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Studies in the *Leguminosae-Papilionoideae* for the 'Flora of Tropical East Africa': II*

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ABREAE

A REAPPRAISAL OF THE SPECIES OF THE GENUS *ABRUS* ADANS.

Breteler has recently revised the genus *Abrus* (in *Blumea* 10: 607-624 (1960)), during the course of which revision very many specimens from throughout the world were examined. Whilst carrying out routine naming of African material of this genus, Mr. J. B. Gillett reached the conclusion that the

* Continued from Kew Bull. 24: 70 (1970). All the material cited is in the Herbarium, Royal Botanic Gardens, Kew, unless otherwise stated. Specimens which have not been examined are indicated by an asterisk.

specific limits had been drawn far too widely in this revision. During the preparation of an account of the genus for the 'Flora of Tropical East Africa', I reached the same conclusion and felt that the specific limits previously assigned were nearer the truth, and indeed, would have followed them had it not been for a need to comment on the revision mentioned. One of the primary practical functions of taxonomy is to give names to different plant populations so that their properties can be recorded, information tabulated and detailed phytogeographical studies made. Even if a species is genuinely polymorphic some grouping of the variants is still necessary if this primary aim is not to be lost sight of. *Abrus fruticulosus sensu* Breteler covers prostrate herbs, erect woody shrubs, plants with smooth pods, plants with densely tuberculate pods, plants with compressed unicolorous seeds and several Madagascan plants with spherical red and black seeds which are unquestionably much closer to *Abrus precatorius* L. but distinct. This aggregate contains many distinct species *by any standards*. Linnaeus would undoubtedly have separated most of the components. To sink wildly different components from areas thousands of miles apart which have not been seen in the field seems to me the height of folly and unlikely to serve any useful purpose. Since this present paper was first drafted Berhaut (in *Adansonia* 5: 359-362 (1965)) has commented on Breteler's paper and also described a further species.

I have not attempted a complete revision since the main object was to find names for the East African entities. What appeared to be six clearly distinct entities in East Africa are treated as three in Breteler's revision so it became essential to look at the genus on a world basis. The following key is imperfect since full material is often not available.

KEY TO THE SPECIES OF ABRUS

Bracts and bracteoles very short or scarcely half as long as the calyx:

Madagascan plants of which ripe pods and seeds are unknown (placed here since it is possible that these will prove to have seeds similar to those of *A. precatorius*):

Flowers (1.3-)-1.5-1.8 cm. long; leaflets about 11-jugate, about 2 cm. long and 1 cm. wide 1. **A. grandiflorus**

Flowers smaller, not exceeding 1.3 cm. in length:

Leaflets 4-5-jugate, dark and glabrous above, the venation conspicuously pale, adpressed pilose beneath; inflorescences very short, about 1 cm. long 2. **A. parvifolius**

Leaflets without conspicuous contrast between venation and rest of surface above and without other characters combined:

Leaflets with fine adpressed greyish indumentum

3. **A. diversifoliolatus**

Leaflets and rachis with longer spreading or less adpressed greyish and ferruginous indumentum 4. **A. sambiranensis**

Ripe seeds known:

Seeds ellipsoid-globose, not compressed, usually red and black, very rarely entirely black or whitish, shiny:

Leaflets and stems with fine adpressed golden indumentum; pods obliquely ribbed (Madagascar):

- Leaflets 6-11-jugate 5a. **A. aureus**
 subsp. **aureus**
- Leaflets 3-4-jugate 5b. **A. aureus**
 subsp. **littoralis**
- Leaflets and stems with sparse white indumentum; leaflets 8-17-
 jugate; pods smoother or densely tuberculate:
- Pod smooth save for hairs 6a. **A. preicatorius**
 subsp. **preicatorius**
- Pod covered with low tubercles 6b. **A. preicatorius**
 subsp. **africanus**
- Seeds markedly compressed, black or brown, sometimes speckled, shiny
 or minutely shagreened:
- Pods sparsely to mostly densely covered with tubercles; shrubs with
 terminal inflorescences:
- Leaflets mostly elliptic-oblong; tubercles on pod well developed:
- Leaflets 10-16-jugate; indumentum of inflorescence rhachis and
 calyx golden 7a. **A. schimperi**
 subsp. **schimperi**
- Leaflets 7-10-jugate; indumentum of inflorescence rhachis and
 calyx greyish 7b. **A. schimperi**
 subsp. **africanus**
- Leaflets oblong; tubercles less marked 7c. **A. schimperi**
 subsp. **oblongus**
- Pods pubescent to hairy but not tuberculate:
- Pods usually thicker and woodier, acute to rounded at the apex;
 seeds mostly rhomboid, 7.5-8 × 5-6 mm. (Arabia)
 8. **A. bottae***
- Pods mostly thinner, not woody, rounded at the apex save for the
 beak which is a continuation of the upper suture; seeds mostly
 ellipsoid, smaller, 3.8-6 × 3-5 mm.:
- Leaflets small and narrow, 3-11 × 1-3 mm., pubescent to silky-
 pilose; pods 2.8-4.5 cm. long 9. **A. fruticosus**
- Leaflets always broader, squarish to oblong or elliptic-oblong:
- Leaflets 5-jugate with the lowest pair very much smaller than
 the upper pair; inflorescence 2.5-3 cm. long, sessile
 (Madagascar) 10. **A. madagascariensis**
- Without above characters combined:
- Leaflets elliptic-oblong, 5-17 × 3.5-6 mm., rounded at both
 ends rather than truncate; leaves and stems sparsely
 whitish-puberulous; reticulation of leaflets raised and
 rather evident; pods 3.7-5.5 cm. long (S. Africa)
 11. **A. laevigatus**
- Leaflets distinctly oblong with truncate ends or even sub-
 cordate at the base; indumentum whitish or ferruginous
 12. **A. pulchellus** aggregate
 (see later key on p. 247)
- Bracts and bracteoles as long as the calyx; corolla very dark red or purple
 13. **A. canescens**

* *A. somalensis* Taub. with 4-7-jugate leaves, linear-oblong, silky pubescent leaflets, 5-7 × 1.5-3 mm. will probably key near here but the pod is not known.

REMARKS ON THE SPECIES

1. ***Abrus grandiflorus*** *Viguiet* in Not. Syst. 14: 172 (1952).

Breteler treats this as a synonym of *A. fruticosus* Wight & Arn. but from the description the very large flowers would seem to rule out that possibility. The species was described from two sheets, both of which I have examined. Although one sheet certainly has flowers in a packet which are at least 1.7 cm. long, the other shows flowers as small as 1.3 cm. Unfortunately the pods are extremely immature and it is impossible to tell what type of seeds this species has; it would not, however, surprise me if they eventually turn out to be globose and red and black, thus indicating relationship with *A. precatorius* L. and *A. aureus* *Viguiet*. Without adequate material it is not possible to proceed further but on the available evidence the species seems quite distinct.

2. ***Abrus parvifolius*** (*Viguiet*) *Verdc.*, comb. et stat. nov.

A. madagascariensis *Viguiet* var. *parvifolius* *Viguiet* in Not. Syst. 14: 174 (1952).

Suffrutex scandens, ramis gracilibus saturate nigro-purpureis primum pubescentibus deinde glabrescentibus. *Foliola* 4-5-juga, stipulis lineari-lanceolatis 3 mm. longis; petiolus 5-8 mm. longus; rhachis 1-2 cm. longa, pilis appressis ferrugineis conspersa; petioluli 0.5 mm. longi, ferrugineo-pubescentes; foliola oblongo-elliptica, 5-12 mm. longa, 2.5-6 mm. lata, apice rotundata et mucronulata, basi subcordata, papyracea, supra glabra, subtus pilis sericeis stricte appressis fere dense obtecta, nervis lateralibus et venulis supra conspicue pallidis. *Inflorescentiae* axillares, pauciflorae, circa 1 cm. longae, pedicellis 0.5 mm. longis. *Calyx* campanulatus, pilis ferrugineis et sericeis appressis obtectus. *Vexillum* suborbiculare, 10 mm. longum, 8.5 mm. latum, apice rotundatum, violaceum; alae oblongo-ellipticae, 9.5 mm. longae; carina 10.5 mm. longa. *Legumen* immaturum stipitatum, 2.9 cm. longum, 3 mm. latum, pilis pallide ferrugineis et sericeis intermixtis appresse obtectum. *Semina* ignota.

MADAGASCAR. Centre: between Mania and Ivato, *Perrier* 12376 (P, holotype—two sheets).

I have examined the type of *Viguiet*'s variety and do not think that it is conspecific with his var. *typicus*. The small leaflets, glabrous above and with a pale reticulation of nerves, but densely adpressed silky pilose beneath, are very different from those of var. *typicus* which has very fine short adpressed hairs beneath. *Viguiet* mentions that the pod is 3-4 times as long as broad but there is only one very immature pod on his type material. Although I would not normally describe a species from a single specimen in this genus, since it already has a name available, I have upgraded it, but its true affinities will remain unknown until ripe fruit is available.

3. ***A. diversifoliolatus*** *Breteler* in *Blumea* 10: 610, fig. 2/I (1960) (nom. nov., *A. acutifolium* *Viguiet* substitutens).

A. acutifolius *Viguiet* in Not. Syst. 14: 173 (1952), non *Miq.* (1855).

A. cyaneus *Viguiet, l.c.*: 172 (1952), *pro parte, nom. confusum*.

A. madagascariensis *Viguiet* var. *dunensis* *Viguiet, l.c.*: 174 (1952).

Without ripe fruits and a great deal more material it is not possible to formulate any useful opinion on this species. Viguier states 'foliis 8-10-foliolatis' and Breteler says 3-5-jugate (his figure shows 3-4-jugate). The only two leaf rhachises preserved on an isotype at Kew, clearly both held 12 leaflets which are smaller than the dimensions given in the original description and measure $1.1-4.5 \times 1-1.5$ cm. It is interesting to note that the anthers are not quite uniform as pointed out by Viguier but all generic descriptions state that the anthers are uniform in *Abrus*. *A. cyaneus* Viguier is clearly composed of two elements, both of which enter into the original description. The fruits are undoubtedly those of *A. precatorius* L. (actually the subsp. *africanus* Verdc.) as suggested by Breteler but the foliage and flowers are scarcely distinct from *A. diversifoliolatus*. The difference in leaflet size is not significant but the pedunculate inflorescences with elongated rhachis nodes are very similar in both. *A. madagascariensis* Viguier var. *dunensis* Viguier has long pedunculate inflorescences and foliage very similar to *A. diversifoliolatus*; it clearly belongs here rather than to *A. madagascariensis* itself.

4. ***Abrus sambiranensis*** Viguier in Not. Syst. 14: 173 (1952).

This, the hairiest Madagascan species, is similar in general appearance to *A. pulchellus* Thw. subsp. *mollis* (Hance) Verdc., and Breteler considers it to be a synonym of *A. fruticosus* Wight & Arn. Although foliage differences are limited to the rounded leaflet apices, I do not feel it would be wise to unite it with subsp. *mollis* until ripe fruits are available. A sheet at Kew, Decary 2084 (Maromandia, Bejofo, 28 Apr. 1923), is not cited by Viguier who does, however, cite a Decary 2034.

5. ***Abrus aureus*** Viguier in Not. Syst. 14: 173 (1952).

I am certain that no one will follow the sinking of this into *A. fruticosus* Wight & Arn. as proposed by Breteler. Viguier in his description clearly states that the seeds are closely similar to those of *A. precatorius* L. and material at Kew shows that they are close in size and colour. The pods are not detached pods but clearly part of the plant which makes up the sheet. Evidently it is clearly a distinct species from *A. fruticosus* and, bearing in mind Breteler's specific concepts, one is surprised that he has not sunk it into *A. precatorius* itself. It differs, however, from *A. precatorius* L. subsp. *africanus* Verdc., its nearest ally, in the very distinct midrib, the adpressed mixed golden and white indumentum and the obliquely ribbed pod. The following sheets at Kew belong to this species and to the typical subspecies.

5a. subsp. **aureus**

MADAGASCAR. Central Madagascar, Andrangaloaka, in forest, Aug. 1881, Parker:—climbing plant, vernacular name 'Vòamaintilamy'; without locality, Baron 817 (BM, K) & 3208. NW. Madagascar, Baron 5040.

A sheet from Paris, Decary 7513, preserved at Kew (Restes de Forêt au nord d'Ankazobe, 13 Mar. 1930) and doubtfully determined as *aureus* is I think correctly named. Which of the 6 or 7 Ankazobes is meant is not clear.

5b. subsp. **littoralis** (Viguier) Verdc. comb. et stat. nov.

A. madagascariensis Viguier var. *littoralis* Viguier in Not. Syst. 14: 175 (1952).

I cannot agree that Viguier's var. *littoralis* has anything to do with his var. *typicus*. The latter is clearly allied to *A. pulchellus* Thw. even though no ripe seeds are present to confirm this. Var. *littoralis* clearly has red and black seeds closely similar to those of *A. precatorius* L. and they are not errors of mounting. The leaflets are 3-4-jugate, 1.3-3.5 × 1.3-2 cm.; the indumentum is sparse but the minute hairs on the undersurface of the leaflets are distinctly yellowish. The pods are drawn out to an attenuate apex. Breteler's reduction of this variety to *A. fruticulosus* Wight & Arn. is clearly an absurdity and I have considered it a subspecies of *A. aureus* Viguier, but the material I have seen is scarcely adequate for a final opinion.

MADAGASCAR. Est: near Ambilo, *Perrier* 15997 & *Decary* 6336* (P, syntypes).

6. **Abrus precatorius** L., Syst. Nat. 2: 472 (1767); Breteler in Blumea 10: 617 (1960).

Even in the case of this widespread and very well-known plant I am unable to agree that the material belongs to a single taxon. Some botanists may not care to follow me in giving names to the two variants but all will agree that two entities are involved, as indeed was suggested by E. Meyer 120 years ago.

A survey of this species throughout the world gives a clear impression that most of the African plants are not quite the same as the Asiatic; the differences are not specific but are usually sufficient to enable one to assign plants cultivated in the New World to their correct continent of origin. African plants have shorter muriculate pods; Indian plants have longer smooth pods in which a subsutural ridge is frequently clearly evident. There also appears to be a difference in the dehiscence of the pods, those of African plants with the valves twisting up considerably at their ends, whereas, in Indian plants, they frequently remain flatter; this is not a completely constant feature however. In Table 1 (p. 241) the results of this survey are tabulated. I am separating off the African plants as a distinct subspecies. The plant is one which is frequently cultivated, the brightly coloured seeds being used for necklaces, rosaries, etc. Doubtless some were taken to the New World during the slaving period. Dealing with the exceptions mentioned in the table—the plants from Brisbane Botanic Gardens clearly came from Africa. Some Polynesian specimens may have had mixed ancestry. Certain material in the Seychelles is the typical subspecies whilst other is the African subspecies; both may have been introduced or one may be indigenous. Material I have seen from Madagascar and Mauritius is of African affinity but that from Rodrigues clearly introduced from India. In the New World both races have been introduced as might be expected. It would be interesting if some botanical garden in the tropics which finds it has both races in cultivation could carry out crossing experiments.

* The 6335 in Viguier's description appears to be an error.

6a. subsp. **precatorius**

Unfortunately the holotype of *A. precatorius* preserved in the Hermann collection at the British Museum (Nat. Hist.) (Vol. 2, p. 6) bears no fruit but it is safe to assume that it is the same taxon as occurs on the island of Ceylon now (represented at Kew by an excellent Thwaites sheet). It is very unlikely that a plant of African origin would have been cultivated in Ceylon in Hermann's day. The specimen in the Linnaean Herbarium at the Linnean Society is also without fruit.

6b. subsp. **africanus** *Verdc.*, subsp. nov. a subsp. *precatorio* leguminibus brevibus muriculatis differt.

A. minor Desv., in Ann. Sci. Nat. 9: 418 (1826).

A. squamulosus E. Mey., Comm. Pl. Afr. Austr. 1: 126 (1836).

A. tunguensis Lima* in Broteria, sér. Bot. 19: 127 (1921).

A. cyaneus Viguier in Not. Syst. 14: 172 (1952), *pro parte*.

Widespread throughout tropical Africa, Seychelles, Madagascar and Mauritius, also introduced into Australia and the New World. Type chosen as follows.

KENYA. Tana River District: Karawa [Kurawa], 48 km. S. of Garsen, on black clay soil with sand admixed, scattered *Terminalia*, *Euphorbia*, *Acacia* with tangled shrub clumps—*Grewia*, *Lansea*, *Lecaniodiscus*, *Commiphora*, *Thespia*, *Dobera*, etc., 15 m., 7 Oct. 1961, *Polhill & Paulo* 628 (K, holotype of subspecies; EA, isotype):—prolific twiner, much branched, corolla mauve, lighter near base and lower side of keel, filaments white; seeds light red with black ends.

I agree with Breteler that *A. cyaneus* Viguier is based on a mixture, the detached fruits certainly belonging to the present subspecies. I have examined the types of *A. tunguensis* Lima and *A. squamulosus* E. Mey. It does not seem necessary to cite at length all the hundreds of available specimens belonging to this subspecies; reference can be made to Breteler's paper.

TABLE 1. Length and surface sculpture of pod in *Abrus precatorius* L.

| Country | Average length (cm.) | Surface sculpture | Number of specimens ¹ |
|--------------------------|-----------------------|---------------------|----------------------------------|
| Taiwan | 3·6 | Smooth | 4 |
| China | 3·4* | Smooth | 5 |
| India | 3·6 | Smooth ² | 30 |
| Burma | at least 3 (immature) | Smooth | 1 |
| Ceylon | 3·7 | Smooth | 2 |
| Malay Peninsula | 3·1 | Smooth | 2 |
| Malay Islands | 3·6 | Smooth | 4 |
| Indo-China | 3·3* | Smooth | 12 |
| Philippines ³ | 3·6 | Smooth | 10 |
| Philippines: | | Faint traces of | |
| Mindoro | 2·4 | roughenings | 1 |

¹ Each with 1 to 20 pods.

² One fruiting inflorescence on a divided sheet separated from *Hohenacker* 248 has short pods 2·8 cm. long with rough valves. There is no real evidence that this came from India since it is on one of those sheets containing many different elements mounted together.

³ Merrill (Sp. Blancoanae: 506) says 'of prehistoric introduction'.

* I have not seen the description but the specific epithet is spelt this way both on the type sheets and in the 'Index Kewensis'.

| Country | Average length (cm.) | Surface sculpture | Number of specimens ¹ |
|--|----------------------|---|----------------------------------|
| New Guinea | 4.3 | Smooth | 5 |
| Australia | 3.6 | Smooth | 8 |
| Australia: Brisbane Botanic Gardens | 2.6 | Rough | 2 |
| Polynesia | 3.54 | Smooth to very slightly roughened | 14 |
| Cape Verde Is. | 2.5 | Muriculate | 1 |
| Annobon | 3 | Muriculate | 1 |
| W. Africa | 2.62 | Muriculate | 18 |
| Cameroon & Congo | 2.9 | Muriculate | 14 |
| NE. Africa | 2.7 | Muriculate | 3 |
| East Africa | 2.86* | Muriculate | 62 |
| Central Africa | 2.9 | Muriculate | 40 |
| Angola | 2.81 | Muriculate or more or less smooth ⁴ | 9 |
| South Africa | 2.96 | Muriculate | 7 |
| Seychelles | 2.5 | Muriculate | 5 |
| Seychelles | 3.8 | Smooth | 1 |
| Madagascar | 2.5 | Muriculate | 8 |
| Mauritius | 2.2 | Muriculate | 1 |
| Rodrigues | 3.3 | Smooth | 2 |
| Florida | 3.1 | Smooth to muriculate ⁵ | 4 |
| Bahamas | 2.2 | Mostly smooth | 11 |
| Cuba | 2.9 | Smooth to muriculate ⁵ | 3 |
| Jamaica | 2 | Almost smooth to muriculate | 4 |
| Haiti | 2.6 | Almost smooth to muriculate | 4 |
| S. Domingo | 2.6 | Muriculate | 4 |
| Porto Rico | 2.5 | Muriculate | 6 |
| Virgin Is. | 2.4 | Muriculate | 2 |
| Antigua | 2.6 | Muriculate | 2 |
| St. Barthelemy | 2.5 | Muriculate | 1 |
| Saba I. | 3 | Muriculate | 1 |
| St. Kitts | 2 | Muriculate | 1 |
| Montserrat | 3.5 | Muriculate | 1 |
| Guadeloupe | 2.3 | Muriculate | 1 |
| Dominica | 2 | Muriculate | 1 |
| Martinique | 2 | Muriculate | 1 |
| Barbados | 3 | Muriculate | 2 |
| Grenada | 2.4 | Muriculate | 1 |
| Trinidad | 2.3 | Muriculate | 1 |
| Mexico | 2.5 | Muriculate | 2 |
| British Honduras | 2.8 | Muriculate | 4 |
| Honduras | 2.9 | Muriculate | 3 |
| Columbia | 2.2 | Muriculate | 1 |
| Venezuela | 2.5 | Muriculate | 4 |
| Guyana | 2.5 | Muriculate | 1 |
| Surinam | 2.7 | Muriculate | 1 |
| French Guiana | 2.5 | Muriculate | 3 |
| Brazil | 2.8 | Muriculate | 10 |

¹ Each with 1 to 20 pods.

⁴ Most Angolan specimens appear to have more or less smooth valves and this needs further investigation.

⁵ Long-fruited specimens with pods over 3.6 cm. long from these territories are of Indian origin.

* Abnormal 1-seeded pods only 1.7 cm. long may occur.

7. *Abrus schimperi* Bak. in Fl. Trop. Afr. 2: 175 (1871).

This is an exceedingly distinct plant having little relationship with *A. fruticulosus* Wight & Arn. with which Breteler has amalgamated it. The distinctly shrubby habit, terminal elongated inflorescences, and particularly the elongated woody pods narrowed at the base and nearly always strongly tuberculate, are distinctive features; in the two commonest subspecies the

leaflets are elliptic with rounded sides. The larger characteristically shaped seeds are also an additional character. The northern populations have more numerous leaflets and a golden indumentum on the rhachis of the inflorescences whereas the southern populations have fewer leaflets and a grey indumentum. They have already been separated at specific level but I am considering them subspecies. In addition a new variant is described from Central Africa. All three have already been included in the main key. The material is briefly cited below.

7a. subsp. **schimperii**

CENTRAL AFRICAN REPUBLIC. Yalinga area, *Le Testu* 3988. Waka, *Le Testu* 1291 (BM).

SUDAN. Kordofan, Jebel Dair, *Turner* 235. Bahr el Ghazal, 'Bongo', *Schweinfurth* 2137 (BM, K), 2166 & s.n. (seeds wrongly mixed with 2345). Mongalla, Gondokoro, *Mearns* 3064 (US) and Imatong Mts., Katire, by R. Kineti, *A. S. Thomas* 1569 (BM, K).

ETHIOPIA. Djeladjeranne, *Schimper* 1552 (K, holotype; BM, isotype).

UGANDA. West Nile District: Metu, *Chancellor* 254; Madi, *Grant*; Terego, *Hazel* 633. Acholi District: Kitgum, *Liebenberg* 255.

7b. subsp. **africanus** (*Vatke*) *Verdc.*, comb. et stat. nov.

Hoepfneria africana *Vatke* in *Oesterr. Bot. Zeitschr.* 29: 222 (1879).

KENYA. Northern Frontier Province: Mathews Range, R. Kichich, *Kerfoot* 2423 (EA); Lorogi [Leroghi] Plateau, *Kerfoot* 1091 (EA, K). Machakos District: Kaiti R., *Katamani Farm Staff* 1053 (EA); Kibwezi, *Dummer* 5036, *Scheffler* 138 (BM, K), *Bally* 710 & 793 in *CM* 8248; Kiu, *Kassner* 668 (BM, K); Ithaba, *Bally* 1260 in *CM* 8247 (EA, K). Kitui District: Kiome, *Edwards* E 132 (EA); Kitui, *Hildebrandt* 2797 (K, isotype). Masai District: Karibani [Garabani] Hill, *V. G. L. van Someren* 126 & 168 (EA, K). Teita District: Voi, *Napier* 976 (EA, K); S. of Voi, Sagala Hill, *Polhill & Paulo* 957; Sasenyi [Sadenyi] Hill, S. of Maungu, *Bally* 12705. Kwale District: Digo, *Sacleux* (P). District uncertain: R. Tana, *Battiscombe* 212.

TANZANIA. Mwanza District: Geita, S. Karumo Forest Reserve, *Carmichael* 826 (EA, K); Nyantukusa, *Rounce* 274 (EA, K); Rumara, Ilemera, *Tanner* 1361. Shinyanga District: Shinyanga, *Bax* 113, *Burt* 5115 & 2447 (BM, EA, K), *Koritschoner* 1756 (EA, K), *Kemp* 1 (BM) & *Greenway* 7398 (EA, K); Kizumbi, *Carnochan* 208 (BM). Pare District: N. Pares, Kisangara [Kissangara], *Peter* 49273 (B, K); E. S. Pares, Kisiwani [Kisuani], *Greenway* 2172 (EA, K). W. Usambaras: Makangala [Makangalla], *Gillman* 796 (EA, K); Makuyuni, *Koritschoner* 672 (EA, K); Boshatal, near Mashewa, *Peter* 49087 (B, K); Mashewa to Nembuibui, *Peter* 48810 (B, K). E. Usambaras: Bwiti to Nyika, *Peter* 48167 (B, K). Tanga District: Amboni, *Holst* 2825 [the only purely coastal record]. Kigoma District: Kigoma, *Peter* 38916 (B, K) & *Pirozynski* 448 (EA). Tabora District: Tabora, *Peter* 35245 & *Friend* 364 (EA); Malongwe to Tura, *Peter* 34771; Kissengi, N. of Malongwe, *Bally* 8295 (EA, K). Kondo District: 19.2 km. S. of Kondo, *Polhill & Paulo* 1215. Dodoma District: Dodoma-Kondo road, *Burt* 1431 (BM, EA, K); km. 36.8, Chunya-Itigi road, *Richards* 19865; km. 12.8 Itigi-Chunya road, *Eggeling*

6086 (EA, K); W. of Dodoma, *Peter* 45680 (B, K); Saranda to Makutupora, km. 560.5 on the Central Railway line, *Peter* 33664 (B, K); Chenene, 73.6 km. N. of Dodoma, *Polhill & Paulo* 1256; Kilimatindi, Mulirahangi, *Claus* in *E.A.H.* 1655 p.p. & *Claus* in *E.A.H.* 2208 (EA). Mbeya District: Igawa-Mbeya road, *Richards* 7930; Igawa-Chimala road, *Richards* 18044.

ZAMBIA. Central: 8.8 km. S. of Kafue, *Angus* 2867; 12.8 km. N. of Kafue, *Angus* 1574 (BM, K); 4.8 km. W. of R. Luangwa crossing on Great East Road, *Exell, Mendonça & Wild* 1197 (BM). East: Lundazi *Fanshawe* 9274. South: Mazabuka, *White* 6629; Choma, *Fanshawe* 5535 & *van Rensburg* 2738; Pemba, *Lawton* 1052.

RHODESIA. North: Sebungwe, *Lovemore* 526 & *Davies* 2031. West: Wankie, Gwai Lutope junction, *Wild* 6028; Shangani, Mbazha Dam, *Davies* in *S.R.G.H.* 32548. Central: Sebakwe, *Eyles* 41 (BM); Gatooma, *Eyles* 5079 & *McKinstry* in *S.R.G.H.* 13309; Hartley, Serui Drift, *Hornby* 3146; 14.4 km. S. of Que Que, *Biegel* 1182 (K, SRGH).

Some of the above records refer to plants approaching subsp. *oblongus*, notably *Claus* 1655 p.p., *Gillman* 796 and *Greenway* 2172.

7c. subsp. **oblongus** *Verdc.*, subsp. nov. a subsp. *schimperi* foliolis oblongis, leguminibus obscure tuberculatis differt.

Suffrutex 1.8–3 m. altus caulibus appresse griseo-pubescentibus vel glabris. *Folia* 10–15-juga, foliolis oblongis, 11–30 mm. longis, 5.5–9 mm. latis, supra glabris, subtus appresse puberulis. *Legumen* lineari-oblongum, 6.3–6.7 cm. longum, 0.9–1 cm. latum, apice attenuatum, rostratum. *Semina* rhomboidea, compressa, pallide brunnea, 6 mm. longa, 5 mm. lata, 2.5 mm. crassa, minutissime rugulosa.

MALAWI. Rumpi District: Near Njakwa, on rocky banks of R. Rukuru, 30 Apr. 1952, *White* 2539 (K, holotype of subspecies; FHO, isotype):—weak-stemmed thicket-forming shrub, 3 m. tall, leaves dark green, dull, standard dull green, suffused with violet, wings and keel violet.

RHODESIA. East: Umtali, commonage, 990 m., 22 Nov. 1951, *Chase* 4182 (BM, K, SRGH); same locality, 1080 m., 7 Jan. 1954, *Chase* 5178 (BM, K, SRGH); same locality, 8 Mar. 1966, *Corby* 1568 (K, SRGH); Chipinga District, Sabi Valley, Rupisi, in thicket with *Androstachys johnstonii*, along river through escarpment hills, 18 Feb. 1960, *Goodier* 930 (K, SRGH):—shrub, stems slender, branches brown, leaves alternate, pinnate, pinnæ oblong, flowers mauve in terminal racemes. South: Nuanetsi District, R. Malongwe, SW. Mateke Hills, stream banks, 600 m., 5 May 1958, *Drummond* 5570 (K, SRGH):—slender shrub 1.8 m. tall often supported by surrounding vegetation.

In foliage this is undoubtedly very similar to some forms of *A. pulchellus* Thw. subsp. *pulchellus*, e.g. *Belcher* 794 from Burma is practically identical, but the pod, habit and inflorescence clearly indicate close affinities with *A. schimperi* Bak. *A. bottae* Deflers, a scarcely known plant from Arabia has rather woody pods and seeds very similar to *A. schimperi* but the valves lack the tubercles; the leaflets are oblong but hairy above. Without ripe pods it could also easily be confused with *A. precatorius*.

8. ***Abrus bottae*** *Deflers*, *Voy. Yemen*: 132 (1889).

This too, Breteler merges with *A. fruticosus* Wight & Arn. and here I agree that the foliage of the type of the latter is very similar to *Schweinfurth* 528 accepted as a specimen of *A. bottae*, but the pod of the Arabian specimens is thick and woody, particularly in the case of *Schweinfurth* 1843. These two *Schweinfurth* sheets from Arabia, are by no means identical, 1843 having larger leaves and indehisced woody pods; 528 has smaller leaves, seemingly thinner pod valves and three loose seeds. These seeds are of the same type as those of *A. fruticosus* but larger and more rugulose. Until more material is available, I would certainly hesitate to reduce *A. bottae* to *A. fruticosus*, even as a subspecies. The seeds of *A. bottae* are very similar to those of *A. schimperi*, and the woodiness of the pod suggests that the two are quite closely related, as was suggested by Deflers when he described the species. No material has been seen which could represent *A. somalensis* Taub. based on *Hildebrandt* 1391 from Meid in northern Somaliland; Taubert does not describe the pod which presumably was not present on the type material. Until material has been recollected its possible identity with *A. bottae* cannot be confirmed and I have preferred to leave it as a dubious species. *Schweinfurth* 1843 is from one of the localities cited by Deflers so there is no doubt as to its identity.

ARABIA. Asir: Harub, *Thesiger* (BM); Jabal Faifa, *Vesey-FitzGerald* 16290/10 (BM). Yemen: Hadie, *Forskål* (BM); Gebel Mehegjarja, *Badjil*, *Schweinfurth* 528; Agara, *Hodjela*, *Schweinfurth* 1843.

9. ***Abrus fruticosus*** *Wight & Arn.*, *Prodr.* 1: 236 (1834); Breteler in *Blumea* 10: 612 (1960), *pro parte*.

It is true, as Breteler mentions, that there are few structural differences to use for separating the species of *Abrus* and that size of the various organs is often the only criterion to be employed. He states (*l.c.*: 615) when dealing with his immense aggregate *A. fruticosus* '*A. fruticosus* is a highly variable species. This variability may be connected with its very different habitats: rain forest to savannah country or even semi-desert. The type-specimens on which the synonyms are based show certain differences between each other, and differ also from the type of *A. fruticosus*. These differences, however, are always restricted to size or shape, indumentum, or number of leaflets, shape or place of the inflorescence, size or shape of the pods, or the habit of the whole plant. Single or together all these characters vary and all conceivable intermediates can be found as soon as a wide range of specimens from a sufficiently large area is examined'. On this basis two uniform populations separated by some thousands of miles on different continents are sunk together because plants in a third area provide a connecting link in some character. Where a population gradually merges into another and it is geographically possible that the two interbreed then I agree that names must reflect this, but where the intermediates have no proved geographical connections nor is there any genetical evidence that the two populations and the intermediates are capable of interbreeding, then it does not seem correct to unite them under one name when they can be clearly distinguished at a glance. There must be few widely distributed genera where intermediates are not found between quite obviously distinct entities when the whole world's species are examined. In the case of *A. fruticosus sensu stricto*, the

material I have seen appears to be separable from *A. pulchellus* Thw. on account of its small narrow leaflets. Very little fruiting material is available at Kew and it appears that the seeds may be either smooth and shiny or distinctly shagreened. There is variation in the amount of indumentum on the leaves which might correlate with this seed character but the seeds available are partly detached in packets and not reliable.

10. ***Abrus madagascariensis*** *Viguier* in Not. Syst. 14: 174 (1952).

I have examined the two syntypes of *Viguier's* var. *typicus* and, although the fruits are immature on the one sheet bearing them, it is obvious that the plant is closely related to *A. pulchellus* Thw. and thus I suppose Breteler is, according to his wide views, justified in including it in his aggregate *A. fruticosus* Wight & Arn. *sensu lato*. From the small amount of material seen I prefer to consider it a distinct species. The leaflets are 5-jugate with the lowest pair very much smaller than the upper pair; the inflorescences are 2.5–3 cm. long, sessile, and the pods 5.5 cm. long, 8 mm. wide. It is unfortunate that the pods are immature but it is certain that the seeds will not be red and black. *Viguier's* description of the seeds in his generalized description of *A. madagascariensis* as '*A. precatorii* similia sed minora' is clearly derived from his var. *littoralis* which, as I have shown, belongs elsewhere.

MADAGASCAR. Ouest: Ambongo, Radama bay, *Perrier* 529 bis & *Decary* 1558 (P, syntypes). Central Madagascar, without locality, *Baron* 4671.

11. ***Abrus laevigatus*** *E. Mey.*, Comm. Pl. Afr. Austr. 1: 126 (1836).

The population of *Abrus* occurring in Cape Province (Pondoland), Natal, Transvaal, Swaziland and southern Mozambique is very uniform in appearance and, although the foliage differences separating it are admittedly small, I consider it is best treated as a distinct species which scarcely intergrades with other species in Africa. What it might do if crossed experimentally with other species is not known. *Baker* (Fl. Trop. Afr. 2: 175 (1871)) considered it to be a synonym of *A. pulchellus* Thw. but in herbaria the species have been kept distinct and in any case *laevigatus* is a much older name. Unquestionably the type of *A. pulchellus* from Ceylon is closer to *A. laevigatus* than is the bulk of *A. pulchellus* but only one sheet has been seen from the island.

12. ***Abrus pulchellus*** *Thw.*, Enum. Pl. Zeyl.: 91 (1859).

In the case of the plant with smooth pods having thin valves, compressed seeds and rather large oblong leaflets, *i.e.* *A. fruticosus sensu* Breteler less the elements I have already removed, I agree there is considerable difficulty in reaching a decision as to their status when looked at on a world basis. In some cases there is great variation in such characters as the number of pairs of leaflets and their size; on the other hand there are distinct trends and some populations are well on the way to being worthy of treatment as separate species, *e.g.* *A. suffruticosus* *Boutique*. Unfortunately the type, as has been mentioned, is not representative of the species as a whole. Pods in Asiatic populations are on the average longer than in African populations. If one treats all the variants linked by intermediates as unworthy of recognition one finds always the problem of having two taxa, which appear quite distinct

indumentum on the stems and rachides is usually grey, sparse and adpressed but some Papuan specimens have spreading hairs. Previously a good deal of African material has invariably been referred to *A. pulchellus* but I consider the typical plant occurs only in India, China, and the Malesian Islands. In the African material the pods are on the average shorter and where the material is sufficient it appears that the rim aril is more developed in Indian material. The sizes of various pods are shown in Table 2, below.

12b. subsp. **cantoniensis** (*Hance*) *Verdc.*, comb. et stat. nov.

A. cantoniensis Hance in Journ. Bot. 6: 112 (1868).

A. cantoniensis Hance var. *hossei* Craib in Bull. Misc. Inf. Kew 1911: 39 (1911).

This small-leafleted form from Thailand and China is distinctive enough to be retained at subspecific level. The small, compressed, ellipsoid seeds, 3.8×3 mm. with a thick rim aril may be a constant character. Craib's variety does not appear to be distinguishable and is mentioned since the type *Hosseus* 155 is included by Breteler in his list of exsiccatae but the varietal name is not listed. It is very interesting to note that T. Samson in the field-note for his 1553 considers that *A. mollis* and *A. cantoniensis* are not distinct species; this is the only comment by any field worker on members of this complex.

TABLE 2. Average fruit lengths (in cm.) of *Abrus pulchellus* Thw. *sensu lato*

| | | | |
|-----------------------------|---------------|--|---------------|
| subsp. <i>pulchellus</i> | | subsp. <i>mollis</i> | |
| Yunnan | 5.1 | China | 4.3 (3.5-4.9) |
| India | 5.7 (3.5-7) | (average of 12 specimens) | |
| Ceylon | 5.5 | North Vietnam | 4 |
| Burma | 5.8 (3.2-7.5) | South Vietnam | 4.7 |
| Perak | 6.5 | Thailand | 4.3 |
| Thailand | 5.8 (5-6.5) | Java | 5.7 (5.5-6) |
| Philippines | 5.9 (4-9) | Sarawak | 4 |
| Papua | 7.5 | Papua | 7 |
| subsp. <i>cantoniensis</i> | | subsp. <i>tenuiflorus</i> | |
| China | 3.1 | Brazil | 3.8 (3.5-4) |
| Thailand | 2.8 (2-3.3) | Africa* | 3.4 (2-4.5) |
| | | (average of 20 specimens) | |
| subsp. <i>suffruticosus</i> | | intermediates between subsp. <i>tenuiflorus</i> and subsp. <i>suffruticosus</i> | |
| Africa | 3.0 (2.2-4) | West Africa | 3.1 (2-4) |
| (average of 17 specimens) | | (average of 8 specimens) | |

* A variant in West Africa has pods 5-6 cm. long—see note under 12c, p. 251.

12c. subsp. **mollis** (*Hance*) *Verdc.*, comb. et stat. nov.

A. mollis Hance in Journ. Bot. 9: 130 (1871).

Typically this is a distinctive variant often closely similar to subsp. *suffruticosus* but with larger leaflets up to 3 cm. long and longer pods; there are, however, intermediate forms linking subsp. *mollis* with subsp. *pulchellus* and *cantoniensis*. There is a flowering specimen in the Kew Herbarium from the Mishmi Hills on the Assam/Tibet border collected by Griffith, unfortun-

ately with no accompanying data, which is very similar to subsp. *suffruticosus*. Material has been seen from northern Assam, Malay Peninsula, Java, North and South Vietnam, Thailand, China, Philippines, Sarawak, Borneo and from Papua. No ripe seeds have been seen.

12d. subsp. **suffruticosus** (*Boutique*) *Verdc.*, comb. et stat. nov.

A. suffruticosus Boutique in Fl. Congo Belge 6: 84 (1954) (*sine descr. lat.*) & in Bull. Jard. Bot. Brux. 25: 127 (1955).

A. repens Tisserant in Bull. Mus. Hist. Nat. Paris., sér. 2, 5: 332 (1933).

[*A. pulchellus* sensu Hepper in Fl. W. Trop. Afr., ed. 2, 1: 574 (1958), *pro parte, non* Thw.]

In the central part of its range this subspecies is distinctive, the low habit, small, very hairy leaves and small pods being fairly constant characters; the calyx is also often distinctly lobed. In the western part of its range it merges gradually with subsp. *tenuiflorus*. If only East Africa were considered one would undoubtedly consider the Uganda plant (*tenuiflorus*) quite distinct from the southern Tanzania plants (*suffruticosus*). Representative material is briefly cited below. Intermediate specimens are frequent in Sierra Leone and have been seen from Mali and Guinea. *A. gorsei* Berhaut based on 16 specimens from Senegal (holotype, *Berhaut* 6877 (P)) is such an intermediate. *Deighton* 5615, *Jordan* 219, *Jones* 188, *Scott Elliot* 4312, all from Sierra Leone, closely match the type.

SIERRA LEONE. Yoni Mamila Chieftdom, Kasawe, *King* 25b (*pro parte*). Rokupr, *Jordan* 381 (*intermediate*). Mando, *Jordan* 219.

N. NIGERIA. Patti Lokoja, *Dalziel* 14. Bauchi Plateau, *Lely* P.813 (FHI, K). About 7 km. NW. of Kaduna, *Jackson* 261 (FHI); Kaduna, near Buruku, *Charter* in *F.H.I.* 35221.

CENTRAL AFRICAN REPUBLIC. Oubangi, Bozoum, *Tisserant* 2946 (P, syntype of *A. repens*).

CONGO (KINSHASA.) Kinshasa [Léopoldville], S. Bayuku, *Devred* 1681. Lubumbashi [Elisabethville], *de Georgi** (BR, holotype), *F. A. Rogers* 26290, *Somona* 63 & *Schmitz* 2781; 12 km. NW. of Lubumbashi [Elisabethville], *Gathy* 431 & 591. Kundelungu Mt., *Kassner* 2596 (BM). Bwana Muto, *Callens* 3122 (BM).

TANZANIA. Kigoma District: Ujiji, R. Mkuti to Msusi, *Peter* 37179. Ufipa District: Kalambo Falls, *Richards* 12803. Rungwe District: Masukulu, *Stolz* 765, Songea District: Mbamba Bay escarpment, *Milne-Redhead* & *Taylor* 9542.

ZAMBIA. North: Kalambo Falls, *Richards* 11323 & *McCallum Webster* 908; near Mbala [Abercorn], track to Kasakalawe, *Richards* 5021; old road to Cascalawa from Chemba village, *Richards* 12492; Kasama, Bimba, *Verboom* LK 28; Nimkola to R. Lunzua, *Richards* 4642; Nimkola, *Richards* 4647; Kasama, Mungwi, *Robinson* 5008; Mporokoso District, Nsama, *Richards* 8971; 9.6 km. Mulwe to Kawambwa, *Angus* 2783. West: Mufulira, *Cruse* 512 & *Exell*, *Mendonça* & *Wild* 1396 (BM); Ndola, Masansa Forest Reserve, *Fanshawe* 4352; Ndola, *Fanshawe* 1015; Kitwe Sewage Works, *Shepherd* 37 & 53; Solwezi, *Robinson* 3517; 6 km. W. of Solwezi, *Drummond* & *Rutherford-Smith*; Machili, *Fanshawe* 6326. Barotseland: edge of R. Luampa, near

Luampa Mission, *White* 2105 & 2105a. Locality dubious, S. of Lake Tanganika, *Clark* (BM). 'N.S. Western Rhodesia' (?), *Martin* 764 (BM).

ANGOLA. Onschingue, Kuito, *Baum* 786 (BM, COI, K). Bié, Monongue, R. Cuiriri, *Gossweiler* 2830 (COI).

12e. subsp. **tenuiflorus** (*Benth.*) *Verdc.*, comb. et stat. nov.

A. tenuiflorus Benth. in Martius, Fl. Bras. 15: 216 (1859).

[*A. pulchellus sensu* Bak. in Fl. Trop. Afr. 2: 175 (1871); Boutique in Fl. Congo Belge 6: 84 (1954); Hepper in Fl. W. Trop. Afr., ed. 2, 1: 574 (1958), non Thw. *sensu stricto.*]

A. gracilis Lima in Broteria, sér. Bot. 19: 127 (1921).

A. stictosperma Berhaut in Mém. Soc. Bot. Fr. 1953-4: 7 (1954) & in Fl. Sénégal: 30 (1954).

Both *A. pulchellus* and *A. tenuiflorus* were published in the same year but it has only been possible to find out a more precise date (30 July) for Bentham's name. Since *pulchellus* is a much better-known name I have used it for the species as a whole. I am uncertain about the true status of subsp. *tenuiflorus* since very little material is available of the American plant, which appears distinctive, the inflorescences being very slender and the flowers small, 8-9.5 mm. long. Some African material, e.g. *Schweinfurth* 2345 is extremely similar and without further evidence I have thought it best not to separate them. A name is available for those who may find it desirable to separate the African plant. In pod length the African plants are closer to the American plants than they are to Indian plants with the exception of one variant mentioned below. On the whole, African material has larger flowers, but not always and the possible significance can scarcely be assessed without much more American material. A selection of material from Africa is cited below.

SENEGAL. Gorom, *Berhaut* 1433 (P, holotype of *A. stictosperma*). Sangalkam, *Berhaut* 5451 & 5600 (these lack ferruginous hairs but have the small pods). Basse Casamance: Bignona, Kalounayes Forest, *Berhaut* 6721; Sédhiou, *Berhaut* 6408. Without locality, *Perrotet* 212 (BM).

GUINEA. Macenta, *Baldwin* 9775.

SIERRA LEONE. Yoni Mamila Chiefdom, *King* 25B (pro parte). Bumbura, *N. W. Thomas* 3716 & 3757 (BM). Kenema, *Deighton* 392 (BM, K). Njala, *Deighton* 1499 (BM, K). Pendembu, *Glanville* 7 (BM). Without locality, *Afzelius* (BM).

LIBERIA. Boporo District: Tawata, *Baldwin* 10319. Ganta, *Harley*.

GHANA. Kumasi, *Darko* 638. R. Volta Forest Reserve, *Morton* GC 6052. Gambaga, *Adams* 4222. Bame Pass, *Morton* GC 9305.

NIGERIA. Lokoja District, *Parsons*. Mada Hills, *Hepburn* 89. Ibadan, *Punch* 47, *Ujor* in *F.H.I.* 29395. Agolo, *N. W. Thomas* 349. Idah, Kabba, Acharane Forest Reserve, *Latilo* in *F.H.I.* 41548. Oyo, Ife, Shasha Forest Reserve, *Emwiogbon* in *F.H.I.* 43539.

CAMEROUN. Bétaré Oya, *Breteler* 1070. Bertoua, 25 km. along road to Nanga-Eboko, *Breteler* 609. Plateau of Adamaoua, 8 km. S. of Ngaoundéré, *Breteler* 577. Bitye, Yaunde, *Bates* 932 (BM). Eboluwe, *Bates* 604 (BM).

EQUATORIAL GUINEA [Rio Muni]. Bebui, path to Oko, *Tessmann* 576 (locality not traced).

CONGO (KINSHASA). Eala, *Lebrun* 1480, 1108 & *Louis* 2046. Luki, *Devred* 3368. Yangambi, Tofende I., *Louis* 12861 (BM). Panzi, *Callens* 2731 (BM). Kinshasa [Léopoldville], Dinga, *Germain* 2212.

SUDAN REPUBLIC. Bahr el Ghazal, Seriba Ghattas, *Schweinfurth* 2345.

UGANDA. Bunyoro District: Budongo Forest, *Harris* 146 in *F.H.* 1110 & *Loveridge* 112. Mengo District: near Entebbe, Kitubulu Forest, *Chandler* 1223; Kipayo, *Dummer* 1099 (BM, K); Buvuma I., *Bagshawe* 652 (BM).

TANZANIA. Uzaramo District: Pugu Hills, *Vaughan* 2377 (BM, EA). Lindi District: Nachingwea, Namanga Hill, *Anderson* 1234 (EA); Rondo [Mwera] Plateau, *Schlieben* 6160 (BM). Tunduru District: 96 km. from Masasi, *Richards* 17944 (exceptionally large-flowered form with many of the characters of subsp. *suffruticosus*).

ZAMBIA. North: Fort Roseberry, *Fanshawe* 8511; Bancroft, *Fanshawe* 8392. West: Mufulira, *Eyles* 8316; Kitwe, *Fanshawe* 2219.

MOZAMBIQUE. Niassa: Palma, *Lima* 257 (PO, holotype of *A. gracilis*). Manica e Sofala: Cheringoma, serração de Durundi, *Barbosa* 1661 (BM, K).

ANGOLA. Cazengo, Granja de S. Luiz, *Gossweiler* 5870 (BM, COI). Malange, Bondo, Quela, *Nolde* 131 (BM).

There is a form (variant 'A') in West Africa with 6-jugate leaflets, wider, longer, more densely pubescent pods, (1.7-)3.5-6 cm. long, which comes close to subsp. *pulchellus* and is the form considered by *Berhaut* to be true *pulchellus*.

SENEGAL. Basse Casamance: Bignona, Koubalan, *Berhaut* 6782; Ziguinchor, Djibélor, *Berhaut* 6873.

PORTUGUESE GUINEA. Bissau, Peluba, *Espirito Santo* 1583.

DAHOMEY. Tchatchou, *Poisson*.

NIGERIA. Nupe, Onitsha, *Barter* 1749 (the sheet cited by Baker, *l.c.*, as *A. pulchellus*).

CONGO (KINSHASA). Yangambi, Île Tofendi, *Louis* 12861; Yangambi, Isalowe, *Louis* 7190.

13. ***Abrus canescens*** *Bak.* in *Fl. Trop. Afr.* 2: 175 (1871); *Breteler* in *Blumea* 10: 609, 620 (1960).

I agree with *Breteler* in his circumscription of this well-marked species. It has been confused at times with typical hairy forms of *A. pulchellus* *Thw.* subsp. *suffruticosus* (*Boutique*) *Verdc.* but is separated by the length of the bracts, very dark flower colour and the rather well-developed rim aril

DUBIOUS SPECIES

14. ***Abrus somalensis*** *Taub.* in *Engl. & Prantl, Pflanzenfam.* III.3: 355 (1894) & *Engl., Bot. Jahrb.* 23: 193 (1896).

Breteler considered this to be a synonym of *A. fruticulosus* and in this case the description does indicate a plant with 4-7-jugate linear-oblong, silky pubescent leaflets, 5-7 × 1.5-3 mm. Unfortunately no pods were available to *Taubert* who stated 'verwandt mit *canescens*' although his floral description does not fit this. Unfortunately the type *Hildebrandt* 1391 appears

to have been destroyed and no material from Somaliland has been seen by either Breteler or myself, despite the fact that the type locality Meid [Mait] has been visited by several collectors. Until the pod is available its probable affinity with *A. bottae* Deflers or *A. schimperi* Bak. (on geographical grounds) cannot be checked.

15. ***Abrus wittei*** Bak. f. in Rev. Zool. Bot. Afr. 21: 303 (1932); Boutique in Fl. Congo Belge 6: 86 (1954).

Both Boutique and Breteler have sunk *A. wittei* Bak. f. into *A. preceptorius* L. but I am not at all convinced of the correctness of their reasoning. I have examined the holotype preserved at the British Museum (Nat. Hist.) and also an isotype kindly sent on loan from Brussels. There are a number of marked differences between these specimens and typical *A. preceptorius*. *A. wittei* appears to be an erect shrub but no data are given and the young fruits are narrower with more tapering ends and the style is scarcely bent. The indumentum on the young attached pods is certainly similar to that often found in *A. preceptorius* but the very short inflorescences are quite dissimilar. On the isotype there is a packet containing a seed indistinguishable from those of *A. schimperi* but Boutique has dismissed this as not part of the main plant mentioning that there were no pods capable of holding ripe seed. On the holotype, however, another packet contains the same sort of seeds and a ripe pod. I see no reason to doubt that it came from the same plant but there is no certainty in the matter. There is a resemblance to the plant described earlier in this paper as *A. schimperi* subsp. *oblongus* and I am leaving *A. wittei* as a distinct species allied to *A. schimperi* but differing in inflorescences and the smooth pods. Until further collections from the type locality, Kiambi, are available the plant will remain a puzzle. A hybrid origin does not seem very likely.

16. ***Abrus*** sp.

Several years after this revision was first completed a rather fragmentary specimen collected by Donaldson Smith in an unfrequented part of Ethiopia was discovered amongst undetermined specimens of *Ormocarpum* at the British Museum (Nat. Hist.). A brief description is given but the material is not adequate enough to justify formal description. Presumably a woody shrub; stems purplish, lenticellate, densely adpressed grey pubescent; young shoots pale, with dense, more spreading fulvous pubescence. Leaflets 8-jugate, oblong-elliptic, 0.7–1.8 cm. long, 2.5–6 mm. wide, rather densely adpressed pilose beneath, the costa yellowish beneath in young leaflets. Calyx 4 mm. long, undulate, sparsely pilose. Vexillum narrowly elliptic, 1.4 cm. long, 4.5 mm. wide. Very immature pod linear-oblong, 3.5 cm. long (excluding thickened persistent style), 4.5 mm. wide, gradually acutely attenuated into the style, densely adpressed yellowish-pilose.

ETHIOPIA. Bale, Scecc Hussen (Sheik Husein), 21 Sept. 1894, *Donaldson Smith* 191 (BM).

Until more material becomes available it would serve no useful purpose to attach a name to the above plant which, judging by the pod, is almost certainly closely allied to *A. schimperi* if not an additional subspecies of it.

A great deal more material is required to solve the numerous problems mentioned in the above account. The attention of collectors is drawn to the need for much more material showing ripe fruit and seeds. Chemical and cytological methods might throw some light on further ways to improve the classification suggested here.

PHASEOLEAE

CLITORIA L.

Two species of this genus occur in East Africa apart from *C. laurifolia* Poir. (= *C. cajanifolia* (Presl) Benth.) which was formerly cultivated in Tanzania at Amani; one the well-known *C. ternatea* L. and the other, *C. rubiginosa* Pers., naturalized in Zanzibar. *C. ternatea* L. has for the purpose of the Flora been accepted as a single polymorphic species, the numerous variants being probably simple Mendelian varieties. The plant naturalized in Zanzibar and collected there as long ago as 1868 by Sir John Kirk requires some discussion. Typical *C. rubiginosa* Pers. has a dense ferruginous indumentum and often ribbed pods, whereas the Zanzibar plant is glabrescent and has a smooth pod. It does in fact closely resemble a number of specimens from the Old World named *C. mariana* L. and it becomes a matter of interest to ascertain the probable origin of the Zanzibar plant. All the material of the *C. rubiginosa*-*C. mariana* complex at Kew was examined and the results are given in Table 3 (pp. 254-5). The conclusion has been reached that two major groups can be separated on the shape of the stipules but I do not propose to revise these groups. It seems unlikely that all the names should be kept up at specific level and it would be better to recognize subspecies and varieties placed under the two main heads *C. rubiginosa* and *C. mariana*. Glabrous forms of *C. rubiginosa* are so distinctive that a variety is proposed to accommodate them. In West Africa the species is also extensively naturalized and the glabrous variety predominates. It is certain that the Zanzibar population stems from a single introduction of this glabrous variant from either West Africa, tropical America or the West Indies and is not a variant of the Asiatic species despite the close resemblance.

Clitoria rubiginosa Pers., Syn. 2: 303 (1807).

var. **glabrescens** Verdc., var. nov. a *C. rubiginosa* typica caulibus glabrescentibus, foliis subtus glabris vel sparse pubescentibus differt; affinis *C. marianae* L. stipulis ovato-ellipticis brevioribus distinguenda.

African sheets and the type are cited below. A number of Brazilian sheets are intermediate between the two extremes.

PORTUGUESE GUINEA. Fulacunda, *Espirito Santo* 2024.

SIERRA LEONE. Along R. Wanjee near Baba, *Bakshi* 176.

LIBERIA. Sanokwele District: Gbau, *Baldwin* 9412.

NIGERIA. Olokemeji, *Foster* 319; *Foster* 16. Lagos, *Meller* 129. Eket, *Talbot* 3350. Ewa, Ahor ?, *Thompson* 518.

TANZANIA. Zanzibar: Masingini Ridge, 1 Feb. 1929, *Greenway* 1290 (EA, K):—a large cream-flowered climbing plant growing in sandy soil in the bottoms of eroded areas, not very common; without locality, *Kirk* s.n., *Toms* s.n. & *Vaughan* 86 (BM); 'Zanzibar and Pemba', *Dowson* 125.

TABLE 3. Characters in the *Cliitoria mariana* L. complex

| Country | Stem Indumentum | Stipule shape | Leaf apices | Leaf indumentum | Calyx indumentum | Bracteoles | Pod | Names in use |
|-----------|--------------------------------------|-----------------------------------|---|------------------------|------------------|-------------------|----------------------|--|
| China | sparse, adpressed | oblong-lanceolate to ovate-oblong | obtuse to subacute, mucronulate | sparse | sparse | oblong-lanceolate | not ribbed | <i>mariana</i> L. |
| India | sparse, adpressed or \pm spreading | oblong-lanceolate to ovate-oblong | obtuse to subacute, mucronulate | sparse | sparse | oblong-lanceolate | not ribbed | <i>grahami</i> Steud. ex Benth. |
| Burma | sparse, adpressed | oblong-lanceolate to ovate-oblong | acuminate, mucronulate | sparse | sparse | oblong-lanceolate | ? | <i>grahami</i> Steud. ex Benth. <i>mariana</i> L. |
| Siam | sparse, adpressed | oblong-lanceolate to ovate-oblong | subacute to acuminate, mucronulate | sparse | sparse | oblong-lanceolate | not ribbed | <i>mariana</i> L. |
| Java | fairly dense, adpressed | ovate | subacute, mucronulate | dense | ? | ? | ? | <i>javanica</i> Miq. |
| Australia | sparse to fairly dense, adpressed | oblong-ovate | rounded to subacute, mucronulate | sparse to fairly dense | sparse to dense | oblong-lanceolate | not ribbed | <i>australis</i> Benth. |
| W. Africa | sparse to dense, spreading | broadly ovate or elliptic, short | obtuse to slightly emarginate, very shortly mucronulate | sparse to dense | sparse to dense | oblong-lanceolate | not ribbed or ribbed | <i>rubiginosa</i> Pers. |

| | | | | | | | | |
|-------------------|---|--|---|--------------------------------|---------------------------------------|---------------------|----------------|-------------------------|
| Zanzibar | sparse | broadly ovate or elliptic, short | slightly emarginate, scarcely mucronulate | glabrescent | minutely puberulous but no long hairs | oblong-lanceolate | not ribbed | <i>rubiginosa</i> Pers. |
| Florida | glabrescent | narrowly lanceolate | obtuse, mucronulate | glabrous | minutely puberulous only | narrowly lanceolate | not ribbed | <i>fragrans</i> Small |
| SE. United States | glabrescent, adpressed | narrowly lanceolate | obtuse, mucronulate | glabrous to sparse | sparse | narrowly lanceolate | not ribbed | <i>mariana</i> L. |
| Mexico | sparse spreading | oblong-lanceolate, rarely elliptic | acuminate, mucronulate; rarely obtuse | sparse | sparse to glabrous | narrowly lanceolate | not ribbed | <i>mexicana</i> Link |
| British Honduras | dense spreading | broadly ovate-elliptic, short | slightly emarginate, scarcely mucronulate | velvety beneath | dense | ovate-lanceolate | ? | <i>rubiginosa</i> Pers. |
| W. Indies | glabrescent to dense, spreading, ferruginous | elliptic to ovate-rhomboid, very short | slightly emarginate, scarcely mucronulate | glabrescent to velvety beneath | glabrescent to dense | ovate-lanceolate | usually ribbed | <i>rubiginosa</i> Pers. |
| Tropical America | glabrescent to dense, adpressed or spreading, ferruginous | elliptic to ovate-rhomboid, very short | subacute, emarginate, shortly mucronulate | glabrescent to velvety | usually dense | ovate-lanceolate | usually ribbed | <i>rubiginosa</i> Pers. |

TOBAGO. Bacolet, in coconut plantations, 13 Oct. 1937, *Sandwith* 1754 (K, holotype of variety):—creeper, leaflets thick, more or less glaucous beneath, corolla white, standard with purplish stripes leaving the median vein within.

GLYCINE WILLD., *nom. conserv.**

The names of the soya bean and its allies have always given much trouble. There are two Linnaean names which refer to the soya bean, namely *Phaseolus max* and *Dolichos soja*, both dating from 1753. Merrill made a new combination for the first under *Glycine* in 1917 and this name has mostly been followed, e.g. by F. J. Hermann in his monograph of the genus. A few years later, however, when discussing Loureiro's Fl. Cochinch. he refutes his own new combination and uses *Glycine soja* (L.) Sieb. & Zucc. Even if this were correct the name *Glycine max* (L.) Merr.† would still be the valid one since Merrill was the first to choose between two names of equal date; it is not, however, correct since Siebold & Zuccarini's name is not based on *Dolichos soja* L. but is a new name, hence no combination of *Dolichos soja* can be made in *Glycine*. This is clear since Siebold & Zuccarini cite *Dolichos soja* L. in synonymy when dealing with the *next* species in their account. F. J. Hermann has used the name *G. ussuriensis* Regel & Maack for the plant called *G. soja* by Siebold & Zuccarini but I would agree with Ohwi that there seems to be no bar to the use of their name. In this discussion I willingly agree to the proposal made by Burtt about the retention of early authors' names in cases where genera are conserved from a later date with a different type (Taxon 15: 307 (1966)).

Glycine max (L.) Merr., Interpr. Rumph. Herb. Amboin.: 274 (1917); Hermann in U.S. Dep. Agr. Techn. Bull. No. 1268: 39 (1962) (further synonymy given).

Phaseolus max L., Sp. Pl.: 725 (1753).

Dolichos soja L., Sp. Pl.: 727 (1753), *non Glycine soja* Sieb. & Zucc.

Soja max (L.) Piper in Journ. Amer. Soc. Agron. 6: 84 (1914).

[*Glycine soja sensu* Merr. in Trans. Am. Phil. Soc. 24: 208 (1935); Paclt in Science 109: 339 (1949), *non G. soja* Sieb. & Zucc.]

Glycine soja Sieb. & Zucc. in Abh. Acad. Muench. 4(2): 119 (1845); Ohwi, Fl. Japan: 570 (1965).

G. ussuriensis Regel & Maack in Regel, Tent. Fl. Ussur.: 50 (1861); Hermann in U.S. Dep. Agr. Techn. Bull. No. 1268: 37 (1962).

The above references are sufficiently full to illustrate the above discussion and to lead to further literature.

* See Verdcourt in Taxon 15: 34-6 (1966).

† I definitely do not support Paclt's proposal (Regn. Veg. 60: 33 (1969)) to reject this name as a confused name. After Piper & Prain's careful detailed typification (Piper, *l.c.*: 75-84) whereby a Cliffortian specimen in the Linnaean Herbarium was chosen as the lectotype, it is a mischievous act to upset it. Incidentally Piper considered *G. max* and *G. soja* to be cultivated and wild forms of one species.

OPHRESTIA H. M. L. FORBES

Several segregate genera have been split from *Glycine* Willd. (conserved as suggested by me in Taxon 15: 34 (1966)) by Hauman and F. J. Hermann—these include *Pseudoeriosema* Hauman, *Pseudoglycine* F. J. Hermann and *Paraglycine* F. J. Hermann. The characters separating these genera from *Glycine* are admittedly slight, although the first-named at least has a characteristic facies, and I have partly followed these authors' delimitations in my treatment of the group for the Flora. Several problems have, however, arisen and are dealt with here. My attention was drawn to the genus *Ophrestia* by the finding of a Natal specimen* tentatively labelled *Tephrosia oblongifolia* E. Mey. at the end of the *Teramnus* covers in the general herbarium of the British Museum (Nat. Hist.). Someone had obviously thought the specimen was more suitably placed in *Teramnus* but the 10 fertile anthers rule out that possibility. Nevertheless the specimen clearly belonged to the *Glycininae*, and on checking it was found that the suggestion that it was the same plant as *Tephrosia oblongifolia* was also correct. Miss Forbes transferred this to a genus *Ophrestia* together with three other 'new species' and stated that it differed from both *Tephrosia* and *Glycine*. Hutchinson (Gen. Fl. Pl. 1: 396 (1964)) has relegated *Ophrestia* to *Tephrosia* but this is clearly not correct; Harms with his usual perspicacity very accurately considered it to be 'not quite a *Glycine*'. Miss Forbes does not mention whether she believes the genus to belong to the *Galegeae* or to the *Phaseoleae*, neither does she select a type species, although she obviously intended *Tephrosia oblongifolia* to act as such. Whilst studying the Natal specimen previously mentioned it was clear to me that it was congeneric with *Paraglycine* F. J. Hermann. He, like myself, had not considered *Ophrestia* for the simple reason it was still maintained in the *Galegeae* in herbaria and placed next to *Tephrosia* itself and one scarcely expects to have to look for relatives of the genus one is dealing with three or four tribes away. The differences between the tribes in this family are often tenuous and, sometimes, as in this case, it is scarcely possible to find clear technical characters which point in one direction. The subtle character of leaf-venation is the best indicator of affinity in this case, the widely spaced lateral nerves looping back and not forming a marginal nerve in *Ophrestia* compared with the closely parallel nerves which reach the margin in *Tephrosia*. The rather strange geographical distributions—*Ophrestia* a Natal and Transvaal genus being unknown in Tropical Africa—*Paraglycine* a tropical African and Asian genus not occurring in South Africa—are now explained. The following new combinations are needed as a result of the amalgamation suggested and also in order to correct several previous errors. The characters given by F. J. Hermann to separate *Pseudoglycine* are I feel inadequate and the genus has exactly the same facies as *Ophrestia*.

Ophrestia H. M. L. Forbes in *Bothalia* 4: 1003 (1948).

Paraglycine F. J. Hermann in U.S. Dep. Agr. Techn. Bull. No. 1268: 52 (1962), **synon. nov.**

Pseudoglycine F. J. Hermann, *op. cit.*: 74 (1962), **synon. nov.**

* Actually *Gerrard* 1082 the type-number of *Ophrestia oblongifolia* (E. Mey.) Forbes var *velutinos* Forbes.

Ophrestia oblongifolia (*E. Mey.*) *H. M. L. Forbes*, *op. cit.*: 1004 (1948).

Tephrosia oblongifolia *E. Mey.*, *Comm. Pl. Afr. Austr.*: 108 (1836).

Glycine ? *wilmsii* *Harms* in *Engl., Bot. Jahrb.* 26: 302 (1899), **synon. nov.**

Ophrestia retusa *H. M. L. Forbes*, *op. cit.*: 1005 (1948), **synon. nov.**

O. swazica *H. M. L. Forbes*, *l.c.* (1948), **synon. nov.**

O. nervosa *H. M. L. Forbes*, *op. cit.*: 1006 (1948), *nom. illegit.*, **synon. nov.**

I have been unable to keep up Miss Forbes's species, the leaf characters she gives being quite unusable and variable. I am also unable to understand her treatment of *Glycine wilmsii*. She cites the name as a synonym under *O. oblongifolia* adding the words 'in part' but gives *Wilms* 383 (the holotype and only element given of Harms's species) under her own *nervosa*. I have not sunk the name *O. oblongifolia* var. *velutinoso* *H. M. L. Forbes* since this does seem a genuine minor variant.

Ophrestia unifoliolata (*Bak. f.*) *Verdc.*, *comb. nov.*

Paraglycine unifoliolata (*Bak. f.*) *F. J. Hermann*, *op. cit.*: 57 (1962); *Torre* in *Consp. Fl. Angol.* 3: 244 (1966).

Glycine unifoliolata *Bak. f.*, *Journ. Bot.* 66, suppl. 1: 114 (1928).

Ophrestia unicostata (*F. J. Hermann*) *Verdc.*, *comb. nov.*

Paraglycine unicostata *F. J. Hermann*, *op. cit.*: 59 (1962).

Ophrestia upembae (*Hauman*) *Verdc.*, *comb. nov.*

Paraglycine upembae (*Hauman*) *F. J. Hermann*, *op. cit.*: 60 (1962).

Glycine upembae *Hauman* in *Bull. Jard. Bot. Brux.* 25: 94 (1955) & in *Fl. Congo Belge* 6: 99 (1954), *non rite publ.*

Ophrestia digitata (*Harms*) *Verdc.*, *comb. nov.*

Paraglycine digitata (*Harms*) *F. J. Hermann*, *op. cit.*: 61 (1962).

Glycine digitata *Harms* in *Engl., Bot. Jahrb.* 28: 408 (1900).

Ophrestia radicata (*A. Rich.*) *Verdc.*, *comb. nov.*

Eriosema radicosum *A. Rich.*, *Tent. Fl. Abyss.* 1: 228 (1847); *Bak.* in *Fl. Trop. Afr.* 2: 226 (1871).

Glycine radicata (*A. Rich.*) *Bak. f.*, *Leg. Trop. Afr.*: 358 (1929).

Paraglycine radicata (*A. Rich.*) *F. J. Hermann*, *op. cit.*: 63 (1962).

var. radicata

Glycine schliebenii *Harms* var. *rufescens* *Hauman* in *Bull. Jard. Bot. Brux.* 25: 95 (1955), & in *Fl. Congo Belge* 6: 98 (1954), *non rite publ.*

Paraglycine radicata (*A. Rich.*) *F. J. Hermann* var. *rufescens* *F. J. Hermann*, *op. cit.*: 65 (1962).

var. schliebenii (*Harms*) *Verdc.*, *comb. nov.*

Glycine schliebenii *Harms* in *Notizbl. Bot. Gart. Berl.* 11: 814 (1933); *Hauman* in *Fl. Congo Belge* 6: 99 (1954).

[*Paraglycine radicata* var. *radicata* sensu F. J. Hermann, *op. cit.*: 63 (1962), non (A. Rich.) F. J. Hermann, sensu stricto.]

var. **enneaneura** (Hauman) Verdc., comb. nov.

Glycine schliebenii Harms var. *enneaneura* Hauman in Bull. Jard. Bot. Brux. 25: 95 (1955), & in Fl. Congo Belge 6: 99 (1954), non rite publ.

Paraglycine radicata var. *enneaneura* (Hauman) F. J. Hermann, *op. cit.*: 65 (1962).

Hermann arranged his three varieties as if the type of *Eriosema radicosum* had been the glabrescent variety but a study of the type shows that it is densely rufous hairy, as indeed Richard's description plainly indicates. I have therefore had to make certain changes.

Ophrestia hedysaroides (Willd.) Verdc., comb. nov.

Glycine hedysaroides Willd., Sp. Pl., ed. 4, 3: 1060 (1802); Bak. in Fl. Trop. Afr. 2: 179 (1871); Bak. f., Leg. Trop. Afr.: 360 (1929); Hauman in Fl. Congo Belge 6: 98 (1954); Hepper in Fl. W. Trop. Afr., ed. 2, 1: 564 (1958); Torre in Consp. Fl. Angol. 3: 243 (1966).

G. pentandra Spreng., Syst. Veg. 3: 235 (1826).

Johnia willdenowii Hook. f. in Hook., Nig. Fl.: 305 (1849).

Paraglycine hedysaroides (Willd.) F. J. Hermann, *op. cit.*: 65, fig. 17 (1962).

Ophrestia laotica (Gagnep.) comb. nov.

Glycine laotica Gagnep., Not. Syst. 3: 196 (1916).

Paraglycine laotica (Gagnep.) F. J. Hermann, *op. cit.*: 67 (1962).

Ophrestia pinnata (Merr.) Verdc., comb. nov.

Glycine pinnata Merr. in Lingnan Sci. Journ. 14: 15 (1935).

Paraglycine pinnata (Merr.) F. J. Hermann, *op. cit.*: 69 (1962).

Ophrestia pentaphylla (Dalz.) Verdc., comb. nov.

Glycine pentaphylla Dalz. in Hook., Journ. Bot. 4: 344 (1852).

Paraglycine pentaphylla (Dalz.) F. J. Hermann, *op. cit.*: 71 (1962).

Ophrestia madagascariensis (F. J. Hermann) Verdc., comb. nov.

Paraglycine madagascariensis F. J. Hermann, *op. cit.*: 73 (1962).

Ophrestia lyallii (Benth.) Verdc., comb. nov.

Glycine lyallii Benth. in Journ. Linn. Soc., Bot. 8: 266 (1865).

G. lantzii Baill. in Bull. Soc. Linn. Paris 1: 382 (1883), *emend.*

Pseudoglycine lyallii (Benth.) F. J. Hermann, *op. cit.*: 74 (1962).

In addition to these species there is a further striking plant which clearly belongs to this genus and has already been mentioned by Dr. Torre. It has been known since 1937 and Dr. Torre has informed me in a letter that he refrained from describing it since no ripe fruits were available. The plant is, however, so distinctive that, although fruits are still not available on any of

the three known gatherings, I have decided to describe it whilst dealing with the genus.

Ophrestia torrei *Verdc.*, sp. nov. ab omnibus speciebus adhuc descriptis, habitu erecto, foliolis multo latioribus, inflorescentiis longioribus differt; affinis *O. oblongifoliae* (E. Mey.) H. M. L. Forbes, vexillo oblongo-cuneiformi, floribus minoribus distinguenda.

Paraglycine sp. nov. ?; Torre in *Consp. Fl. Angol.* 3: 244 (1966).

Herba suffruticosa erecta vel frutex usque 0.9 m. alta, ramis lignosis 4–5 mm. diametro pilis brevibus patentibus vel appressis dense subvelutine obtectis. *Folia* 3–5-foliolata; stipulae lineari-lanceolatae, 4–7 mm. longae, 0.5–0.8 mm. latae, deciduae vel persistentes; petiolus 1–2 cm. longus; rhachis 0.7–5.2 cm. longa; petioluli 1–3 mm. longi; foliola oblonga usque elliptica, 2–13 cm. longa, 0.8–5.2 cm. lata, apice rotundata vel retusa, minute mucronulata, basi rotundata vel levissime subcordata, chartacea, supra obscure appresse pilosa, subtus praecipue ad nervos venulisque dense pilosa, nervis lateralibus 7–12-jugis supra subplanis subtus valde prominentibus; rete venarum dense reticulatum subtus valde prominens. *Inflorescentiae* elongatae, 11–36 cm. longae, pseudoracemosae, floribus in fasciculas 5–10-floras numerosas aggregatis; pedunculi 1.5–5 cm. longi; pedicelli 0.5 mm. longi; bractae persistentes, lineari-lanceolatae, 3–6 mm. longae; bracteolae filiformes 2–3.5 mm. longae. *Calyx* pilis saturate brunneis dense obtectus; tubus campanulatus, 2 mm. longus, limbo bilabiato lobis 3 inferis ovato-lanceolatis vel anguste triangularibus 2–3 mm. longis 1 mm. latis lobis 2 superis in labio rotundato 3 mm. longo et lato apice breviter bifido connatis. *Vexillum* oblongo-cuneiforme, vel leviter panduriforme, 6–8 mm. longum, 2.5–3.5 mm. latum, apice rotundatum, basi in ungue 1.5 mm. longo sensim angustatum, albo-viride, extra superne pilis appressis saturate brunneis dense obtectum. *Alae* 5.5–7.5 mm. longae, valde calcaratae, ungue 2 mm. longo; lamina in parte superiore brunneo-pilosa. *Carinae* laminae oblongo-ellipticae, 4–5 mm. longae, 1.8 mm. latae, leviter calcaratae, in parte inferiore brunneo-pilosae, unguibus 2–2.5 mm. longis. *Filamentum* vexillare liberum basi valde dilatatum. *Ovarium* fusiforme, 2 mm. longum, 2-ovulatum, dense pilosum; stylus basi subcomplanatus, glaber, superne leviter incrassatus, apice uncinatus, 2.5 mm. longus, stigmatate terminali. *Legumen* ignotum. (Fig. 1, p. 261.)

ZAMBIA. Mwinilunga District: near source of R. Isongailu, in *Brachystegia* woodland on sand, 31 Dec. 1937, *Milne-Redhead* 3897 (K, holotype):—shrub to 0.9 m., inflorescence green, covered with brown hairs; petals greenish-white, with brown pubescence.

ANGOLA. Lunda: R. Cuango, Xa-Sengue, without exact locality, 1000 m., Apr. 1937, *Gossweiler* 11744; Alto Cuilo, 28 May 1954, *Sanjinje* V.54–9* (LISC).

The genus as constituted above seems compact and has a more plausible distribution. I do not feel that it can be divided into sections equivalent to the genera I have sunk, since some species of '*Paraglycine*' are closer to *O. oblongifolia* than they are to other species of '*Paraglycine*'. Hermann divides his *Paraglycine* into two sections *Digitatae* F. J. Hermann and *Hedysaroides* F. J. Hermann but the latter, since it contains the type of *Paraglycine*,



FIG. 1. *Ophrestia torrei*. 1, habit, $\times \frac{2}{3}$; 2, enlarged portion of leaf, abaxial surface, $\times 3$; 3, portion of inflorescence, $\times 3$; 4, flower, $\times 5$; 5, calyx, $\times 5$; 6, standard, $\times 5$; 7, wing petal, $\times 5$; 8, keel, $\times 5$; 9, androecium, $\times 5$; 10, gynoecium, $\times 5$; 11, style and stigma, face view, $\times 14$; 12, immature fruit, $\times 5$. All drawn from Milne-Redhead 3897.

should have been called section *Paraglycine*; he includes five species in each of these sections separated on the degree of hairiness of the petals, the indumentum of the inflorescence and the number of ovules. Some striking differences are to be found in the genus in the length of the petioles, the length of the peduncles and the shape of the standard. *O. hedyсарoides* differs from the other species in its subsessile axillary clusters of flowers and its elliptic or rounded-oblong standard, contrasting with elongate false racemes and mostly panduriform standards. It might be worth retaining *Paraglycine* as a section for this species. Miss Forbes mentions the spurs at the end of the blades of the wing and keel petals and these are indeed noticeable in *O. oblongifolia* where the lower corners of the standard blade are also acutely produced. These are present in some of the species previously referred to *Paraglycine* (e.g. *O. unicastata*, *O. digitata*) and absent in others (e.g. *O. hedyсарoides*). In *Pseudoglycine* the standard is broadly oblong-elliptic and the other petals are scarcely spurred; in fact little use can be made of this character. The digitate leaflets of *O. digitata* and the very marked costae and narrow leaflets of *O. upembae* and *O. unicastata* are distinctive individual characters but on the whole *Ophrestia*, as emended, is a natural genus.

PSEUDOERIOSEMA HAUMAN

In the coastal areas of northern East Africa there is a plant closely related to *P. borianii* (Schweinf.) Hauman but differing from it in a number of ways. The general facies of the two is so similar that I have preferred to treat it as a subspecies. I believe the two have only quite recently evolved, owing to isolation resulting from late Pleistocene climatic changes.

Pseudoeriosema borianii (Schweinf.) Hauman in Bull. Jard. Bot. Brux. 25: 98 (1955).

subsp. ***longepedunculatum*** Verdc., subsp. nov. a *P. borianii* typico pedunculis longioribus usque 5 cm. longis, inflorescentiis longioribus et laxioribus usque 3 cm. longis differt.

Caules pilis ferrugineis obtecti. *Vexillum* spathulatum, 7–7.5 mm. longum, 3.5–4.5 mm. latum. *Legumen* dense ferrugineo-pilosum.

KENYA. Kilifi District: 5.6 km. from Malindi, in abandoned cultivations, Apr. 1960, *Rawlins* 838 (EA, K):—trailing vine with pink flowers. N. of Mombasa to Lamu and Witu, *Whyte* (BM).

TANZANIA. Lushoto District: Lwengera Valley, 6.4 km. E. of Korogwe, tall grass areas, river valley flats, on black cotton soil, 300 m., 20 July 1953, *Drummond & Hemsley* 3385 (EA, K):—climbing on low vegetation by twining, height to 1 m., calyx green, standard and wings pink, keel pale pink, ripe pods brown. Handeni District: Handeni, red clay soil in *Vitex* formation, 10 July 1960, *Semsei* 3017 (K, holotype of subspecies; EA, PRE, isotypes):—trailing over bushes and trees, flowers purple-mauve. Tanga District: Magunga Estate, low-lying grassland which is swampy during the rainy season, 300 m., 11 July 1952, *Faulkner* 970:—plants spreading 2–3 ft., flowers pinky-red; Pongwe to Ngomeni, grassland in open bush association on black cotton soil, 150 m., 17 May 1930, *Greenway* 2245 (EA, K):—very common twining herb with pink flowers; Tanga, Tongoni, grassland and coastal savanna, sea-level, 24 June 1967, *Faulkner* 3961: flowers scarlet

fading to pinky mauve. Pangani District: Madanga, Bushiri, sandy soil, track through sisal estate, 45 m., 20 July 1955, *Tanner* 1963:—limp climber over grass; Bushiri, in grass, May 1950, *Faulkner* 555 (EA, K):—very spreading plant with bright red flowers, common; Hale to Kalilanga, 250 m., 17 Aug. 1918, *Peter* K630 (O IV 330); Mkwaja, Mkaramo, mixed grassland, 7 July 1951, *van Rensburg* 545 (EA, K); Mwera, Ntaru, Nseko, in thick long grass on edge of permanent swamp on heavy black fissuring clay, 90 m., 6 June 1956, *Tanner* 2894:—creeper, flowers mauve and red, not aromatic, sap colourless; Mwera to Pangani, 29 Apr. 1926, *Peter* 39929 (B):—red-flowered trailing plant; Hale to the Great Pangani Falls, 9 June 1914, *Peter* 49708a (B).

Pseudoeriosema andongense (*Bak.*) *Hauman* in Bull. Jard. Bot. Brux. 25: 97 (1955).

subsp. ***bequaertii*** (*De Wild.*) *Verdc.* comb. et stat. nov.

Glycine bequaertii De Wild. in Fedde, Rep. Sp. Nov. 11: 547 (1913).

Pseudoeriosema bequaertii (*De Wild.*) *Hauman*, l.c. (1955).

I prefer to treat this plant, which occurs in the Katanga and southern Tanzania, as a subspecies of the widely distributed *P. andongense*. It differs in having more cuneate leaf-bases, more contracted inflorescences, due to the suppression of the primary pedicels, shorter blunter calyx-lobes and a shorter standard but the characters are not entirely constant. I have examined all the types involved in *Hauman's* account of this genus and consider that *P. homblei* (*De Wild.*) *Hauman* is no more than a variety of *P. andongense* with trifoliolate leaves—*de Witte* 3147 has some leaves trifoliolate and some unifoliolate and clearly links the two. *P. moeroëense* (*De Wild.*) *Hauman* is, as *Hauman* points out, very close to *P. longipes* (*Harms*) *Hauman*, differing in scarcely more than its longer petioles, but it is still known only from a single specimen.

A SURVEY OF THE GENUS TERAMNUS P.BR. WITH SPECIAL REFERENCE TO EAST AFRICA

An attempt to sort out the East African species of this genus with only limited reference to material collected elsewhere proved abortive. This led to a survey of the genus throughout the world, but this has been carried out only so far as was necessary to obtain names for the members of the genus occurring in East Africa.

The genus was for long confounded with *Glycine* Willd. (*non L.*)* and, even though described long ago, the transfer of all the species belonging to it occupied nearly a century. It is unquestionably a natural genus and clearly distinguished by both flowers and fruits (and when studied for some period by foliage also) from *Glycine*. As is usual this naturalness is accompanied by difficulty in deciding how many species can be recognized. In truth, the genus is scarcely divisible into species which are clear cut and, without resorting to cytology and experiments on living plants, it is likely that ordinary taxonomic treatments will remain unsatisfactory. Regrettably once

* See *Verdcourt* in *Taxon* 15: 34 (1966).

again I have had to use an infraspecific hierarchy of names. I have much sympathy with those who feel that if anything can be distinguished at all it might as well be maintained at specific rank. With the immense amount of material now available it has been found that most taxa are not clear cut and infraspecific units are the only way of dealing with the situation.

Use has been made of the smoothness or roughness of the seeds. The rough seeds have a minutely granular or reticulate covering and traces of this reticulate covering are often visible on the corresponding endocarp of the pod. This covering can frequently be removed by rubbing and it might be thought to be due to a secretion or decomposition of the pulp rather than part of the original testa. Dr. C. R. Metcalfe informs me, however, that he believes that the epidermal cells of the testa have broken down releasing their contents which have become deposited on the surface of the seeds. Hermann (U.S. Dep. Agr. Techn. Bull. No. 1268, 11 (1962)) when discussing Australian species of *Glycine*, mentions that the 'seeds are usually of two kinds in each species, very different in appearance one smooth and often glossy, the other variously muriculate or papillose and foveolate. The latter condition is due to the true seed coat being covered by the dried persistent remains of the perisperm which otherwise remains attached to the inner wall of the pod'. More field information is required. There does seem to be a significant correlation between rough seeds and other characters, and I have employed the character.

In the past, use has been made of inflorescence characters but many species with usually elongated inflorescences can have the flowers in sessile clusters; such variation can be seen on a single plant. The holotype of *T. labialis* has the flowers in such clusters and too much reliance must not be placed on this character.

KEY TO THE GENUS TERAMNUS P.Br.

Pods (4.5-)5-6 mm. wide, glabrous or with adpressed hairs; leaflets usually distinctly acuminate (E. Asia) 5. **T. flexilis**

Pods 2-4 mm. wide or if 4-4.5 mm. wide then densely spreading hairy:

Erect subshrub; leaflets oblong-elliptic, velvety hairy beneath; pod densely covered with more or less spreading, ferruginous hairs (W. Africa) 8. **T. buettneri**

Climbing, twining or prostrate herbs:

Stems stout, the lower rounded, up to 4 mm. in diameter, the upper distinctly angular; leaflets velvety beneath, mostly large, rhomboid or ovate-oblong, 4-10 cm. long; pods densely, mostly adpressed hairy; calyx-lobes usually distinctly more hairy than the tube

7. **T. micans** (*sensu lato*)

Stems more slender and if angular then leaflets narrow, oblong-lanceolate:

Calyx with dark blackish-brown hairs; leaflets usually narrowly oblong 6c. **T. uncinatus** subsp. **ringoetii**

Calyx with white or ferruginous hairs but not so obviously blackish-brown:

Seeds dark, minutely but distinctly reticulate or roughened when ripe, sometimes with a delicate wrinkled membranous wing:

Pod with spreading hairs:

- Upper 2 calyx-teeth united or almost so the calyx appearing 4-fid; leaflets elliptic; wings of corolla toothed (India, Burma) 4. **T. mollis**
- Upper 2 calyx-teeth not entirely united, calyx distinctly 5-fid; leaflets round or oblong, obtuse; wings often not so toothed (E. Africa) 3b. **T. repens** subsp. **gracilis**
- Pod with adpressed hairs or rarely with rather spreading hairs; calyx 5-toothed; leaflets elliptic, usually with apex acute
2e. **T. labialis** subsp. **arabicus**
- Seeds smooth, pale chestnut or orange-brown to dark brown:
- Calyx with the 2 upper teeth entirely joined; wings of corolla with no tooth; pods 2-2.5 mm. wide, sparsely adpressed hairy (New World) 1. **T. volubilis**
- Calyx 5-toothed (or more or less 4-toothed in some Indian variants of *T. labialis*):
- Pods, stems and leaves with spreading ferruginous hairs and leaflets round or rounded-elliptic, rarely exceeding 3 cm. in length; plant prostrate (Africa) 3a. **T. repens** subsp. **repens**
- Pods with adpressed hairs or if spreading then leaflets oblong-lanceolate or narrowly elliptic and plant a climber:
- Leaflets oblong, linear-oblong or narrowly elliptic, 2-6 times as long as broad:
- Leaves, stems and pods with a close ferruginous indumentum, often velvety and usually well obscuring the surface; leaflets mostly over 5 cm. long; inflorescences mostly with more numerous flowers and pedicels short (America and Africa):
- Leaflets predominantly narrowly oblong (Africa):
- Indumentum of calyx dark brown; inflorescence elongated 6c. **T. uncinatus** subsp. **ringoetii**
- Indumentum of calyx of brown and creamy hairs; inflorescences often subsessile clusters but sometimes elongated (leaflets often rather silvery beneath) 6b. **T. uncinatus** subsp. **axilliflorus**
- Leaflets narrowly elliptic with rounded sides; pods mostly with spreading indumentum (America)
6a. **T. uncinatus** subsp. **uncinatus**
- Leaves, stems and pods or at least the pods with sparse indumentum not entirely covering the surface or if so leaflets under 5 cm. long; inflorescence often few-flowered and pedicels longer (*T. labialis*):
- Leaflets linear-oblong; pod indumentum sparse but spreading; pod 3.5 mm. wide; plant of N. Somalia
2d. **T. labialis** var. **somalensis**
- Not as above:
- Leaflets more or less glabrous above; pod 2-2.5 mm. wide (Tropical Africa) 2c. **T. labialis** var. **abyssinicus**

- Leaflets glabrous or pubescent above; pod usually
2.5–4 mm. wide 2a. **T. labialis**
var. **labialis** and unnamed variants
- Leaflets round, broadly elliptic or rhomboid, 1–3 times as
long as broad:
- Leaflets larger, 5–10 × 4–9 cm.; usually robust climber
(Tropical Africa):
- Leaflets rhomboid, acuminate; pedicels 1–2 mm. long
7c. **T. micans** var. **fagifolius**
- Leaflets ovate, acute or acuminate; pedicels 2–5 mm.
long 2b. **T. labialis** var. **acutus***
- Leaflets smaller, usually well under 5 cm. long; weak
climbers or straggling:
- Leaflets glabrous above and pod 2–2.5 mm. wide
(Tropical Africa) 2c. **T. labialis**
var. **abyssinicus**
- Leaflets glabrous or pubescent above; pod usually
2.5–4 mm. wide 2a. **T. labialis**
var. **labialis** and unnamed variants

1. **Teramnus volubilis** Sw., Prodr. Veg. Ind. Occ.: 105 (1788).

Glycine oblonga Benth., Bot. Voy. Sulphur: 84 (1844).

This closely resembles some forms of *T. labialis* but the 4-fid calyx is distinctive. The leaflets are elliptic or oblong, mostly glabrous above; pods sparsely adpressed pubescent; seeds smooth.

JAMAICA. St. Mary's Parish, *Orcutt* 4113 & 4249; Charlton, near Ewarton, *Harris* 6695 (BM); Ferry River, *Harris* 11424 (BM). Without locality, *Swartz* (S, holotype*; BM, UPS, isotypes).

TRINIDAD. Woodbrook, *Broadway* 6927 (BM, K). Tobago, Gomez's Bay, *Eggers* 5493.

BRAZIL. R. Trombetas, *Spruce*. Belem, *Ruhlmann* 18214. Icou-Lau (?), beside the R. Javari, *Traill* 147. Matto Grosso, between Corumbá and Cuyabá, *D. Smith* 104 & *Moore* 1010 (BM).

COLOMBIA. Nare, *Holton*. Bolivar, Magangue, *Pennell* 3941. Santa Marta, *H. Smith* 283.

ECUADOR. Guayaquil, *Sinclair* (K, holotype of *G. oblonga*); *Spruce* 6354 (BM, K) & *Jameson* 572 (BM).

It is assumed that the three lines of synonymy given by Swartz under *T. volubilis*, which obviously refer to *T. uncinatus*, have become transposed (see Fawcett & Rendle, Fl. Jamaica 4: 49 (1920) for discussion).

2. **Teramnus labialis** (Linn. f.) Spreng., Syst. Veg. 3: 235 (1826).

Glycine labialis Linn. f., Suppl. Pl.: 325 (1781).

The typification of this species is crucial to an understanding of the genus as a whole. Fawcett & Rendle (Fl. Jam. 4(2): 49 (1920)) mention that there is a Koenig specimen in the herbarium of the British Museum (Nat. Hist.).

* An unnamed variant resembling subsp. *arabicus* will key here also.

In the Linnaean herbarium there are two sheets labelled *G. labiata* 901.15 and 901.16; the latter bears the name *tanmanni* crossed out and *labiata* added by J. E. Smith but the former has the letters HU (Hortus Upsaliensis) at the base of the stalk of the plant. The original description also contains the letters HU and, since the specimen 901.15 is in substantial agreement with the description, I am accepting it as the lectotype despite the slight change in the spelling of the epithet. Linnaeus filius does not mention Koenig's name under *G. labialis* whereas in species to either side he does. For use in connection with the photographs which are available the following is a short description of the lectotype for the guidance of those who may wish to subdivide *T. labialis*.

Stems slender, covered with half-adpressed white hairs. Leaflets pale, rounded-elliptic, up to 2 cm. long and 1.4 cm. wide, rounded or emarginate at the apex, almost glabrous above save for hairs on the midrib and a few other scattered hairs, adpressed white pubescent beneath. Inflorescences axillary clusters; pedicels up to 2 mm. long; bracteoles 0.75 mm. long. Calyx adpressed pubescent all over; corolla small. Pod linear, 4.2 cm. long, 2.5 mm. wide, adpressed pubescent; pedicel 3 mm. long. In 901.16 which is the same plant the seed is smooth. In most Indian material which I have referred to typical *T. labialis* the pod is wider, up to 4 mm. wide, the width in the type being less owing to immaturity.

The division of *T. labialis* into infraspecific variants is extremely difficult, and has been attempted only in order to give names to East African groupings, which appear different in the field, but are linked with each other when the species is examined on a world basis. Other variants have not been formally named. Their status will have to be decided by those working on the floras of the areas concerned. I have not seen the types of all the synonyms involved but where the pod indumentum is described there seems little doubt as to the identity. Dalzell describes his *Glycine warreënsis* as having a 4-fid calyx and diadelphous stamens but adpressed pod indumentum; the type has not been seen and is presumably in Calcutta.

Some Siamese specimens have the leaflets densely velvety beneath, e.g. Kerr 1531B and many also have the flowers in axillary clusters, the reticulation of these characters giving rise to some distinctive looking variants. The actual working out of infraspecific variants in this area does not come within the scope of this paper. *T. angustifolius* is, I feel, no more than a narrow-leafleted form which intergrades with the typical form in the Philippines. I have seen no material from Formosa.

2a. subsp. **labialis**

var. **labialis**

Glycine parviflora Lam., Encycl. 2: 738 (1786).

G. debilis Ait., Hort. Kew. 3: 34 (1789).

G. pentandra Spreng. in Schrad. Journ. Bot. 2(1 & 2): 197 (1802).

G. dolichoïdes Desv. in Ann. Sci. Nat., Bot. 9: 415 (1826).

Teramnus parviflorus (Lam.) Spreng., Syst. Veg. 3: 235 (1826).

?*Glycine warreënsis* Dalz. in Hook., Kew Journ. Bot. 3: 210 (1851).

Teramnus debilis (Ait.) Prain, Bengal Pl.: 393 (1903).

T. angustifolius Merrill in Philipp. Journ. Sc., Bot. 7: 83 (1912).

?*Glycine subonensis* Hayata, Ic. Pl. Formosa 9: 27 (1920).

Leaflets rounded or elliptic, often glabrous above but pubescent above in many specimens from the Philippines. Pods (2.5-)3-4 mm. wide, glabrescent or adpressed pubescent. Seeds smooth. Some of the material cited below matches the type in that at least some inflorescences are more or less sessile clusters but every intermediate links these with other specimens with longer inflorescences and in fact the great majority of sheets of *T. labialis* show elongated inflorescences. Baillon (Bull. Soc. Linn. Paris 1: 382 (1883)) includes *Galactia sericea* Pers. in the synonymy of *T. labialis*. A photograph of the type of the latter kindly sent from Paris shows that it is not a *Teramnus*—the pods are not turned up at the apex. The type is a Commerson specimen from Bourbon, No. 15173 in the Jussieu Herbarium, and also bears the name *Clitoria (phryne)*. This specimen is unfortunately not borrowable but appears to be closely similar to *Scott Elliot* 2465 from Fort Dauphin, Madagascar and wrongly named *Teramnus labialis*. I am content to leave the species in *Galactia* at present.

INDIA. Punjab: Sikh States, Ambala, *Edgeworth* 154; Punjab, *Drummond* 24608, 24609, 24610, 24618, 24628, 24629, 25354 & 26822. Uttar Pradesh: Moradabad, *Thomson* 367 (BM, K). Bihar: Plains of Behar, *Hooker*; Gya, *Clarke* 31813 (BM); above Monghyr on the Ganges, *Madden*; Bihar and Orissa, Japla, Palamau, *Haines* 2613. Bengal: Beaulah, *Clarke* 31869 (BM). Gujarat: Ahmadabad, *Saxton* 526. Madhya Pradesh/Maharashtra: Raj Nandgaon, *Haines* 3017. Maharashtra: Chanda District, *Duthie* 9459; Concan, *Law & Stocks* (BM, K); Bombay, *Gaburne*; *Dalzell**. Orissa: Patna, Turekela, *Mooney* 2415; Kalahandi, Morijuska in Kutiya-Kond Tract, *Mooney* 3230. Andra Pradesh: Godavani District, Samalcoltah, *Heyne*. Mysore: Belgaum, *Ritchie* 182; Kolar, *Bourne* 3580. Kerala: Travancore, *Lawson* 185. Madras, *Shuter*; *Thomson*; *Barber* 78; Tranquebar, *Roxburgh*; *Rottler*; Coromandel, *Koenig* (BM). Locality dubious: Bunda, *Edgeworth*; NW. Plains, *Falconer*; Damboul (? Ceylon), *Beckett*; Teynampet, Bishops Compound, *Bourne*; *Herb. Wight* 5508H, 5510C; sheet of elements of *Wallich* Cat. No. 5508 (BM, K); *Herb. Wight* 221, 738 & 877 (BM, K); Sirivaka, *Bourne* 3454; E. India, *Koenig* (BM, syntypes of *Glycine debilis* Ait.).

BURMA. *Wallich* 5508G. Meiktila, *Collett* 42. Upper Burma, *Huk* (BM).

E. PAKISTAN. Dacca, *Clarke* 6752, 7894 (BM).

CEYLON. Peradenia, *Gardner* 211 (BM, K). Jungle Nalande, *Simpson* 9230 (BM). Pahalaveva Dambulla Tank Margin, *Simpson* 9801 (BM). Without locality, *Thwaites* 1471, (BM pro parte, K).

PENANG. *Wallich* Cat. No. 5518 (BM, K) & 5519 (BM, K).

THAILAND. Sriracha, *Collins* 274 & 1698. Chiangmai, *Kerr* 1531B. Bangkok, *Marcen* 486 (BM, K) & *Kerr* 3871.

INDO-CHINA. *Thorel*.

VIETNAM. Saigon, *Godefroy-Lebeuf*.

INDONESIA. Java: W., road from Dago to Tjiburiah, *Holstvoogd* 278; without locality, *Horsfield* 125; Res. Kediri Gadoengan Paré, *Korders* 22835; Res. Semarang, Kedoengdjati, *Korders* 24925; SE. Java, *Forbes* 1230E (BM). N. Celebes, Gorontalo, *Riedel*.

PHILIPPINES. Luzon: Bontoc, *Vanoverbergh* 716 (BM, K, isotypes of *T.*

* *Dalzell* collected a series of all the variants of *T. labialis*; No. 8 has the upper calyx-lip entire and the pods 3 × 0.4 cm. It might be of hybrid origin—it certainly is not, as indeed *Dalzell* points out, typical *T. labialis*.

angustifolius); Ilocos, Bangui, *Ramos* in *P.B.S.* 27634 (BM, K); Peñablanca, *Ramos & Edaño* 46564 (BM); Manila, *Loher* 2314 & 2315 pro parte; *Herb. Mus. Petropol.*? 165; La Union, Bauang, *Fénix* in *P.B.S.* 12985 & *Elmer* 5586; Bataan, Mt. Mariveles, R. Lamao, *Williams* 268; Rizal, Bosoboso, *Ramos* 2050. Mindoro: Mansalay, Bo Manual, *Sulit* in *P.B.S.* 17068. Without locality, *Cuming* (BM, K).

NEW GUINEA. New Britain, 40 km. from Rabaul, S. Coast, Ulaveo Plantation, Kokopo, *Froggatt* 2.

MICRONESIA. Guam: Upi, *Bryan* 1268; 3.2 km. S. of Agat, near beach, *Rodin* 783.

MADAGASCAR. Central Madagascar, *Parker*.

RODRIGUES. *Balfour* (BM, K).

LOCALITY UNCERTAIN. Indes Orientales, *Sonnerat** (P, holotype of *Glycine parviflora*; K, photoholo).

var. A

Bujacia gampsonychia E. Mey., *Comm. Fl. Afr. Austr.*: 127 (1836).

Glycine meyeri Benth., *Comm. Leg. Gen.*: 62 (1837).

G. gampsonychia (E. Mey.) Walp. in *Linnaea* 13: 533 (1839).

This is scarcely different from the forms occurring in the Philippines. The stem is covered with a spreading ferruginous indumentum and the oblong or elliptic leaflets are pubescent above and below. The material from Madagascar scarcely differs.

MOZAMBIQUE. Maniamba, Malulu, Jessi Mt. (Jeci), *Pedro & Pedrógão* 4020 (EA).

SWAZILAND. Hlatikulu, Gollel, *Karsten*.

SOUTH AFRICA. Transvaal: Rustenburg, *Nation* 1904; Pretoria, *Leendertz* 460 & *Schlechter* 4148 (BM, K); Lydenberg, *Wilms* 366 (BM, K); Shilouvane, *Junod* 582 & 2390; Nelspruit, *Codd & de Winter* 5133 & *Acocks* 16664; Brits, *Mogg* 16679; Magaliesberg, *Schlieben* 7832; Kruger National Park, Pretoriuskop, *van der Schijff* 1477; Houtbosh, *Rehmann* 6244. Natal and Pondoland: Drège. Natal: Northdene, *Wood* 3183; Helpmekaar, Rorkes Drift, *Codd* 8242; Hlabisa, *Ward* 2407 & 1769; Umzimkulu, Clydesdale, *Tyson* 1443 & 2088 (BM, K); Drackensberg, *Cooper* 2249; without locality, *Gerrard* 1573 (BM, K). Cape Province: Kentani, *Pegler* 1443 (BM, K); Komgha, *Drège*; between Omtendo and Omsamculo, *Drège* (BM, syntype of *Bujacia gampsonychia*); Cape Town, Cape Flats, *Rehmann* 2113 (BM) (is locality correct?).

MADAGASCAR. Central Madagascar, *Baron* 3807, 2663, 2664, 2398 & *Parker*. NW. Madagascar, *Baron* 5524. Imeri mandroso, *Decary* 375 (BM, K, P).

2b. var. **acutus** *Verdc.*, var. nov. a var. *labialis* foliolis majoribus usque 7 cm. longis 4 cm. latis apice acutis differt.

[*T. labialis* sensu Hauman in *Fl. Congo Belge* 6: 103 (1954), pro parte; & sensu Hepper in *Fl. West Trop. Afr.*, ed. 2, 1: 573 (1958), pro parte, non (L.f.) Spreng. sensu stricto.]

This is a rather diffuse variety covering glabrescent West African plants

and more pubescent East African plants. It is mostly a forest variant and may be merely an ecological one.

SIERRA LEONE. Hanga, *N. W. Thomas* 7796.

LIBERIA. Vonjama District, Zigida, *Baldwin* 9994.

GHANA. Anum. *Morton* GC7993. 9.6 km. N. of Kumasi, *Morton* GC9682. 80 km. S. of Kumasi, *Morton* A2551. 6.4 km. beyond Senya Bereku, *Morton* GC7945. Kpeve Agricultural Station, *Irvine* 1742 (mixed with *Vigna* sp.). 6.4 km. beyond Akisuma, *Morton* GC7945. Roadside, Ejura Scarp, *Morton* A1552. N. of Nangodi, *Morton* A1265.

TOGO. Kpandu, *Robertson* 51 (BM).

NIGERIA. Lagos, *Millen* 114 pro parte & 61. Ibadan, *Jones & Keay* in *F.H.I.* 14228.

CAMEROUN. Bipinde, *Zenker* 4156, 4809 (K, holotype of variety; BM, isotype). Yaunde, *Zenker & Staudt* 593. 20 km. S. of Fort Foureau, near Nguouama, *Letouzey* 7127. 17 km. N. of Bertoua along road to Deng Deng, *Breteler, de Wilde & Leeuwenberg* 2420.

CONGO (KINSHASA). Oubangi, between Bulinga and Banzyville, *Lebrun* 2025 (BM, BR, K).

UGANDA. Mengo District: Bulemezi [Bulimezi], Luwero [Luwelo], *Maitland* 905; Kampala, Mutungo, *Chandler* 1485; Entebbe road, Kajansi Forest, *Chandler* 1240 (this sheet bears a remarkably close resemblance to the type of *T. mollis* from India, showing the plasticity of the genus); Mabira Forest, Mulange, *Dummer* 4108 (BM, K, US).

KENYA. Trans-Nzoia District: cultivated at Kitale from seed collected near Kisii, *Bogdan* 3982 (EA, K) & *Boonman* KL 37/51265 (EA, K) (probably belongs here).

Plants almost identical with those from Uganda have been found in Madagascar, e.g. *Baron* 2398. The leaflets are usually glabrous above and the variety grades with typical Indian var. *labialis*. In the Usambaras a trailing plant with very acute leaflets up to 6 cm. long and 2.5 cm. wide, pods with spreading hairs and smooth seeds perhaps represents an allied new variant but it has the facies of subsp. *arabicus*.

TANZANIA. Lushoto District: W. Usambaras, above Kwashemshi, *Peter* 48852 (B). Tanga District: Longuza [Longusa] rubber plantation, *Peter* 48589 (B).

2c. var. **abyssinicus** (*A. Rich.*) *Verdc.*, comb. et stat. nov.

Glycine abyssinica A. Rich., Tent. Fl. Abyss. 1: 212 (1847).

[*Teramnus axilliflorus* sensu Hauman in Fl. Congo Belge 6: 105 (1954), *pro parte, non* (Kotschy) Bak. f.]

[*T. repens* sensu Hauman in Fl. Congo Belge 6: 102 (1954), *pro parte, non* (Taub.) Bak. f.]

Much of the material of *T. labialis* from the highland areas of East and Central Africa is distinctive in facies and fairly well characterized by the leaflets being small, round or narrowly elliptic-oblong, glabrous above and the pods much narrower than in typical Indian var. *labialis*, 2–2.5 mm. wide. The seeds are smooth. A number of variants have been included under this general varietal name, some of which approach *T. uncinatus*, particularly its

subsp. *axilliflorus*, and no hard and fast characters can be given to distinguish them. Some of these minor variants are in their extreme forms quite distinctive but no more than populations which will at present interbreed with ease.

In East Africa var. *abyssinicus* is clearly distinct from subsp. *arabicus* and almost entirely occupies a different area of distribution, the latter being mainly coastal. Without a study of the world variation one would doubtless treat them as specifically distinct.

Typically var. *abyssinicus* has the stems with a rather adpressed pale indumentum; other specimens have a mostly spreading, pale ferruginous indumentum on the stems and the leaves, although glabrous above, are often quite densely covered with more or less adpressed, ferruginous hairs beneath. The pods have a sparse adpressed or sometimes denser, rather loosely adpressed, sometimes even velvety indumentum. No attempt has been made to sort out these variants which grade together imperceptibly.

CONGO (KINSHASA). Beni-Kasindi, *Lebrun* 4625. Lula, *Lebrun* 8192.

ETHIOPIA. Adowa, *Schimper* 1057 (P, lectotype; BM, K, isolectotypes). Nadda, *Mooney* 6221. 24 km. NW. of Harar, NE. of Lake Alemaya, *Berhe* 23. Tigre v Begemder, Memsach, *Schimper* 526 (BM, K). Saroe, Adi Ganá, *Pappi* 191 (? 248) (BM, K). Agherimariam, *Gillett* 14519. Eritrea, Mt. Savour, *Pappi* 5374 (EA).

UGANDA. Bunyoro District: Masindi, *Hazel* 283 (EA, K). Toro District: Semliki Flats, Sempayo-Kibuku road, *Liebenberg* 948. Ankole District: R. Ruizi, *Jarrett* 220 (EA, K). Kigezi District: Rukungiri, *Purseglove* 2903 (EA, K). Teso District: Kasilo, *Chandler* 307; Serere, *Chandler* 204 p.p. & 890. Mbale District: Bugisu [Bugishu], Budadiri, *Chandler* 507. Mengo District: Kampala, *Hargreaves* T1224; Kampala, Makerere Hill, *Chandler & Hancock* 148; W. Kampala, Kawanda, *Chandler* 1547; Victoria Nyanza Region, *Maitland* 127, 170; Banda, *Dummer* 430 (BM, K) & 970 (BM, K).

KENYA. Uasin Gishu District: Kipkarren, *Brodhurst-Hill* 407 (EA, K). Machakos District: Ol Doinyo Sabuk, *Birch* B59/123 (EA). Masai District: Olulunga Rest House, *Glover et al.* 1721 (EA, K).

TANZANIA. Arusha District: Mt. Meru, *Peter* 49905 (B).

ZAMBIA. Mumbwa, *Macaulay* 663. Solwezi District: R. Mwafue, *Milne-Redhead* 731. Mwinilunga District: Mwinilunga to Kabompo, km. 72, *White* 3341. Petauke District: hot spring near old boma, *Verboom* 681.

RHODESIA. Salisbury District: Henderson Research Station, *S.R.G.H.* 32732. Umtali, *Chase* 8414 (K, SRGH).

ANGOLA. Ambriz, near Mubango, *Welwitsch* 2213.

A further variant has smaller, broadly elliptic leaflets very similar to typical var. *labialis* but still with narrow pods. Part of *Teramnus repens* sensu Hauman in Fl. Congo Belge 6: 102 (1954) belongs here.

CONGO (KINSHASA). Kivu, Lake Edward, Vithumbi, *van der Ben* 282; Lake Kirwa, *Lebrun* 9401.

ETHIOPIA. Jimma area, Milan Teffari, *Siegenthaler* 1532 (EA, K).

UGANDA. Toro District: Bwamba, Hakitengya-Buyayu road, *Maitland* 1092; shores of Lake Edward, *G. Taylor* 2647 (BM); Bwamba, Busaru-Bubandi [Bubande] road, *Liebenberg* 907. Mbale District: Bugisu [Bugishu], Budadiri, *Chandler* 489. Mengo District: Kampala, *Chandler* 2424 & *Snowden*

708 (BM, K); Old Entebbe, *Harker* 491 (EA, K); Jumba, *Dummer* 3041 (BM, K).

TANZANIA. Moshi District: E. Kilimanjaro, Mrao [Mraw], *Haarer* 673 (EA, K); Kilimanjaro, Marangu, *Volkens* 2286. Arusha District: SW. Meru, *Haarer* 242 (EA, K). Buha District: Kasulu, Heru Chini, *Rounce* 35 (EA, K). Rungwe District: Bomala-Kitana, *Stolz* 915.

A fairly distinctive minor variant with a more marked spreading ferruginous indumentum on the pods closely resembles forms of *T. uncinatus* but has the pods narrower; it may be the result of hybridization. *Richards* 20142 cited below has two very similar shoots mounted together one with pods spreading pubescent, the other with them adpressed hairy.

CONGO (KINSHASA). Kisolo, Beni, *Gille* 132. Nioka, Aru, *Liben* 399.

UGANDA. Ankole District: Mbarara, *Harker* 53 (EA, K).

KENYA. Northern Frontier Province: Mt. Nyiro, *Kerfoot* 1920 (EA, K) (form with large, more broadly elliptic leaflets approaching var. *acutus*). Trans-Nzoia District: E. Elgon, Endebess, *Irwin* 137 (EA, K). S. Kavirondo District: Kisii, *Napier* 2993 in *C.M.* 5298 (EA, K).

TANZANIA. Mbulu District: Gt. North Road, Pienaars Heights, *Polhill & Paulo* 2332; Lake Manyara National Park, Endabash, *Greenway & Kanuri* 11320 (EA). Arusha District: Meru, near Ngongongare, *Peter* 49893 (B); Engare Nanyuki, *Peter* 49929 (B); Ngurdoto National Park, Lake Rashitany, *Richards* 20142 in part (EA, K). Moshi District: Ngare Nairobi, *van Rensburg* 583. Pare District: S. Pares, near Mbagu, *Peter* 49468*. Lushoto District: W. Usambaras, near Lushoto [Wilhelmstal], Jägertal, *Peter* 49662.

2d. var. **somalensis** *Vatke* in *Oesterr. Bot. Zeit.* 28: 261 (1878).

This plant has been synonymised with *T. uncinatus* subsp. *axilliflorus* (Kotschy) *Verdc.* but does not seem to have any affinities in that direction. The leaflets are very elongated with the veins leaving the midrib at almost a right angle; the indumentum is mainly white; pods with sparse spreading hairs and smooth pale seeds. It is geographically isolated and no further material has turned up. It may be a distinct species but is left at this rank for the present.

SOMALI REPUBLIC (N.). Meid, Serrus Mts., *Hildebrandt* 1389 (B, holotype of variety†; BM, K, isotypes).

2e. subsp. **arabicus** *Verdc.*, subsp. nov. a subsp. *labialis* seminibus granulatis non nitidis differt.

Glycine senegalensis DC., *Prodr.* 2: 242 (1825).

The leaflets are nearly always adpressed pilose above and the pod is adpressed pilose save in a few uncommon variants. The position of several West African populations is not at all certain owing to a lack of ripe fruits. These are mentioned at the end. Subsp. *arabicus* has the pods about 3.5 mm. wide, thus resembling typical subsp. *labialis* var. *labialis*. It is possible that the occurrence of this subspecies in America is due to accidental introduction

* Peter numbers not followed by a herbarium abbreviation are at both Berlin and Kew.
† Specimen believed to have been destroyed.

from the coastal parts of East or West Africa. Some specimens may resemble *T. uncinatus* subsp. *andongensis* but in general *T. labialis* and its variants have much longer pedicels. The stem and inflorescence indumentum varies from closely adpressed and sparse to dense and spreading but intermediates render it inadvisable to further subdivide the subspecies at this stage. Since exactly parallel forms occur in both East and West Africa varietal status is indicated.

ARABIA. Fatme near Unsert, *Schimper* 900 (*Kennedyia arabica* Hochst. & Schimper, *nomen*) (K, holotype of subsp.).

SENEGAL. Pays de Walo, *Perrotet* 222 (BM, isotype of *Glycine senegalensis*).

MALI. Kara, *Davey* 193.

GHANA. Labadi, *Morton* A1745. Achimota, *Irvine* 4789. Tema, *Morton* A989.

PRINCIPE. S. Antonio, R. Papegaio, *Monod* 12068 (BM). Without locality, *Barter*.

S. TOME. Praia Melão, *Monod* 12288 (BM).

ANNOBON. Towards Pico de Fogo, S. of Ambo, *Melville* 109 (BM).

SUDAN REPUBLIC. Blue Nile Province: Geziret el Fil, *Andrews* 101; Sennar, Karkoj, *Brown* 730; Kordofan: Nuba Mts., Wadelka, *Andrews* 220; Mulbas, *Kotschy* 300 (BM, K). Equatoria: Bahr el Ghazal, (?) Kitt, *Schweinfurth* 1264 (BM, K).

UGANDA. Acholi/Bunyoro District boundary: Paraa, *Harker* 644 (EA) (? small leaved and atypical, lacking ripe pods).

KENYA. Machakos District: Kiboko, *Bogdan* 2343. Lamu District: Lamu to Witu, *Whyte*. Kilifi District: 1.6 km. W. of Garashi, *Moomaw* 917 (EA). Kwale District: Ukunda, *Symes* 179 (EA).

TANZANIA. Mbulu District: Lake Manyara National Park, Endabash, *Greenway* & *Kanuri* 11318 (EA, K) & 11320 (K)*. Lushoto District: Makumba to Korogwe, *Peter* 49150 (B, K); near Mashewa, *Peter* 49058 (B); T.T.C. site, *Archbold* 51; Amani to Derema [Nderema], *Grote* in *E.A.H.* 5618 (EA, K); Fanusi, *Zimmermann* in *E.A.H.* 5929 (EA, K); R. Pangani near Korogwe, *Peter* 49772 p.p.; Amani, Kiumba, *Greenway* 3930 (EA, K). Tanga District: Tengeni, *Greenway* 1943 (EA, K) & *Peter* 49523 (B); Muheza, *Milne-Redhead* & *Taylor* 7274 (EA, K); Mlingano Sisal Research Station, *Grundy* L77†, L49 (EA, K); Sawa, *Faulkner* 2011; Kigombe Beach, 11.2 km. NE. of Pangani, *Drummond* & *Hemsley* 3326 (EA, K); Nyika, Bariti to Tanga, *Peter* 48525 (B); R. Sigi, forest below Longusa, *Peter* 48585; Longusa to Magrotto, Mt. Mlinga, *Peter* 48634 (B); Sigi to Mpandeni [Pandeni], *Peter* 48734 (B). Pangani District: Bushiri Estate, *Faulkner* 658 (EA, K). Bagamoyo District: Saadani, *Peter* 48972 (B). Uzaramo District: Dar es Salaam, Mbagaza Sec, *Peter* 44936. Zanzibar: Massazine, *Faulkner* 2480; Ndgaa road, R. O. *Williams* 85; Fumba, *Oxtoby* 16; Mwera Swamp, *Vaughan* 1712; without locality, *Hildebrandt* 958 (BM, K) (a form with oblong leaves); Pemba, Chake Chake, *Vaughan* 497 (EA, K).

MOZAMBIQUE. Niassa, between Meconta and Nampula, 23 km. from Nampula, *Pedro* & *Pedrogão* 3179. Sul do Save, between Boane and Moamba, 34.9 km. from Moamba, *Myre* & *Carvalho* 1308.

ZAMBIA. Katondwe, *Fanshawe* 8295. Mpika District: Luangwa Valley, M'fuwe Game Camp, *Verboom* 810.

* EA duplicate is subsp. *labialis* var. *abyssinicus*.

† Originally from Lindi District: Lukuledi Valley.

RHODESIA. Mazoe District: cultivated at Henderson Research Station (indigenous to area), *Wild* 3830. Ndanga District: N. side of R. Lundi, Chipinda Pools area, *Goodier* 796.

MADAGASCAR. Nossi Bé, *Hildebrandt* 2887 (BM, K).

COMORO Is. Johanna, *Hildebrandt* 1590 (BM, K) & *Bojer*. Mayotte, *Boivin*.

SEYCHELLES. Mahé, *Lionnet* 1 & *Dupont* 2. La Digne, *Horne* 295 & 477. Without locality, *Wright* (BM).

MAURITIUS. Port Louis, *Bouton*; *Johnston*. Pamplemousses, *Bouton*. Without locality or locality not decipherable: *Bojer*; *Bouton*; *Ayres*.

RÉUNION. St. Benoit, *de l'Isle*; without locality, *Balfour*.

JAMAICA. Black River, *Harris* 9923 (BM); Ferry River, *Harris* 10040 (BM, K); St. Elizabeth, *Sangster* 508 (BM); Old Harbour, *Ridley*. Without locality, *MacFadyen*.

HAITI. Port-au-Prince, *Ekman* 9254.

VIRGIN Is. St. Thomas, *Eggers* (BM).

LEEWARD Is. Tortola: *Fishlock* T153 & T276. Antigua: *Donovans*, *Box* 958 (BM); *Sandersons*, *Box* 1014 (BM).

WINDWARD Is. St. Lucia: *Velez* 3327A. St. Vincent: *Squire*; *H. H. & G. W. Smith* 1042. Barbados: *Welchman's Hall Gully*, *Sandwith*.

TRINIDAD. Tobago: Milford Main road, *Freeman & Williams* in *T.H.* 11453; Government Farm, *R. O. Williams* in *T.H.* 12218; Government House, *R. O. Williams* in *T.H.* 12108; Store Bay, *Sandwith* 1825; Botanic Station, *Broadway* 9051 (BM); Highmoor, *Broadway* 3060 (BM). Trinidad: Reform, *Broadway* 8904 (BM); Botanic Station, *Broadway* 9 (BM).

GUYANA. Georgetown, *Kortwright*.

There are a number of West African sheets that probably belong here—Senegal (a 'Roger Dedit' sheet 89—authentic specimen of *Glycine senegalensis* DC.); Senegambia (? *Heudelot* 114—a drawing on the sheet indicates a 4-fid calyx but this could not be checked from the material available); Galam (*Heudelot*; *Guillemin* 1839); N. Nigeria: *Bauchi* (*Lely* 632); S. Tomé (*Moller*); Annobon (*Burton*); Ghana: *Achimota* (*Milne-Redhead* 5167), *Accra Plains* (*Irvine* 3028; *Rose Innes* GC30075). These sheets also come very close to South African material and to Philippine material. H. & M. Stehlé (Fl. Agron. des Antilles Françaises, 3, F. des Légumineuses et Anti-Erosion: 78 (1960)) also records it from Guadeloupe, Grand Terre and Martinique.

An uncommon variant of subsp. *arabicus* has spreading hairs on the pods.

UGANDA. Karamoja District: *Namalu*, *Wilson* 1707 (EA). Teso District: *Serere*, *Chandler* 614.

TANZANIA. Mbulu District: *Tarangire*, *Mahinda* 454 (EA, K); rift wall estate W. of Lake Manyara, *Frahm Leliveld* 62130; *Karatu*, *van Rensburg* 196 (EA). Moshi, *Haarer* 595 (EA, K). Lushoto District: *Magunga*, near *Korogwe*, *Peter* 48684 (B, EA, K). Tanga District: *Maramba*, *Mwele* to *Tanga*, *Peter* 48489, 48517 (B, EA, K). Morogoro District: 41.6 km. NE. of Morogoro, 2.4 km. NE. of *Kitulanghalo Hill*, *Welch* 611 (EA, K).

Some of these are scarcely different from *T. repens* subsp. *gracilis* and are possibly the result of hybridization.

A rather well-marked variant resembling subsp. *arabicus* in leaf-shape, inflorescence and indumentum but having spreading hairs on the pods and

some of the facies of *T. uncinatus* (L.) Sw. is also recognized. It might be of hybrid origin. The following three specimens have been examined.

ZAMBIA. South: Mazabuka District, Monze to Magoye, km. 31, *White* 7256 (FHO, K).

RHODESIA. North: Gokwe, on road from Gokwe to Copper Queen, *Bingham* 946 (K, SRGH). East: Inyanga, Cheshire, *Norlindh & Weimarck* 4793 (K, LD).

3. ***Teramnus repens*** (*Taub.*) *Bak. f.* in Journ. Bot. 66, Suppl. 1: 115 (1928).

Glycine repens Taub. in Engl., Pflanzenw. Ost-Afr. C: 220 (1895).

This has a distinctive prostrate habit and almost round leaflets; the pods nearly always have a spreading indumentum, but in Zambia, specimens have been found with almost adpressed hairs (*e.g. Robinson* 911). There is little difficulty in maintaining this species if Africa alone is considered but in India the position is different, *T. mollis* being close. The calyx character is not entirely constant; *T. mollis* usually has the upper two teeth entirely joined but sometimes they are partially joined to form a bifid lobe. Leaf shape also varies immensely. Material from India has not been adequate to reach a decision but what I am calling *T. repens* in Africa certainly occurs in India. I am maintaining two subspecies based on seed characters.

3a. subsp. **repens**

Seeds smooth, pale.

BURUNDI. Bugesera, Buhuha, *Liben* 1163.

RWANDA. Gabiro, *Lebrun* 9567 (BM, BR, K).

UGANDA. Bunyoro District: Bulisa [Bulesa], *Purseglove* 1097 (EA, K); Butiaba, *Mearns* 2754 (US). Toro District: Ruwenzori, Muhokya, *Maitland* 1045. Kigezi District: Queen Elizabeth Park, Ishasha R. camp, *Symes* 701 (EA, K). Teso District: Bukedea, *Harker* 24 (EA).

KENYA. Mt. Elgon foothills, cult. at Kitale, *Strange* 162 (EA).

TANZANIA. Bukoba District: R. Kagera, Kavingo, *Stuhlmann* 2000 (B, holotype†; BM, fragment); Karagwe, near Mabira, *Haarer* 2215 (EA, K). Buha District: Kasulu, Heru Chini, *Rounce* 15 (EA, K).

ZAMBIA. Lusaka District: 19.2 km. S. of Lusaka, Mt. Makulu Research Station, *Angus* 1298 (EA, K), *Verboom a & van Rensburg* 3093 (BM, K). 19.2 km. N. of Choma, Muckle Neuk, *Robinson* 911. Mumbwa, *Macaulay* 393.

RHODESIA. Marandellas, Grasslands Research Station, *Corby* 978.

ANGOLA. Cuanza Sul, Seles, *Gossweiler* 9309 (BM, COI, K). Cuanza Norte, Quizenga, *Gossweiler* 6340 (BM, COI). Huila, *Capello & Ivens* 26 (some of these have roughish seeds).

3b. subsp. **gracilis** (*Chiov.*) *Verdc.*, comb. et stat. nov.

T. gracilis Chiov. in Ann. Inst. Bot. Roma 8: 432 (1908).

[*T. labialis* var. *mollis* sensu Balf. f. in Trans. Roy. Soc. Edinb. 31: 82 (1888), non (Benth.) Bak.*]

* Balfour's citation of *Kennedyia arabica* Hochst. & Steud. (*nomen*) as a synonym is not correct.

Seeds rough.

The typical form of this is certainly very different from the type of *T. mollis*, particularly in leaflet shape, but further work may show that the two are not specifically distinct. East African material has distinctly more oblong leaflets than the types but there is much variation.

INDIA. Bombay, *Dalzell*.

AUSTRALIA. Cultivated at Canberra from seed collected in Tanzania, Lake Manyara, *Morgan* in *CPI* 32705 (seeds not ripe and placing not certain).

SOCOTRA. Tamarid, *Schweinfurth* 287. Galonsir, *Balfour* 143, 243 (BM, K).
Jebel Rughid, *Smith & Lavranos* 587.

COMORO Is. Mayotte, *Boivin*.

CONGO (KINSHASA). Parc National Albert, Katanda, *Lebrun* 7535.

SUDAN REPUBLIC. Bahr el Jebel, W. channel, Sheik Tombe, *H. M. & A. F. Broun* 1446.

ETHIOPIA. Eritrea: Dahlak Archipelago, *Terracciano* 739† (FI, syntype of *T. gracilis*); Assaorta, Henrob, *Pappi* 60 (FI, syntype of *T. gracilis*); Ingal-Ras Koral, *Terracciano* 16 (FI, syntype of *T. gracilis*); Amasen, Pianura di Sabarguma, *Pappi* 4057 (FI, syntype of *T. gracilis*).

KENYA. Kwale District: S. of Mombasa to Shimoni, *Whyte* (BM).
Mombasa District: Likoni, *Thorold* 1574. Kilifi District: Kilifi, Mfumbini, *Jeffery* K235 (EA, K); Malindi, Sabaki Bridge, *Rawlins* 848 (EA, K); Malindi, *Tweedie* 1015, 3142 & *Bogdan* 2559. Lamu District: Tangawanda, *Rawlins* 89 (EA, K); Witu area, *Rawlins* 63 (EA, K); Utwani Forest Reserve, Mambasasa, *Greenway & Rawlins* 9355 (EA, K).

TANZANIA. Tanga District: Sawa, *Faulkner* 2183 & 3855; Tanga-Pangani road, Machui, *Faulkner* 1658 (EA, K) & 3519; Kange, *Faulkner* 817 & 2098; Kigombe to Tangata, *Peter* 39737 (B). Bagamoyo District: lower path, Ruvu to Saadani, *Peter* 44698. Uzaramo District: Ruvu Estate, *Grundy* L83 (EA, K) & *Rykebusch* 126 (EA, K); Dar es Salaam, *Revell* 129. Zanzibar: Mbweni, *Vaughan* 1055 (EA, K); Migombani, *Vaughan* 1099 (EA, K).

LOCALITY NOT TRACED. ? Togodele, *Ehrenberg*.

4. ***Teramnus mollis* Benth.** in *Journ. Linn. Soc., Bot.* 8: 265 (1865), *non Glycine mollis* Wight & Arn., *Prodr. Fl. Ind. Or.*: 209 (1834).

Wight & Arnott distinctly describe the pods of their *Glycine mollis* as adpressed pubescent and the Wallich collection sheets they cite support this. Bentham describes a different plant with patently pilose pods and I am treating his name as a new name with a new type and not as a transference of Wight and Arnott's epithet. This is, I feel, permissible, because after citing their name Bentham adds *ex parte* and this can be assumed to exclude their types which he agrees are but forms of *T. labialis*.

The combination of long spreading hairs on the pod, roughened seeds and often only 4-fid calyx, due to the complete fusion of the two upper calyx-teeth, render this plant easy to distinguish, but the status is not easy to decide. A few intermediates with *T. labialis* occur in the Bombay area and small-leaved specimens are very similar indeed to *T. repens* subsp. *gracilis*. The matter is complicated by the fact that the lectotype is somewhat different from the rest of the Indian material. The species needs study in

† 736 cited in original paper of Chiovenda is an error.

India but since typical *T. mollis* does not occur in Africa I have not pursued the matter further. The seeds frequently have a thin membranous keel and C. B. Clarke remarks 'seeds black with a green line round'.

INDIA. Uttar Pradesh: Saharanpur, *Edgeworth* 152; Moradabad, *Thomson*. Gujarat: Saurashtra, Gurnar, *Raizada* 21184; Gir, R. Hiran, *Raizada* 22782. Maharashtra: Bombay, *Dalzell*. Orissa: Kalahandi, Lanjigarh, *Mooney* 3237. Mysore: W. Ghats, Castle Rock, *Bell* 4324; Tambachury Ghat, ? Wynadd, *Beddome* (BM); Belgaum, Chulu Hill, *Ritchie* 1043 (long-leaved variant). Andra Pradesh: R. Godavari, Kortur, *Barber* 5157. Madras: Courtallum, *Herb Wight* 222 (K, lectotype). Without definite locality or not traced: NW. India, *Royle*; Sikh States, ? Jayadhr, *Edgeworth* 154; Parwur Ghat, *Ritchie* 1043 (long-leaved variant); Brumagiri Hills, *Beddome*; Ind. or, *Rupel* (BM).

E. PAKISTAN. Dacca, *Clarke* 8132; ? Dhaka, *Clarke* 16734.

CEYLON. A plant grown from Ceylon seed, flowered Dec. 1847, *Herb. Hooker*. Without locality, *Walker, Moon* 1819 (BM) & *Thwaites* 1471 (BM p.p.).

BURMA. *Wallich* Cat. No. 5508H.

INDONESIA. Lombok, *Rensch* 167 (acuminate leaflets rather like *T. flexilis*). Java, Surokirto, *Horsfield* (BM, mixed with *labialis*).

5. ***Teramnus flexilis* Benth.** in Journ. Linn. Soc., Bot. 8: 265 (1865); Prain in Journ. Asiatic Soc. Bengal 66: 412 (1897).

I am at a loss to understand Prain's remarks on this species. He claims that *T. oxyphyllus* (Benth.) Kurz (based on *Galactia oxyphylla* Benth.) is undoubtedly a *Teramnus* and differs only from *T. flexilis* in its shorter racemes. I can only assume that he examined material quite different from Bentham's type since even at a glance it is obvious that the two names refer to very different species. *T. flexilis* has flowers barely 5 mm. long with short deltoid pubescent calyx-lobes 1-1.5 mm. long whereas the flowers of *Galactia oxyphylla* are just over 1 cm. long with longer lanceolate bristly calyx-lobes 4-7 mm. long; in the former the leaves are much less hairy. No pods are available of *G. oxyphylla* at Kew, where it is still only represented by two old sheets seen by Bentham, though doubtless some may be lurking elsewhere, but a dissection of one of the few flowers showed that all ten anthers are fertile, the style is equal in length to the ovary and the stigma is large and peltate; these characters rule it out of *Teramnus*. Despite the lack of fruits I feel its affinity is with '*Dolichos lagopus* Dunn, which has the above characters and also very similar pollen grains; this species has nothing to do with *Dolichos* L. and a further discussion of this matter will be given in my account of the generic delimitation of that genus in a later paper.

T. flexilis is closely allied to *T. labialis*, differing only in its larger mostly more acuminate leaves and longer, broader pods.

INDIA. Manipur, Jhirighat, *Meebold* 6320. Assam, *Jenkins* (K, syntype of *T. flexilis*).

E. PAKISTAN. Dacca, *Clarke* 4261. Chittagong, *Clarke* 19738 (BM, K); Khan 594 & *Hooker f. & Thomson* (BM, K). Sylhet, *Wallich* Cat. No. 5521 (K, syntype of *T. flexilis*, BM, K-W, isosyntypes), & *Hooker f. & Thomson*.

BURMA. Martabania, *Wallich* Cat. No. 5508b pro parte.

THAILAND. Chiengmai, Nù Têng, *Kerr* 4473.

6. **Teramnus uncinatus** (L.) Sw., Prodr. Veg. Ind. Occ.: 105 (1788).

Dolichos uncinatus L., Sp. Pl., ed. 2: 1019 (1763).

This is a widespread species in tropical America and Africa, easily distinguished in the New World from the other two species occurring there by the ferruginous furry indumentum. Hauman in Fl. Congo Belge comments on the extreme closeness of '*T. andongensis*' and *T. uncinatus* and I have found that, if members of the '*T. andongensis*'-*T. axilliflorus* complex are laid out mixed with American material it is almost impossible in the case of some intermediate material to tell from which country they originated. There is, nevertheless, a general difference in facies due chiefly to the shape of the leaflets and colour of the indumentum. I have therefore kept up three subspecies. There is, however, an unfortunate complication; although the name *andongensis* has long been in use for the common African taxon, an examination of the type shows that it has leaflets closely similar to typical *T. uncinatus* and is not representative of the African plant, which has narrow mostly oblong leaflets. I have therefore reluctantly made use of a synonym for this subspecies. *T. andongensis* must be considered an atypical form intermediate with the South American subspecies.

6a. subsp. **uncinatus**

Glycine angulata Desv. in Journ. de Bot. 3: 78 (1814).

Teramnus botrydium Schott in Wien Zeitschrift 4: 1216 (1830).

Glycine botrydium (Schott) Walp., Rep. 1: 760 (1842).

G. discolor Mart. & Gal. in Bull. Acad. Brux. 10(2): 190 (1843).

G. elliptica Mart. & Gal., l.c. (1843).

G. uncinata (L.) Macbride in Publ. Field Mus. Nat. Hist., Bot. 13(3): 350 (1943).

In this subspecies the leaflets are mostly elliptic with rounded sides and the indumentum ferruginous. The inflorescence is, in certain plants, reduced to a subsessile head, as is also the case in the African subspecies; the pods are mostly rather longer than in African material but the indumentum may be spreading or adpressed. Numerous sheets have been seen from Mexico, El Salvador, Costa Rica, Panama, Cuba, Jamaica, Haiti, S. Domingo, Puerto Rico, Colombia, Venezuela, Peru, Brazil, Bolivia and Paraguay.

True subsp. *uncinatus* has also been cultivated in Rhodesia (Marandellas, Corby 993) and in Kenya (Kitale, Bogdan 3862 (EA, K)). The holotype is specimen 900.3 in the Linnaean Herbarium; this was sent from Jamaica to Linnaeus by Patrick Browne.

6b. subsp. **axilliflorus** (Kotschy) Verdc., comb. et stat. nov.

Glycine axilliflora Kotschy in Sitzb. Akad. Wiss. Wien 51: 366 (1865).

G. gillettii De Wild. in Ann. Mus. Congo Belge, Bot. sér. 5, 5(1): 150 (1904).

G. reducta De Wild. in Rev. Zool. Afric. 12, suppl. Bot.: 16 (1924).

Teramnus axilliflorus (Kotschy) Bak. f., Leg. Trop. Afr.: 364 (1929).

T. gillettii (De Wild.) Bak. f., *op. cit.*: 365 (1929).

This is extremely close to subsp. *uncinatus* but differs in the narrower oblong leaflets. From subsp. *ringoetii* it differs in the presence of a mixture of white and pale ferruginous rather than dark blackish-brown hairs on the

calyx. The inflorescence is more usually a subsessile cluster than in either of the other subspecies and the leaves are more silvery. There are, however, numerous intermediates showing alternative combinations of characters. Some specimens show a strong resemblance to *T. labialis* var. *abyssinicus* and are scarcely distinguishable.

SENEGAL. Niokolo-Koba, *Berhaut* 4462.

SIERRA LEONE. Musaia, *Deighton* 4422.

GHANA. Wenchi area, Banda village, *Morton* GC25302.

NIGERIA. Abinsi, *Dalziel* 589. Lake Chad area, Lassa, *Royer* 101 (BM). R. Benue, *Talbot* (BM). (The last two have the long inflorescences of subsp. *ringoetii*.)

CONGO (KINSHASA). Kisantu, *Gillet* (BR, holotype of *Glycine gilletii*). Rutshuru, *Bequaert* 6232* (BR, holotype of *G. reducta*).

SUDAN. Equatoria, Shillick District, Ajab, *Binder* 1 (W, holotype of *Glycine axilliflora*).

UGANDA. Bunyoro, *Grant*. Teso District: Serere, *Chandler* 23 & 791. Without locality, *Liebenberg* 962.

TANZANIA. Buha District: Kasulu, Heru Chini, *Rounce* 29 (EA, K). Lushoto District: Korogwe, *Archbold* 949. Tanga District: E. Usambaras, Tengeni, *Peter* 49518. Ufipa District: W. Rukwa, Kinambo, Kipompo Swamp, *Michelmores* 1595; N. Rukwa, *Robinson* 1666 (this is a form very similar to *T. labialis* but depauperate).

ZAMBIA. Fort Jameson area, *Verboom* 499.

ANGOLA. Golungo Alto, R. Cuango, near Ndele, *Welwitsch* 2188 (BM, K).

6c. subsp. **ringoetii** (*De Wild.*) *Verdc.*, comb. et stat. nov.

Glycine andongensis Bak. in *Fl. Trop. Afr.* 2: 179 (1871).

G. ringoetii De Wild. in *Fedde, Rep. Sp. Nov.* 12: 295 (1913).

G. lanceolifoliata De Wild. in *Rev. Zool. Afric.* 12, suppl. Bot.: 12 (1924).

Teramnus andongensis (Bak.) Bak. f. in *Journ. Bot.* 66, Suppl. 1: 115 (1928).

T. lanceolifoliatus ('*lanceolifoliolatus*') (De Wild.) Bak. f., *Leg. Trop. Afr.*: 364 (1929).

This is usually clearly distinguishable by its narrowly oblong leaflets and very dark indumentum on the calyx, but intermediates are too frequent to maintain it as a distinct species and unfortunately the type of *andongensis* has rounded elliptic leaflets. In some specimens it seemed that there were distinct floral differences between this and subsp. *uncinatus*. In the latter the calyx-lobes are often narrower and longer, the vexillum more abruptly narrowed into the claw and the wings less spatulate distally; the pods are also usually spreading hairy. A survey of all the available material shows that none of these is a constant character. That Harms agreed with uniting *T. uncinatus* and *T. andongensis* is shown by the fact that he cites *Lindblom* s.n. from Mt. Elgon, Kitosh as *T. uncinatus* and gives the distribution as tropical America and Africa (*Notizbl. Bot. Gart. Berl.* 10: 85 (1927)). Similarly Rossberg (*Fedde, Rep. Sp. Nov.* 39: 164 (1936)), records *T. uncinatus* from Angola; Malange, Bondo, Quela, *Nolde* 403 (B†) which Torre (*Consp. Fl. Angol.* 3: 247 (1966)) includes as an imperfectly known species. *Glycine vanderystii* De Wild. which E. G. Baker (*Leg. Trop. Afr.*: 364 (1929))

suggests is a *Teramnus* close to *T. lanceolifolius* is actually *Eriosema vanderystii* (De Wild.) Hauman, previously better known as *E. velutinum* Bak. f. & Haydon.

SIERRA LEONE. Jigaya, *N. W. Thomas* 2689. Musaia, *Deighton* 5704 & 4872. Near Kuruboula on path to Seredu and Loma Mts., *Morton* SL2519.

GHANA. Pawpaw Mt., Nkwanta Krachi, *Morton* A3722 (intermediate between subsp. *axilliflorus*).

NIGERIA. Bauchi Plateau, *Lely* 721 (elliptic-leaved variant). Jos Plateau, *Batten-Poole* 140. Zaria, Kujama, Afaka Forest Reserve, *Olorunfemi* in *F.H.I.* 55060.

CAMEROUN. Adamawa Plateau, *Breteler* 353. 20 km. WNW. of Tibati, *Letouzey* 5793. 20 km. NNW. of Mokolo, near Loubam, *Letouzey* 6805. Kounden, *Saxer* 257. 30 km. ENE. of Bagodo, *Letouzey* 7530. 35 km. NNE. of Bafia, Nyandingi, *Letouzey* 7858. 35 km. WNW. of Linte, *Letouzey* 8000.

CENTRAL AFRICAN REPUBLIC. 69 km. W. of Yalinga, Bambélé, *Le Testu* 3171 (BM).

CONGO (KINSHASA). Lubumbashi [Elisabethville], Lubumbashi Valley, *Robyns* 1610. Upper Katanga: Shinsenda, *Ringoet* in *Homblé* 466 (BR, holotype of *G. ringoetii*). S. of Thysville, M'vuazi, *Devred* 1148. About 18 km. E. of Dungu, *Keay* K40 (BM, K). Orientale, Aru, *Froment* 129. Irumu, *Bequaert* 2865 (BR, holotype of *G. lanceolifoliata*).

RWANDA. Parc National Kagera, Mt. Kiburara, *Lebrun* 9749.

UGANDA. West Nile District: Aka, behind Paida Dispensary, *Chancellor* 198 (EA, K). Acholi District: Rom, *Liebenburg* 235. Toro District: Kichuamba [Kichwamba], Kitakwenda, *Bagshawe* 1219 (BM). Ankole District: Ibanda, *Thornton* 33 (EA); Rwashamaire [Lwasamaire], *Snowden* 1659B; Rwampara, Bugamba, *Harker* 258 (EA, K). Kigezi District: Nyakagyeme, *Purseglove* 2083 (EA, K). Teso District: Serere, *Maitland* 1194 & *Chandler* 697 (EA, K). Mbale District: Bugisu [Bugishu], Sipi, *A. S. Thomas* 407. Masaka District: Buddu, *Brown* 130. Mengo District: Banda, *Dummer* 430; Bulemezi [Bulimuzi], Luwero [Luwelu], *Maitland* 897; N. Mengo, Wakyato to Ngoma, *Langdale Brown* 2274 (EA, K).

KENYA. Trans-Nzoia District: Kitale, *Bogdan* 3564 (EA, K); Kitale, Mabaonde, *Tweedie* 1340. Elgeyo District: Marakwet, *Brodhurst Hill* 271. Masai District: Chyulu Hills N., *Bally* 366, 385 in *C.M.* 8246 (EA, K) (variant with small leaves but calyx characteristic).

TANZANIA. Bukoba District: Kabirizi, *Haarer* 2284 (EA, K); Bukoba, *Lind* 2376; Masaka-Bukoba road, 6.4 km. within the Tanganyika border, *Norman* 71; Bunazi, *Gillman* 490 (EA). Ngara District: Muganza, Rusengo, *Tanner* 4750. Buha District: Mbirira [Birira] to 'Manyoni See', *Peter* 46302 (B); Mbirira [Birira] to Kisuzi [Nisusi], *Peter* 37883 (B). Kigoma District: Ujiji, R. Mkuti to Msosi, *Peter* 37198 p.p.; Uvinza [Uvinsa], *Peter* 36466 (B). Ufipa District: Kasamvu, *Bullock* 2700 (BM, K); Sumbawanga, Chapota, *Richards* 8504; Memya Mt., *Bullock* 3681; Lake Kwela, *Richards* 12154. Mbeya, *Davies* D86, 429 (EA, K). Rungwe District: Rungwe, *Davies* D45 (EA, K); Kyimbila, *Stolz* 845 (BM, K); Mwasukulu, *Stolz* 669 (BM, K). Songea District: Matengo Hills, Miyau, *Milne-Redhead & Taylor* 8798, 8798A (EA, K).

MOZAMBIQUE. Zambezia, between Muobede and Tacuana, 3 km. from Muobede, *Barbosa & Carvalho* 2843.

MALAWI. North: Mzimba, *G. Jackson* 1290 (BM, EA, K). South: Shire Highlands, *Buchanan* 432; Zomba, *Salubeni* 284 (K, SRGH). Unlocalized, *Buchanan* 333 (US).

ZAMBIA. North: Mbala [Abercorn], *McCallum-Webster* 853; Kalambo Farm, Sabi Valley, *Richards* 5099; Lumi marsh, *Richards* 4374. West: Kitwe, *Fanshawe* 2309, 10094 & *Mutumushi* 1322; Luano, *Fanshawe* 9639. South: Mumbwa, *Macaulay* 784; Mazabuka, *van Rensburg* KBS1585.

RHODESIA. East: Nyumquarara Valley, *Gilliland* 1584 (BM); Chirinda, *Swynnerton* 442, 1437 (BM); Umtali, Inyamatshira Mt., *Chase* 5977 (BM, K); Melsetter, Black Mountain Inn, *Corby* 1105; Haroni R., near Dragon's Tooth, *Hall* 483 (BM, SRGH).

ANGOLA. Pungo Andongo, near Luxilo, *Welwitsch* 2189 (LISU, holotype of *G. andongensis*; BM, isotype). Cazengo, Dalatondo, *Gossweiler* 5528 (BM, COI).

Robinson 3474 (Zambia: Solwezi) is a form or perhaps even a hybrid of subsp. *ringoetii* with very small leaflets about 2 cm. long and 4–7 mm. wide but with the dark blackish indumentum on the calyx.

7. ***Teramnus micans*** (*Bak.*) *Bak. f.* in Journ. Bot. 66, Suppl. 1: 115 (1928); Hauman in Fl. Congo Belge 6: 103 (1954).

Glycine micans *Bak.* in Fl. Trop. Afr. 2: 179 (1871).

This is a robust climber with the stems conspicuously angled, or almost winged in the typical variety. The leaflets are elliptic-rhomboid or broadly elliptic, usually thickly hairy beneath. The lower part of the calyx-tube is frequently much less hairy than the calyx-lobes, or even glabrescent. Even here, however, there is a gradation to the large-leaved forms of *T. labialis* on the one hand and broader leaved forms of *T. uncinatus* on the other.

Hauman has divided the species into three varieties and these seem quite distinctive in their typical states.

7a. var. ***micans***

Stems robust and angular. Leaflets distinctly rhomboid. Corolla usually orange but sometimes blue.

PORTUGUESE GUINEA. Bafatá, *Santo* 2971.

SIERRA LEONE. Yonibana, *N. W. Thomas* 4698 & 5101. Musaia, *Deighton* 4543. Sefadu, *Deighton* 3577.

LIBERIA. Nimba, *J. G. Adam* 20366 (K, P, UPS) (atypical, leaves glabrous above).

NIGERIA. Jos Plateau, Naraguta, *Hepper* 1075.

CAMEROUN. Bamenda, Belo, *Maitland* 1688. Bertoua, *Breteler* 620. Bitya, Ebolowa, *Bates* 601, 602 (BM).

CONGO (KINSHASA). Kasai, Kanda Kanda, Gandajika, *Liben* 3022. Katanga, Kapona to Kalima [Albertville], *Devred* 3745. Mt. Senga, *Kassner* 2918 BM). ? Lufonzo, *Kassner* 2840.

ZAMBIA. North: Mbala [Abercorn], Ndundu, *Richards* 15156 (EA, K). West: Solwezi District, R. Mwafue, *Milne-Redhead* 727; Lualaba, *Holmes* 1479; Kitwe, *Fanshawe* 10074.

ANGOLA. Cuanza Norte: Cazengo, Camondai, *Gossweiler* 5177 (BM, COI),

5667 (BM, COI) & 10188 (BM, COI). Golungo Alto: Sobado de Mussengue, *Welwitsch* 2186 (LISU, holotype; BM, COI, K, isotypes).

7b. var. **cyaneus** (*De Wild.*) *Hauman* in Fl. Congo Belge 6: 104 (1954).

Glycine cyanea De Wild. in Rev. Zool. Afric. 12, suppl. Bot.: 8 (1924).

Teramnus stolzii Bak. f., Leg. Trop. Afr.: 365 (1929).

Stems distinctly angled but the leaflets are more regularly oblong-elliptic; the calyx is usually more densely hairy all over. The corolla is often blue but this is not a constant character.

CONGO (KINSHASA). Nioka, *Liben* 406, *Bamps* 105 & *De Craene* 218 (BM, BR). Rutshuru, *Bequaert* 6126 (BR, syntype). Mboga, *Bequaert* 3030 (BR, syntype).

UGANDA. Toro District: Musandama, *Maitland* 1010; Ibanda, *Ross* 404 (BM); Ruwenzori, Nyamwamba [Namwamba Valley], Kilembe, *G. Taylor* 2543 (BM). Ankole District: Bunyaruguru, *Purseglove* 480; Rwashamaire [Lwasamaire], *Snowden* 1658 (BM, K). Mengo District: Entebbe, *Maitland* 26; Victoria Nyanza Region, *Maitland* 151; Kirerema, *Dummer* 349 (BM); Kyagwe, Banda, *A. S. Thomas* 787. Mubende District: 160 km. NW. of Kampala on Mubende road, *E. Brown* in *Dummer* 2723. Dubious, possibly in Kenya, 2nd and 3rd days out from Mumia's, *Whyte*.

KENYA. Kavirondo, *Scott Elliot* 7061.

TANZANIA. Ulanga District: Ukwama, Kwiwo, *Haerdi* 548/0 (EA, K); Mahenge, Liondo, *Schlieben* 2056 (BM, K). Rungwe District: Kyimbila, *Stolz* 827 (BM, holotype; K, isotype of *T. stolzii*) (leaves rather less obtuse than usual. Songea District: 14.5 km. N. of Mahanje by R. Mwandia, *Milne-Redhead* & *Taylor* 10940 (EA, K); Matengo Highlands, Umgano [Ugano], 8 May 1936, *Zerny* 648 (W).

MALAWI. Chipata Mt., *Verboom* 881. Zomba District: R. Mulunguzi, Banda 19 (BM).

ZAMBIA. Luangwa Valley, Upper Mtonga R., *Verboom* LK 117 (atypical leaves). Fort Jameson, Kalichero, *Verboom* 452.

7c. var. **flagifolius** *Hauman* in Bull. Jard. Bot. Brux. 25: 95 (1955).

Stems much more rounded than in the other varieties, scarcely if at all winged, but robust. Leaflets elliptic-rhomboid.

CAMEROUN. W. of Tibati, Mayo Tolore, *Letouzey* 5746.

CONGO (KINSHASA). Masisi to Walikale, *Lebrun* 5197 (BR, holotype of variety). Ubangi, between Libenge and Gemena, *Lebrun* 1772. Yambuya, *Bequaert* 1341. Between Yangambi and Yakusu, *Germain* 4662. Uele, Lebo, *Gerard* 716 (BM, BR).

SUDAN. Equatoria, Yei, Kagelo Station, *Myers* 7803.

UGANDA. Mengo District: Kyagwe, Banda, *A. S. Thomas* 786 (EA, K) & Pool 1184; ? Kirerema, *Dummer* 322 (BM, K).

8. **Teramnus buettneri** (*Harms*) *Bak. f.*, Leg. Trop. Afr.: 365 (1929).

Glycine buettneri *Harms* in Engl., Bot. Jahrb. 26: 302 (1899).

This savanna species is characterized by its erect shrubby habit, the leaflets

densely felted or velvety beneath and the pod densely covered with somewhat spreading ferruginous hairs. Nevertheless, there are no real structural differences between this and other species and it is pretty clearly derived from the same stock as *T. uncinatus* subsp. *ringoetii* and *T. micans*, the stems often being distinctly angular, as in the latter.

IVORY COAST. Cercle de Mankono, between Buonolougou and Marabadiassa, *Chevalier* 21990.

GHANA. Ashanti, Wanki, *Chipp* 482. NW. Ashanti, Sampaa, *Morton* A3253; *Enti* in *F.H.* 6355. Banda, *Hale* 2032. Kumasi, *Vigne* (EA, K). Atebubu-Kete Krachi road, *Enti* in *F.H.* 7604. Krachi, Nkwanta Hills, path from Shiare to Chilinga, *Morton* A3981. Kete Krachi-Kpedsu road, *Morton* in *GC* 7160.

TOGO. Kpandu, *Robertson* 135 (BM). Bismarckburg, *Büttner* 163 (B, holotype†).

NIGERIA. Ilorin, Ilesha, 9.6 km. from Ilesha on Okuta road, *Okafor & Latilo* in *FHI* 58845.

CENTRAL AFRICAN REPUBLIC. Buar, *Mildbraed* 9440; 'Kamerun' 50 km. SE. of Buar. above Lobaje, *Mildbraed* 9623. Yalinga region, *Le Testu* 3037 (BM, K).

DOUBTFUL SPECIES OR SPECIES EXCLUDED FROM TERAMNUS P.BR.

Other names published in *Teramnus*, not previously mentioned, with suggested or certain identities are as follows:—

T. CLANDESTINUS (Wendl.) Spreng. = ***Glycine clandestina*** Wendl.*

T. GRANDIFLORUS Griseb. = ***Herpyza grandiflora*** (Griseb.) C. Wright

T. HEDYSAROIDES (Willd.) Spreng. = ***Ophrestia hedysaroides*** (Willd.) Verdc.

T. OBCORDATUS Baill.† = ***Galactia obcordata*** (Baill.) Verdc., comb. nov.

T. TENUIFLORUS (Willd.) Spreng. = ***Galactia tenuiflora*** (Willd.) Wight & Arn.

T. RHOMBIFOLIUS Beurl. presumed to be a synonym of ***T. uncinatus*** (L.) Sw. but not seen

T. WALLICHII Kurz = ***Neocolletia wallichii*** (Kurz) Schindler

UNIDENTIFIED SPECIMENS OF TERAMNUS P.BR.

Beddome 2165 (BM) from India, Andhra Pradesh, Kurnool, Nallamalais Hills, is a distinctive plant and although not in flower the reflexed tips of the pods leave little doubt that it is a true *Teramnus*. It certainly cannot be a variant of *T. labialis*. The leaflets are densely adpressed silky pilose beneath and the short, broad, 3-4-seeded pods are 2.5-2.7 cm. long, 4.5 mm. wide, densely covered with mixed adpressed fulvous and silver hairs. The seeds are very finely reticulate-foveolate quite unlike those of any other *Teramnus*. Further material is needed.

Hassler 7563 (BM) from north Paraguay, an obviously perennial native plant resembling *T. volubilis*, has the upper calyx-lobes joined for only two-

* Burt's proposal (Taxon 15: 307 (1966)) has been adopted; my original indication of Willd. as the correct author (op. cit: 35 (1966)) is now incorrect.

† In Bull. Soc. Linn. Paris 1: 382 (1883). I have examined the type collected by Boivin and agree with this collector's suggestion that the plant is a *Galactia*. Unfortunately only small buds are present but 10 anthers can be seen. Further material is much desired.

thirds of their length. The indumentum rules out *T. uncinatus* and technically it appears to be *T. labialis* but this is not likely. The pod has fine adpressed hairs, as in that species, but the standard is 7 mm. long. In a genus of such featureless plants only an analysis of large populations can evaluate specific characters. The present problem is beyond the terms of reference of this revision.

ERYTHRINA L.

Erythrina abyssinica DC., Prodr. 2: 413 (1825); Gillett in Kew Bull. 15: 426 (1962); Torre in Consp. Fl. Angol. 3: 248 (1966).

subsp. **abyssinica**

Chirocalyx abyssinica (DC.) Hochst. in Flora 29: 600 (1846).

C. tomentosa Hochst., l.c. (1846).

Erythrina tomentosa A. Rich., Tent. Fl. Abyss. 1: 213 (1847); Bak. in Fl. Trop.

Afr. 2: 184 (1871), pro parte; Bak. f., Leg. Trop. Afr.: 373 (1929);

Majot-Rochet & Duvign. in Fl. Congo Belge 6: 120 (1954), pro parte.

E. bequaertii De Wild. in Rev. Zool. Afric. 8, suppl. Bot.: B15 (1920); Bak. f., Leg. Trop. Afr.: 376 (1929).

E. kassneri Bak. f., Leg. Trop. Afr.: 375 (1929).

E. platyphylla Bak. f., l.c.: 376 (1929).

E. tomentosa A. Rich. var. *longicauda* Bak. f., l.c.: 374 (1929).

E. webberi Bak. f., l.c.: 373 (1929), pro parte.

E. eggelingii Bak. f. in Journ. Bot. 76: 238 (1938).

subsp. **suberifera** (Bak. f.) Verdc., comb. et stat. nov.

E. suberifera Bak., Fl. Trop. Afr. 2: 183 (1871); Bak. f., Leg. Trop. Afr.: 372 (1929).

E. huillensis Bak., l.c. (1871); Bak. f., l.c. (1929).

[*E. tomentosa* sensu Majot-Rochet & Duvign., l.c. (1954), pro parte, non A. Rich.]

Majot-Rochet & Duvigneaud (l.c.) have considered *E. suberifera* to be completely synonymous with *E. abyssinica* (which they call *E. tomentosa*) but I would agree with J. B. Gillett (annotations on Kew folders) that there appears to be a good case to recognize two subspecies. In the north-east of the combined range the calyx-lobes are predominantly linear or filiform and in the south-west they are predominantly short, often elliptic, obovate or spatulate. As the Belgian authors have stated, mixed intermediate populations occur in the intervening areas, e.g. in Rhodesia and Congo (Kinshasa), and intermediates are so frequent as to render the use of subspecific names in that area impossible. Nevertheless, the considerable difference between the two extremes makes subspecific names useful in certain areas. An additional problem is how to treat *E. sudanica* Bak. f. and *E. sigmoïdea* Hua (= *E. dybowskii* Hua and *E. eriotracha* Harms) both of which have very short calyx-lobes resembling those of subsp. *suberifera* but even shorter; since there are indumentum differences and apparently no merging with *E. abyssinica*, they are left distinct for the present. Clearly all have been derived from the same immediate ancestor.

Erythrina haerdii Verdc., sp. nov. *E. sacleuxii* Hua valde affinis, sed bracteis primariis et secundariis conspicuis 0·6–1·1 cm. longis, foliis adultis majoribus, vexillo minore, indumento rhachidis floriferae minus tenui differt; a *E. abyssinica* DC. inflorescentiis longioribus, foliis adultis subtus glabris distinguenda.

Arbor usque 8 m. alta floribus praecocibus; truncus haud descriptus verosimiliter crassispinosus; ramuli ferrugineo-velutini, demum glabrescentes, porcati, spinis rectis armati. *Folia* trifoliolata; stipulae deciduae, crassae, oblongae, 1 cm. longae, 2 mm. latae, leviter falcatae, hirsutae; petiolus 8–26 cm. longus, aculeatus; rhachis 2·5–9 cm. longa; petioluli 5–10 mm. longi; foliola anguste vel late ovato-rhomboida, 10–28 cm. longa, 8·5–22·5 cm. lata, apice rotundata vel subtruncata, basi truncata, rotundata vel late cuneata, primum hirsuta, mox glabra, nervis lateralibus 10–15-jugis interdum aculeis minutis instructis venulis subtus reticulatis prominentibus. *Inflorescentiae* densae, circa 15 cm. longae, pilis pallide ferrugineis velutine obtectae; pedunculi 18–20 cm. longi, primum velutini, demum glabrescentes; pedicelli 2–3 mm. longi; bractea primariae et secundariae linearispathulatae, 0·6–1·1 cm. longae, 1–2 mm. latae, deciduae vel subpersistentes; bracteolae filiformes, 0·5–1·5 cm. longae, 0·5 mm. latae, deciduae. *Calyx* fusiformis, primum dense hirsutus, mox glabrescens; tubus 1·3 cm. longus, prope ad basin unilateraliter fissus spatham distinctam formans; limbus in 5 lobis linearibus 0·8–1·3 cm. longis 0·5–1·5 mm. latis divisus. *Vexillum* ellipticum, 3·1–3·5 cm. longum, 1·5–1·8 cm. latum, breviter unguiculatum, coccineum, glabrum vel extra pilis perpaucis conspersum. *Alae* falcatae, 9–10 mm. longae, 4·5 mm. latae. *Petala carinae* subrotundatae, 5–6 mm. longae, 4–5 mm. latae. *Filamenta* 1·9 cm. longa, stamen vexillare liberum antheris linearibus 1·8–2·5 mm. longis. *Ovarium* anguste cylindricum, 1·4 cm. longum, 13–14 ovulatum, pilis pallide ferrugineis dense obtectum; stylus filiformis 1–1·1 cm. longus. *Legumina* 8 cm. longa, moniliformia, articulis subglobois valde compressis 1 cm. longis 1·5–2 cm. latis, glabrescentia. *Semina* miniata, ellipsoidea, 8·5 mm. longa, 6·5 mm. lata et crassa, hilo nigro ornata.

TANZANIA. Ulanga District: Kiberege, 300 m., Oct. 1935, *Culwick* 1:—small tree with thorns and broad triangular leaves, flowers scarlet coming at the end of the dry season before the leaves, used as a galactogogue for foster mothers, vernacular name (Kibena) 'murongoloma'; Ulanga Valley, in the hills bordering the valley, 330 m., June 1935, *Culwick* 12:—tree with small thorns, and broad leaves with tiny prickles on the veins; Ifakara, 15 Aug. 1959, *Haerdi* 305/0 (K, holotype; EA, isotype):—tree to 8 m.; same locality, Dec. 1959, *Haerdi* 305/0B (EA, K).

This species is closely allied to *E. sacleuxii* but has smaller flowers, larger leaflets, which are usually much blunter, more conspicuous bracts and a coarser indumentum. It is, however, equally allied to *E. abyssinica* and flowering material can be difficult to distinguish. If it were not for the extreme care of Mr. Haerdi I would not have ventured to describe the plant since the leaves have a prominent venation beneath very similar to those of *E. schliebenii* Harms. There is a possibility that *E. sacleuxii* and *E. abyssinica* hybridize. Careful collections of *Erythrina* from marked trees in south-eastern Tanzania are very much needed. In no other East African genus is more care needed to make quite certain that leaves produced and

collected later in the season do actually correlate with flowers which have been collected earlier.

ERYTHRINA WEBBERI Bak. f., Leg. Trop. Afr.: 373 (1929).

This species based on *Webber* 608 collected in 'British East Africa' (and, judging by the number, in the 'coastal forests') has never been satisfactorily understood. It is true that Dale & Greenway in 'Kenya Trees and Shrubs' (p. 365) cite further material, but an examination of this does not clear the matter up; they state that further flowering material will probably demonstrate that the name is a synonym of *E. sacleuxii* Hua. Immediately on examining the type of *E. webberi* preserved at Kew, I was struck with the strong resemblance shown by the inflorescences to those of *E. abyssinica*, both having the same rather woolly indumentum, quite different from the tomentose inflorescences of *E. sacleuxii*. Nevertheless, the glabrous leaflets preserved on the type-sheet are undoubtedly those of *E. sacleuxii* and there is no doubt in my mind that the sheet is a mixture of the two species. There is further strong evidence that this is possible. *Graham* who knows the coastal forests well collected *both* species giving them successive numbers 278 and 279; moreover he has labelled the packets of flowers in the field showing that it was possible he thought there might be confusion if he did not. I suspect that the *Webber* specimen was collected like the *Graham* specimens in the Shimba Hills.

MUCUNA ADANS.

Seventy years ago Prain (Journ. Asiatic Soc. Bengal 66: 404 (1897)) stated that a monographer would almost certainly find it necessary to divide *Mucuna* into two genera, *Mucuna* and *Stizolobium* P. Br. Since then many other authors have said much the same and several American workers (including Burkart) have kept up *Stizolobium*. There is much to be said in favour of maintaining two genera. In *Stizolobium* the seeds are compressed oblong-ovoid with a very short hilum surrounded by a conspicuous rim aril whereas in typical *Mucuna* the seeds are discoid, large and flat with a hilum extending $\frac{3}{4}$ of the circumference and without an aril. There are associated characters but these have not been studied for more than a few species. The first leaves to appear above the cotyledons are opposite, simple and cordate in *Stizolobium* whereas in *Mucuna* proper the initial leaves are said to be all alternate and scale-like. The dorsifixed anthers in *Mucuna gigantea* (Willd.) DC. are barbate whereas in *M. pruriens* (L.) DC., *M. glabrialata* (Hauman) Verdc. and *M. stans* Bak. (all of which belong to *Stizolobium*) they are glabrous. An examination of the pollen of a few species shows that in subgenus *Stizolobium* the walls are thin with an easily visible open reticulation whereas in *Mucuna* the walls are thick and the reticulation is much closer and more difficult to see. *M. poggei* Taub. presumably belongs to the subgenus *Stizolobium* but the pods appear to be more or less indehiscent with discoid seeds having the hilum extending almost one-third of the way around the seed; there is a faint rim aril and it does to a certain extent bridge the gap between the two groups. Bearing in mind this latter species, the fact that the genus needs a general monograph and that, despite the marked differences between the two groupings, there are also great similarities (e.g. general flower structure, stiffened keel apex, inflorescence structure, presence of

irritant hairs, etc.), I have decided to follow the general tradition of maintaining a single genus divisible into two well-marked subgenera. Another fact, perhaps of some significance, is that other undoubtedly distinct genera have seeds very similar in structure to those of subgenus *Mucuna*, *Dioclea* being an example.

The following notes are needed to validate names used in the flora treatment.

Mucuna gigantea (Willd.) DC., Prodr. 2: 405 (1825).

subsp. ***quadrialata*** (Bak.) Verdc., comb. et stat. nov.

M. quadrialata Bak. in Fl. Trop. Afr. 2: 186 (1871); Bak. f., Leg. Trop. Afr.: 379 (1929); Brenan, Check-List of Tanganyika Trees and Shrubs: 436 (1949).

M. longipedicellata Hauman in Bull. Jard. Bot. Brux. 25: 99 (1955); & in Fl. Congo Belge 6: 133 (1954), *sine descr. lat.*

I agree with Dyer (Bull. Misc. Inf. Kew 1931: 464 (1931)) that *M. quadrialata* Bak. and *M. gigantea* (Willd.) DC. are conspecific but a survey of the available Asiatic material shows that it has mostly smaller flowers than the African material. Certain Oriental specimens with large flowers do not appear to be correctly named and unfortunately are not correlated with fruits; practically no material has been seen from India and nothing from Malabar, the type-locality. Until a better survey can be made I have preferred to treat the uniformly large-flowered African populations as a distinct subspecies. I have examined the holotype of Hauman's supposed species (*Ghesquière* 3771) and an isotype and can find no differences between it and *M. gigantea* subsp. *quadrialata*.

THE *MUCUNA* *POGGEI* TAUB. COMPLEX

M. poggei Taub. varies greatly in the size of its flowers and I have felt unable to maintain *M. pesa* De Wild. as a distinct species. It seems convenient to recognize three varieties covering the area of East Africa which do not appear to be correlated with geography or habitat. I have examined the types of the entities involved. The three varieties occurring in East Africa can be separated as follows:

Corolla 6–9 cm. long; leaflets densely silvery-grey hairy beneath

var. ***poggei***

Corolla 4–5 cm. long:

Leaflets densely grey hairy beneath var. ***pesa***

Leaflets glabrescent beneath var. ***glabrescens***

Mucuna poggei Taub. in Engl., Bot. Jahrb. 23: 194 (1896).

var. ***pesa*** (De Wild.) Verdc., comb. et stat. nov.

M. pesa De Wild. in Fedde, Rep. Sp. Nov. 13: 115 (1914); Bak. f., Leg., Trop. Afr.: 381 (1929); Hauman in Fl. Congo Belge 6: 133 (1954).

CONGO (KINSHASA). Katanga, Kapiri Valley, *Homblé* 1162 (BR, holotype of *M. pesa*). Lake Tanganyika shore, *Kassner* 3032 (BM).

UGANDA. Toro District: Ruimi [Wimi] Forest, *Bagshawe* 1037 (BM) (no leaves).

TANZANIA. Handeni District: Tamota, *Bally* Med. 101 in *C.M.* 12046 (EA). Mpwapwa, *Mr. & Mrs. Hornby* 702 (EA, K). Ulanga District: Ulanga Valley, *Culwick* 17. Iringa District: 80 km. NE. of Iringa, Image, *Polhill & Paulo* 1686A (EA, K). Rungwe District: Tukuyu-Chimala road, Kiwira R. bridge, *Greenway & Hoyle* 8332 (EA, K); Usafua, *Goetze* 1040 (BM). Lindi District: Rondo [Muëra] Plateau, *Busse* 2637 (EA).

MOZAMBIQUE. Niassa Province, Amaramba Division, Mandimba to Mas-sangulo, 12 km. from former, *Pedro & Pedrógão* 3416 (EA). 'Zambeziland', *Kirk*. Macequeçe District: Vila de Manica, R. Zambusi, *Chase* 2263 (BM, K, SRGH).

MALAWI. Nyambi, *G. Jackson* 1647. Without locality, *Buchanan* 1066 (BM, K).

RHODESIA. Inyanga District: Pungwe R. near Mozambique border, *Chase* 6450 (K, SRGH); Honde Valley, *Phipps* 1117 (K, SRGH); Nyumquarara Valley, *Wild* 5717 (K, SRGH) & *Corby* 1326 (K, SRGH).

var. **glabrescens** (*Hauman*) *Verdc.*, comb. nov.

M. pesa De Wild. var. *glabrescens* Hauman in *Bull. Jard. Bot. Brux.* 25: 99 (1955); & in *Fl. Congo Belge* 6: 133 (1954), *sine descr. lat.*

CONGO (KINSHASA). Parc National de l'Upemba, Mt. Kia to Lake Upemba, *van Meel* in *de Witte* 5704 (BR, holotype of *M. pesa* var. *glabrescens*).

TANZANIA. Buha District: Kalinzi, *Verdcourt* 3414A. Ufipa District: Namwele-Kisungu, *Bullock* 3747. Ulanga District: near Kwiwo, *Haerdi* 534/0 (EA, K); 35 km. S. of Mahenge, Sali, *Schlieben* 2246 (BM, BR, K). Iringa District: Dabaga, *Emson* H16/36 (EA); Iringa, *Emson* 522 (EA). Rungwe District: between Tukuyu and Mbelezi, Igale, *St. Clair-Thompson* 1041 (EA, K).

Also related to this complex is the Ethiopian plant, *Mucuna melanocarpa* A. Rich., which seems to differ in little else than its dark blackish-purple (not greenish-white) flowers. At present I prefer to treat *M. poggei* as a separate species from this; far more material is needed from Ethiopia.

THE MUCUNA CORIACEA BAK. COMPLEX

Mucuna stans Bak. is a common and well-known erect *Mucuna* of the savanna areas of East and Central Africa, Cameroun and Angola; it is clearly derived from climbers and scramblers of the *M. coriacea* complex. Some difficulty has been experienced in classifying the non-erect members of this group. Attempts to divide *M. coriacea* into several subspecies failed until it was decided that one of the taxa involved was best treated as a separate species; the results then obtained were more satisfactory. A key to the taxa involved follows:

- Corolla with wings glabrous or hairy only at base; leaves glabrescent or finely pubescent **M. glabrialata**
 Corolla larger; wings with conspicuous zone of hairs on upper part of lamina:
 Leaves woolly, especially beneath . . . **M. coriacea** subsp. **coriacea**
 Leaves finely pubescent **M. coriacea** subsp. **irritans**

Mucuna glabrialata (Hauman) Verdc., stat. nov. affinis *M. coriaceae* Bak. subsp. *coriaceae*, foliis pilis minutis fulvis obtectis non dense hirsutis, alis apice glabris distincta; *M. coriaceae* Bak. subsp. *irritantis* (Burt Davy) Verdc. valde similis, floribus minoribus, alis apice glabris differt.

M. coriacea Bak. var. *glabrialata* Hauman in Bull. Jard. Bot. Brux. 25: 99 (1955); & in Fl. Congo Belge 6: 132 (1954), *sine descr. lat.*

M. sp. 1; F. White in For. Fl. N. Rhod.: 160 (1962).

Herba volubilis robusta usque 3 m. alta, ramis leviter sulcatis in siccitate nigrescentibus glabris vel praecipue ad nodos pilis minutis fulvis appressis sparse obtectis. *Folia* 3-foliolata; stipulae triangulares vel lanceolatae, 4 mm. longae, 1.5 mm. latae, extra hirsutae; stipellae filiformes, usque 4 mm. longae; petiolus 2.5–18 cm. longus; rhachis 1–3 cm. longa; petioluli 2.5–6 mm. longi; foliola rhomboideo-ovata, lateralia valde obliqua, 2.6–8.5 cm. longa, 2–7.5 cm. lata, apice late rotundata vel levissime emarginata sed mucronulata, basi rotundata, chartacea, in siccitate nigrescentia, pilis minutis fulvis appressis obtecta; nervi laterales 5–6-jugis subtus prominentes. *Inflorescentiae* pseudo-racemosae, 5–15 cm. longae, multiflorae, floribus in fasciculis 3-floris dispositis; pedunculi 2–9 cm. longi; pedicelli 4–5 mm. longi; bracteae deciduae, lanceolatae, 1–1.1 cm. longae, 4 mm. latae, fulvopilosae; bracteolae bractearum similes, 7–9 mm. longae 1.5 mm. latae. *Calyx* appresse fulvopilosus, tubo 5 mm. longo 1 cm. lato; lobi inferiores triangulares, 4.5–9 mm. longi, acuti, lobis 2 superioribus in labio integro apice obtuso connatis. *Vexillum* fere nigrum, rotundato-ovatum, 2.1–2.4 cm. longum, 2–2.2 cm. latum, apice rotundatum, basi in ungue brevi 7.5 mm. lato productum, glabrum. *Alae* atro-coccineae vel fere nigrae, anguste oblongo-falcatae, 2.5–3.2 cm. longae, 6–9.5 mm. latae, basi margine inferiore hirsutae. *Carina* atro-coccinea vel fere nigra, falciformis, 2.5–3 cm. longa, 6 mm. lata, apice rigida. *Filamenta* 3.3 cm. longa, antheris basifixis elliptico-oblongis 2.2 mm. longis aliis dorsifixis 1.2 mm. latis omnibus glabris. *Ovarium* subcylindricum 1 cm. longum, 2 mm. latum, stylo 2.8 cm. longo ultra medium torto inferne breviter piloso; stigma minute capitatum. *Legumen* elongato-sigmoideum, 7–8 cm. longum, 1.1–1.4 cm. latum, 4–5-seminatum, compressum, pilis rigidis pallide flavido-fulvis irritantibus circa 2 mm. longis dense obtectis. *Semina* ambitu elliptica vel rotundata, valde compressa, olivaceo-brunnea usque nigra, 8–9.5 mm. longa, 7–8 mm. lata, 2.5–4.5 mm. crassa, hilo oblongo 3.5 mm. longo margine conspicue nigro-arillata. (Fig. 2, p. 290.)

CONGO (KINSHASA). Upper Katanga: Lubumbashi [Elisabethville], Mt. Mukuen, Schmitz 1502 (BR, holotype); Parc National Upemba, 21 Feb. 1948, de Witte 3430 (BR, K); Tshinsenda, Ringoet 502* (BR).

TANZANIA. Buha District: Bagaga-Kasulu [Kassulo], in forest remnant, 1260–1350 m., 22 Nov. 1926, Peter 37389 (B):—climber with almost black flowers. Kigoma District: Uvinza [Uvinsa], W. of Malagarasi, km. 1084–1087.5 on Central Railway line, mixed bush, 1060 m., 1 Feb. 1926, Peter 36071 (B, K):—large liane with blackish flowers. Chunya District: 152 km. from Mbeya on Itigi road, Lupa N. Forest Reserve, slope in *Brachystegia-Julbernardia* woodland, 1400 m., 1 March 1963, Boaler 857:—climber to 4 m., flower dark purple, occasional. Mbeya District: Mbosei to Mkama, 9 April 1932, Davies 627 (EA, K). Songea District: about 1.5 km. S. of Gumbiro,

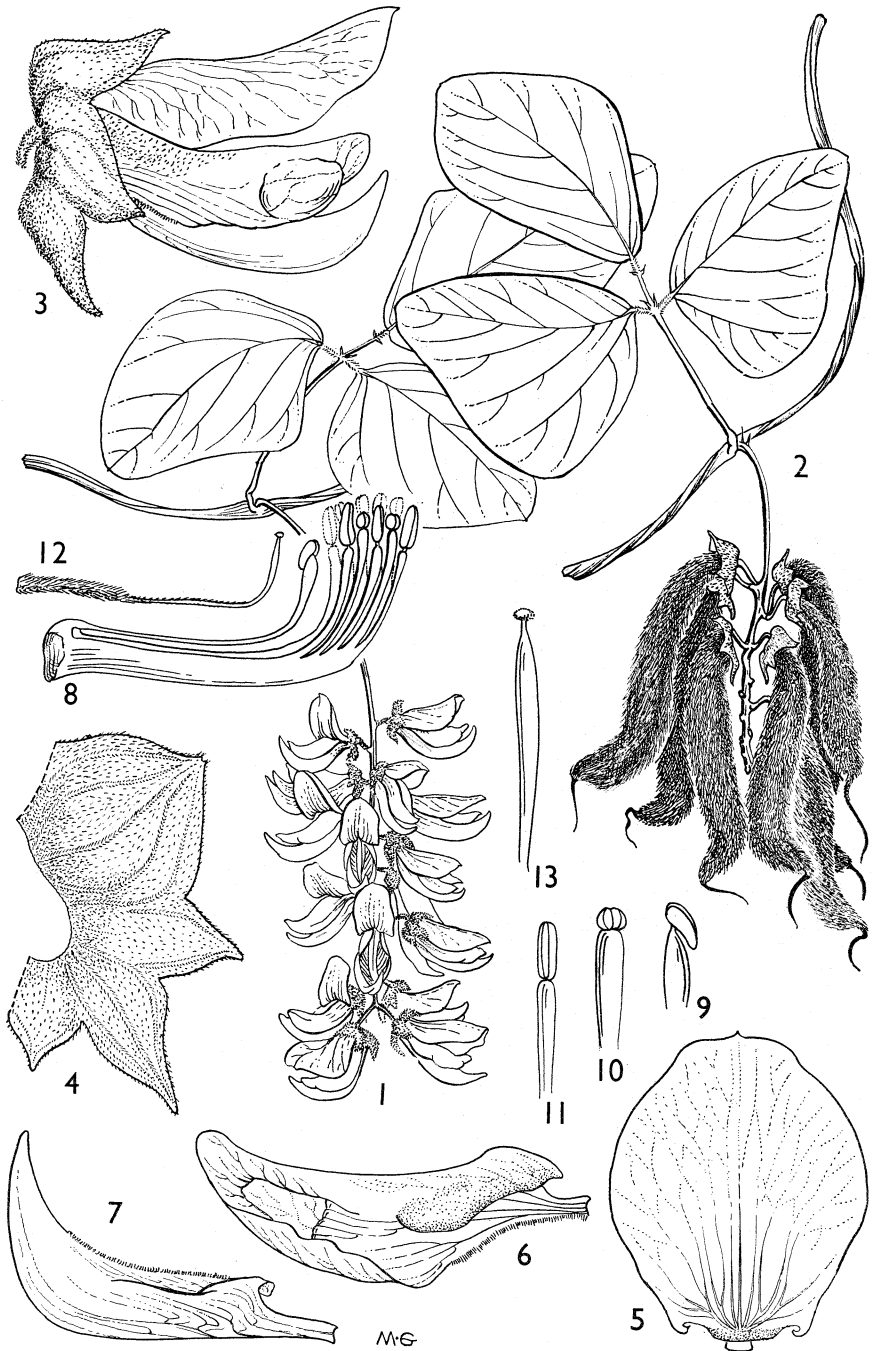


FIG. 2. *Mucuna glabrialata*. 1, part of stem with inflorescence, $\times \frac{1}{3}$; 2, part of stem with infructescence, $\times \frac{1}{3}$; 3, flower, $\times 2$; 4, calyx, $\times 2$; 5, standard, $\times 2$; 6, wing petal, $\times 2$; 7, keel, inside view, $\times 2$; 8, androecium, $\times 2$; 9-11, stamens showing medifixed and basifixed anthers, $\times 4$; 12, gynoecium, $\times 2$; 13, style and stigma, $\times 4$. All drawn from Milne-Redhead & Taylor 10116.

in *Brachystegia* woodland on sand, 900 m., 8 May 1956, *Milne-Redhead & Taylor* 10116 (EA, K):—strong twiner going up shrubs to 3 m., stem, petiole, rhachis and nerves yellow-green, leaves green with a fine \pm level reticulation above, pale green with fine level reticulation beneath, peduncles thick and pendulous, dull green, calyx dull, the colour of sunburnt skin, standard black, wings very deep maroon, almost black, keel ditto with very hard sharp beak, stamens included in keel the basal part of which is flattened dorsally.

MALAWI. North: Mzimba, Mbawa Expt. Station, in *Julbernardia* scrub woodland, 6 April 1955, *Jackson* 1600:—climbing or prostrate weed, leaves with yellow veining, flowers blackish-purple. South: Liwonde district, in *Uapaca-Brachystegia* forest, March 1937, *Clements* 833 (FHO, K):—root extract used as a black dye for cloth.

ZAMBIA. North: Mbala [Abercorn] District: Mpulungu road, about 8 km. from Mpulungu, in bush by side of road, over low bushes, 900 m., 20 April 1952, *Richards* 1613; near Kambole Falls, woodland, 1500 m., 5 June 1957, *Richards* 10026:—climber to 0.9 m., pea dark (practically over), seeds shiny yellow-straw colour with bands of green. West: Ndola District: Ndola, over shrubs and lower parts of trees in plateau woodland, 16 July 1954, *Fanshawe* 1380; same locality, 4 March 1954, *Fanshawe* 1155:—flowers dusky purple in dense pendent racemes, calyx with reddish hairs; Mufulira, 21 April 1966, *Lawton* 1396:—creeping legume with deep purple flowers; Kitwe, woodland, 6 June 1955, *Fanshawe* 2319 (EA, K):—vine twining clockwise up lower part of trees to 3 m., flowers dusky purple, young fruits flat, S-curved, appressed golden-brown woolly. South: Mumbwa District: Kafue National Park, Mumbwa–Mankoya road, 16 km. E. of Kafue Hook pontoon, in woodland (Trapnell's P.5) of *Julbernardia paniculata*, *Uapaca kirkiana* and *Hyparrhenia* spp., 12 June 1964, *Mitchell* 25/74. Locality uncertain: B.D.C.?, 28 May 1958, *Verboom* LK 29 (K, PRE).

***Mucuna coriacea* Bak.** in Fl. Trop. Afr. 2: 187 (1871); Bak. f., Leg. Trop. Afr.: 380 (1929); Brenan, Check-List of Tanganyika Trees and Shrubs: 433 (1949).

subsp. ***coriacea***

M. rhynchosioïdes Taub. in Engl., Bot. Jahrb. 23: 194 (1896).

The material seen is cited in condensed form:

TANZANIA. Mbulu District: Pienaar's Heights, *Burt* 2202 (BM, EA, K); Ufioni, Bonga to Bereu [? Bereku], *Peter* 44219 (B). Kondo District: 47 km. N. of Kondo turn-off, *Milne-Redhead & Taylor* 11274 (EA, K). Ulanga District: Mahenge, *Haerdi* 567/0 (EA, K). Songea District: N. of Songea, by R. Luhira near Mshangano fish-ponds, *Milne-Redhead & Taylor* 10821 (EA, K); Matengo–Songea, Ugano, *Zimmer* 56 (BM). Lindi District: Rondo [Mwera] Plateau, *Schlieben* 6281 (BM) (verging to subsp. *irritans*).

MOZAMBIQUE. Niassa, Massangulo, *Pedro & Pedrógão* 3549 (EA); Vila Cabral, *Torre* 197, 198 (BM, K). Manica e Sofala: Chupanga, *Kirk* (K, syntype) & *Stewart* (K); Chupanga, near Mazzara, *Kirk*. Without detailed locality, 'Sambesi', *Carvalho* (B, holotype of *M. rhynchosioïdes*†).

MALAWI. 'N. Nyasaland', *Whyte*. South: Mt. Chiradzulu, *Johnston* (somewhat intermediate with subsp. *irritans*); Lower Valley of R. Shire, *Meller*; near Cholo, *Pole Evans & Erens* 541; Manganja Hills, *Meller* (K, syntype) [note this sheet is rather nearer to subsp. *irritans* so, if lectotype is selected, the *Kirk* specimen should be chosen]. Without locality, *Lawrence* 794 & *Webb* (BM).

ZAMBIA. East: Lunkwakwa-Fort Jameson, *Mutumushi* 1491 (only a sterile shoot seen).

subsp. **irritans** (*Burt Davy*) *Verdc.*, comb. et stat. nov.

M. irritans Burt Davy, Flowering Pl. Ferns Transvaal 2: xxvii, 414 (1932). [*M. coriacea* sensu Hauman in Fl. Congo Belge 6: 131 (1954), non Bak. sensu stricto]

CONGO (KINSHASA). Uele, frontier with Sudan, Missa Dogo, *Piedboeuf* 49 (BR, K fragment).

UGANDA. Bunyoro District: near Bugoma Forest, *Bagshawe* 1404 (BM).

TANZANIA. Ufipa District: Mpui-Ilemba gap road, *Richards* 12931 (not typical but no more than varietally distinct). Morogoro District: Uluguru Mts., Mgeta-Bunduki, *Harris* 127 (EA, K).

MOZAMBIQUE. Niassa, Massangulo, 13° 51' S., 35° 35' E., *Gomes Sousa* 1404. Zambezia, Lugela-Mocuba, Namagoa Estate, *Faulkner* 250 (BM, K). Manica & Sofala, 12.8 km. N. of R. Pungwe on road to Vila Gouveia, *Evans & Erens* 479 (K, PRE). 'Zambeziland', *Kirk*.

MALAWI: South: Mt. Mlanje, *Whyte* (BM).

RHODESIA. North: Darwin, Kandeya, Pachanga Store, *Bingham* 1438 (K, SRGH); Goromonzi, Ngomakwira, Chindamora Reserve, *Wild* 7569 (K, SRGH); Mazoe, *Eyles* 361 (BM); Shamwa, ? *Mainwar* in *Eyles* 2241 (K, PRE). East: Odanzi [Odzani] R. Valley, *Teague* 495 (BOL, K); Melsetter, Stapleford, Nyumquarara, *Wild* 5685 (K, SRGH); Umtali Commonage, *Chase* 4955 (BM, K, SRGH); Umtali-Vumba road, near Inyanga, *Corby* 934 (K, SRGH); Inyanga, *Phipps* 1075 (EA, SRGH); near Chirinda, *Swynnerton* 450 (BM, K); Chipetzana, *Swynnerton* 1487 (BM, K); R. Nyahodi, *Swynnerton* 1488 (BM, K). South: Zimbabwe Ruins, *Mundy* 2799 (K, SRGH) & *Leach* 8220 (K, SRGH).

TRANSVAAL. Pietersburg: Tzaneen Estate, *Burt Davy* 2578 (FHO, K); *Sampson* (K, fragment); Houtbasloop, *Mogg* 30431 (K, PRE); Pietersburg, *Dyer* 3161 (K, PRE); Duivels Kloof, *Galpin* 9670 (K, PRE). Letaba: by side of old road between the prov. road and Mtataspruit, Westfalia, *Scheepers* 218 (K, PRE); old road between 2nd prov. road to Duivels Kloof and riverside meadow above bridge near quarry, *Scheepers* 123 (BM, EA, K, PRE). Nelspruit: Pretorius Kop entrance to Kruger National Park, *Rodin* 4138 (K, UC); Kruger National Park, Numbi, *van der Schijff* 2653 (K, PRE); 4.8 km. S. of Nelspruit, *Leach* 12735 (K, PRE). Barberton: Barberton, *F. A. Rogers* 23850; Barberton, Louws Creek, *van Dam* in *F. A. Rogers* 23875; 21.6 km. SW. of Hectorspruit, *Codd* 7813 (EA, K, PRE). Without exact locality, *Saunders* 166 in *Wood* 3893 (not from Natal). Burt Davy gives the type as Zoutpansberg and Barberton, *F. A. Rogers* 20255, a number not represented at Kew.

SWAZILAND. Piggs Peak, Lomati R., *Compton* 27664 (EA, K, PRE).

THE SPHENOSTYLIS MARGINATA E. MEY. COMPLEX

There seems to be very little, if any, difference between *S. marginata* E. Mey. and *S. erecta* (Bak. f.) Bak. f. save in habit and the frequency of occurrence of acute leaflets. Most South African material is prostrate and most Central and East African material either erect or prostrate. The frequency of occurrence of various habits is shown in the following table drawn up from the Kew material.

TABLE 4. Habit data for *Sphenostylis marginata*-*S. erecta* complex

| Country | Number of erect plants | Number of climbing or prostrate plants | Habit not obvious |
|------------------|------------------------|--|-------------------|
| Congo (Kinshasa) | 10 | 3 | |
| Tanzania | 8 | 6 | 3 |
| Mozambique | 1 | | |
| Malawi | 8 | | 1 |
| Zambia | 54 | 25 | 4 |
| Rhodesia | 17 | 1 | 2 |
| South Africa | 1 | 10 | 9 |

The South African material has mostly oblong, very obtuse leaflets which can be exactly matched in Tanzania but there is a marked tendency for Central African material, particularly that which is prostrate, to have more or less acuminate leaflets. It is possible that field studies may reveal further differences but, at present, I am dividing the whole complex into three rather diffuse subspecies which are not well-separated geographically. As is usual, Zambia is the area where intermediates are most profuse. More information is needed concerning the relationship between habit and burning before any comments can be made on the possibility that the prostrate Central African plants are due to an invasion of subsp. *marginata* north into an area where subsp. *erecta* had become the common race. In most pyrophytic herbs it has been found that habit is a most variable character. A certain amount of material is cited below in condensed form.

***Sphenostylis marginata* E. Mey.**, *Comm. Pl. Afr. Austr.*: 148 (1836); I. Verdoorn in *Fl. Pl. Afr.*, t. 1521 (1968).

Habit climbing or prostrate:

Leaflets oblong, rounded at the apex subsp. **marginata**

Leaflets elliptic-lanceolate to almost orbicular, mostly subacute or acuminate at the apex subsp. **obtusifolius**

Habit erect; leaflets oblong to elliptic-lanceolate, rounded to acuminate at the apex subsp. **erecta**

subsp. **marginata**

SOUTH AFRICA. Widespread in Natal and Swaziland.

subsp. **obtusifolia** (Harms) *Verdc.*, comb. et stat. nov.

S. obtusifolia Harms in *Notizbl. Bot. Gart. Berl.* 5: 205 (1911).

[*S. marginata* sensu Wilczek in *Fl. Congo Belge* 6: 278 (1954), *non* E. Mey. *sensu stricto*]

CONGO (KINSHASA). Katanga: Bianco station, *Symoens* 5090.

ZAMBIA. North: Mbala [Abercorn] District: Chilongowelo, Plain of Death, *Richards* 5529; Kasama District: Misamfu, *Astle* 1279 & *Angus* 2653; Mwamba's, *Richards* 16171; Kasama, *J. M. Wright* 329; Chibutubutu, R. Lukulu, 48 km. S. of Kasama on Mpika road, *Richards* 12540; Chisimba Falls, *Exell, Mendonça & Wild* 1361 (BM); Malole Rock, *Richards* 12689; Kasama to Mbala [Abercorn] road, *Richards* 12684; Chinsali District: Shiwa Ngandu, Machipara Hill, *Richards* 10688; Fort Roseberry, *Watmough* 182; Mpika, *Fanshawe* 1951. West: Ndola, *Symoens* 10000. Central: Katonino (Kitinina) Hills, *Kassner* 2176 (B, holotype†; BM, K, isotypes). South: Mumbwa, *van Rensburg* 2180.

RHODESIA. East: Melsetter District: Chimanimani Mts., gully above upper Haroni, *Phipps* 456 p.p. Umtali District: Vumba, *Chase* 1530 (BM, K) & *Head* 172 (BM); Inyanga, Mtarazi, *Goodier* 1035 & *Chase* 1627 (BM, K); R. Nyumkombu, *Gilliland* 1420 (BM, K). South: Bikita, *Cleghorn* 172.

ANGOLA. Benguela: Caala, Cuima, *Exell & Mendonça* 1939 (BM, COI); between Nova Lisboa and Vila Teixeira de Silva, *Exell & Mendonça* 1799 (COI); Ganda-Caconda, *Hundt* 916 (BM). Bié: Cuito, mouth of R. Campaluwe, *Baum* 796 (BM, COI, K). Moxico: Dilolo, R. Cassai, Dundo road, *Exell & Mendonça* 1495 (BM, COI). Huila: Lubango, Quilemba, *Exell & Mendonça* 2525 (BM, COI).

S. gossweileri Bak. f., of which I have seen only the type, comes very close to this subspecies. Material from eastern Rhodesia with 1–few-flowered inflorescences may be distinct enough to recognize varietally.

subsp. **erecta** (*Bak. f.*) *Verdc.*, comb. et stat. nov.

Dolichos erectus Bak. f. in *Trans. Linn. Soc.*, ser. 2, 4: 10 (1894).

Sphenostylis erecta (*Bak. f.*) *Bak. f.*, *Leg. Trop. Afr.*: 422 (1929); *Wilczek* in *Fl. Congo Belge* 6: 274 (1954); *Torre* in *Consp. Fl. Angol.* 3: 277 (1966).

CONGO (KINSHASA). Katanga: Lubumbashi [Elisabethville], *Quarré* 3580, *F. A. Rogers* 10165, 26158 & *Burt Davy* 17925 (BM); Baudouinville, *Robyns* 2254; Likasi [Jadotville], *Robyns* 1725 (BM, K), *Hoffman* 873 & *Poelman* 60. Upemba Park, source of R. Lunga, *Robyns* 3879. Mushoshi, *F. A. Rogers* 10380. Mt. Morumbe, *Kassner* 2943 (BM, K).

BURUNDI. Kitaba–Rururi, *Becquet* 131 (BM, K) (cited by *Wilczek* as *S. marginata* but the habit is doubtful). Murutoke–Niakassu, *Peter* 38096 (B) (not erect).

TANZANIA. Biharamulo District: Lusahunga, *Tanner* 5325; Usui, *Grant* 206 (habit?). Ngara District: Keza, Bushubi, *Tanner* 5112 (EA, K) (creeper). Buha District: Mbirira [Birira]—See *Deschi*, *Peter* 37824 (B) (habit?); am See Manyoni bei Mbirira [Birira], *Peter* 37810 (B) (climber); Bujenzi–Kwa Bikare (olim Kwa Kijina), *Peter* 38676 (B) ('liegt'); Kibondo, *Bullock* 3108 & *Verdcourt* 2872 (EA, K); Kasulu, Heru Chini, *Rounce* 44 (EA). Kahama District: Ushirombo, *Joseph* 4033. Mpanda District: Mahali Mts., Utahya, *Newbould & Jefford* 1684. Ufipa District: Lake Kwela, *Richards* 6854. Morogoro, *Wallace* 548 & *Schlieben* 4242 (BM). Chunya District: Lupa Forest Reserve, *Boaler* 664. Mbeya District: Mbeya, *Davies* D426; Mbosi, *Horsburgh Porter* (BM). Songea District: 32 km. E. of Songea, *Milne-Redhead & Taylor*

10693 (EA, K); Songea area, *Warne* (EA). Lindi District: 11.2 km. W. of Nachingwea, *Evans* 15 (EA); Lake Lutamba, *Schlieben* 5340 (BM).

MOZAMBIQUE. Between Beira and Massi Kesi (Macequeçe), *Cecil* 25. Niassa: Vila Cabral, Mt. Mandimba, *Torre* 264 (BM).

MALAWI. North: S. Rukuru Plains, *McClounie* 43. Central: Lilongwe, *J. M. Wright* 232, *Kantikana* 29 (BM); Lilongwe, Chankhandwe Dambo, *G. Jackson* 79 & 602. South: Shire Highlands, *Scott Elliot* 8528 (BM, K) (habit?); Manganja Hills, *Waller*; Kankanje, *Kirk*; Cholo District, *Wiehe* 715; Blantyre, *Banda* 348 (BM, K); Mt. Mlange, *Whyte* (K, lectotype) & *Shinn* 191 (BM). ? Sandawa to Msambanjati, *Laurence* 593; Zomba Mt., *Banda* 181 (BM); Ncheu District, Msasa escarpment, Dedza-Golomoti road, *Exell, Mendonça & Wild* 1038A (BM). Without locality, *Buchanan* 63 (BM).

ZAMBIA. North: Mbala [Abercorn], *Bullock* 1017 (EA, K), 3325, *Kafuli* 41, *Nash* 24 (BM), *Siame* 6A (BM) & 709 (BM); Mpulungu-Mbala [Abercorn] road, *Richards* 2324; Lake Chila, *Richards* 4963 & *Kafuli* 41 (BM); Mbala [Abercorn], Simanve Farm, *Richards* 4966; Mbala [Abercorn] Sandpits, *Richards* 13109; Mbala [Abercorn]-Kambole road, *Richards* 13204; Mbala [Abercorn], old Kasama road to Pans, *Richards* 1297, 2030 & 5909; 1.6 km. from Ndundu on Kawimbe road, *McCallum Webster* 857; 2.4 km. from Ndundu, N'Kali side of dambo road, *Richards* 1912; near Ndundu, *Richards* 21561; R. Inono, 40 km. from Mbala [Abercorn], *McCallum Webster* 858B ('subclimber'); 43.2 km. S. of Mbala [Abercorn], *Hutchinson & Gillett* 3868; Chilongowelo, Plain of Death, *Richards* 1271 (partly climbing); Nkolemfumu to Kasama, *Lawton* 743; Kasama, *J. M. Wright* 307; Kawambwa, *Fanshawe* 3690; 8 km. from Luwingu, *Richards* 11464. Central: Broken Hill to Bwana Mkubwa, *Allen* 334; Broken Hill, *F. A. Rogers* 8295 & *Mutumushi* 952; 9 km. S. of Broken Hill, *Gillett* 17459; 16 km. S. of Broken Hill, *Evans & Erens* 1902; Lusaka, *Lusaka N.H.C.* 53; Chilanga, *J.H.H.* 163; Chilanga, Quien Sabe, *C. Sandwith* 88; Chilanga Fish Farm, *Lusaka N.H.C.* 137; Rufunsa to Lusaka, *Greenway & Brenan* 8074 (EA, K); 12.8 km. E. of Lusaka, *King* 126. East: Fort Jameson, Lunkwakwa Forest Reserve, *Verboom* 689; Fort Jameson, *White* 2437; Katete, *Wright* 47; Chadiza, *Robson* 774 (BM, K); Lundazi, *White* 2493; Lundazi-Chama, Tigone Dam, *Robson* 140 (BM, K). West: Mwinilunga District: 64 km. S. of Boma and 19.2 km. W. of R. Lunga, *Milne-Redhead* 910; NE. of Matonchi Farm, *Milne-Redhead* 2550; Mwinilunga, *Marks* 8; Solwezi, *White* 3214, 3237 (BM, K); Mutanda Bridge, *Milne-Redhead* 532; Chingola, *Fanshawe* 1131 (EA, K); Kitwe-Nkana, *Shepherd* 115a (sprawling); Mufulira, *Cruse* 10; 8 km. SE. of Mufulira, *Cruse* 384 (intermediate in habit); Ndola, *Greenway & Miller* 5654 (EA, K), *Fanshawe* 185 & *Young* 103 (BM); Chichele Forest Reserve, 9.6 km. W. of Ndola, *Angus* 369 & *Fanshawe* 446. South: Mumbwa, *Macaulay* 783 & *van Rensburg* 2493; Mapanza W., *Robinson* 943; Mapanza W., near R. Mungeke, *Robinson* 228; Namwala to Kalomo, Muchila's, *Trapnell* 1100; Kalomo, *Gilges* 453 (EA, PRE); Nanwala, *Read* 46; Pemba, *F. A. Rogers* 8555 & 8576; Mazabuka, *Angus* 91.

RHODESIA. North: Shamva, *Moubray* in *S.R.G.H.* 5225 (BM); Salisbury to Shamva, *Gilliland* 681 (BM); Miami, *Rand* 145 (BM); Sinoia, *Rand* 227 (BM); Umvukwe Hills, Mermaid's Pool, *Gilliland* Q627 (BM, K); Trelawney, *Jack* 51. Central: Selukwe, *Walters* 2356; Salisbury, *Craster* 120; *Peter* 30658, *Walters* 2454, *Rand* 607 (BM), 461 (BM) & *Eyles* 1789; Wedza, *Myres* 576; Hartley, Pool Farm, *Hornby* 3386. East: Umtali, Commonage, *Chase* 7008;

Nyumquarara Valley, *Gilliland* 1585 (BM, K); Chirinda, *Swynnerton* 364 (BM); S. Melsetter, *Swynnerton* 6626 (BM). South: Zimbabwe, Chilopopo R., *Rendle* 407 (BM).

ANGOLA. Malange: between Nova Gaia and Chassengue, *Young* 765 (BM). Benguela: Caála, Lepi, Calusipa, *Gossweiler* 12129 (BM).

NESPHOSTYLIS VERDC.

Nesphostylis *Verdc.*, gen. nov. tribus *Phaseolearum*; *Sphenostylidi* Harms affinis, calycis lobis superioribus in labio truncato connatis, bracteolis magnis rotundatis persistentibus, vexillo appendicibus ornato, filamentis apice dilatatis, filamento vexillare basi dente armato valde differt.

Herba perennis volubilis. *Folia* alterna, pinnatim 3-foliolata, petiolata, stipulae haud infra insertionem productae, persistentes; stipellae praesentes. *Inflorescentiae* axillares, 1-florae, pedunculis apice glandulosi. *Flores* pedicellati; bracteolae 2, magnae, suborbiculares, calycis tubo imbricatae, subsistentes. *Calycis* tubus campanulatus, lobis 2 superioribus in labio leviter bifido vel truncato connatis, 3 inferioribus ovato-triangularibus. *Vexillum* suborbitale, basi auriculatum, unguiculatum, apice emarginatum, glabrum, intus medio appendicibus 2 lamelliformibus subparallelis ornatum. *Alae* anguste obovatae, unguiculatae, basi brevissime calcaratae, in parte inferiore leviter corrugatae. *Carina* obovata, unguiculata, apice leviter incurvata, rotundata. *Androecium* staminibus 10 diadelphis, filamentis apice valde dilatatis, filamento vexillare basi dente armato, antheris 5 subdorsifixis, antheris 5 alternantibus basifixis. *Discus* breviter vaginifer, lobatus. *Ovarium* lineare, subsessile, pluri-ovulatum; stylus cartilagineus, basi leviter incrassatus, superne in parte obtriangulare compressa dilatatus; stigma terminale. *Legumina* linearia, compressa, marginata, dehiscentia. *Semina* oblongo-ovoidea, hilo lineare ornata, arillata.

Typus generis: *Nesphostylis holosericea* (Bak.) Verdc.

Species 1, Africae tropicalis incola.

Nesphostylis holosericea (Bak.) *Verdc.*, comb. nov.

Vigna holosericea Bak. in Fl. Trop. Afr. 2: 200 (1871); Hiern, Cat. Afr. Pl. Welw. 1: 258 (1896).

V. hastifolia Bak., *l.c.* (1871).

Sphenostylis holosericea (Bak.) Harms in Engl., Bot. Jahrb. 33: 177 (1902); Bak. f., Leg. Trop. Afr.: 419 (1929); Hepper in Fl. W. Trop. Afr., ed. 2, 1: 565 (1958); Torre in Consp. Fl. Angol. 3: 275 (1966).

S. kerstingii Harms, *op. cit.*: 176 (1902).

S. holosericea (Bak.) Harms var. *hastifolia* (Bak.) Bak. f., *l.c.* (1929).

S. calantha Harms in Notizbl. Bot. Gart. Berl. 11: 818 (1933).

Herba perennis, volubilis, usque 1 m. longa, ramis pilis patulis ferrugineis dense obtectis. *Stipulae* triangulares, circa 4 mm. longae; petiolus 1.2–8 cm. longus; rhachis 0.3–2.5 cm. longa; petioluli 1.5–4 mm. longi; foliola oblonga, lanceolata vel elliptico-rhomboidea, 3–8 cm. longa, 1.5–6 cm. lata, integra vel trilobata, apice acuta vel rotundata, mucronulata, basi cuneata vel rotundata, chartacea, ubique dense vel velutine pubescentia,

nervis lateralibus 6–9-jugis, supra subplanis, subtus prominentibus. *Inflorescentiarum pedunculi* 1–5.5 cm. longi; pedicelli 2–9 mm. longi; bractee deciduae, triangulares, 2.5 mm. longae; bracteolae 6–10 mm. longae et latae, dense ferrugineo-pubescentes. *Calyx* velutine pubescens; tubus circa 6 mm. longus, lobis circa 5 mm. longis. *Vexillum* albescens vel caeruleum, demum flavescens, 2.5 cm. longum, 2.7 cm. latum, emarginatum. *Alae* purpureae; lamina 2.6 cm. longa, 1.4 cm. lata, ungue 7 mm. longo. *Carina* pallida; laminae 2.1 cm. longae 0.8–1.0 cm. latae, unguibus 7–8 mm. longis. *Ovarium* lineare, 2.3 cm. longum, stylo 8–9 mm. longo, parte superiore 3 mm. lato. *Legumina* 10–12(–15) cm. longa, 7.5–9 mm. lata, dense velutine griseo-vel ferrugineo-pubescentia. *Semina* saturate brunnea, 5.5–6.6 mm. longa, 4 mm. lata, 2.5–3 mm. crassa, arillo oblique incrassato 5 mm. longo ornata. (Fig. 3, p. 298.)

SENEGAL. *Berhaut* 1799 (*fide* Hepper, *l.c.*).

IVORY COAST. Cercle du Baoulé-Sud, district de Toumodi, entre Angouakoukro et Toumodi, 15 Aug. 1909, *Chevalier* 22405. Vallé du Camoé, entre le Camoé et Yabarasso, 12 Dec. 1909, *Chevalier* 22557.

GHANA. Ashanti, N. Agogo, Dukwesein, grass savannah, 23 Dec. 1913, *Chipp* 605:—blue-flowered climber. Wenchi District: Banda ravine, 21 Feb. 1953, *Morton* GC25162:—flower mauve, climber on tall grasses.

TOGO. Sokodé-Basari, *Kersting* 497 & 518 (B, syntypes of *Sphenostylis kerstingii* Harms†).

NIGERIA. Nupe, grassy plains, *Barter* 937 (K, syntype of *Vigna hastifolia* Bak.):—rootstock tuberous, flowers pale blue, turning yellow as they fade, very fragrant; same locality, *Yates* (BM). Jebba, *Barter* (K, syntype of *Vigna hastifolia* Bak.). Lokoja, in bush, 20 Oct. 1908, *Dalziel* 26. Lokoja, grassland, 21 Sept. 1907, *Parsons* L18:—handsome mauve flowers. Gombe, in long grass, 3 Oct. 1921, *Lely* 655:—a climbing leguminous herb to 3 m. with very large, highly scented mauve flowers, the wings darker than the standard, keel white, a very handsome plant, even more suitable for garden cultivation than *Vigna violacea*, as the flowers are larger and more highly scented. Lagos, 10 Oct. 1900, *Punch* 30:—igbogula (? vernacular name). Western Lagos, *Rowland*:—vernacular name 'eruwa'. Abbeokuta, *Irving* 88. Oyo, Olokemeji Forest Reserve, NW. corner, in open savannah woodland with *Daniellia* and *Lophira*, 12 Sept. 1949, *Keay* in *F.H.I.* 25385:—herbaceous twiner with mauve flowers. Cameroons, Adamawa Division, Vogel Peak area, Gurum, at foot of pass to R. Kirimi, dry savannah with scattered cultivation and *Khaya senegalensis* and *Parkia clappertoniana*, 640 m., 11 Nov. 1957, *Hepper* 1300:—twiner several m. long over tall grasses, leaves grey-green beneath, white nerves, well below the inflorescence, standard cream, tinged purple, wings mauve, keel cream.

TANZANIA. Tanga District: grown at Mlingano Sisal Research Station from plants originally from Sakura Estate in Pangani District, Oct. 1961, *Grundy* L138 (EA, K):—climbing twining creeper, large blue flowers, found so far only in a limited area S. of the R. Pangani and on the coast. Pangani District: Mwera, Kenge, 6 June 1908, *Braun* 1818 (EA):—climber with large red flowers, vernacular names (Kiswahili) 'majani fundofundo' & (Kishambaa) 'nfundo'; Mwera sisal plantation, 28 April 1926, *Peter* 39926:—climber with large lilac flowers. Ulanga District: between Mahenge Plateau and the junction of the rivers Kilombero, Luwegu and Rufiji, Schauri,

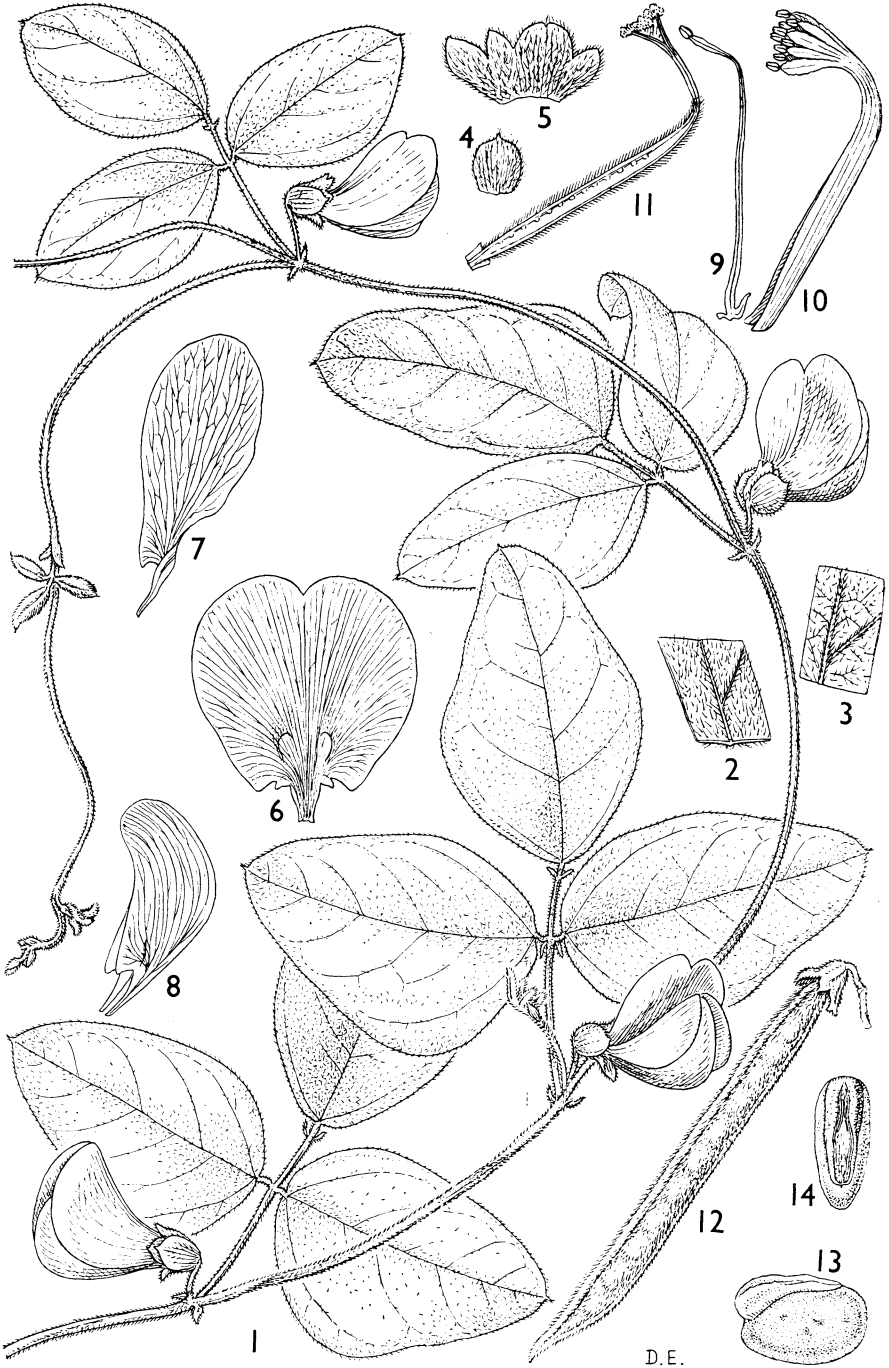
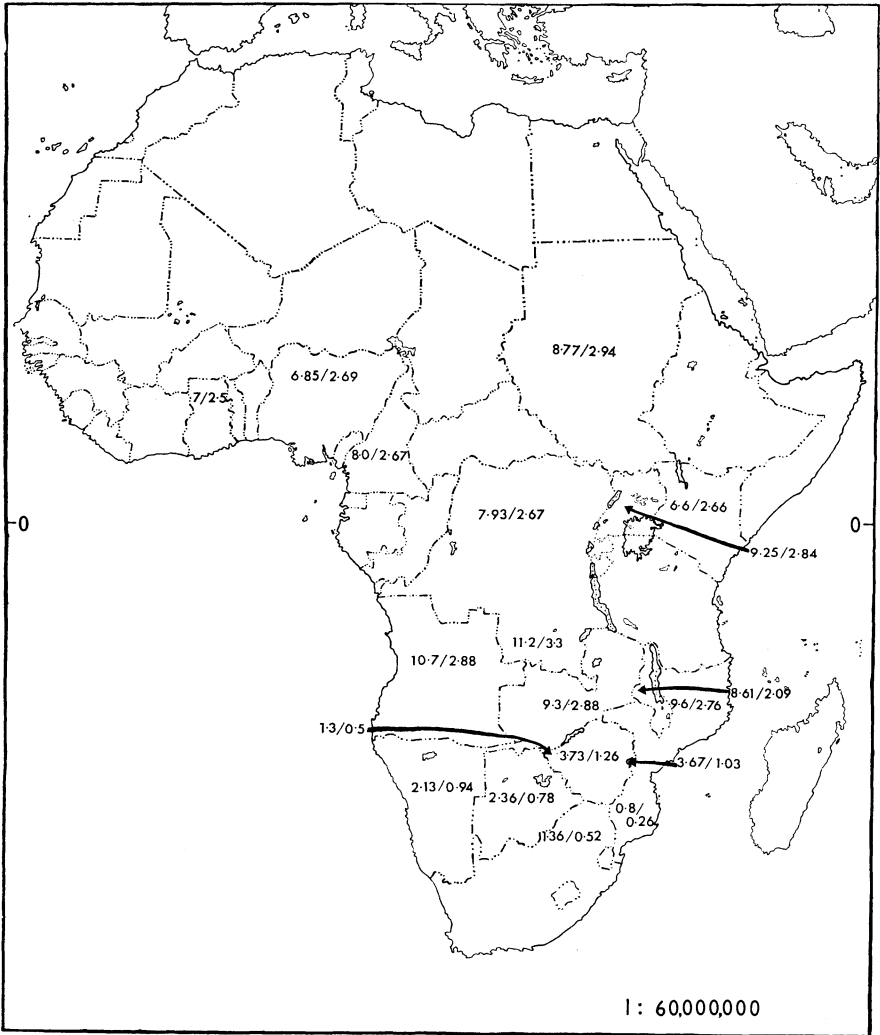


FIG. 3. *Nesphostylis holosericea*. 1, flowering stem to show habit, $\times \frac{2}{3}$; 2, portion of leaf, adaxial surface, $\times 4$; 3, same, abaxial surface, $\times 4$; 4, bract, $\times 1$; 5, calyx, $\times 1$; 6, standard, $\times 1$; 7, wing petal, $\times 1$; 8, keel, $\times 1$; 9, free vexillary stamen, $\times 1\frac{1}{2}$; 10, united stamens, $\times 1\frac{1}{2}$; 11, gynoecium, longitudinal section, $\times 1\frac{1}{2}$; 12, fruit, $\times \frac{2}{3}$; 13, 14, seed side and face views. 1, 4-12 from *Faulkner* 253; 2, 3 from *C. D. Adams* 4866; 13, 14 from *Grundy* L.138.

11 June 1932, *Schlieben* 2314 (B, holotype of *S. calantha*). Masasi, light woodland and grass, 450 m., 22 April 1935, *Schlieben* 6361 (BM). Lindi District: Nachingwea, disturbed ground by roadside, formerly miombo woodland, grey sandy soil, 420 m., 9 April 1955, *Anderson* 1036 (EA, K):—twining herb with perennial rootstock, corolla purple.

MOZAMBIQUE. Mocuba District: Namagoa, growing among grass, 14 April 1948, *Faulkner* 253:—a handsome pea, growing in plantations, flowers large, pale purple, sweet-scented, opening in the morning and closing in the afternoon; same locality, in bush and plantation, 60–120 m., Jan.–Mar. 1943, *Faulkner* 364 (PRE number) (Drawing 390):—trailing and climbing plants



MAP 1. Variation of petiole lengths of *Neorautanenia* in tropical Africa (excluding Tanzania—see Map 2). First figure is mean length (in cms.) and second figure is ratio of petiole to rachis length.

E

extending to many feet from a single root, flowers large, handsome, pale purple and scented, very common.

ANGOLA. Cuanza Norte: Cazengo, *Gossweiler* 4553 (BM, K); Cazengo, between Cambondo and Luinha, by thickets, June 1855, *Welwitsch* 2258b (BM, K):—flowers about 3·8 cm. long, pods (young) 13–15 cm. long, rather rare; Cazengo, Camondai, Jan. 1912, *Gossweiler* 5765 (BM); Golungo Alto, in bushy places at the banks of the R. Muio, Sobado de Cabanga Cacalungo, June 1856, *Welwitsch* 2258 (LISU, holotype; BM, K, isotypes):—whitish-silky in all parts, flowers very large, 4·5 cm. long, rose-purple.

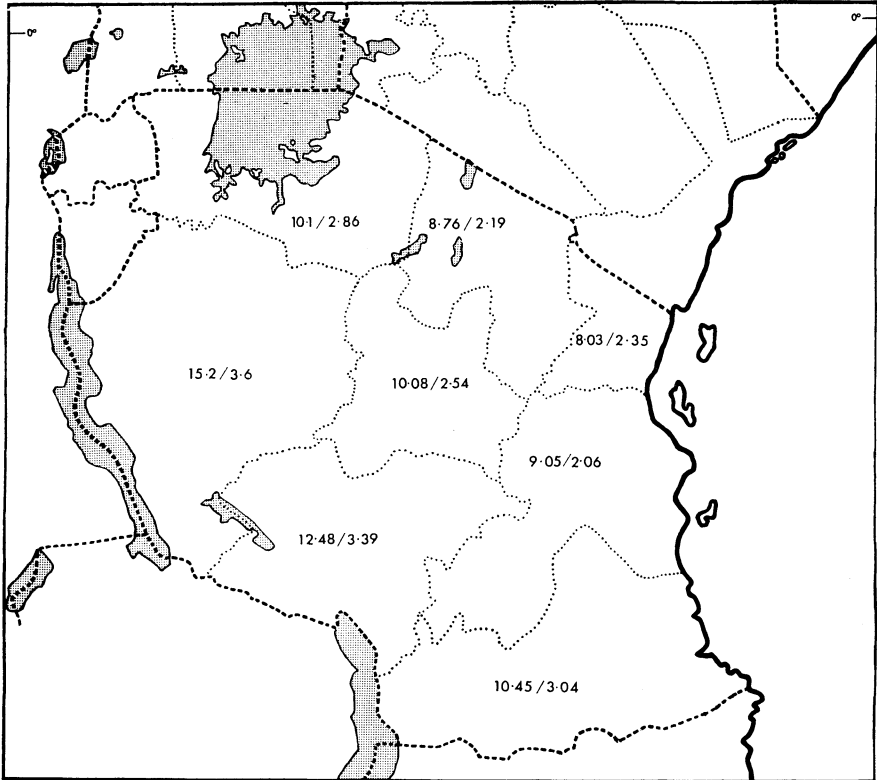
THE GENUS *NEORAUTANENIA* SCHINZ

The genus *Neorautanenia* was erected by Schinz (Bull. Herb. Boiss. 7: 35 (1899)) and is equivalent to *Dolichos* L. section *Pseudopachyrhizus* Harms. As a generic unit it is compact and easily recognized but the division into species is exceedingly difficult unless a wide view is taken. C. A. Smith described a number of species from the Transvaal and also started to study material from further north. It is clear from his notes that he had decided to describe quite a number of new species. After several detailed examinations of the genus in the herbarium and over 15 years of routine naming, during which time members of the genus turned up regularly, I am convinced that only three species are clearly recognizable. For the purposes of the 'Flora of Tropical East Africa' I am not even attempting to describe named varieties although extremes can appear very different. A short erect form which flowers before the leaves, appears very distinct from a vigorous liane which flowers when the foliage is fully developed. This type of behaviour is now well known in savanna species particularly where burning plays a part in the ecology. It is of great interest to note that *Stony* 4982 collected 272 miles NW. of Molepolole in Botswana was recorded as 'erect 2' tall' on the field note but as prostrate when cultivated at Prinshof, Pretoria. In order to investigate any possible geographical correlation between combinations of characters a large number of herbarium sheets were scored for those characters which contribute most to the difference in appearance of the various forms. The results are shown in Table 5 (p. 302). One evident correlation with geography is the ratio of length of petiole to length of rhachis and this is shown in detail in Maps 1 & 2* (pp. 299 & 301).

The flowers are uniform in structure, differing only in dimensions; in one case only did it appear that distinct structural differences were available. *Napier* 2055 (Kenya) and *Andrews* A1456 (Sudan) have the claws of the petals extremely short and the staminal tube about half the normal length. It was discovered that this was due to the galling of the ovaries which had affected the development of the flower. Every flower on the plant can be involved, producing a deceptively different looking inflorescence.

Even when only three species are recognized there are a fair number of specimens which are either completely intermediate or whose facies agree in most characters with one of the species recognized, save those which have been considered important, and hence are put into one of the other

* To save space the original tables of data have been omitted and only the averages given in map form.



MAP 2. Variation of petiole length of *Neorautanenia* in Tanzania. First figure is mean length (in cm.) and second figure is ratio of petiole to rachis length.

species. For instance *Greenway* 4512, and *Greenway* 10927 from NE. Tanzania are basically the same as *de Winter & Wiss* 4227 from South West Africa. I feel that the situation in this genus can be explained either by the fact that in the south two species are just separating from the main bulk of the genus, while there is still gene flow or, more probably, that formerly quite distinct species have come into contact again recently and are hybridizing, particularly in Rhodesia. It can be seen from Table 5 that there is scarcely any correlation between any one character or combination of characters with geography, but slight tendencies are noticeable which may show that varieties are developing.

KEY TO SPECIES OF NEORAUTANENIA

Petiole short and ratio of petiole to rachis lengths under 1:

Leaves usually elliptic or rhomboid, entire or slightly lobed

N. amboënsis

Leaves mostly broad and deeply divided, resembling those of *Ficus carica*

N. ficifolius

Petiole usually long and ratio of petiole to rachis lengths over 1 . ***N. mitis***

Neorautanenia amboënsis *Schinz* in Bull. Herb. Boiss. 7: 35 (24 Jan. 1899).

TABLE 5. Analysis of characters in *Neorautanenia*

| Number of plants showing combination of characters indicated | Stems and foliage | | Mid-lobe of leaflet | | | Leaflets entire | Habit | | Petiole length (cm.) | Rhachis length (cm.) | Remarks on geographical correlation* |
|--|-------------------|-----------|---------------------|-------------------|-----------------------------|---------------------------------|-------------------------------|----------|----------------------|----------------------|--|
| | densely velvety | pubescent | glabrous | broadened at apex | broadened, short and obtuse | | not broadened, long and acute | twinning | | | |
| 7 | + | | | + | | | habit not ascertainable | | 7-13.5 | 3-5.5 | T 1, 6, 8; Congo; Zambia |
| 2 | + | | | + | | | + | | 9-14.5 | 4-4.5 | T 4 |
| 11 | + | | | + | | | + | | 6-17 | 2-5.8 | T 1, 3, 4, 5, 8; Zambia |
| 1 | + | | | | + | | + | | 10 | 4 | U 1 |
| 3 | + | | | + | | Some | + | | 10-18 | 1.5-4.5 | T 4; Malawi; Transvaal |
| 1 | + | | | + | | Some | | | 25.5 | 7.5 | T 7 |
| 6 | + | | | + | | | habit not ascertainable | | 3-9.3 | 1-4 | U 3; T 7; Nigeria; Rhodesia; Angola |
| 4 | + | | | | | | habit not ascertainable | | 0.5-8 | 2-4 | K 7; Zambia; Transvaal |
| 3 | + | | | | | | + | | 1-5 | 3-3.5 | Transvaal |
| 5 | + | | | | | | + | | 4-3-10 | 1.3-4 | U 3; T 1, 8; Rhodesia |
| 10 | + | | | | | | + | | 2-15.5 | 1-5 | U 1, 2; T 4, 5; Mozambique; Malawi |
| 1 | + | | | | | divided leaflets just appearing | + | | 3 | 0.5 | Zambia |
| 8 | + | | | | | | habit not ascertainable | | 1-10.5 | 1-4.7 | U 1, 2; K 2, 6; T 2, 6; Sudan; Congo (Orientale) |

| | | | | | | | | |
|----|---|---|--|--|-------------------------|----------|---------|---|
| 5 | + | | | | + | 7-23 | 2.5-6 | T 4, 8; Malawi; Mozambique; Angola |
| 1 | + | | | | habit not ascertainable | 7 | 4.5 | T 6 |
| 8 | + | ± | | | + | 2-10.5 | 2.5-4.8 | T 6; Zambia (6); Caprivi Strip |
| 3 | + | + | | | + | 9-21.5 | 3-7.3 | T 4; Sudan |
| 1 | + | + | | | + | 9.5 | 5 | T 3 |
| 3 | + | + | | | + | 6.5-13 | 3.2-4.7 | T 6; Zambia |
| 19 | + | + | | | habit not ascertainable | 1-16.5 | 1.2-7.5 | K; T 3, 5, 6; Mozambique; Congo; Zambia; Rhodesia; Transvaal; Botswana; South West Africa |
| 1 | + | | | | + | 1.3 | 1.5 | Rhodesia |
| 11 | + | | | | Some | 3.5-14.5 | 2.5-6.3 | U 1; T 6; Ghana; N. Nigeria; Sudan; Mozambique; Zambia; Rhodesia |
| 3 | + | | | | Some | 4.5-7.3 | 2-4.5 | T 2, 3, 6 |
| 1 | + | | | | + | 4.3 | 2.5 | Rhodesia |
| 3 | + | | | | + | 2-3 | 2.5-3.5 | South West Africa; Rhodesia |

| Number of plants showing combination of characters indicated | Stems and foliage | | | Mid-lobe of leaflet | | | Leaflets entire | Habit | | | Petiole length (cm.) | Rhachis length (cm.) | Remarks on geographical correlation* |
|--|-------------------|-----------|----------|---------------------|---------------------------------|-------------------------------|-----------------|-------------------------|-----------|---------|----------------------|--|---|
| | densely velvety | pubescent | glabrous | broadened at apex | not broadened, short and obtuse | not broadened, long and acute | | twining | prostrate | erect | | | |
| 21 | | + | | | + | | | habit not ascertainable | | | 1-14.5 | 2-6.5 | K; T 1, 2, 3, 6; Sudan; Nigeria; Cameroons; Congo; Rhodesia; South Africa |
| 1 | | + | | | + | | | + | | 7 | 5 | Mozambique | |
| 1 | | + | | | + | | | + | | 1.3 | 2.5 | Transvaal | |
| 5 | | + | | | + | | | + | | 0.5-7.5 | 1.8-4 | T 1; Transvaal | |
| 7 | | + | | | + | | | + | | 5-11 | 2.7-5.6 | K 1, 6, 7; T 1, 2; | |
| 1 | | + | | | + | | Some | + | | 1 | 2 | Botswana | |
| 2 | | + | | | + | | Upper | habit not ascertainable | | 9 | 4 | T 3 | |
| 19 | | + | | | + | | | habit not ascertainable | | 0.5-16 | 1.7-7 | K 4, 7; T 2, 3; Mozambique; Rhodesia; Transvaal; Natal; O.F.S. | |
| 11 | | + | | | + | | + | + | | 1.5-19 | 1.7-4.5 | K 2; T 4, 5, 6, 7, 8; N. Nigeria; Sudan; Botswana; South West Africa | |
| 1 | | + | | | + | | + | + | | 2 | 2 | Pretoria | |
| 1 | | + | | | + | | + | + | | 7.2 | 2.5 | Angola | |
| 4 | | + | | | + | | + | + | | 0.5-8.3 | 2.5-3.5 | Zambia; Botswana; Ngamiland | |

| | | | | | | | | | | | | |
|----|---|--|--|--|--|--|--|---|-------------------------|---------|---------|--|
| 15 | + | | | | | | | + | + | 0·5-14 | 1·5-6 | T 2; Gazaland; Botswana; South West Africa; Transvaal |
| 40 | + | | | | | | | + | habit not ascertainable | 0·3-23 | 1-9 | K 1, 3; T 2, 3, 4, 6, 7; Ethiopia; Sudan; Congo; N. Nigeria; Malawi; Mozambique; Zambia; Rhodesia; Botswana; South West Africa; Transvaal |
| 2 | | | | | | | | | habit not ascertainable | 11-13 | 4-7 | Congo; Angola |
| 1 | | | | | | | | | + | 11 | 6·5 | T 8 |
| 1 | | | | | | | | | + | 7 | 3 | Nigeria |
| 1 | | | | | | | | | + | 11 | 4·5 | T 8 |
| 1 | | | | | | | | | habit not ascertainable | 7·5 | 4 | T 3 |
| 1 | | | | | | | | | + | 1·3 | 2·6 | Rhodesia |
| 1 | | | | | | | | | + | 9 | 4 | T 1 |
| 3 | | | | | | | | | habit not ascertainable | 3·5-5·5 | 3·5-4·5 | Transvaal; Mozambique |
| 1 | | | | | | | | | + | | | T 2 |

* The numbers prefixed by U, K or T represent the geographical divisions used in the Fl. Trop. E. Afr. for Uganda, Kenya and Tanganyika respectively.

- Dolichos brachypus* Harms in Engl., Bot. Jahrb. 26: 323 (31 Jan. 1899).
Galactia lugardii N. E. Br. in Bull. Misc. Inf. Kew 1909: 104 (1909).
Dolichos seineri Harms in Notizbl. Bot. Gart. Berl. 5: 206 (1911).
Pueraria rogersii L. Bolus in Ann. Bolus Herb. 1: 189 (1915).
Neorautanenia brachypus (Harms) C. A. Smith in Burt Davy, Flowering Pl. Ferns Transvaal 2: xxvii & 418 (1932).
N. coriacea C. A. Smith, *l.c.* & 417 (1932).
N. edulis C. A. Smith, *op. cit.* xxviii & 418 (1932).
N. lugardii C. A. Smith, *l.c.* & 417 (1932).
N. rogersii (L. Bolus) C. A. Smith *ll.cc.* (1932).
N. seineri (Harms) C. A. Smith *l.c.* & 418 (1932).

DISTRIBUTION. South West Africa, Transvaal, Rhodesia, Botswana.

Neorautanenia ficifolius (*Benth.*) C. A. Smith in Burt Davy, Flowering Pl. Ferns Transvaal 2: xxviii & 417 (1932).

- Rhynchosia ficifolia* Benth. in Harv. & Sond., Fl. Cap. 2: 251 (1862).
Pueraria ficifolia (Benth.) L. Bolus in Ann. Bolus Herb. 1: 189 (1915).
Dolichos ficifolius (Benth.) Harms in Pflanzenw. Afr. 3(1): 681 (1915).
Neorautanenia deserticola C. A. Smith, *l.c.* xxvii & 417 (1932).

DISTRIBUTION. Transvaal, Natal, Orange Free State, Botswana.

Dr. Codd and Dr. de Winter in a letter to Kew (12 Dec. 1962) concluded after an examination of the South African material that only two species could be recognized and I have followed them since there appears to be more correlation between leaf-lobing and other characters in the south than in the north where it is not really feasible to separate entire-leaved specimens from lobed-leaved specimens.

Neorautanenia mitis (*A. Rich.*) Verdc., Common Poisonous Plants of E. Afr.: 89 (1969).

- Dolichos mitis* A. Rich., Tent. Fl. Abyss. 1: 224 (1847).
Pachyrhizus ? orbicularis Bak. in Fl. Trop. Afr. 2: 208 (1871).
 [*Pachyrhizus angulatus* sensu Bak. in Fl. Trop. Afr. 2: 208 (1871), *quoad spec. Barter, Petherick et Schimper, non A. Rich.*]
Cacara ? orbicularis (Bak.) Hiern, Cat. Afr. Pl. Welw. 1: 261 (1896).
Dolichos pseudopachyrhizus Harms in Engl., Bot. Jahrb. 26: 320 (1899).
D. pseudopachyrhizus Harms var. *subintegrifolius* Harms, *l.c.* (1899).
D. pseudopachyrhizus Harms var. *kilimandscharii* Harms, *l.c.* (1899).
D. ellenbeckii Harms in Engl., Bot. Jahrb. 33: 177 (1902).
Pueraria hochstetteri Chiov. in Ann. Ist. Bot. Roma 8: 434 (1908); Cuf., Enum. Pl. Aeth. Sperm.: 319 (1955).
Dolichos orbicularis (Bak.) Bak. f., Leg. Trop. Afr.: 451 (1929).
Neorautanenia pseudopachyrhiza ('*pseudopachyrhiza*') (Harms) Milne-Redh. in Kew Bull. 5: 355 (1951).
N. pseudopachyrhiza (Harms) Milne-Redh. var. *ellenbeckii* (Harms) Cuf., Enum. Pl. Aeth. Sperm.: 315 (1955).
N. orbicularis (Bak.) Torre in Bol. Soc. Brot., sér. 2, 39: 216 (1965).

DISTRIBUTION. Widespread in Tropical Africa.

I am indebted to the Director of the Laboratoire de Phanérogamie, Paris, for sending me on loan the type of *Dolichos mitis*. From the description it was fairly evident what it must be. It has presumably long been ignored because it consists only of a few fruits and leaflets. I have seen authentic material of all the other names save *D. ellenbeckii*. It does not seem worth while to cite at length the very large number of specimens available of this common and easily recognizable plant. It should be stated that various workers who have seen this plant in the field consider my treatment wrong and would prefer to recognize several species, but the furthest I would go is to give varietal names to each of the various combinations of characters that appear commonly in Table 5. I would not even subscribe to this until some genetic information is available.

Botany in Leningrad.—It is hard to explain the peculiar charm and fascination of Leningrad, the spell the city casts upon those who visit it, however briefly, calling forth feelings of affection and love. Physical beauty, a sense of living history, a scientific and cultural community of outstanding strength and vigour, human warmth and hospitality—all these and more enter into it, yet the whole is more than the sum of its parts. To the botanist, however, there is one more cogent reason for visit and return; the city is the home and birthplace of the Komarov Botanical Institute, one of the world's greatest centres of botanical research activity. Stanwyn Shetler visited Leningrad in 1964 and did not escape its spell. The result is this book*, in which he attempts to present the history of the Institute and its scientific activity, from its earliest beginnings in young St. Petersburg to its 250th anniversary in 1964.

The author's enthusiasm for his subject is obvious, yet he never lets it get the better of objectivity and accuracy. Bias and omissions are there, of course, as he himself readily admits. Being an American and a taxonomist, he naturally writes from an American taxonomist's viewpoint; but what matters is that a most important chapter of botanical history has been brought widely to the notice of the English-speaking world, where too long it has remained too little known.

The book opens with a brief outline of the history of Leningrad and of the modern city, sketching the background to the more detailed account of the Institute itself which forms the second part. This is the bulk of the book. It is a compilation from the published sources given in the bibliography. It is good to see Russian names and titles given in their original as well as in transliterated and (where appropriate) translated form; but the Russian title to reference 8, the author's most important source, has inadvertently been omitted. A short final section attempts to assess the past and present and to look to the future. The general lay-out of the book is pleasing; it is clearly printed, free from errors and well illustrated with half-tone plates, including many portraits of past and present members of the Institute's staff. A useful chronological table is provided. Some of the footnotes are placed unfortunately far from the places in the text to which they refer, and there is a certain verbosity and repetitiveness here and there. This latter may, I fear, be more a reflection of a parallel fault in some of the sources than the

* *The Komarov Botanical Institute*. By Stanwyn G. Shetler. Pp. xiv + 240, numerous black-and-white photographs. Washington: Smithsonian Institution Press, 1967. Price \$5.95.