

The *Acacia senegal* complex

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ABSTRACT

A brief account of the present state of knowledge of the species in the *Acacia senegal* complex is given. A short description of each species is provided together with a key to the identification of the species. Attention is drawn to the taxonomic difficulties encountered within the complex.

INTRODUCTION

The *Acacia senegal* complex is taken to include all of those *Acacia* species with spicate inflorescences and armed at or near the nodes with prickles either in threes, with the central one typically hooked downwards and the two laterals curved upwards or at times spreading laterally, or else solitary, the two laterals being absent. Occasionally all three prickles may point up or down but the presence of the three prickles at or near the nodes will identify the specimen as a member of this complex. Very rarely and in only one species (*A. ankokib*) are specimens sometimes unarmed. Whether the prickles occur singly or in threes near the nodes in some species appears of no significance as both arrangements may occur on one and the same shoot, although some gatherings may show all or nearly all the prickles arranged singly. The species currently recognized within this taxonomically difficult complex, in chronological order, are: *A. senegal* (L.) Willd., *A. asak* (Forsk.) Willd., *A. hamulosa* Benth., *A. oliveri* Vatke, *A. somalensis* Vatke, *A. hunteri* Oliv., *A. dudgeoni* Craib ex Holl., *A. thomasi* Harms, *A. condyloclada* Chiov., *A. ogadensis* Chiov., *A. caraniana* Chiov., *A. cheilanthi-olia* Chiov., *A. zizyphisina* Chiov. and *A. ankokib* Chiov.

Apart from *A. senegal* which is widespread throughout Africa and extends into Arabia, and *A. dudgeoni* which is confined to tropical West Africa, the remaining species in the complex are concentrated in north east tropical Africa and Arabia. The difficulties within this complex are aggravated by the paucity of the material of several of the species and the inadequate field notes on many of the existing specimens. Not only are the limits of some of the species not very clearly defined, but the range of morphological variation within certain species is poorly understood. Field studies in north east tropical Africa are essential to clarify many of the problems encountered in this complex.

The aim of this paper is to provide an account of the present state of knowledge of the species in this complex and to draw attention to the gaps in our information in the hope that future collectors will concentrate on gathering the required information and material. A short description of each species is provided and the difficulties within each species are discussed. Only the most important synonyms and brief literature references are included as it is the intention to deal with these in detail elsewhere. As both flowering and fruiting material is often not available, in the key to the identification of the species the dichotomies are based, as far as is possible, on vegetative characters.

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KEY TO SPECIES

All or most leaflets more than 3 mm wide:

Leaves with 1 pinna pair:

Calyx 3-4 mm long; corolla 4-6 mm long; stamen-filaments 13-18 mm long; slender straggling virgately branched tree; prickles in threes; leaflets (2)3-4 pairs per pinna..... 12. *A. ogadensis*

Calyx 1-1.5 mm long; corolla 1.75-2.25 mm long; stamen-filaments up to 5 mm long; shrub or small tree with a rounded crown; prickles solitary or in threes; leaflets 4-9 pairs per pinna.... 8. *A. oliveri*

Leaves with 2-6 pinnae pairs:

Leaflets 1 or 2 pairs per pinna, 8-19 x 5-13 mm, obovate, minutely appressed-puberulous on both surfaces; pods (2,6)3,2-4,8 cm wide..... 15. *A. zizyphisina*

Leaflets 3-20 pairs per pinna:

Leaves with 2 pinnae pairs..... 8. *A. oliveri*

Leaves with 3-6 pinnae pairs:

Petiole with a large flattened ± discoid gland 1-3 mm in diameter at the base of the petiole or at the point of attachment of the lowest pinna pair; internodes 5-9 cm long:

Petiole 1,3-2,8 cm long, the gland basal; leaflets 3-9 mm wide, minutely appressed-puberulous on both surfaces or the lower only, rarely glabrous; pods 1,8-2,1 cm wide, densely puberulous..... 13. *A. condyloclada*

Petiole 2-6 mm long, the gland at the point of attachment of the lowest pinna pair; leaflets 3-4 mm wide, glabrous; pods 0,9-1 cm wide, glabrous..... 14. *A. caraniana*

Petiole with a small slightly raised gland <1 mm in diameter which is variable in position but seldom situated as above; internodes mostly <2,5 cm long, seldom up to 4,5 cm long..... 7. *A. asak*

All or most leaflets less than 3 mm wide:

All leaves with 1 or 2 pinna pairs:

Leaflets 2 (rarely 3) pairs per pinna, glabrous; prickles solitary..... 9. *A. somalensis*

Leaflets 3-15 pairs per pinna, if only 3 pairs present then lower surface fairly densely clothed with appressed hairs and not glabrous as above; prickles solitary or in threes:

Leaflets less than 1 mm wide:

- Leaves with 2 pinnae pairs; leaflets 6-8 pairs per pinna; prickles in threes; calyx puberulous; confined to Aden..... 1. *A. hunteri*
 Leaves with 1 (rarely 2) pinna pairs; leaflets 8-15 pairs per pinna; prickles solitary; calyx glabrous; confined to Somalia..... 4. *A. sp.*

Leaflets 1-2,5(3) mm wide:

- Calyx 3-4,5 mm long; corolla 6,5-7 mm long; stamen-filaments 13-15 mm long; leaflets 7-15 pairs per pinna; straggling shrub or slender tree with elongate whippy branches 11. *A. thomasii*
 Calyx 1-2,25 mm long; corolla 1,75-3,25 mm long; stamen-filaments up to 6 mm long; leaflets 3-9 pairs per pinna; shrub or small tree with a rounded crown:
 Leaflets 3-5 pairs per pinna, the lower surface fairly densely clothed with conspicuous whitish appressed-hairs; inflorescence axis clothed with spreading hairs basally at least; petiole and leaf-rhachis clothed with spreading hairs; leaves with 1 pinna pair..... 10. *A. sp. near somalensis*
 Leaflets 4-9 pairs per pinna, glabrous; inflorescence axis sparingly to densely puberulous throughout or basally only; leaves with 1 or 2 pinna pairs..... 8. *A. oliveri*

All or most leaves with 3-16 pinnae pairs:

Leaves with 3-6 pinnae pairs:

- Leaf-rhachillae each with a recurved prickles on the lower surface at or just below the apex..... 5. *A. hamulosa*

Leaf-rhachillae without a recurved prickles on the lower surface but sometimes with a prickles terminating the leaf-rhachis:

- Pinnae with 3-4 (rarely 5) pairs of leaflets..... 6. *A. cheilanthifolia*

All or most pinnae with 5-25 pairs of leaflets:

- Leaves very small, petiole and rhachis together <1 cm long..... 1. *A. hunteri*

Leaves larger than above, petiole and rhachis together >1 cm long:

- Corolla 6,5-7 mm long; calyx 3-4,5 mm long; stamen-filaments 13-15 mm long; straggling shrub or slender tree with elongate whippy branches; leaves with 3 pinnae pairs..... 11. *A. thomasii*

- Corolla 1,5-4 mm long; calyx 1-3,5 mm long; stamen-filaments up to 8 mm long; leaves with 3-6 pinnae pairs:

- Petiole with a large flattened \pm discoid gland 1-3 mm in diameter at the point of attachment of the lowest pinna pair; leaves with 3 pinnae pairs; internodes 5-8,5 cm long; pods 0,9-1 cm wide, glabrous..... 14. *A. caraniana*

- Petiole with a small often slightly raised gland <1 mm in diameter which is variable in position but seldom situated as above, or eglandular; leaves with 3-6 pinnae pairs; internodes mostly <4,5 cm long:

- Bark on young branchlets greyish, the outer layer flaking away to expose a papery peeling yellowish inner layer; prickles often absent; leaflets (4)6-9 pairs per pinna, glaucous, minutely puberulous on both surfaces; corolla 1,5-2 mm long; pods 0,9-1 cm wide; confined to Somalia..... 16. *A. ankokib*

- Epidermis of young branchlets not flaking away to reveal a papery peeling yellowish inner layer; prickles invariably present; leaflets (3)7-25 pairs per pinna, not minutely puberulous on both surfaces; corolla 2,5-4 mm long; pods (0,9)1,1-3,4 cm wide:

- Leaflets 1,25-3 mm wide, glaucous, mostly glabrous throughout or sometimes with a small basal tuft of hairs on the lower surface; pinna widely spaced, >(5)7 mm apart giving the leaf an "open" look; petiole and leaf-rhachis glabrous or sparsely pubescent but hairs not spreading conspicuously; pods (0,9)1,1-1,5(1,8) cm wide, glabrous; confined to Ethiopia, Sudan and Arabia..... 7. *A. asak*

- Leaflets 0,5-1,75 mm wide, very rarely wider, glabrous or appressed-pubescent beneath, with or without spreading marginal cilia; pinna usually <5 mm apart; petiole and leaf-rhachis mostly sparingly to densely clothed with spreading hairs; pods (1,2)1,5-3,4 cm wide, sparingly to densely appressed puberulous or pubescent, seldom glabrous; widespread..... 3. *A. senegal*

Leaves with 7-16 pinnae pairs:

- Leaves with 7-16 pinnae pairs; pods almost glabrous when mature; confined to tropical West Africa..... 2. *A. dudgeoni*

- Leaves with 7-10(12) pinnae pairs; pods sparingly to densely appressed puberulous or pubescent when mature; absent from tropical West Africa..... 3. *A. senegal*

1. *Acacia hunteri* Oliv. in Hook., Icon. Pl. 14: 36, t.1350 (1881). Type: Neighbourhood of Aden. *F. Hunter* 156 (K, holo.).

Small shrub; young branchlets greyish, as though whitewashed over a purplish background. Prickles in threes, all three pointing upwards. Leaves very small: petiole up to 4 mm long, pubescent; rhachis up to 6 mm long, pubescent; pinnae 2-3 pairs; rhachillae up to 8 mm long; leaflets 6-8 pairs per pinna, up to 2 \times 0,75 mm, glabrous. Inflorescence axis up to 1,5 cm long, pubescent. Calyx \pm 1,5 mm long, puberulous. Corolla \pm 2 mm long. Pods yellowish- or reddish-brown, up to 3 \times 0,9 cm, compressed, valves brittle, inconspicuously venose, sparingly pubescent throughout or on margins and stipe only.

A. hunteri is known only from the type collection. It differs from *A. senegal* in being very small in all of its parts and the suggestion has been advanced that perhaps *A. hunteri* is no more than a diminutive variant of *A. senegal*. More material is desired.

2. *Acacia dudgeoni* Craib ex Holl. in Kew Bull., Add. Series ix: 291 (Dec. 1911); Craib in Kew Bull. 1912: 98 (1912); Keay & Brenan in Kew Bull. 1949: 129 (1949). Syntypes: Nigeria, Borgu. *Dudgeon* 58 (K!); Kontagora, *Dalziel* 41 (K!).

A. samoryana A. Chev. in Bull. Soc. Bot. Fr., Mém. viii D: 167 (2nd March 1912). Type: Dahomey, between Firou and Konkobiri, *Chevalier* 24326 (P, holo.).

A. senegal subsp. *senegalensis* (Houtt.) Roberby var. *samoryana* (A. Chev.) Roberby in Candollea 11: 157 (1948). Type as above.

Shrub or small tree to 4 m high, seldom up to 8 m high; bark grey or brown, rough; young branchlets brown or reddish-brown, densely pubescent, bark on older branches grey to yellowish-brown or brown, flaking minutely. Prickles in threes, the central one hooked downwards and the two laterals curved upwards, or occasionally solitary. Leaves: petioles, rhachides and rhachillae densely clothed with spreading hairs; petiole 0,4-1,5 cm long, glandular;

rhachis 2.2–5 cm long, usually with a small gland at the junction of the top 1–3 pinnae pairs, often with scattered recurved prickles on the lower surface; pinnae 7–16 pairs; rhachillae 1.2–4 cm long; leaflets 13–25 pairs per pinna, 1.5–5 × 0.5–1 mm, linear-oblong, oblong or slightly broader apically, apex rounded, glabrous or with marginal cilia. *Inflorescence* axis densely pubescent, up to 9 cm long. *Calyx* 1–1.75 mm long, glabrous to fairly densely pubescent. *Corolla* 1.5–2.75 mm long, glabrous. *Stamen-filaments* up to 6 mm long. *Pods* yellowish-brown or brown, 5–10 × 1.7–2.5 cm, straight or slightly curved, rounded to acute apically, venose, glabrous when mature.

Found in Mali, Ivory Coast, Ghana, Dahomey and Nigeria. Occurs in moister regions than *A. senegal*.

The following is a selection of specimens examined in the Kew Herbarium:

IVORY COAST.—Bouana Wildlife Reserve, 43 km east of Ouangofetini on road to Bouana, *Wilde & Leeuwenberg 3497*.

GHANA.—Wenchi-Sunyani district, Ashanti, *Hepper & Morton A3200*; near Tamale, *Lloyd Williams 115*; north Gambaga district, *Lloyd Williams 490*.

NIGERIA.—Bauchi Prov., between Dindima and Gar, *Keay FHI 37900*; Bornu Prov., Kojofa district, Kojofa, *Rosevear FHI 26604*.

In tropical West Africa *A. dudgeoni* is distinguished from *A. senegal* in having 7–16 pinnae pairs per leaf and 13–25 pairs of leaflets per pinna as opposed to the 3–6 pinnae pairs and 8–15 pairs of leaflets of *A. senegal*. The pinnae tend to be more crowded on the rhachis in *A. dudgeoni* giving the leaf a somewhat different "look" to the leaves of *A. senegal*.

In southern Africa (Natal), however, *A. senegal* sometimes has up to 12 pinnae pairs per leaf and up to 24 pairs of leaflets per pinna so that when viewed on a continental basis the difference in the number of pinna and leaflet pairs provides no clear discontinuity between *A. dudgeoni* and *A. senegal*. In Natal the greater number of pinnae and leaflet pairs are recorded from plants in more mesic habitats which is interesting because in West Africa *A. dudgeoni* grows in moister habitats than does *A. senegal*. However, whereas the largest leaflets in Natal are found on plants in mesic habitats, in West Africa *A. dudgeoni* tends to have smaller leaflets than *A. senegal*.

The geographical distributions of *A. dudgeoni* and *A. senegal* in West Africa were reported to be quite distinct and were plotted by Aubreville, *Fl. Forest. Soudano-Guin.*: 255, t.23 (1950). Recently, however, *A. dudgeoni* has been recorded from Senegal (Berhaut, *Fl. Senegal*, ed. 2: 46, 1967). I have not seen a specimen of *A. dudgeoni* from Senegal and have been unable to substantiate this reported occurrence of the species in Senegal. Confirmation of the existence of *A. dudgeoni* in Senegal is desired.

3. *Acacia senegal* (L.) Willd. in L., *Sp. Pl.* ed. 4, 4: 1077 (1806) excl. icon. et syn. fere omnibus cit.; Benth. in *Trans. Linn. Soc. Lond.* 30: 516 (1875); Brenan in *Fl. Trop. E. Afr. Legum.-Mimos.*: 92 (1959); in *Fl. Zamb.* 3, 1: 79 (1970). Type: Senegal, *Herb. Adanson* No. 16899 (P, neo.).

Mimosa senegal L., *Sp. Pl.* 1: 521 (1753) excl. icon. et syn. fere omnibus cit.; Ross in *Bothalia* 11: 449 (1975). Type uncertain, presumably a specimen collected by Adanson in Senegal.

Shrub or tree to 15 m high with a slightly rounded or flattened and somewhat spreading crown, or a slender spindly tree with irregular virgate branches; bark yellowish- or greyish-brown to purplish-black, rough or smooth and papery and peeling off in strips; young branchlets yellowish- or greyish-brown to

purplish-black, sometimes as though whitewashed over a darker background, glabrous to densely pubescent. *Prickles* in threes, the central one hooked downwards and the two laterals ± curved upwards, or else solitary. *Leaves*: petioles, rhachides and rhachillae sparingly to densely clothed with spreading hairs, seldom glabrous; petiole glandular or not, gland ± 0.5–0.75 mm in diam.; rhachis 0.7–7 cm long, with a gland at the junction of the top 1–5 pinnae pairs, between each pinna pair or absent from some, with or without scattered recurved prickles on the lower surface; pinnae (2)3–8(12) pairs; rhachillae 0.5–4 cm long; leaflets 7–25 pairs per pinna, 1–5(9) × 0.5–1.75(3) mm, linear to elliptic-oblong, sparingly appressed-pubescent on both surfaces, or glabrous. *Inflorescence* axis densely pubescent or glabrous, up to 12 cm long. *Calyx* 2–2.75(3, 5) mm long, glabrous to somewhat pubescent. *Corolla* 2.75–4 mm long, glabrous or subglabrous. *Stamen-filaments* up to 7 mm long. *Pods* yellowish- or greyish-brown to brown, (1,8)4–19 × 1.2–3.4 cm, rounded to acuminate apically, venose, sparsely to densely appressed-pubescent or puberulous.

A. senegal is widespread in tropical Africa from Senegal in the west to Ethiopia and Somalia in the north-east, southwards to the Transvaal, Swaziland and Natal, and it extends to India. The most widespread and unquestionably the most variable and taxonomically difficult species within the entire complex.

The present delimitation of infraspecific taxa within *A. senegal*, which of necessity relies partly on growth form, is most unsatisfactory as numerous specimens cannot be referred to a particular taxon with certainty. This is largely the result of inadequate information concerning the exact nature of the morphological variation in parts of the species range, particularly in north-east tropical Africa. When more information is available the varietal limits may need to be re-defined. Until such time it is hoped that the accompanying key to the currently recognized varieties will enable most specimens to be identified.

Key to varieties

Inflorescence axis glabrous throughout or sometimes with some basal hairs:

Slender spindly tree with irregular straggling branches or a well-grown tree with a rounded crown; bark yellow, papery and peeling; young branchlets glabrous or subglabrous; inflorescence axes often purplish with yellow mottling; flowers often produced before or with the young leaves..... (c) var. *leiorhachis*

Tree with a flattened and spreading or lax rounded crown; bark not papery and peeling; young branchlets sparingly to densely pubescent; inflorescence axes olive-green; flowers usually produced after the leaves..... (a) var. *senegal*

Inflorescence axis sparingly to densely pubescent:

Tree:

Apex of pod rounded to acute, seldom acuminate..... (a) var. *senegal*

Apex of pod usually strongly acuminate or rostrate..... (d) var. *rostrata*

Shrub or bush:

Apex of pod rounded to acute, seldom acuminate; leaves with up to 4 pinnae pairs.... (b) var. *kerensis*

Apex of pod usually strongly acuminate or rostrate; leaves with up to 12 pinnae pairs... (d) var. *rostrata*

The four varieties currently recognized within *A. senegal* and the difficulties encountered are discussed below.

(a) var. *senegal*.

Brenan in *Fl. Trop. E. Afr. Legum.-Mimos.*: 93 (1959); Ross in *Bol. Soc. Brot., Sér.* 2, 42: 226 (1968); Brenan in *Fl. Zamb.* 3, 1: 79 (1970). Type: Senegal, *Herb. Adanson* No. 16899 (P, neo.).

Mimosa senegal L., Sp. Pl. 1: 521 (1753) excl. icon. et syn. fere omnibus cit. Type uncertain, presumably a specimen collected by Adanson in Senegal.

M. senegalensis Houtt., Nat. Hist. 3: 614 (1774); Lam., Encycl. Méth. Bot. 1: 19 (1783) excl. ref. Forsk., Aegypt. p. 176 et icon. cit.; non *M. senegalensis* Forsk., Fl. Aegypt. Arab.: 176 (1775). It is not known whether Houttuyn's new binomial, although not indicated as such, was published inadvertently or deliberately. However, as *M. senegalensis* Houtt. was based on *M. senegal* L., the name was superfluous when published and therefore illegitimate. *M. senegalensis* Forsk., a later homonym of *M. senegalensis* Houtt. and therefore illegitimate, referred to a quite different plant (*A. hamulosa*).

Acacia verek Guill. & Perr. in Fl. Seneg. Tent. 1: 245, t.56 (1832). Syntypes from Senegal (P!).

A. rupestris Stocks ex Boiss., Fl. Or. 2: 638 (1872). Type: Belouchistan, Stocks 502 (K, holo.).

A. virchowiana Vatke & Hildebr. in Oesterr. Bot. Zeit. 30: 275 (1880) pro parte quoad fol. et flor. tantum. Type: Kenya, Teita Distr., Voi River and elsewhere, *Hildebrandi* 2486 (BM, iso!).

A. senegal var. *platysprion* Chiov., Fl. Somalia 2: 187, fig. 114 (1932). Syntypes: Somalia, Mogadiscio, *Senni* 191 (FI!); Chisimaio, *Senni* 116 (FI!), *Senni* 201 (FI!); da Bur Gao e Cu Daio, *Senni* 87 (FI!); Gobiun, *Gorini* 421 (FI!); between Bug Berde and Ato, *Guidotti* 3 (whereabouts unknown).

Var. *senegal* grows as a tree up to 14 m high with a flat and spreading or lax and rounded crown. The inflorescence axes are typically pubescent throughout although occasionally the axes may be glabrous or subglabrous, and the pods are rounded to acute or acuminate apically. Var. *senegal* shows a wide range of variation in general habit, indumentum, leaflet-size and flower-size but the arborescent growth form, pubescent inflorescence axes and pods with rounded to acuminate apices distinguish the variety. Var. *senegal* is widespread in tropical west, north-east and east Africa and extends as far south as Mozambique.

(b) var. *kerensis* Schweinf. in Bull. Herb. Boiss. 4, app. 2: 216 (1896); Brenan in Fl. Trop. E. Afr. Legum.-Mimos.: 93 (1959); Ross in Bol. Soc. Brot., Sér. 2, 42: 229 (1968). Syntypes: Ethiopia, near Keren, *Schweinfurth* 745 (B†, K!); Bogu valley, *Schweinfurth* 741 (B†); near Djuffa, *Schweinfurth* 998 (B†).

As indicated by Brenan, in Fl. Trop. E. Afr.: 93 (1959), the application of the name var. *kerensis* is not certain and considerable reliance is placed on Schweinfurth's reference to the shrubby growth form. At present var. *senegal* and var. *kerensis* are distinguished from one another entirely on growth form. All shrubby specimens of *A. senegal* in north-east Africa are referred to var. *kerensis* which is most unsatisfactory since it is not known whether var. *kerensis* represents a good taxon or whether it merely embraces a heterogeneous assemblage of shrub-like growth forms. Occasional specimens described by collectors as, for example, "a spreading bush or sometimes a small tree" cannot be referred to a variety with certainty, while other specimens, which are morphologically indistinguishable from typical var. *kerensis* but which have been described as "small straggling trees", are often referred to var. *senegal*.

Of the three syntypes of var. *kerensis*, only one, namely *Schweinfurth* 745 from the Afbaron valley near Keren, has been traced. The specimen of *Schweinfurth* 745 in the Kew Herbarium has small leaves with up to 3 pinnae pairs, pubescent inflorescence axes, and large pods 9–11.5 × 2–2.6 cm with acute or acuminate apices. Schweinfurth drew attention to the frequent presence of a small recurved prickle on the lower surface of the leaf-rhachis either at or near the apex even when the rhachis is otherwise without prickles but this character is often found in other variants of *A. senegal*.

Var. *kerensis*, as delimited at present, accommodates a heterogeneous assemblage of shrubs and does not appear to represent a good taxon. As the only available syntype of var. *kerensis* has large pods with acute or acuminate apices, it is proposed that those plants in north-east Africa with rostrate pod apices should be referred to var. *rostrata* Brenan. As mentioned above, the necessity to distinguish var. *kerensis* from var. *senegal* on growth form alone is unsatisfactory because, in the absence of field notes, it is often not possible to refer a specimen to either variety with certainty. Var. *kerensis* does often have smaller leaves than in var. *senegal*, but this is an inconsistent tendency on which no great reliance can be placed. Until the nature of the variation in north-east Africa is carefully investigated in the field and properly understood this unsatisfactory situation will prevail. The significance of growth form as a means of delimiting infraspecific categories within *A. senegal* requires critical evaluation and it would be interesting to know whether var. *senegal* ever grows as a shrub. The effect on plants of tapping for gum is not clear.

Var. *kerensis* is recorded from Ethiopia, Somalia, Uganda, Kenya and Tanzania.

(c) var. *leiorhachis* Brenan in Kew Bull. 8: 98 (1953); Ross & Brenan in Kew Bull. 21: 69 (1967); Ross in Bol. Soc. Brot., Sér. 2, 42: 231 (1968); Brenan in Fl. Zamb. 3, 1: 80, t.15 fig. 5 (1970). Type: Tanzania, Tanga Prov., Pare Distr., Same, *Greenway* 2192 (K, holo.!, EA, FHO!, iso.).

A. circummarginata Chiov. in Ann. Bot., Roma 13: 394 (1915); Brenan in Fl. Trop. E. Afr. Legum.-Mimos.: 94, fig. 14/18 (1959). Syntypes: Ethiopia, Ogaden, *Paoli* 794, 913 bis, 920, 1010 (FI!).

A. senegal var. *senegal* sensu Brenan, Fl. Trop. E. Afr. Legum.-Mimos.: 93 (1959) pro parte quoad syn. *A. senegal* var. *leiorhachis*.

Var. *leiorhachis* grows either as a slender spindly tree with irregular straggling branches or as a well-grown tree with a rounded crown, and the bark is usually yellow, papery and peeling. The inflorescence axes are normally glabrous apart from some basal hairs or glabrous throughout, and the pods have rounded or acute apices and are several times longer than they are broad. The glabrous inflorescence axes distinguish var. *leiorhachis* from the other varieties of *A. senegal*, although it must be borne in mind that occasional specimens of var. *senegal* have glabrous inflorescence axes. Indeed, the possibility exists that the type specimen of var. *leiorhachis* is an atypical specimen of var. *senegal* with glabrous inflorescence axes.

In the southern part of the range of distribution of var. *leiorhachis* the slender irregular straggling growth form is sufficient, in many instances, to distinguish it in the field from the other varieties of *A. senegal*. However, in Kenya the situation is more complicated because var. *leiorhachis* embraces two quite different growth forms. In addition to the slender straggling growth form reminiscent of *A. thomasi*, there is a form with non-virgate branching which grows into a substantial tree with a rounded crown (*A. circummarginata*). Although the two growth forms are strikingly different in the field, herbarium specimens are extremely difficult to separate. The decision to include these two different growth forms in var. *leiorhachis* was taken because of the inability to find any constant distinguishing morphological characters. Field observations on the variation in habit assumed by var. *leiorhachis* in Kenya, together with notes on ecological preferences,

would be welcome. It may ultimately be found desirable in the light of new evidence to accord the two different growth forms separate status.

The slender straggling growth form of some specimens of var. *leiorhachis* is reminiscent of that exhibited by *A. thomasi* and by *A. ogadensis*. Both *A. thomasi* and *A. ogadensis* differ in having larger flowers and, in addition, *A. ogadensis* differs in having leaves with only 1 pinna pair and (2)3–4 pairs of large leaflets per pinna.

Var. *leiorhachis* occurs in Ethiopia, Kenya, Tanzania, Zambia, Rhodesia, Mozambique and the Transvaal.

(d) var. *rostrata* Brenan in Kew Bull. 8: 99 (1953); Ross in Bol. Soc. Brot. Sér. 2, 42: 233 (1968); Brenan in Fl. Zamb. 3, 1: 79 (1970). Type: Transvaal, Zoutpansberg Distr., Dongola Reserve, *Verdoorn* 2264 (K, holo., PRE, iso.).

A. spinosa Marloth & Engl. in Bot. Jahrb. 10: 20 (1888) nom. illegit., non *A. spinosa* E. Mey., Comm.: 170 (1836). Type: South West Africa, Hereroland, near Usakos, *Marloth* 1257 (K!, PRE!, iso.).

A. trispinosa Marloth & Engl. [Marloth in Trans. S. Afr. Phil. Soc. 5: 269 (1893) nom. nud.] ex Schinz in Mém. Herb. Boiss. 1: 115 (1900) sphalm, nom. illegit., non *A. trispinosa* Stokes in Bot. Mat. Med. 3: 168 (1812). Type as for *A. spinosa*.

A. rostrata Sim, For. Fl. P.E. Afr.: 55, t.37a (1909) nom. illegit., non *A. rostrata* Humb. & Bonpl. ex Willd. in L., Sp. Pl. ed. 4, 4: 1060 (errore typogr. 1054) (1806). Type: Mozambique, Lourenco Marques & Maputo, *Sim* 6263 (whereabouts unknown).

A. oxyosprion Chiov. var. *oxyosprion*, Fl. Somalia 2: 188, fig. 115 (1932). Type: Somalia, Pozzi di El Meghet, *Senni* 651 (Fl, holo.).

A. volkii Suesseng. in Mitt. Bot. Staatssamml. München 2: 40 (1954). Type as for *A. spinosa* Marloth & Engl.

Var. *rostrata* differs from the other varieties in having pods with rostrate or strongly beaked apices, although on occasional specimens the apices may be acute or even rounded. The latter, however, are usually accompanied by pods with rostrate apices so that there is little difficulty in identifying the specimens. Var. *rostrata* grows either as a shrub branching at or near the base or a small tree up to 6 m high with a flattened or rounded crown, and yellowish- or greyish-brown ± papery bark. The inflorescence axes are pubescent.

Var. *rostrata* was initially thought to be confined to Angola, South West Africa, Botswana, Rhodesia, Mozambique, Transvaal, Swaziland and Natal, but specimens with rostrate pod apices from Uganda, Kenya and Somalia are also referable to this variety. Some of the specimens from north-east Africa sometimes have slightly larger leaflets than those recorded in southern Africa but, apart from this, there is little difference between the specimens from the two areas and the differences do not appear worthy of formal taxonomic recognition.

The possibility exists that *rostrata* is not the earliest epithet available at varietal rank for this taxon. *A. oxyosprion* Chiov. var. *oxyosprion* is regarded as a synonym of var. *rostrata*, but the identity of *A. oxyosprion* var. *pubescens* Chiov. remains in doubt. Unfortunately, *Guidotti* 21, the type of var. *pubescens* has not been traced. From the description, var. *pubescens* apparently differs from var. *oxyosprion* solely in having a denser indumentum. If this is indeed so, then there is a distinct possibility that var. *pubescens* belongs to the same taxon as *A. senegal* var. *rostrata* in which case the varietal epithet *pubescens* would have to be adopted.

Chiovenda described several other taxa, which are very closely related to or conspecific with *A. senegal*, which is unfortunate as it has only served to complicate an already confused situation. *A. cufodontii* Chiov., in Miss. Biol. Borama Racc. Bot. 4: 55, fig. 5 (1939), from Ethiopia is conspecific with *A. senegal* but, owing to the absence of pods and field notes, it has not been possible to assign it to a particular variety. The densely pubescent inflorescence axes exclude it from var. *leiorhachis*.

Chiovenda based his description of *A. senegal* var. *pseudoglaucophylla*, in Stefanini-Paoli Miss. Somal.: 72 (1916), on six syntypes from Somalia. As discussed in Bothalia 11: 302 (1974) these syntypes belong to three different taxa. As Chiovenda apparently had no clear concept of his var. *pseudoglaucophylla*, and as uncertainty over its circumscription remains, it seems desirable to select one of the specimens as the lectotype of the variety. I now select *Paoli* 83 from Mogadiscio as the lectotype of var. *pseudoglaucophylla*. *Paoli* 83 is a fruiting specimen with glabrous or subglabrous inflorescence axes and puberulous pods up to 8.3 × 2.7 cm with rounded or subacute apices. The leaf-rhachides and rhachillae are glabrous or almost so and the leaflets are dark on the upper surface and pale beneath. The decision to be taken when more information is available is whether *Paoli* 83 represents a distinct variety within *A. senegal* or whether, as intimated in Bothalia l.c., var. *pseudoglaucophylla* should be assimilated into var. *senegal*. Several other flowering specimens with glabrous inflorescence axes and discolorous leaflets from Somalia in the Kew Herbarium, namely, *Gillett* 4396 from Duwi [10°5'N × 44°15'E], *Drake-Brockman* 51, *Thomson* 27, may possibly belong to the same taxon as *Paoli* 83 but this requires investigation.

In addition, there remain a few other specimens from Somalia and Ethiopia that cannot be satisfactorily placed. At present the status of these specimens is not clear. It is not known whether they represent distinct local races or whether they represent the response to unusual or extreme habitats.

4. *A.* sp.

Represented in the Kew Herbarium by *Ironsides Wood* S/73/46 from Hudiso near Sheikh in Somalia. This may well prove to be only a variant of *A. senegal* but, until more material is available, it seems prudent to keep it separate. It differs from *A. senegal* in having only 1 pinna pair per leaf although the occasional leaf sometimes has 2 pinnae pairs. The 8–15 pairs of leaflets per pinna are up to 4 × 1 mm. The prickles are solitary, the inflorescence axes are very sparingly pubescent, and the immature pods are acute apically. The 1 pinna pair per leaf gives the specimen quite a different facies to the material of *A. senegal*.

Gillett 4427 *pro parte* (one twig of *Gillett* 4427 is referable to *A.* sp. near *somalensis*) from Duwi in Somalia probably also belongs here.

5. *Acacia hamulosa* Benth. in Hook., Lond. J. Bot. 1: 509 (1842); in Trans. Linn. Soc. Lond. 30: 516 (1875) *pro parte* excl. ref. *Mimosa* asak et *Acacia* asak; Brenan in Kew Bull. 8: 100 (1953); Ross in Bothalia 11: 301 (1974). Type: Arabia, hills near Gedda, *S. Fischer* 72 (K, holo.).

Mimosa senegalensis Forsk., Fl. Aegypt.-Arab.: 176 (1775) nom. illegit., non *M. senegalensis* Hoult., Nat. Hist. 3: 614 (1774). Syntypes from Arabia, *Forsk.* (C!).

Acacia asak sensu auct. mult., non (Forsk.) Willd.

A. paradoxa Chiov., Fl. Somalia 1: 165, t.17 fig. 2 (1929) nom. illegit., non *A. paradoxa* DC., Cat. Hort. Monsp.: 74 (1813). Type: Somalia, Obbia, Ilbehla, *Puccioni* & *Stefanini* 533 (Fl, holo.).

Shrub to 2,75 m high; young branchlets whitish, grey or grey-brown to purplish, sometimes as though whitewashed over a purplish background, glabrous or sparingly pubescent at first but becoming glabrous later. *Prickles* in threes, the central one strongly hooked downwards and the two laterals curved upwards. *Leaves* glabrous: petiole 0,3–1,3(2) cm long; rhachis 0,6–1,5(2,5) cm long; pinnae 3–4 pairs; rhachillae 0,3–1 cm long, with a recurved prickle on the lower surface either at or just below the apex; leaflets (3)5–8 pairs per pinna, 2–5 × 0,75–2 mm in Africa (up to 10 × 3,25 mm in Arabia), glabrous. *Inflorescence* axis up to 4 cm long, glabrous or pubescent. *Calyx* 1,5–2,5 mm long, glabrous or sparingly pubescent. *Corolla* 2,5–3,75 mm long. *Pods* greenish-yellow to brown, (3,5)4–8,5 × (2)3–5 cm, 1–4-seeded, valves thin and ± papery, venose, glabrous.

Found in Ethiopia, Somalia, Kenya (Northern Frontier Province) and Arabia. Appears to occupy a diverse range of habitats.

The following is a selection of the specimens examined:

ETHIOPIA.—Ogaden, Danot–Mersin road, *Simmons* S22 (K).

SOMALIA.—Eastern Al Madu Range at Baditir near Dana, *Bally* 10913 (K); Einad *Newbould* 1010 (K); 8 km south of Galkayu, *Hemming* 1407 (K); boundary pillar 93 [45° 9' E × 8° 37' N], *Gillett* 4178 (K).

KENYA.—Northern Frontier Province, 10 km north of Isiolo–Wajir road on the Garba Tula–Merti road, *Bally* & *Smith* B14697 (K).

ARABIA.—15 km north of Jidda on Medina road, *Schwan* 24 (K); behind Zamuk, *Popov*, *Tillin* & *Gilliland* 4211 (K); around Jidda, *Trott* 32 (K); upper parts of Khusaf valley, Aden, *Waring* 102 (K).

A. hamulosa is readily distinguished from all of the other species in this complex by the presence of a recurved prickle either at or near the apex on the lower surface of each rhachilla. There is sometimes a recurved prickle terminating the rhachis in some of the other species in the complex but never the rhachillae.

6. *Acacia cheilanthifolia* Chiov., Fl. Somalia 1: 168, t.xvii fig. 1, t. xlv fig. 2, t. xlv fig. 1 (1929); Ross in *Bothalia* 11: 299 (1974). Syntypes: Somalia, Migiurtini, between Erèri Jellehò e Martisor Dinsai, *Puccioni* & *Stefanini* 663 [727] (FI!); valle di Bacba, *Puccioni* & *Stefanini* 762 [843] (FI!); Bacino del Darror, El Uncùd, *Puccioni* & *Stefanini* 1010 [1115] (FI!); Obbia, Magghiòle, *Puccioni* & *Stefanini* 479 [531] (FI!); Obbia, between Uarandi e Scillin-Bihelli, *Puccioni* & *Stefanini* 509 [562] (FI!).

Shrub or small tree; young branchlets reddish-brown, sparingly to densely puberulous; older twigs ashen to greyish-brown, often somewhat mottled, the epidermis flaking off here and there to reveal a yellowish-brown inner layer. *Prickles* in threes, the central one curved slightly downwards and the two laterals upwards or else all three prickles pointing upwards. *Leaves* small: petiole up to 6 mm long, with a rounded or elongate adaxial gland; rhachis up to 1,5(2,4) cm long, with a fairly large discoid gland at the junction of the top 1–2 pinna pairs, sometimes with recurved prickles on the lower surface; pinnae 3–6 pairs; rhachillae up to 7 mm long; leaflets 3–4 (rarely 5) pairs per pinna, 1,5–2(5) × 1–2,5 mm, oblong, elliptic, obovate-oblong or rotund-ovate, glabrous or densely puberulous. *Inflorescence* axis up to 4 cm long, glabrous to densely puberulous. *Calyx* glabrous to densely puberulous. *Pods* yellowish-brown, 3–4,5 × 1–1,1 cm, straightish, rounded or mucronate apically, compressed, inconspicuously venose, densely puberulous.

A. cheilanthifolia is endemic in Somalia.

Young branchlets, petioles, rhachides, rhachillae, leaflets, inflorescence axes and calyces glabrous to sparingly puberulous..... (a) var. *cheilanthifolia*

Young branchlets, petioles, rhachides, rhachillae, leaflets, inflorescence axes and calyces densely puberulous..... (b) var. *hirtella*

(a) var. **cheilanthifolia**.

Chiov., Fl. Somalia 1: 169 (1929).

Apart from the five syntypes only one other specimen, namely *Popov* GP/57/18 (BM) from El Gal, has been seen.

(b) var. **hirtella** Chiov., Fl. Somalia 1: 169 (1929).

Type: Somalia, Migiurtini, between Dhur and Hossa Uein, *Puccioni* & *Stefanini* 695 [769] (FI holo!).

Known only from the type collection.

A. cheilanthifolia is closely related to *A. senegal* and to *A. hamulosa*. It differs from *A. senegal* in having 3–4 (rarely 5) pairs of leaflets per pinna and narrower pods, and from *A. hamulosa* in lacking a recurved prickle at or near the apex on the lower surface of each rhachilla, and in having narrow pods. More material of both varieties of *A. cheilanthifolia* is desired.

7. *Acacia asak* (Forsk.) Willd. in L., Sp. Pl. ed. 4, 4: 1077 (1806), non auct. al., quae = *A. hamulosa* Benth.; Brennan in Kew Bull. 8: 97 (1953). Type: Arabia, *Forsk.* (C, holo!).

Mimosa asak Forsk., Fl. Aegypt.-Arab.: 176 (1775). Type as above.

Acacia glaucophylla Steud. ex A. Rich., Tent. Fl. Abyss. 1: 243 (1847); Benth. in Trans. Linn. Soc. Lond. 30: 516 (1875); Bak. f., Leg. Trop. Afr. 3: 827 (1930). Syntypes: Ethiopia, mountain sides near Takazze River below Djeladjeranne, *Schimper* 725 (BM!, K!, OXF!); depression near Takazze River, *Schimper* 1710 (BM!, K!).

A. triacantha Hochst. ex A. Rich., Tent. Fl. Abyss. 1: 244 (1847). Type: Ethiopia, Modat, *Schimper* 1746 (P, holo!; BM, FI, K, iso!).

Shrub or slender tree to 10 m high; bark on young stems yellow, papery and peeling, on older stems dark grey and deeply fissured; young branchlets dark grey- or reddish-brown to purplish, lenticellate, glabrous or sparsely puberulous; internodes mostly <2,5 cm long but occasionally up to 4,5 cm long. *Prickles* solitary or in threes, the central one slightly hooked downwards, the laterals spreading almost at right angles to the stem or pointing slightly upwards. *Leaves* glabrous throughout or sparingly pubescent: petiole 0,4–2,4(4) cm long, with a small slightly raised gland <1 mm in diameter which is variable in position; rhachis 0,9–5,5 cm long; pinnae 3–6 pairs; rhachillae 0,8–4,5(6,8) cm long; leaflets (3)7–20 pairs per pinna, 3–9 × 1,25–3,75 mm, glaucous, glabrous throughout or lower surface sparingly pubescent, sometimes with a small basal tuft of hairs to one side of the midrib on the lower surface, inconspicuous marginal cilia sometimes present. *Inflorescence* axis up to 11 cm long, glabrous or very sparingly pubescent. *Calyx* 1,5–2 mm long, glabrous. *Corolla* 2,5–3 mm long. *Stamen-filaments* up to 5 mm long. *Pods* brown or reddish-brown to purplish, (2,8)3,8–12 × 0,9–1,5(1,8) cm, straight or almost so, compressed, inconspicuously venose, glabrous.

Found in the Sudan, Ethiopia and in Arabia. Occurs in rocky areas and on stream banks.

The following is a selection of the specimens examined in the Kew Herbarium:

SUDAN.—Kassala, *Broun* 1039; Karora Hills, *Crowfoot* s.n.; between Suakin and Berber, *Schweinfurth* 89.

ETHIOPIA.—80 km west of Dire Dawa along road to Addis Ababa, *Burger* 2531, below Filfil, *Mooney* 8079; 6.4 km north of Barentu, *Hemming* 1015; Mont Zibo, near Saati, *Schweinfurth* 537.

ARABIA.—Dhofar plain, *Bent* 157, Yemen, Gebel Melhan, *Schweinfurth* 610.

Although a few specimens of *A. asak* sometimes show an approach to some specimens of *A. senegal*, the two species have quite a different facies. The differences between the two species are difficult to express concisely in words but *A. asak* may be distinguished by its normally larger glaucous leaflets, larger leaves with widely spaced pinnae, and usually narrower glabrous pods.

8. *Acacia oliveri* Vatke in Oesterr. Bot. Zeit. 30: 274 (1880) excl. descr. leguminis; Ross in *Bothalia* 11: 303 (1974). Type: Ethiopia, Danakil territory, *Hildebrandt* 729c (BM, drawing!).

A. asak (Forsk.) Willd. var. *unispinosa* Fiori in Agric. Colon. 5: 93, fig. 673 (1911). Type: Ethiopia, Samhar, Uakiro, 7 Feb. 1909, *Fiori* 135b (FI, lecto!).

A. unispinosa (Fiori) Chiov., Fl. Somalia 1: 169 (1929); Fl. Somalia 2: 186, fig. 112 (1932). Type as for *A. asak* var. *unispinosa*.

Shrub or small tree to 4 m high with a rounded crown; young branchlets reddish-brown, glabrous or sparingly pubescent, older stems greyish or greyish-brown to purplish-grey; internodes 0.8–2.5 cm long. Prickles solitary or in threes, recurved. Leaves: petiole 2.5–10 mm long, sparingly to densely pubescent; pinnae 1–2 pairs; rhachillae 0.5–1.5 (2.5) cm long, glabrous to densely pubescent; leaflets 4–9 pairs per pinna, 3–5(9) × 1.25–1.75(3.75) mm, oblong or obovate-oblong, glaucous, glabrous. Inflorescence axis sparingly to densely puberulous throughout or basally only. Calyx 1–1.5 mm long, glabrous or very sparsely puberulous. Corolla 1.75–2.25 mm long. Stamen-filaments up to 5 mm long. Pods olive-brown, 3.2–6 × 1–1.6 cm, ± straight, acute apically, 2–5-seeded, compressed, relatively inconspicuously venose, glabrous or very sparingly pubescent on margins and near stipe.

A. oliveri is endemic in Ethiopia. Its ecological preferences are not clear but it apparently favours rocky areas.

The following is a selection of the specimens examined:

ETHIOPIA.—24 km south of Massawa, *Bally* 7044 (K); near Alta, *Hemming* 1182 (BM); Airuri, *Popov* 1377 (BM); Mont Zibo, near Saati, *Schweinfurth* 538 (K); Mabra Plain, *Hemming* 1263 (BM).

The 1 or 2 pinna pairs per leaf and 4–9 pairs of glabrous leaflets per pinna enable *A. oliveri* to be easily identified. It differs from *A. somalensis* in having a greater number of leaflets per pinna, and from *A. sp.* near *somalensis* in having glabrous leaflets. Specimens of *A. oliveri* often have galled leaflets and inflorescences.

9. *Acacia somalensis* Vatke in Oesterr. Bot. Zeit. 30: 274 (1880). Type: Somalia, near Meid, *Hildebrandt* 1396 (BM, K, iso!).

Shrub to 3 m high; young branchlets reddish or reddish-brown, glabrous, older stems grey or grey-brown, sometimes as though whitewashed over a darker background. Prickles solitary (never in threes), typically ± straight and pointing upwards, the tip alone being slightly reflexed, or, recurved and hooked downwards. Leaves small; petiole to 2 mm long; pinna 1 pair; rhachillae to 4 mm long; leaflets 2 (very rarely 3) pairs per pinna, 3.5–4.5(5) × 1.75–2(3) mm, obovate-oblong, glaucous, glabrous. Inflorescence axis glabrous. Calyx 1.5–2.25 mm long,

glabrous. Corolla 2.5–3.25 mm long. Stamen-filaments up to 5 mm long. Pods dark reddish-brown, 2.5–3.5(5) × 1.5–1.8 cm, 1–3-seeded, compressed; valves thin, venose, glabrous.

A. somalensis is endemic in Somalia. Found mostly at low altitudes near the coast on gravel, rocky stony plains or hillsides.

In addition to the isotype, the following specimens have been examined:

SOMALIA.—Heis, a few kilometres along the coast from Meid, *Glover & Gilliland* 711 (BM, K); Mait, *Bally* 11231 (K); near Mait, *Popov* GP157.7 (BM, K); 57 km from Erigavo to Mait, 17 km from Mait, *Hemming* 2040 (K); coast east of Berbera, *Popov* 1183 (K), *Popov* 1184 (BM).

A distinctive species which is usually easily recognized by the solitary prickles, leaves with 1 pinna pair, and the 2 (rarely 3) pairs of glabrous leaflets per pinna.

10. *Acacia* sp. near *somalensis*.

Superficially very similar to *A. somalensis* with which it agrees in habit, in the prickles being solitary, ± straight and ascending or recurved, and in the leaves having only 1 pinna pair. It differs from *A. somalensis*, however, in the following characters:

1. the young extremities are fairly densely pubescent;
2. the petioles and leaf-rhachillae are clothed with spreading hairs;
3. the rhachillae are 4–9 mm long;
4. there are 3–5 pairs of leaflets per pinna;
5. the leaflets are 3–5 × 1–2.25 mm, linear-oblong to obovate-oblong, fairly densely clothed with conspicuous whitish appressed hairs on the lower surface;
6. the inflorescence axes are clothed with spreading hairs basally at least.

This taxon is endemic in Somalia. It is represented in the Kew Herbarium by the following specimens:

SOMALIA.—112 km from Borama, Durkahamaya in Marahle Hills, *Glover & Gilliland* 877; Afard, *Gillett* 4458; Duwi, *Gillett* 4427 pro parte; near Bulhar, *Drake-Brockman* 669.

With the exception of the last specimen, the specimens were all collected at considerably higher altitudes than the specimens of *A. somalensis*.

The sheet of *Gillett* 4427 in the Kew Herbarium consists of mixed gathering and it is not possible to establish whether the collector's notes refer to the specimen of this taxon mounted in the upper left hand corner of the sheet or to the other entity (*A. sp.*) mounted on the sheet. The capsule above the collector's label contains loose pods, but, once again, it is not possible to establish with certainty to which taxon they belong although it seems probable that they belong to the other entity (*A. sp.*). It would be reassuring to have confirmation that the loose pods in the capsule mounted above the collector's label of *Gillett* 4458 definitely belong to *A. sp.* near *somalensis*.

In *Glover & Gilliland* 877 the bark on the trunk is yellowish and flakes off to reveal a greenish-yellow inner layer, and that of *Gillett* 4458 is described as "yellow scaling off". No details concerning the bark of *A. somalensis* are available but there may well be a difference between the bark of this taxon and that of *A. somalensis*. Field observations are required to establish whether any such difference does exist.

The pubescent young branchlets, petioles, leaf-rhachillae and inflorescence axes, and the more numerous pairs of leaflets with densely appressed-pubescent lower surfaces are sufficiently distinctive

to indicate that this taxon almost certainly requires formal taxonomic recognition. However, as the available material is rather inadequate, and as there is an element of doubt whether the loose pods of the two *Gillett* specimens actually belong, it is considered premature to decide precisely what rank should be accorded to this taxon. The decision on whether to give this taxon infraspecific status within *A. somalensis* or specific status must wait until more material, particularly fruiting material, is available for examination.

A. oliveri is readily distinguished by its glabrous leaflets from specimens of this taxon.

11. *Acacia thomasii* Harms in Bot. Jahrb. 51: 366 (1914); Brenan in Fl. Trop. E. Afr. Legum.-Mimos.: 95, fig. 14/20 (1969). Type: Kenya, Kitui District, Ikutha, *F. Thomas* III 127 (B. holo.†, BM, drawing!).

Straggling shrub with elongate branches or slender virgately branched tree up to 7(12) m high; young branchlets usually grey- or yellowish-brown, sometimes as though whitewashed over a darker background, densely pubescent; internodes 1,2–4 cm long. *Prickles* in threes, the central one hooked downwards and the laterals curved upwards or sometimes nearly straight, or occasionally prickles solitary. *Leaves*: petiole 0,2–1,2 cm long, glandular; rhachis 0–0,8 cm long, pubescent; pinnae 1–2(3) pairs; rhachillae (1)1,5–4 cm long; leaflets 7–15 pairs per pinna, 3–9 × 1,5–3 mm, obliquely oblong or elliptic-oblong, rounded to acute or mucronulate apically, glabrous or sometimes pubescent on lower surface. *Inflorescence* axis sparingly pubescent below, glabrous above, up to 9,5 cm long. *Calyx* 3–4,5 mm long, glabrous. *Corolla* 6,5–7 mm long, glabrous. *Stamen-filaments* 13–15 mm long. *Pods* yellowish-brown or brown, 5–10 × 1,5–2,3 cm, straight or nearly so, subacute to acuminate apically, coriaceous, venose, puberulous. *Seeds* ± subcircular-lenticular, 10–12 mm in diam.

A. thomasii is confined to Kenya.

The following is a selection of specimens examined in the Kew Herbarium:

KENYA.—Northern Frontier Province, 66 km east of Isiolo near the end of the Nyambeni Range, *Bally & Smith B14466*; Machakos district, mile 138 and 129 from Mombasa on the main Nairobi road, near Kenani, *Verdcourt 2390*; Masai district, Laitokitok, Seret River, *Vesey-Fitzgerald 29*; Teita district, Voi–Mwatate road, *Drummond & Hemsley 4281*.

The distinctive growth form and large flowers distinguish *A. thomasii* from all of the other species in this complex except *A. ogadensis*. It differs from *A. ogadensis* in having more numerous pairs of narrower leaflets per pinna, and a different range of distribution.

12. *Acacia ogadensis* Chiov. in Ann. Bot., Roma 13: 393 (1915); Fl. Somalia 1: 167 (1929). Syntypes: Somalia, Ogaden, *Robecchi Bricchetti 594* (FI!); between Bardera and Marda, *Paoli 811* (FI!), *Paoli 812* (FI!).

Albizia ogadensis (Chiov.) Bak.f. ex Chiov., Fl. Somalia 2: 182, fig. 110 (1932). Syntypes as above.

Slender virgately branched straggly tree up to 5 m high, sometimes (fide *Glover & Gilliland 1037*) with two tiers of foliage, one at ± 1 m high through which the stem grows to produce a second tier at 2,75–5 m; young branchlets grey or reddish-brown to purplish, sometimes as though whitewashed over a purplish background. *Prickles* in threes, the central one hooked downwards and the two laterals spreading almost at right angles to the stem or sometimes also

slightly hooked downwards. *Leaves*: petiole up to 4 mm long, glandular; pinna 1 pair; rhachillae 0,8–2 cm long; leaflets (2)3–4 pairs per pinna, 5–15 × (2,5)3–9 mm, oblong, obovate-oblong or obovate, glabrous or minutely appressed-pubescent on lower surface. *Inflorescence* axis puberulous or glabrous, up to 5 cm long. *Calyx* 3–4 mm long, pubescent or glabrous. *Corolla* 4–6 mm long. *Stamen-filaments* up to 18 mm long, lilac. *Pods* olive- or yellowish-brown, 6–7 × 1,3–1,9 cm, compressed, acute apically, venose, densely puberulous.

A. ogadensis is endemic in Somalia, where it apparently favours limestone outcrops.

A. ogadensis is represented in the Kew Herbarium by the following specimens:

SOMALIA.—South border at Dalaliso, *Glover & Gilliland 1037*; 104 km south of Belet Wein, *Hemming CFH 93*; Galkayu Plains, *Bally 9606*; 100,8 km north of Dusa Mareb, *Bally 9574*; 49,6 km north of Gardo, *Hemming 1579*.

All three syntypes are leafless flowering specimens in which the inflorescence axes are puberulous and the calyces fairly densely pubescent. The flowering specimens in the Kew Herbarium cited above agree with the syntypes in flower size and in overall facies but differ in having glabrous inflorescence axes and calyces. The taxonomic significance of the presence or absence of the indumentum is not clear and requires investigation.

The slender straggling virgate growth form of *A. ogadensis* is reminiscent of *A. thomasii* and of *A. senegal* var. *leiorhachis*. *A. ogadensis* differs from both *A. thomasii* and *A. senegal* var. *leiorhachis*, however, in having fewer pairs of broader leaflets per pinna. The large flowers also help to distinguish *A. ogadensis* from all of the other species in the complex except *A. thomasii*. *A. ogadensis* appears to be most closely related to *A. thomasii*.

Flower colour in *A. ogadensis* needs clarification: it is not clear whether the stamen-filaments alone are lilac or whether the corolla too is lilac.

13. *Acacia condyloclada* Chiov. in Ann. Bot., Roma 13: 391 (1915); Brenan in Fl. Trop. E. Afr. Legum.-Mimos.: 94, fig. 14/19 (1959). Type: Ethiopia, Ogaden, between Sassaban and Carbaden, *Riva & Ruspoli 1079* (FI, holo.!).

Tree 2–11 m high with white or yellow peeling bark; young branchlets reddish-brown, purplish or blackish, puberulous; internodes 5,5–9 cm long, often ± enlarged towards the apex. *Prickles* solitary or in threes, slightly hooked or ± straight and spreading. *Leaves*: petiole 1,3–2,8 cm long, with a large flattened ± discoid gland 1,5–3 mm in diameter near the base; rhachis 3–6,5 cm long, eglandular, puberulous; pinnae 3–4 pairs; rhachillae 2–7,5 cm long; leaflets 6–9 pairs per pinna, 9–20 × 3,5–9 mm, obliquely oblong to slightly ovate or obovate, rounded apically, puberulous above and below. *Inflorescence* axis glabrous, up to 13 cm long. *Calyx* ± 2,5–2,75 mm long, glabrous, with a dark stripe running from the base of the calyx to the apex of each lobe. *Corolla* ± 3,5 mm long, glabrous. *Pods* brown or reddish-brown, 6–10,5 × 1,8–2,1 cm, straight, rounded or apiculate apically, venose, densely puberulous.

Found in Ethiopia, Somalia and Kenya (Northern Frontier Province). Appears to favour limestone outcrops.

The following specimens have been examined:

SOMALIA.—Bugshenleh, *Peck Y102* (K).

KENYA.—Northern Frontier Province, Lag Ola, 45 km west of Ramu on Banessa road, *Gillett 13279* (K).

Burger 3396(K) and 3397(K), a sterile and a flowering specimen respectively, from limestone slopes west of Daletti above the Gobelli river valley in the Harar Province of Ethiopia [42°7'E - 8°32'N] are almost certainly referable to *A. condyloclada*. Unfortunately there is very little material of *A. condyloclada* available for comparison, but the two above specimens have the overall facies of this species. They agree in having smooth white peeling bark, puberulous purplish to blackish young branchlets with long internodes, a large gland at the base of the petiole, eglandular rhachides, 3-5 pinnae pairs, 6-12 pairs of mostly puberulous large leaflets per pinna, glabrous inflorescence axes, and sessile flowers with glabrous calyces and corollas. However, one twig of *Burger* 3397 is unusual in having two leaves with slightly smaller leaflets (6 × 2 mm), although the other twig has the typical larger leaflets (up to 10 × 4.5 mm). Some of the leaflets are ± glabrous. In addition, the flowers tend to be slightly smaller than in the other flowering specimen examined, i.e. the calyx is ± 2 mm long as opposed to 2.5-2.75 mm. As in *A. condyloclada*, in many of the flowers a dark stripe is evident running up each calyx-lobe. These two specimens clearly match *A. condyloclada* more closely than any other species and the present circumscription of the species could easily be amended to make provision for the slight differences noted above. More material is required.

The white peeling bark, long internodes, large basal petiolar gland, and few pairs of large leaflets per pinna distinguish *A. condyloclada* from the other species in this complex.

14. *Acacia caraniana* Chiov., Fl. Somalia 1: 166, t.18 (1929). Type: Somalia, Migiurtini, Behèn, Puccioni & Stefanini 704 (FI, holo.).

Slender tree to 7 m high with pale grey or whitish bark; young branchlets reddish-brown to purplish or as though whitewashed over a reddish or purplish background, glabrous; internodes 5-8.5 cm long. Prickles solitary or in threes, central prickles not strongly recurved, the laterals (when present) spreading laterally and almost at right angles to the stem. Leaves: petiole 2-6 mm long, with a large flattened gland 1-2 mm in diameter at the point of attachment of the lowest pinna pair; rhachis 1.5-4 cm long, glabrous; pinnae 3 pairs; rhachillae 2-7.5 cm long; leaflets 5-13 pairs per pinna, 5-13 × 1.25-4 mm, oblong or obovate-oblong, glaucous, glabrous. Inflorescences on abbreviated axillary shoots, axes up to 12.5 cm long, glabrous. Flowers? (only remnants present but corolla apparently < 4 mm long). Pods olive, 6-15.5 cm long (including a stipe 1.8-4 cm long), 0.9-1 cm wide, straight or almost so, compressed, margins slightly constricted between some of the seeds, 3-7-seeded, finely venose, glabrous.

A. caraniana is endemic in Somalia, where it apparently favours gypsum outcrops.

The following specimens have been examined:

SOMALIA.—Hills between Garoe and Galcaic, Hemming CFH75 (K); 17 km SW of Garoe, Hemming 1376 (K); SE Nogal area, Glover & Gilliland 1047 (BM, K).

A. caraniana is a distinctive species which is easily recognized by the long internodes, large petiolar gland at the point of attachment of the lowest pair of pinna, the 3 pinnae pairs, and the narrow, long-stipitate pods.

15. *Acacia zizyphispina* Chiov., Fl. Somalia 1: 167 (1929). Syntypes: Somalia, between Garass-Hebla-Aden and Jesomma, Puccioni & Stefanini 152 (FI!); between Avorrei and Bulo-Burti, Puccioni & Stefanini 171 (FI!).

A. impervia Gilliland in Kew Bull. 6: 139, t.3 (1951). Type: Somalia, Ogaden, between Wardere and Walwal, Glover & Gilliland 386 (K, holo.!; BM, FHO, iso.).

Shrub to 2.75 m high, often with a short trunk 0.3-0.6 m high and then branching to give a flattish or rounded crown; young branchlets glabrous or very sparingly puberulous, dark reddish-brown, becoming dark grey-brown to purplish, sometimes as though whitewashed over a purplish background. Prickles in threes, the central one strongly hooked downwards, the two laterals strongly curved upwards. Leaves: petiole 0.6-1.8 cm long; rhachis 0.7-2.5 cm long; pinnae 2-3 pairs; rhachillae 0.3-1.3 cm long; leaflets 1 or 2 pairs per pinna, 8-19 × 5-13 mm, obovate, asymmetric basally, minutely appressed-puberulous on both surfaces. Inflorescence axis glabrous, up to 4 cm long. Calyx up to 2.5 mm long, glabrous. Corolla up to 4 mm long. Stamen-filaments up to 7 mm long. Pods yellowish-brown, brown or reddish-brown to purplish, 4.5-9.3 × (2.6)3.2-4.8 cm, rounded apically, compressed, valves thin, venose, glabrous.

Found in Ethiopia and Somalia. Ecological preferences not clear.

The following is a selection of specimens examined in the Kew Herbarium:

ETHIOPIA.—Ogaden, near Wardere, Popov 1124; 25.6 km east of Wardere, Hemming 1463; 82 km east of Wardere, Hemming 1514.

SOMALIA.—27 km north of Giuale, Hemming CFH81; 28.8 km south of Ghelinsor, Hemming 1429.

A. zizyphispina is a distinctive species, which is easily distinguished by the 1 or 2 pairs of large leaflets per pinna, 2 or 3 pinnae pairs per leaf, and the broad thin-valved pods.

16. *Acacia ankokib* Chiov., Fl. Somalia 2: 190, fig. 116 (1932). Syntypes: Somalia, unlocalized, Robecchi-Bricchetti 529 (FI!); Migiurtinia, Bender Merajo, Guidotti 35 (whereabouts unknown).

Tree to 6 m high, sometimes several-stemmed from the base; bark yellowish, papery, peeling off in large thin pieces; very young branchlets greyish or reddish-brown, fairly densely puberulous at first but becoming glabrous, the greyish epidermis on older branchlets peeling off to expose a papery yellowish inner layer. Prickles present or often absent (see note below). Leaves: petiole 0.6-1.9 cm long, with a small slightly raised gland which is variable in position; rhachis 2-5 cm long; pinnae (2)3-6 pairs; rhachillae 1.2-3.2 cm long; leaflets (4)6-9 pairs per pinna, 4-10 × 0.75-1.75(2.5) mm, linear-oblong or oblong, obtuse apically, distinctly petiolulate, often bent basally so that the apex of the leaflet tends to point upwards towards the apex of the pinna, glaucous, minutely puberulous on both surfaces. Inflorescence axis minutely puberulous, up to 6 cm long. Calyx 1-1.5 mm long, glabrous or almost so. Corolla 1.5-2 mm long. Stamen-filaments up to 4 mm long. Pods brown, 4.5-7.5 × 0.9-1 cm, compressed, acute apically, inconspicuously venose, minutely puberulous.

A. ankokib is endemic in Somalia. Ecological preferences unknown.

The following specimens have been examined:

SOMALIA.—Mijertein, Everard 3 (BM); 64 km from Scuciuban on El Gal road, Hemming 1771 (K); El Gal, Popov GP/57/23 (K).

The true nature of the armature in *A. ankokib* is not clear and requires clarification. In *Robecchi-Bricchetti* 529 the prickles are mostly paired with a small, sharp or blunt outgrowth in the position

normally occupied by the third prickle, while occasionally a well-developed third prickle is present but situated some distance below the paired prickles. It is not clear whether the outgrowths are reduced prickles or whether they merely simulate prickles. *Guidotti* 35, the other syntype, was said by Chiovenda to be unarmed, and all of the specimens cited above are unarmed. Until it has been established conclusively whether the prickles are basically paired or

in threes, it is uncertain whether *A. ankokib* is a member of the *A. senegal* complex or whether it should be excluded.

A. ankokib is readily distinguished by the yellowish papery bark on the bole which peels off in large pieces, the greyish epidermis on the older branchlets which peels away to expose a papery yellowish inner layer, the few pairs of distinctly petiolulate, glaucous, minutely puberulous leaflets, and the narrow pods.