BLUMEA 27 (1981) 223–234

SUPPLEMENTARY DATA ON MALESIAN KNEMA (MYRISTICACEAE) INCLUDING THREE NEW TAXA

W. J. J. O. DE WILDE

Rijksherbarium, Leiden, The Netherlands

Among the collections of *Knema* acquired by the Rijksherbarium since the publication of my new account of the genus *Knema*, in Blumea 25, 1979: 321–478, a few specimens caused problems with the identification, and at closer examination these yielded facts of interest which are published here. Some specimens represented stages not yet known, for instance fruits, or male flowers, while other specimens meant a significant range extension of the species. Two new species and one new subspecies are described.

For easy reference, the sequence and numbers of the species presently treated correspond with the numbers as used in the account of 1979. The new species bear the number of the species after which they appear in the general key of 1979, with the addition '-bis'.

The latin diagnoses were kindly translated by Dr. R. C. Bakhuizen van den Brink jr., the drawings are by Mr. J. van Os.

A large part of the specimens used for the present publication was collected through financial aid by the Netherlands Foundation for the Advancement of Tropical Research (WOTRO), for which it is gratefully acknowledged.

17. Knema furfuracea (Hook. *f.* & Th.) Warb.; de Wilde, Blumea 25 (1979) 387.

This species is known from southern peninsular Thailand (1 collection) and from abundant collections from a wide range in Malaya and Singapore.

During our third inventory in the Gunung Leuser area, northern Sumatra, we collected from two localities identical sterile specimens, viz. *de Wilde & de Wilde-Duyfjes 18897* and *19411-A*, respectively from the lower Alas River valley and from Sekundur Forest Reserve, i.e. from W. and E. of the Barisan Range. Most likely they belong to *K. furfuracea*, according to the dark brown-blackish colour of the flaking bark of the older twigs, rather than the usually paler brown or grey-brown colour of the flaking bark in the related *K. lampongensis* and *K. lamellaria*.

24b. Knema latericia Elmer subsp. **ridleyi** (Gandoger) de Wilde, Blumea 25 (1979) 396.

This is widely distributed in southern peninsular Thailand, Malaya, Singepore, and Borneo. From the Sumatran plant-geographical unit it was only known from Bangka I. The subspecies *ridleyi* is a very variable entity within *K. latericia*. Sterile material, *de Wilde & de Wilde-Duyfjes 19411-B*, collected in northern Sumatra, Sekundur F. R. (a part of the Gunung Leuser complex of nature reserves, NW. of

Medan), i.e. in East Coast division, obviously belongs in *K. latericia* subsp. *ridleyi*. It was collected in lowland forest in the upper Besitang River area, from one of locally quite common treelets, all in the sterile state. The specimens differ slightly from the abundant material from Malaya by a rather stouter general habit (twigs at apex 3 – 5 mm diam., leaf blades up to 30 × 9 cm), the twigs but little striate at apex, and the tertiary venation fine and very distinct on the upper leaf surface. The material from northern Sumatra is a record new for the island.

26. Knema pulchra (Miq.) Warb.; de Wilde, Blumea 25 (1979) 399.

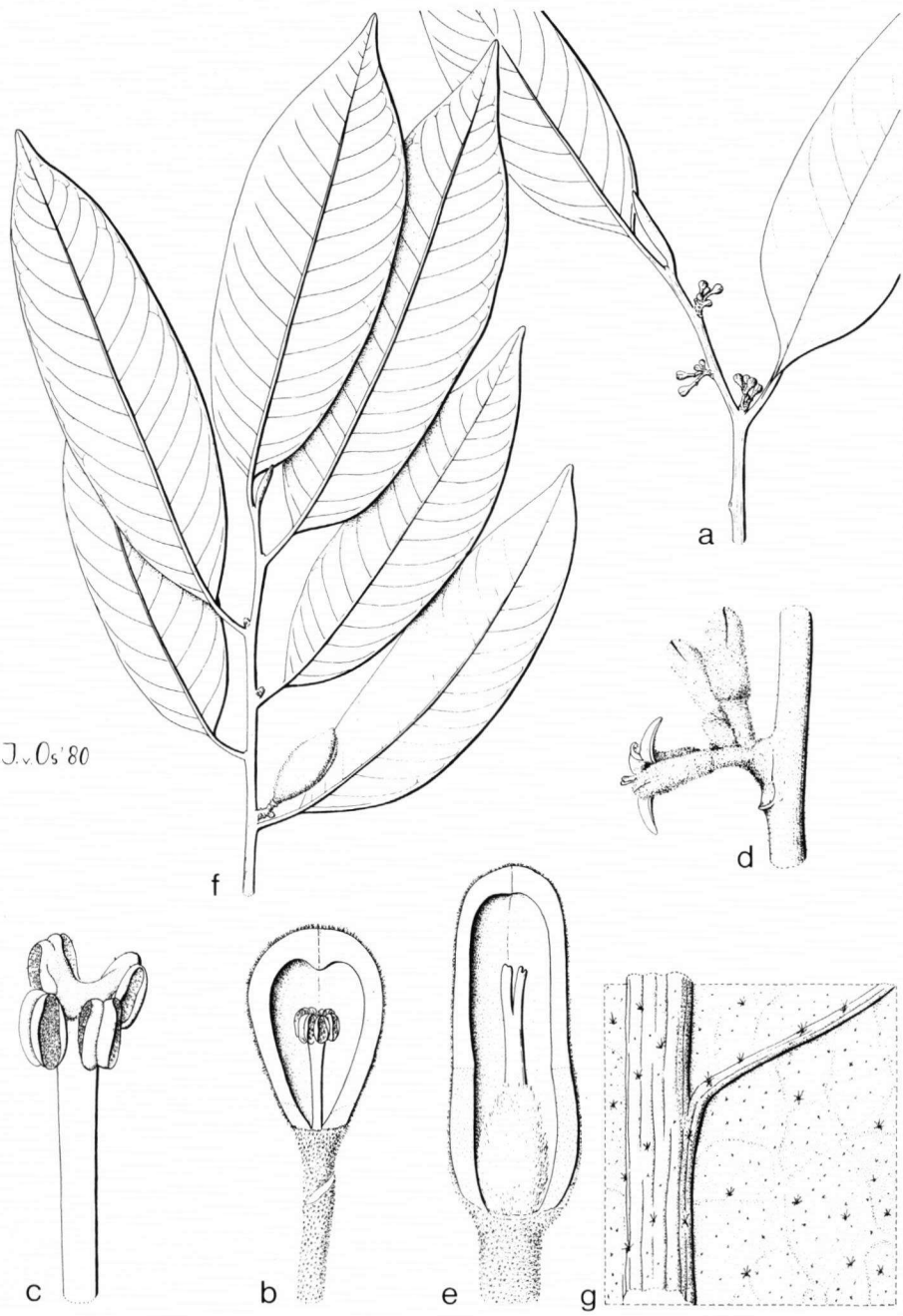
This species occurs in Malaya and Borneo, and appears as not been found in Sumatra, from which island two doubtful collections were reported. A short note explaining the matter is given under 76. *K. losirensis*.

27-bis. Knema steenisii de Wilde, *sp. nov.* — **Fig. 1.**

Knema *alabastris* ♂ maturis obconicis vel pyriformibus, basi decrescentibus, 2.8 – 3.5 mm longis, 2 – 2.2 mm latis, in anthesi fere usque ad basin fissis. *Antherae* 4 vel 5, suberectae, circa 0.4 mm longae, substipitatae. *Discus staminalis* circa 0.8 mm diam., antheris inclusis. *Columna staminalis* tenuis, 1.1 – 1.5 mm longa. *Pedicelli* ♂ 2 – 3 mm longi, bracteola caduca plus minus medio inserta. *Ramuli* tereti, cortice haud fissuro. — T y p u s: *Schmutz 4162* (L).

Tree. *Twigs* towards apex 1 – 2 (– 3) mm diam., terete, smooth or finely striate, tomentose by stellate-scaly and dendroid hairs less than 0.2 (generally *c.* 0.1) mm long, lower down glabrescent; bark of twigs not tending to crack. *Leaves* membranous to thinly chartaceous, drying olivaceous to brown; beneath without blackish dots, with subpersistent tomentum composed of scattered stellate-scaly and dendroid hairs of mixed sizes, generally *c.* 0.1 mm long or less, but with a few emergent ones up to 0.4 mm; blade oblong to oblong-lanceolate, broadest below to usually above the middle, 7 – 19 × 2 – 5.5 (– 6) cm, base attenuate to narrowly rounded, top acute or up to 1.5 cm acute-acuminate; midrib above slender, slightly raised; nerves 15 – 25 pairs, little raised above; tertiary venation forming a fine network well-visible above; petiole 10 – 15 × 1 – 1.5 mm, late-glabrescent from short woolly hairs up to 0.3 mm. *Inflorescences* 1 – 4 mm long, simple, sessile, 1 – 5-flowered in ♂ and ♀; flowers tomentose by rusty stellate-dendroid hairs 0.1 – 0.2 mm. *Male flower* pedicels 2 – 3 mm, the bracteole at or somewhat above halfway, *c.* 0.5 mm long, caducous; perianth in bud obovoid or pear-shaped, at base tapering, top ± truncate, 2.8 – 3.5 × 2 – 2.2 mm, the valves at sutures *c.* 0.3 – 0.4 mm thick, at apex knobbled towards the centre, inside smooth, probably pinkish, splitting the bud to *c.* 5/6 deep; staminal disc circular, flattish, incl. anthers *c.* 0.8 mm diam.; anthers 4 or 5, just stiped, suberect, 0.4 (– 0.5) mm long; staminal column slender, terete, slightly tapering, 1.1 – 1.5 mm long. *Female flowers* subsessile, pedicel 0.5 – 1.5 mm long; perianth in bud ovoid-oblong, *c.* 5 – 6 × 1.5 – 2.5 mm, the valves

Fig. 1. *Knema steenisii* de Wilde. — a. habit of male flowering twig, × 1; b. opened mature male flower bud, showing the androecium, × 8; c. mature androecium, × 25; d. female inflorescence, × 3; e. mature female flower, opened, showing pistil, × 8; f. habit of fruiting twig, × ½; g. detail of lower leaf surface, showing minute stellate hairs of mixed sizes, × 12 — a – c. from *Schmutz 4162*; d & e. from *Schmutz 4164*; f & g. from *Schmutz 4420*.


J.v.Os '80
a
d
f
c
b
e
g

at sutures *c.* 0.5 mm thick, splitting the bud slightly over halfway deep; pistil 4 – 4.5 mm long; ovary ovoid-ellipsoid, *c.* 2 mm long, densely tomentose by stellate-dendroid hairs 0.2 (– 0.3) mm; style glabrous, *c.* 1 mm long, stigmas 1 – 1.5 mm long, consisting of 2 erect lobes, each entire or faintly 2-lobulate at apex. *Fruit* 1 (– 3?) per infructescence; ellipsoid-oblong, subacute at apex, *c.* 22 – 24 × 10 mm, brown-grey tomentose by stellate-dendroid hairs 0.2 – 0.3 (– 0.5) mm long, late glabrescent; stalk 1 – 1.5 mm long.

LESSER SUNDA I. W. F l o r e s: Manggarai, *E. Schmutz 4162* (♂ fl.), *4164* (♀ fl.), *4420* (♀ fl., fruits); the collections are from 780 and 800 m alt.

N o t e s: 1. The present new species is distinct by its small flowers, with a structure rather unique in the genus: there are 4 or 5 anthers, the staminal column is slender and much longer than the diameter of the staminal disc, whereas the perianth is split by the valves at anthesis nearly to the base. Therefore, it occupies a position apparently somewhat intermediate between the series *Laurinae* and the series *Obovoideae* as defined in my treatment of the genus in Blumea 25, 1979: 331, 333. Series *Laurinae* is mainly characterized by the male perianth in bud ellipsoid-oblong to (ob)ovoid or obconical, the staminal column longer than the diameter of the staminal disc incl. anthers, the male perianth in anthesis split by the valves to *c.* halfway to 2/3 rds; in series *Obovoideae* the male perianth in bud is obovoid or pear-shaped, the staminal column about as long as to shorther than the diameter of the staminal disc incl. anthers, and the male perianth in anthesis is cleft by the valves to *c.* halfway to 3/4 (– 4/5).

Possibly, the new species represents a series of its own, because of the long staminal column in combination with the deeply cleft perianth, but provisionally I prefer to include it in series *Obovoideae*. This series is already rather heterogeneous, and should now be amended (p. 333 and 397) as containing also a species with a rather narrow perianth deeply cleft in anthesis, with as few as 4 or 5 anthers, and with the staminal column longer than the diameter of the staminal disc. In series *Obovoideae*, this latter character is known in part of the material of the Bornean species *K. piriformis*.

2. In the general key to the male flowering specimens as given in my account (l.c., p. 343), the present new species fits in as given below. In the regional key for East Malesia, to female specimens (in the account, l.c., p. 365), it is inserted as in the key presented under the species 64-bis *K. matanensis*.

30 b. Twigs rather slender, at apex 1 – 3 mm diam. Leaf base rounded to attenuate. Male flower pedicels 2 – 5 mm long . . . . . 30[1]

30[1]a. Mature male perianth in bud 4 – 5 mm long, cleft by the valves to *c.* 1/2 – 2/3; pedicel 2 – 5 mm long; anthers 11 or 12 (Compare also 73. *K. hirtella* var. *stylosa*). . . . . **27. K. piriformis**

b. Mature male perianth in bud 2.8 – 3.5 mm long, cleft by the valves to *c.* 5/6; pedicel 2 – 3 mm long; anthers 4 or 5. . . . . **27-bis. K. steenisii**

3. Resembling species. As stated under note 1, because of its long staminal column this species may be taken for one of the species of series *Laurinae*, from which it essentially differs by its perianth deeply cleft at anthesis. In general habit, however, when male flowers are lacking, it may be confused with several species, and in East Malesia notably with *K. cinerea* (series *Glaucae*) and *K. stenocarpa*

(series *Glomeratae*). Both these species have globose male perianths, and differ vegetatively in, for instance, the nature of the tomentum on the lower leaf surface. In *K. cinerea* this tomentum consists of generally more uniformly sized and smaller stellate scales, in *K. stenocarpa* it is composed of mixed stellate and dendroid hairs, of a more woolly nature, not scale-like. In both species the pistil and the fruits are rather different from those of *K. steenisii*.

4. The type material consists of 2 sheets, with on one of these an herbarium label *E. Schmutz 4164*; on both sheets are male and female specimens mounted. On a field label, attached to one of the female twigs, is written in pencil by Schmutz: *4164* ♀ = *4162* ♂. I have chosen the male specimens, hence *Schmutz 4162*, as the type.

5. I have named the present new species after professor C. G. G. J. van Steenis, my teacher; also to commemorate his efforts to determine the plants collected by father Schmutz and his colleagues, and to acknowledge his recently published treatise on the plant geography of East Malesia.

37. Knema linguiformis (Sinclair) de Wilde, Blumea 25 (1979) 416.

This species was recognized by Sinclair, Gard. Bull. Sing. 18 (1961) 200, as a variety in the related variable species *K. curtisii*.

When examining the specimen *Chai S. 34734*, from S. Baram District, Sarawak, I was puzzled where it could belong, as it obviously was close to but different from *K. curtisii*.

The specimen is stout, with the twigs rather angled by ridges from the bases of the petioles, at apex 2.5 – 3 mm diam., bearing large chartaceous leaves, the blades up to 23 × 6 (– 7) cm., finely distinctly reticulate at both surfaces, the petiole to over 20 mm long. It has stout inflorescences, with stout immature male flower buds, with stout pedicels. After thorough comparison I concluded that it belongs to *K. linguiformis*. The largest leaves hitherto seen in the ample material of *K. linguiformis* measure *c.* 15 × 5 (– 6) cm, with the twigs at apex 1 – 2 mm diam.

Under *K. curtisii* var. *curtisii* I mentioned (l.c., p. 419) a stout deviating specimen, *Amdjah 144*, from Sabah, but the present specimen *S. 34734* is quite different.

While going through the material of *K. linguiformis* and *K. curtisii* it was obvious that the material of the former species generally has the twigs more angled by ridges from the bases of the petiole, especially as compared to *K. curtisii* var. *curtisii* from Borneo, a fact not noticed before.

47. Knema pectinata Warb.; de Wilde, Blumea 25 (1979) 430.

In my account of *Knema* (l.c., p. 431), I commented under *K. pectinata* on two deviating specimens, *Ilias Paie S. 26349* and 26431, from Sarawak. Recently the specimen *Nooteboom & Chai 2236*, from the same area, which was stored under *Myristica*, came to my attention. It exactly maches the two deviating specimens under *K. pectinata*. This leads me to describe the three specimens as a new subspecies, although male flowers are still lacking. The main differences are in the tomentum of the lower leaf surface and in the shape of the fruit, but there are also a number of difficult to define smaller differences, e.g. in leaf texture and distinctness of the reticulation. I feel, however, that the specimens are still sufficiently similar to typical *K. pectinata* to presume that the flowers will be largely identical.

KEY TO THE SUBSPECIES

1a. Leaves coriaceous. Tomentum of lower leaf surface inconspicuous, subpersistent to glabrescent, consisting of rather weak scattered minute stellate hairs of various sizes. Fruit flanged along the line of suture. **a.** subsp. **pectinata**

b. Leaves rigidly coriaceous. Tomentum of lower leaf surface largely persistent, consisting of densely set minute stellate hairs, mixed with fewer emergent ones. Fruit not flanged. . . . . **b.** subsp. **vestita**

b. subsp. **vestita** de Wilde, *subsp. nov.*

Knema pectinata similis, differt foliorum pagina inferiora tomentibus persistentibus e pilis confertim constitutis vestita, fructibus haud porcatis. — T y p u s: *Ilias Paie S. 26349* (L; iso K, SING, *n.v.*).

Twigs stout, at apex 3 – 5 mm diam., rusty puberulous by minute stellate-scaly hairs *c.* 0.1 mm long or less. *Leaves* rigidly coriaceous, on the lower surface with greyish to yellowish-rusty subpersistent tomentum composed of densely set stellate hairs 0.1 – 0.2 mm long or less, mixed with fewer slightly longer hairs; leaf blades elliptic-oblong to lanceolate, broadest below to above the middle, (10 –)20 – 30 × (3 –)3.5 – 10.5 cm, base rounded to cuneate, top obtuse to acute-acuminate; midrib and nerves raised above, side nerves 25 – 30 pairs; tertiary venation forming a fine network, distinct at both surfaces. *Flowers* not seen. *Fruits* 1 per infructescence, broadly ellipsoid to subglobose-obovoid, *c.* 30 – 40 × 27 – 30 mm, not flanged along the line of suture, the tomentum of minute stellate-dendroid hairs 0.1 – 0.2 mm long; stalk *c.* 3 mm long.

BORNEO. S a r a w a k: 5 th Division, Lawas, *Ilias Paie S. 26349, 26431*; Ulu Limbang, *Nooteboom & Chai 2236*.

N o t e s: 1. Trees recorded as 6 – 25 m tall, collected at 1400 – 1600 m alt.; fruits orange or brown.

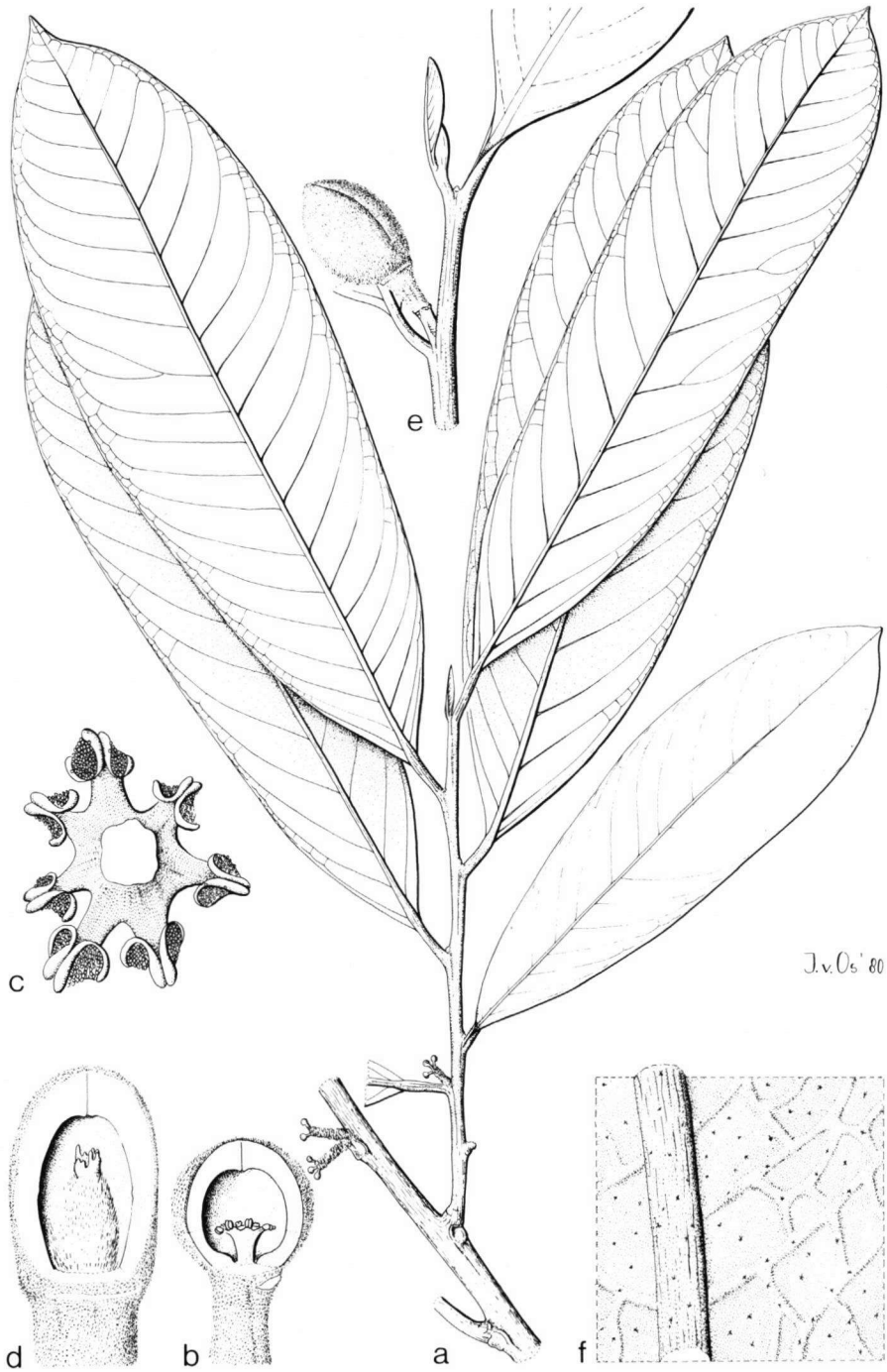
2. Apart from related species as apparent from the general key, this subspecies is reminiscent of *K. kinabaluensis* from adjacent Sabah. This latter has a less stout habit, the tomentum on the lower leaf surface composed of scattered very minute stellate scales, the fruits generally smaller and usually ridged.

3. In subsp. *pectinata* the leaves are less rigidly coriaceous and with the reticulation on the upper surface generally somewhat finer and sharper marked as compared to subsp. *vestita*.

64-bis. Knema matanensis de Wilde, *sp. nov.* — **Fig. 2.**

Knema *alabastris* ♂ maturis globosis, circa 2.5 mm diam., in anthesi usque ad circa 4/5 fissis, intus luteis. *Antherae* 7 vel 8, horizontales, stipitatae. *Discus staminalis* (antheris inclusis) circa 1.5 mm diam. *Columna staminalis* circa 0.5 – 0.7 mm longa. *Pedicelli* ♂ circa 2.5 mm longi, bracteola persistente ad apicem inserta. *Ramuli* validi, subtereti, tomento deciduo pilorum circa 0.1 mm longorum vel minus obtecti; cortice haud fissuro. *Folia* coriacea. — T y p u s: *de Vogel 6060* (L).

Fig. 2. *Knema matanensis* de Wilde. — a. habit of male flowering twig, × ½; b. opened mature male flower bud, showing the androecium, × 6; c. mature androecium, seen from beneath, × 25; d. opened mature female flower bud, showing pistil, × 6; e. portion of twig with submature fruit, × 1; f. detail of lower leaf surface showing scattered minute stellate hairs, × 12½. — a – c, & f. from *de Vogel 6109*; d & e. from *de Vogel 6128*.


e
c
J.v.Os '80
d
b
a
f

Tree 6–25 m. *Twigs* at apex 3–4(–8) mm diam., terete or faintly angled, smooth, towards apex tomentose by hairs *c.* 0.1 mm long or less, lower down early glabrescent; bark of twigs not tending to crack. *Leaves* coriaceous, drying olivaceous to brown; on lower surface without blackish dots, subglabrescent from thin tomentum of scattered minute stellate and stellate-dendroid hairs of mixed sizes, *c.* 0.1 mm long or less; blade oblong to oblong-lanceolate, broadest at about or above the middle, 14–31 × 4.5–10.5 cm, base attenuate, top up to 1.5 cm acute-acuminate; midrib above rather broad, flattish; nerves 18–26 pairs, flat or but little raised above; tertiary venation forming a fine network, distinct above; petiole 7–18 × 2–5 mm, early glabrescent from minute tomentum. *Inflorescences* up to 20 mm long brachyblasts, sessile, single or 2 or 3 together, each 2–5-flowered in ♂ and ♀; flowers tomentose by dark rusty dendroid hairs 0.1–0.2 mm long. *Male flower* pedicels 2–3 mm, the bracteole apically, *c.* 0.5 mm long, persistent; perianth in bud (sub)globose, 2.5(–3) × 2.5–3 mm, the valves at sutures to *c.* 1.2 mm thick, inside creamy to yellow, splitting the bud to *c.* 4/5 deep; staminal disc subtriangular, flattish, incl. anthers *c.* 1.5 mm diam.; anthers 7 or 8, distinctly stiped, horizontal, the thecae *c.* 0.2–0.3 mm long, opening ± downwards; staminal column terete, 0.5–0.7 mm long. *Female flowers* subsessile, pedicel *c.* 1 mm long; perianth in bud ovoid-oblong, *c.* 4.5 × 2.5 mm, the valves at suture *c.* 1 mm. thick, splitting the bud to *c.* halfway; pistil *c.* 3 mm long; ovary ovoid, *c.* 2 × 2 mm, densely tomentose by hairs *c.* 0.2 mm long; style short, less than 0.5 mm, stigmas *c.* 0.5 mm long, consisting of 2 broad lobes, each 3–4-lobulate. *Fruits* 1 or 2 per infructescence; when immature ellipsoid, *c.* 20 × 12 mm, densely dark rusty tomentose by dendroid hairs 0.2–0.3(–0.5) mm; stalk stoutish, *c.* 5 mm long.

CELEBES. C e n t r a l (N. of SE. Peninsula): N. side of Lake Matano, *c.* 600 m alt., thin soil cover over conglomeratic rock, *de Vogel 6059* (young fr.), *6060* (♂ fl.); ditto, on alluvial flatland, *de Vogel 6109* (♂ fl.), *6128* (♀ fl., immature fr.).

N o t e s: 1. In the general key to male flowering specimens, as given in the account of *Knema* (l.c., p. 349) this new species fits in as follows:

72a. Leaves coriaceous; the reticulation on the upper surface usually very distinct and prominent. Twigs usually drying dark brown to blackish. [Fruits with persistent very short tomentum]. . . . . 72[1]

b. Leaves membranous to thinly coriaceous, above drying greenish to brown, or blackish; reticulation distinct or not. Twigs drying grey to brown. [Fruits early glabrescent, usually leaving a finely warty surface, or in 65. *K. luteola* minutely scaly]. 73

72[1]a. Twigs at apex 1.5–2.5 mm diam. Leaves 9–21 × 2.5–5 cm, drying brown above. Bracteoles caducous. Perianth inside red. Anthers subsessile. *Sabah: Mt. Kinabalu and vicinity*. . . . . **64. K. kinabaluensis**

b. Twigs stouter, at apex 3–4 mm diam. Leaves generally larger, 14–31 × 4.5–10.5 cm, drying olivaceous to brown above. Bracteoles persistent. Perianth inside creamy-yellow. Anthers stiped. *Central Celebes: Lake Matano area*. . . . . **64-bis K. matanensis**

In the regional key to female flowering and fruting specimens for East Malesia (l.c., p. 365), 27-bis. *K. steenisii* and 64-bis. *K. matanensis* fit in as follows:

8a. Twigs stout, at apex 3–4 mm diam. Leaves coriaceous. Perianth inside creamy-yellow. Fruits with persistent tomentum of short hairs. [Male perianth in bud 2.5–3 mm diam.; anthers 7 or 8]. *Central Celebes.* **64-bis K. matanensis**

b. Twigs generally more slender, at apex 1–3.5 mm diam. Leaves membranous to chartaceous. . . . . 8[1]

8[1]a. Lower leaf surface early glabrescent from weak stellate hairs. Perianth inside reddish (always?). Fruits 18–30(–40) mm long, usually early glabrescent. [Male perianth in bud globose, 2.5–3.5 mm diam.; anthers 11–15]. *Bali I.* (See also *K. glomerata*). . . . . **66. K. glauca**

b. Lower leaf surface with persistent tomentum of minute scales or of mixed minute scales and low dendroid hairs. Fruits 12–24 mm long, with (sub)persistent minute tomentum. . . . . 8[11]

8[11]a. Lower leaf surface with tomentum of minute stellate scales. Style *c.* 0.5 mm long. Perianth inside greenish-creamy. Fruit 12–18(–20) × 10–16 mm. [Male perianth in bud globose, 3.5–4.5 mm diam.; anthers 9–14]. *Lesser Sunda I. (except Bali), Celebes, Moluccas, S. Philippines: Mindanao.* **71. K. cinerea**

b. Lower leaf surface with tomentum of mixed minute scales and stellate-dendroid hairs. Style *c.* 1 mm long. Perianth inside pink-red (?). Fruit *c.* 22–24 × 10 mm. [Male perianth in bud pear-shaped, *c.* 2 mm wide; anthers 4 or 5]. *W. Flores, at 780 m alt.* . . . . . **27-bis K. steenisii**

2. Related species. The present new species obviously belongs to series *Glaucae*, in which besides to species which key out close to it, e.g. *K. kinabaluensis*, *K. glauca*, and *K. cinerea*, it also seems particularly related to the rare Bornean *K. kostermansiana*, because of the small globose male perianths and the bracteole apically on the pedicel. The latter differs, however, by the much more membranous leaves with cordate base, and minor differences in the flower, e.g. 8–10 anthers, bracteole caducous, etc.

3. *K. matanensis* (together with *K. stellata* subsp. *minahassae*) was collected in the vicinity of Lake Matano, only in the forests on conglomeratic rock covered by a thin layer of poor soil as well as on alluvial soil, all north of the lake. It was not seen in the area with ultrabasic rock south of the lake, where *K. celebica* exclusively was found.

4. The perianth in both sexes was reported as outside brown or ochrish brown, inside yellow or cream, in the male with a bright dark red staminal column.

76. Knema losirensis de Wilde, Blumea 25 (1979) 463.

This species was based on 9 collections from Aceh and North Sumatra (E. Coast) provinces, including 6 collections from the Ketambe area, along the Alas River, in the Gunung Leuser Nature Reserves.

Several additional collections of the species have been recently made, in July 1979, in the Leuser Reserves, notably in the area of the mouths of the Renun and Bengkong rivers, where they flow into the Alas, viz. *de Wilde & de Wilde-Duyfjes 18669, 18785, 18883, 18892, 18930, 18932.* All these are in fruit.

One of these, *de Wilde & de Wilde-Duyfjes 18669*, with female flowers and fruits, is a relatively stout specimen from fertile clay soil along the river, and I first thought that it might belong to *K. pulchra*, because of its stoutness in twigs and leaves and by

the rather cordate leaf bases of most of the leaves. However, with comparison it surely is conspecific with the other gatherings of *K. losirensis*. Checking of the hitherto known two putative specimens of *K. pulchra* from Sumatra revealed that one of these (*Beccari 532*) belongs to *K. sumatrana*, the other, *Grashoff 1019*, from Palembang, to *K. losirensis*. This latter collection considerably extends the distributional area of *K. losirensis*, which is otherwise only known from northern Sumatra.

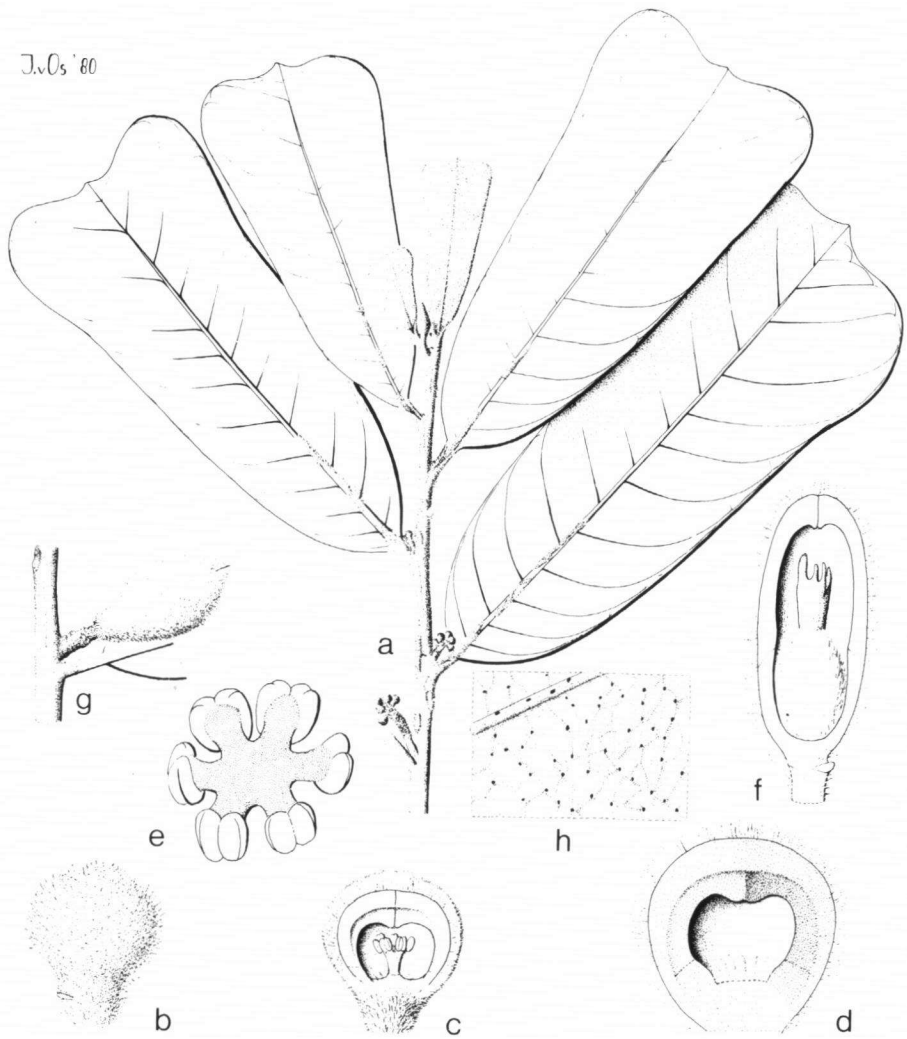


Fig. 3. *Knema celebica* de Wilde. — a. habit of male flowering twig, × ½; b. mature male flower bud, × 6; c. opened mature male perianth in bud, showing the androecium, × 6; d. valve of male perianth seen from inside, × 10; e. androecium, seen from above, × 20; f. opened mature female flower, showing pistil, × 5; g. portion of twig with fruit, × 1; h. detail of lower leafsurface showing minute blackish dots on the veinlets, × 6. — a – e, & h. from *van Balgooy 3847*; f & g. from *van Balgooy 3947*.

77. Knema celebica de Wilde, Blumea 25 (1979) 464. — **Fig. 3.**

Of this species recently two fine collections have become available, one of which containing abundantly female flowers and fruits. As these were hitherto not known, they are described below. Other additional information on the species is given in the notes.

Female flowers densely pubescent by dark rusty hairs 0.7 – 1 mm long; pedicels 0.5 – 1.5 mm long, the bracteole minute, persistent, inserted above halfway; mature perianth in bud ellipsoid-oblong, 5 – 6.5(– 7) × 2 – 3 mm, valves 3, at sutures *c.* 0.4 mm thick, splitting the bud to slightly over halfway deep; pistil *c.* 4 – 5 mm long, ovary ellipsoid, *c.* 2.5 – 3 × 2 – 2.5 mm, densely tomentose by hairs 1 – 1.5 mm long; style *c.* 1 mm long; stigma *c.* 1 mm long, erect, 2-lobed and each lobe again deeply 2 – 5-lobulate. *Fruits* 1 per infructescence, ellipsoid-fusiform, *c.* 2 – 2.2 × 1.2 – 1.3 cm, rather acutish at both ends, densely rusty tomentose by hairs 1 – 1.5 mm long; pericarp *c.* 1.5 mm thick at suture; stalk *c.* 2 mm long.

CELEBES. C e n t r a l (N. part of SE. Peninsula), near Soroako, *c.* 600 m. alt.: *van Balgooy 3847* (♂ fl.), *3947* (♀ fl., fruits).

N o t e s: 1. Both collections have the leaves at apex typically truncate, with a short blunt acumination in the middle, giving the whole top the shape of an accolade.

This appears not to be related with any disease, but is a character of the species, by which it is very easily recognized. All specimens have the typically dark punctation on the lower leaf surface, characteristic of series *Punctatae*.

2. The twigs at apex are densely dark rusty tomentose by hairs up to *c.* 1 mm long. The leaves are glabrescent from a dense tomentum of stellate-dendroid hairs 0.5 – 1 mm long, which persist for some time as flakes in the younger leaves, especially on the lower surface near the midrib.

3. The male flowers in van *Balgooy 3847* deviate only slightly from those described from the type. They have 6 anthers; the perianth splits in anthesis to *c.* 4/5 deep, i.e. nearly to the base; and the pedicel is only *c.* 0.5 – 1 mm long. The male flowers of the type specimen have 7 – 9 anthers.

4. Both collections are from an area with ultrabasic soil, serpentine, containing heavy metals, south of Lake Matano (W. of Soroako). In the area north of Lake Matano, with conglomeratic rock and soils of different origin, the species could not be detected. Most likely the species is endemic and confined to the former particular area.

81c. Knema stellata Merr. subsp. **minahassae** (Warb.) de Wilde, Blumea 25 (1979) 472.

Of this there are two recent collections from Central Celebes, *de Vogel 6092*, with male flowers, and *de Vogel 6093*, with submature fruits and female flowers; both clearly belong to the same taxon.

The three subspecies of *K. stellata* were keyed out in my account in Blumea (l.c., p. 471) solely on fruit characters, because male flowers were only known from the subsp. *cryptocaryoides*, from the Philippines.

Through the two new collections it now appeared that the differences between subsp. *minahassae* and subsp. *cryptocaryoides*, which are vegetatively very similar, as defined by the fruits are less apparent than originally thought. However, in the male flowers they appeared to be quite different, and the key should be altered as follows:

1a. Hairs on fruit 0.5 – 1 mm long. Fruit stalk 6 – 10 mm long. *Samar I.* **a.** subsp. **stellata**
b. Hairs on fruit *c.* 0.1 – 0.2 mm long. Fruit stalk 3 – 10 mm long. 2
2a. Male pedicel 5 – 9 mm long; perianth subglobose, *c.* 3 × 3 – 3.5 mm; anthers 11. *Mindanao, Sibuyan I., Luzon.* . . . . . **b.** subsp. **cryptocaryoides**
b. Male pedicel *c.* 1 mm long; perianth ± broadly obovoid, *c.* 2.5(– 3) × 2(– 2.5) mm; anthers 5. *N. and C. Celebes.* . . . . . **c.** subsp. **minahassae**

Based on the two new collections the following supplementary description should be made:

Inflorescences in ♀ sessile or up to 1 mm peduncled, in ♂ consisting of brachyblasts up to 8 mm long, peduncled for 1 – 2 mm. *Male flower* pedicels 1 – 1.2 mm long, the bracteole late caducous, situated apically; mature perianth in bud subglobose to broadly obovoid, *c.* 2.5(– 3) × 2(– 2.5) mm; valves 3, at sutures 0.2 – 0.3 mm thick, splitting the bud to *c.* 4/5 deep; staminal disc ± flat, incl. anthers subcircular, *c.* 0.8 mm diam.; anthers 5, half-erect, stiped, *c.* 0.3 – 0.4 mm long; staminal column 0.6 – 0.7 mm long. *Fruit* stalk 5 – 6 mm long.

CELEBES. C e n t r a l: opposite Soroako, north side of Lake Matano, *de Vogel 6092* (♂ fl.), *6093* (♀ fl., fr.); both at *c.* 600 m alt.

N o t e s: 1. In the architecture of the inflorescences and the male flowers *K. stellata* subsp. *minahassae* is reminiscent of *K. celebica* (both in series *Punctatae*), but these species differ considerably e.g. in leaf shape and tomentum of the twigs and leaves. From the subsp. *cryptocaryoides* it now appears to differ considerably in the male flowers, whereas vegetatively the two subspecies can hardly be distinguished.

2. The stalks of the fruits in the previously known collections were *c.* 2.5 – 3 mm long.

3. Both collections are from an area with poor soil on conglomeratic rock north of lake Matano, where *K. celebica* was not found. On the other hand, on the ultrabasic rock south of the lake the present species was not seen.

4. The perianth within was observed as yellow with a red centre.