotia duparquetiana*.

Evidently Autran's description, cited above, is not adequate. *D. duparquetiana* Autran is a 'nomen seminudum'. If it is not rejected for that reason it is possibly a synonym of *D. engleri*.

Prof. J. Léonard informed me that *Didelotia* sp., referred to in Fl. W. Trop. Afr. 2nd ed. 1, 2, (1958 481 is *Tetraberlinia tubmanniana* J. Léonard (to be published).