

with six well-spaced seeds and leaves with up to 10 pairs of leaflets. As ALI has indicated in *Biologia (Lahore)* 10: 29 (1962) this seems to correspond with Indian specimens of *T. purpurea* rather than *T. pumila*.

Subsp. **leptostachya** (DC.) Brummitt, comb. et stat. nov.

Basionym: *Tephrosia leptostachya* DC., Prodr. 2: 251 (1825). — Benth. in Mart., Fl. Bras. 15(1): 48 (1859). — Grisebach, Fl. Brit. W. Ind. Is.: 182 (1860). — Bak. f., Leg. Trop. Afr. 1: 191 (1926). — Hutch. & Dalziel, Fl. W. Trop. Afr. 1(2): 385 (1928). — Morton, Journ. W. Afr. Sci. Ass. 2(1): 70 (1956). Type: Senegal, *Perrottet* (G, proposed here as lectotype, seen in microfiche only).

Tephrosia lineata Schum. & Thonn. in Schum., Beskr. Guin. Pl.: 376 (1827). Type in Isert & Thonning herbarium (C, seen in microfiche only).

Cracca leptostachya (DC.) Rusby in Mem. Torrey Bot. Club 33: 18 (1893). Type as for *Tephrosia leptostachya*.

Annual or short-lived perennial, stems procumbent or ascending, weak and straggling, or sometimes (var. *delagoensis*) stouter, erect and \pm bushy. Stems thinly appressed-to spreading-pubescent. Leaves with (3)4-10(11) pairs of leaflets; petiole (0.1)0.2-2.0(2.5) cm, petiole and rhachis together (1)2.5-9(10) cm; leaflets (0.5)0.8-2.5(3.0) \times 0.2-0.9 (1.1) cm; upper surface glabrous to thinly appressed-pubescent; stipules 2-7(8) \times 0.2-1 mm. Inflorescences (2)5-18 (25) cm, lax, the axis not white-pubescent; bracts (1)2-5 mm long. Petals 5-8(10) mm long. Pods (20)32-50(56) \times 3-4.5 (5) mm; seeds (6)7-10(11).

Africa; introduced in the West Indies and America.

Var. **leptostachya**

Stems procumbent or ascending, usually \pm straggling, subglabrous or with closely appressed hairs.

Widespread in tropical Africa but apparently local and absent from large areas (see map, fig. 3); Algeria, Senegal, Gambia, Dahomey, Nigeria, Sudan, Ethiopia, Somali Repu-

blic, Uganda, Kenya, Tanzania, Mozambique, Comoro Islands, Botswana, Rhodesia, Angola and South Africa (Transvaal). The following specimens from southern Africa have been seen:

BOTSWANA. South-east. 60 km N. W. of Serowe, fr. 24.iii.1965, *Wild & Drummond* 7206 (SRGH).

RHODESIA. Eastern Div. Chipinga Distr., Lower Sabi, east bank, Hippo Mine area, fl. & fr. 12.iii.1957, *Phipps* 594 (SRGH).

MOZAMBIQUE. Niassa. Mozambik, fl. & fr. 5.iv.1894, *Kuntze* (K). Mocimboa da Praia 5 km towards Diaca, fl. & fr. 14.iv.1964, *Torre & Paiva* 11949 (LISC). **Zambesia or Manica e Sofala.** Shupanga, fl. 2.viii.1859, *Kirk* (K). Margens do Zambezi, fl. & fr. 1884-1885, *Carvalho* (COI). **Lourenço Marques.** Cidade de Lourenço Marques, fl. & fr. 25.ii.1945, *Esteves de Sousa* 46 (LISC; PRE). Maputo, Bela Vista, fl. & fr. 16.ii.1952, *G. Barbosa & Balsinhas* 4709 (LISC).

COMORO ISLANDS. Mayotte, *Boivin* (K).

ANGOLA. Cuanza Norte. Rio Cuanza, prox. de Mopopo, *Welwitsch* 2099 (K).

SOUTH AFRICA. Transvaal. Shilouvane, fr. ii-iii, *Junod* 1125 (K). Komati Poort, fl. & fr. iii.1918, *Rogers* 20814 (K).

Plants from the Sahara region here referred to var. *leptostachya* often appear to have the habit of a low bush and may be taxonomically separable — see for example *Chipp* 49 from southern Algeria (K), *Vogel* 38 from Lake Chad, Nigeria (K) and recent collections from the same region by *Léonard* (BR).

Three further collections from southern Rhodesia may be referable to *T. purpurea* var. *leptostachya* but their relationship to *T. limpopoensis* Gillett in *Kew Bull.* 13(3): 418 (1958) requires further investigation:

RHODESIA. Southern Div. Gwanda Distr., Shashi Plain, Beit Bridge alluvium, fl. xii, 1954, *R. M. Davies* 890 (SRGH). Gwanda Distr., Special Native Area G, fl. & fr. 15.xii.1956, *R. M. Davies* 2307 (K; SRGH); 2318 (K; SRGH): Beitbridge, between Customs Post and Limpopo River, fl. & fr. 25.iii.1959, *Drummond* 6000 (K; LISC; PRE; SRGH).

T. limpopoensis differs from *T. purpurea* in its leaves with only 1-2 pairs of leaflets and its low shrubby habit and woody stems, but its flowers and fruit seem to differ little from those of *T. purpurea*. The four Rhodesian collections cited are all woody towards the base, and if they had been grazed by animals, as all available specimens of *T. limpopoensis* appear to have been, they would show a marked resemblance to that species; furthermore they have leaves with 1-4(5) pairs of leaflets, the lowermost ones having usually only 1-2 pairs. More collections and field observations from the Limpopo valley are required before the position of these plants and the status of *T. limpopoensis* can be satisfactorily determined. Specimens of *T. uniflora* Pers. from the same area—see for example *R. M. Davies* 2291 (K; SRGH) from Gwanda and *Wild* 5352 (K; SRGH) from Beitbridge—tend to have a remarkably similar facies, but are distinguished by their wholly axillary flowers, longer calyx teeth and twisted style.

Var. **pubescens** Bak. in Oliv., Fl. Trop. Afr. 2: 125 (1871).
—Bak. f., Leg. Trop. Afr. 1: 191 (1926).—Cronquist, Fl. Congo Belge 5: 98 (1954).—Torre in Consp. Fl. Angol. 3: 153 (1962). Type: Tanzania/Mozambique, Rovuma River, *Meller* (K, chosen here as lectotype).

Tephrosia laurentii De Wild., Miss. Laurent: 111 (1905); Pl. Bequaert. 3: 330 (1925).—Bak. f., Leg. Trop. Afr. 1: 192 (1926). Type from the Congo, not seen, referred to this variety by Cronquist loc. cit.

Tephrosia transvaalensis Hutch. & Burt Davy in Burt Davy, Fl. Pl. Ferns Transvaal 1(2): xxxii, 376, 378 (1932).—Forbes in Bothalia 4(4): 975 (1948) pro parte, excl. spec. *Rogers* 6881. Type: S. Africa, Transvaal, Komati Poort, fr. 16.xii.1897, *Schlechter* 11783 (11785 in Hutch. & Burt Davy in error) (K).

T. burchellii, *T. semiglabra*, *T. capensis*, *T. polystachya* etc. sensu auctt. S. Afr. pro parte.

Stems procumbent or ascending, usually \pm straggling, covered with spreading or ascending hairs.

This the commoner form of this species in most parts of Tropical Africa, from Ghana to Ethiopia and Somalia and south to S. W. Africa and the Transvaal.

Var. **delagoensis** (H. Forbes) Brummitt, comb. et stat. nov.

Basionym: *Tephrosia delagoensis* H. Forbes in *Bothalia* 4(4): 968 (1948). Type: Mozambique, in arenosis Lourenço Marques, *Schlechter* 11521 (PRE, holotype not seen; COI, K, isotypes).

Tephrosia indigofera Bertol., *Misc. Bot.* 19: 9, t. 5 (1858). Type: Mozambique, Inhambane, *Fornasini* (BOLO; photograph K).

T. polystachya sensu auctt. S. Afr. pro parte.

Stems \pm stout, erect, forming a low bush up to 70 cm high, sometimes becoming woody in the lower parts, the younger stems with appressed to spreading hairs.

Coastal lowlands and river valleys of south-eastern tropical Africa.

BOTSWANA. Northern Prov. Corner of Makarikari Pan (N. E.), fl. & fr. 15.i.1959, *West* 3826 (LISC; PRE; SRGH).

ZAMBIA. Barotseland. Banks of Zambesi 10 miles below Senanga, fl. & fr. 8.ii.1952, *White* 2029 (K — 'shrub 1.5 m high').

RHODESIA. Northern Div. Sebungwe Distr., Zambesi Valley, Bumi R. walk, *Kirkia*, mopane, *Combretum* veld, fl. & fr. ix.1955, *R. M. Davies* 1486 (K; SRGH). Urungwe Distr., near Chirundu Sugar Estates, on Zambesi River sand dunes, fl. & fr. 2.ix.1964, *Corby* 1142 (K). **Southern Div.** Ndanga Distr., Triangle Ranch, 610 m, fr. 6.xi.1946, *Bates* (K). Sabi-Lundi Junction, near Lundi River, mopane woodland, fr. 8.vi.1950, *Wild* 3460 (K; PRE; SRGH). Gwanda Distr., Gilchrist's Causeway, Bubyia river, 245 m, fl. & fr. v.1955, *R. M. Davies* 1276 (K; SRGH). Beitbridge Distr., Chikwarakwara, Limpopo River, fl. & fr. 23.ii.1961, *Wild* 5340 (K; LISC; PRE; SRGH). Ndanga Distr., Hippo Valley, fl. & fr. 20.iv.1961, *Whellan* 1837 (K; SRGH). Nuanetsi Distr., Lundi R., near Fishans, fl. & fr. 28.iv.1962, *Drummond* 7781 (K; SRGH).

MALAWI. Southern Prov. Symon's Village on Lisungwe R., fl. & fr. 5.xi.1937, *Lawrence* 467 (K). Port Herald, road to Agric. House, roadside, fl. 26.i.1938, *Lawrence* 569 (K). Lower Mwanza River, Chickwawa Distr., fl. & fr. 4.x.1946, *Brass* 17972 (K; SRGH). Port Herald Distr., between Muona and Shire River, 80 m, fl. & fr. 20.iii.1960, *Phipps* 2579 (K; PRE; SRGH).

MOZAMBIQUE. Niassa. Fernão Veloso, Nacala, fl. & fr. 17.v.1937, *Torre* 1425 (COI). **Zambézia.** Quelimane, 30 m, fr. 1908, *Sim* 20551 (PRE). **Manica e Sofala.** About 5 km from Chemba on the road to Tambara, fr. 23.iv.1960, *Lemos & Macuácuá* 142 (COI; K; LISC; LMJ; PRE; SRGH). **Sul do Save.** Guilala, near Inhambane, coconut plantation, fl. & fr. ix.1935, *Gomes e Sousa* 1649 (COI; K). Near Morrumbene, fl. & fr. ix.1937, *Gomes e Sousa* 2027 (COI; K; LISC). Inhambane, fl. & fr. 15.i.1939, *Torre* 1605 (COI; LISC). Homoine, Maxixe, fl. & fr. 10.x.1945, *Gomes Pedro* 293 (LMJ; PRE; SRGH). Arredores do Guijá, fl. & fr. 14.iii.1948, *Torre* 7487 (LISC). Entre Dinga e Sairté, Caniçado, fr. 15.v.1948, *Torre* 7828 (LISC). Caniçado região da Chamasca, fr. 19.v.1948, *Torre* 7871 (LISC). Inharrime, Mangôorro, Est. Exp. Malamba, fl. & fr. 7.iv.1954, *Barbosa & Balsinhas* 5538 (LISC; LMJ). Between Morrumbene and Massinga, fl. & fr. 26.ii.1955, *Exell, Mendonça & Wild* 658 (LISC; SRGH). Near Chibuto, road to Alto Changane, fl. & fr. 12.ii.1959, *Barbosa & Lemos* 8382 (COI; K; LISC; LMJ; PRE; SRGH). **Lourenço Marques.** Marracuene, fl. & fr. v.1893, *Quintas* 4 (COI). Delagoa Bay, fl. & fr. 29.iii.1894, *Kuntze* (K, as *Cracca villosa* var. *cinerea*). Lourenço Marques, in arenosis, fl. & fr. 29.xi.1897, *Schlechter* 11521 (COI; K; isotypes of *T. delagoensis*). Rikatla, fr. xi.1917, *Junod* 221 (PRE). Lourenço Marques, fr. xii.1917, *Moss & Rogers* 742 (K). Lourenço Marques?, fr. 1917-18, *Junod* 540 (LISC). Lourenço Marques, fl. & fr. 1.ii.1920, *Borle* 292 (PRE). Polana Flats, fr. 27.viii.1940, *A. J. Hornby* 2059 (K — «small tree»). Chobela-Magude, fr. 9.i.1941, *Viana* 12 (PRE). Polana Flats, 11.vi.1941 *Hornby* 864/A, 864/B (K). Near Lourenço Marques, fl. & fr. xii.1945, *Pimenta* 17301 (LISC; SRGH). Km 7 of the road L. Marques — R. Garcia (Boane), fl. & fr. 17.ii.1945, *Estêves de Sousa* 18 (LISC);

PRE). Lourenço Marques town, fl. & fr. 25.ii.1945, *Estêves de Sousa* 45 (LISC; PRE). Near Lourenço Marques, fl. & fr. xii.1945, *Lab. Quím.* 2031 (PRE). Lourenço Marques, Ponta Vermelha, fl. & fr. 25.ix.1945, *Gomes Pedro* 135 (LMJ; PRE). Near Marracuene, 35 km northwards Lourenço Marques, fl. & fr. 27.ii.1946, *Gomes e Sousa* 3391 (K). Lourenço Marques, fl. & fr. 29.ii.1947, *Pedro* 3138 (LMJ). Between Umbeluzi and Boane, new road, fr. 24.iv.1947, *Pedro & Pedrógão* 629 (PRE). Lourenço Marques commonage, fl. & fr. 18.i.1948, *Mrs. Faulkner* 185 (K). About 3 miles north of Lourenço Marques, strand association, fl. & fr. 29.iii.1948, *Rodin* 4163 (K; PRE). New Capitania do Porto, fl. & fr. 5.iii.1949, *Myre* 405 (LISC). 4.2 km from Marracuene towards Manhiça, fl. & fr. 28.ii.1952, *Barbosa & Balsinhas* 4840 (LISC; LMJ). Alvor, fr. 1.iii.1952, *Barbosa & Balsinhas* 4871 (LISC; LMJ). Near Polana Hotel, 60 m, fl. ix.1960, *O. B. Miller* 7458 (PRE). Lourenço Marques, Costa do Sol, fl. & fr. 15.ix.1961, *Moura* 13 (COI). Lourenço Marques, Povoação de Arricata, 23 km towards Marracuene, fl. & fr. 30.iv.1964, *Balsinhas* 714 (LISC).

Subsp. *altissima* Brummitt, subsp. nov.

Annua (? vel interdum perennis) caulibus erectis usque 1.5 m altis, plus minusve gracilis et laxis. Caules juveniles pilis appressis vel patentis vestiti. Folia (5)6-8(9) foliolorum praedita; petiolus 0.3-1.4 cm, petiolus et rhachis coniunctim (4)5-10(12) cm; foliola (1.5)1.8-4(4.5) × 0.4-1.0(1.3) cm, elliptico-oblonga, basi cuneata, apice rotundata ad truncata; pagina superior glabra; stipulae (3)4-8 × 0.2-1 mm. Inflorescentiae usque 20(24) cm, laxae, non albo-pubescentes; bractee 2-5 × 0.2-0.6 mm. Petala 7-10 mm longa. Legumina (40)48-60 × (4)4.5 cm; semina 7-9.

Typus: Mozambique, Manica e Sofala, Serra do Garuzo, Chimoio, fl. & fr. 5.iii.1948, *Barbosa* 1137 (LISC, holotypus).

Mountain areas of Mozambique, eastern Rhodesia and southern Malawi.

RHODESIA. **Eastern Div.** Umtali Distr., Darlington, sand-pits, 1130 m, fl. & fr. 10.ii.1955, *Chase* 5468 (BM; COI; K; LISC; SRGH).

MOZAMBIQUE. **Niassa.** Entre Fernão Viloso e Itoculo (Nacala), fl. & fr. 15.x.1948, *Barbosa* 2439 (LISC). **Manica e Sofala.** Encosta da Serra do Garuzo, Chimoio, fl. & fr. 5.iii.1948, *Barbosa* 1111 (LISC). Serra do Garuzo, Chimoio, fl. & fr. 5.iii.1948, *Barbosa* 1137 (LISC; type). Serra do Garuzo, Chimoio, fl. & fr. 5.iii.1948, *Garcia* 539 (LISC). Região de Garuzo, Chimoio, fl. and fr. 20.iii.1948, *Barbosa* 1220 (LISC). Região de Bandula, fl. & fr. 9.iii.1948, *Barbosa* 1152 (LISC).

MALAWI. **Southern Prov.** Port Herald Distr., Malawe Hill, 700 m, fl. & fr. 23.iii.1960, *Phipps* 2641 (K; PRE; SRGH).

Subsp. **dunensis** Brummitt, subsp. nov.

?*Tephrosia leucoclada* Scott Elliot in Journ. Linn. Soc. 29: 13 (1891). Type: Madagascar, Fort Dauphin, sand dunes, comm. 1890, *Scott Elliot* 2297 (K). See notes below.

Tephrosia evansii auctt. pro parte, non Hutch. & Burt Davy.

Perennis caulibus procumbentibus vel adscendentibus ad suberectis, in partibus inferioribus lignosis. Caules juveniles dense albo-pubescentes pilis valde appressis vel rarissime (in planta unica ad lacum Malawi) patentibus. Folia (3)5-9(10) partibus foliolorum praedita; petiolus 0.7-3.5 cm, petiolus et rhachis coniunctim 2-8.5 cm; foliola 1.0-2.7 × (0.3)0.4-0.9 mm; pagina superior subglabra ad tenuiter appresse-pubescentis, non sericea; stipulae (0.5)1-3(3.5) × 0.8-1.5 mm. Inflorescentiae (1)2-12(22) cm, breves et compactae ad elongatae et laxae, axibus dense albo-pubescentibus, bractaeae 0.5-2(3) × 0.5(1) mm. Petala (5.5)6-8 mm longa. Legumina 30-45 × (4)4.5 mm; semina 6-8.

Typus: Tanganyika, ? Uzaramo Distr., 16 miles N. of Dar-es-Salaam, sand dunes, fl. & fr. 2.vii.1960, *Leach & Brunton* 10164 [K, holotypus (sheet 2) et isotypus (sheet 1); SRGH, isotypus].



Sand dunes on east coast of Africa from Somali Republic to northern Mozambique, and on shores of Lake Malawi.

SOMALI REPUBLIC. **Northern Region.** Las Koreh, 48° 11' E: 11° 09' N, shingle and coarse sand on sea shore, fl. & fr. 9.viii.1957, *Newbould* 870 (K).

KENYA. **K7. Lamu Distr.** Shella sand dunes, fl. & fr. 16.ii.1956, *Greenway & Rawlins* 8914 (K). Lamu Town, south side, dominant in large patches on sand in coconut plantations, fl. & fr. 16.ii.1956, *Greenway & Rawlins* 8923 (K). 30 m (48 km) N. of Lamu, fl. & fr. ix.1956, *Rawlins* 100 (K). Nazi Moja. W. of Lamu Township, fl. & fr. 3.xi.1957, *Greenway & Rawlins* 9436 (K). **Kilifi Distr.** Malindi, sand dunes, fl. & fr. 13.viii.1949, *Bogdan* 2577 (K). **Distr. uncertain.** N. of Mombasa to Lamu and Witu, fl. & fr. 1902, *Whyte* (K).

TANZANIA-INDIAN OCEAN. **T3. Pangani Distr.** Mbuyuni, dunes on shore, fr. 21.xii.1915, *Peter* K258 (0.III.240), 48919 (K). Ushongo, Mwera, sandy soil, sea level, fr. 7.ix.1955, *Tanner* 2129 (K). Kigombe Plantation, border of Dhali wood, sandy soil, fl. & fr. 20.v.1958, *Mrs. Faulkner* 2149 (K). **T6. ?Uzaramo Distr.** Kawi, north of Dar-es-Salaam, fl. & fr. vii. 1958, *Mrs. Tweedie* 1655 (K). 16 m (26 km) N. of Dar-es-Salaam, fl. & fr. 2.vii.1960, *Leach & Brunton* 10164 (K; SRGH — types). **T8. Mikindani Distr.** Msimbati, coral sand under coconut trees, fl. & fr. 10.iii.1963, *Mrs. Richards* 17804 (K). Mtwara, sea shore, coral sand dunes, fl. & fr. 12.iii.1963, *Mrs. Richards* 17855 (K). **T6. Mafia Island.** Boyjuu Is., sand in coconut plantations, fl. & fr. 29.ix.1937, *Greenway* 5333 (K).

TANZANIA-LAKE MALAWI. **T8. Songea Distr.** Mbamba Bay, sandy ground near shore of L. Nyasa, fl. & fr. 5.iv.1956, *Milne-Redhead & Taylor* 9537 (K).

MALAWI. **Central Prov.** Kota-Kota, sandy soil, fl. 15.ii. 1944, *Benson* 339 (PRE). Lake Nyasa Hotel, near Salima, eroded sand bank above lake beach, fl. & fr. 15.ii.1959, *Steele & Robson* 1606 (K; LISC; SRGH). Between L. Nyasa Hotel and Senga Bay Hotel, sand hills beside lake, fl. 17.ii.1959, *Robson* 1637 (K; LISC). Salima, shore of Lake Nyasa, sand dune coloniser, fl. & fr. 10.vii.1962, *Verboom*

651 (K; SRGH). **Prov. uncertain.** Lake Nyasa, Uvera, (received 1901) *Miss Kenyon* (K).

MOZAMBIQUE. Niassa. Quinga, old dunes, fr. 25.vii.1948, *Pedro & Pedrógão* 4643 (LMJ). Maputo, by the lighthouse of Ponta do Ouro, fl. & fr. 21.ii.1952, *Barbosa & Balsinhas* 4806 (LMJ). Goa mainland, sand dunes about 1 mile N. of Lumbo, fr. 20.v.1961, *Leach & Rutherford-Smith* 10937 (K; SRGH). Mogincual, praia da Quinga, fr. 28.iii.1964, *Torre & Paiva* 11452 (LISC). **Zambezia.** 20 miles (32 km) N. of Quelimane, fl. & fr. 10.viii.1962, *Wild* 5872 (PRE). **Manica e Sofala.** Beira, fl. & fr. iv.1921, *Dummer* 4669 (K).

MADAGASCAR. Fort Dauphin, sand dunes, comm. 1890, *Scott Elliot* 2297 (K — type of *T. leucoclada*). Mourondava, comm. 1890, *Grevé* 43 (K). Delta de la Linta (côte sud-ouest), sables, fl. & fr. 24-28.viii.1928, *Humbert & Swingle* 5462 (K). Andrahanana (distr. Fort Dauphin) fl. 21.ix.1932, *Decary* 10693 (K).

The position of the Madagascar plants (*T. leucoclada*) is somewhat doubtful; some of them resemble subsp. *canescens* as much as subsp. *dunensis* in habit and indumentum, but they all lack the characteristic broad pods of the former and are here referred to subsp. *dunensis*.

Subsp. *canescens* (E. Mey) Brummitt, comb. et stat. nov.

Basionym: *Tephrosia canescens* E. Mey., Comment Pl. Afr. Austr.: 109 (1836). — Harv. in Harv. & Sond., Fl. Cap. 2: 204 (1862). — Forbes in *Bothalia* 4(4): 962 (1948). — Mogg in *Macnae & Kalk*, Nat. Hist. Inhaca Is.: 146 (1958). Type: S. Africa, Natal, prope Omsamculo, *Drege* (K, ? isotype).

Cracca canescens (E. Mey.) Kuntze, Rev. Gen. Pl. 1: 174 (1891). Type as for *Tephrosia canescens*.

Perennial with procumbent branches, woody in the lower parts. Young stems densely appressed-pubescent with silvery-white hairs. Leaves with (3)4-7(8) pairs of leaflets; petiole (0.5)1.0-2.2(3.0) cm, petiole and rhachis together (2)3.5-

7(8) cm; leaflets 0.8-2.0(2.5) \times 0.4-1.0 cm, the margins often undulate; upper and lower surfaces densely and closely appressed-pubescent with silvery hairs, \pm sericeous; stipules 1-2(3) \times 1-1.5 mm, \pm broadly triangular. Inflorescences short and compact, 2-8(10) cm; bracts 0.5(1) mm long, broadly triangular. Petals 6-7 mm long. Pods (30)35-47 \times 4.5-6.5 mm; seeds 6-7(9).

Sandy shores of southern Mozambique (Sul do Save and Lourenço Marques) and Natal, with a single record from northern Mozambique, Niassa Prov., Nejobo Island, 16° 33' S : 39° 48' E, fl. & fr. 27.x.1965, *Gomes e Sousa* 4899 (K).

Some specimens seen appear to be intermediate between subsp. *canescens* or subsp. *dunensis* and subsp. *leptostachya*:

MOZAMBIQUE. **Zambézia**. Quelimane, fr. 1908, *Sim* 20718 (PRE). **Sul do Save**. Vilanculos, fl. 27.iii.1952, *Barbosa & Balsinhas* 5029 (K). **Lourenço Marques**. Inhaca Island, $\frac{1}{4}$ mile south of marine biological station, fl. & fr. 31.viii.1959, *Watmough* 391 (K).

6. ***Tephrosia micrantha*** J. B. Gillett in Kew Bull. **15**(1): 41 (1961). Type: Tanzania, Songea Distr., by R. Nakawali about 2.5 km S. W. of Kitai, *Milne-Redhead & Taylor* 9112 (K, holotype).

Annual to biennial with a fairly stout tap root and usually tufted habit with several ascending, much-branched stems arising from the base and 10-25 cm high, or sometimes \pm mat-forming with more elongate \pm procumbent branches up to 30 cm long. Stems pubescent with appressed to ascending or occasionally spreading hairs. Leaves pinnate with (2)3-6(9) pairs of leaflets; petiole 0.1-1.8(3.0) cm, varying from much shorter to much longer than the lower pair of leaflets, petiole and rhachis together (1)2-6(8) cm, pubescent like the stem; leaflets (0.5)0.8-2.0(2.5) \times (0.1)0.2-0.5(0.6) cm, oblanceolate or narrowly elliptic to linear-elliptic, subcuneate at the base, subacute to rounded at the apex; upper surface glabrous or appressed-pubescent,

lower surface appressed-pubescent, sometimes densely so and conspicuously greyish, or rarely \pm sericeous; stipules 3-7(8) \times 0.1-0.5 mm, subulate, usually persistent and often conspicuous near the base of the plant. Flowers in terminal and leaf-opposed racemes 1-6(11) cm long; bracts 2-5 \times 0.2-0.5 mm, \pm subulate; pedicels 2-3(4) mm. Calyx (1.5)2-3 mm long, shortly appressed-pubescent; teeth about equalling the tube, the two upper connate for up to $\frac{1}{2}$ their length. Petals 4-5(6) mm long, pink to purplish. Staminal tube connate above. Ovary pubescent; style glabrous; pods 20-37 \times 3.5-4.5 mm, brown to straw-coloured; seeds (4)5-6(7), c. 3 \times 2 \times 1.5 mm, subreniform-oblong.

Southern Tanzania, Zambia, Rhodesia, Malawi, Mozambique. The following collections have been seen in addition to those cited by GILLET with the original description of the species:

ZAMBIA. **Northern Prov.** Kalambo Falls, path along cliff at edge of gorge, fl. 15.ii.1964, *Mrs. Richards* 19028 (K). Near Katete River, Mfuwe, Luangwa Valley, bud 10.ii.1966, *Astle* 4526 (K). **Western Prov.** Ichimpi, Kitwe, fl. & fr. 7.x.1964, *Mutimushi* 1087 (K). **Central Prov.?** Eastern Forest Reserve, fl. & fr. 4.iii.1962, *Lusaka Natural History Club* 102 (K). **Southern Prov.** Mazabuka Distr., P. DeVilliers Louw's farm, Choma to Pemba mile 10, fl. & young fr. 15.ii.1960, *White* 7068 (K; SRGH).

RHODESIA. **Northern Div.** Urungwe Distr., Zwipani, fl. & fr. 6.iii.1958, *Phipps* 1034 (K; LISC; SRGH). Gokwe Distr., near the source of the Guye R., fl. & fr. 28.iii.1962, *Bingham* 192 (K; LISC; SRGH). Selukwe Distr., 15 m. S. of Selukwe on Great Dyke, fl. & fr. 16.iii.1963, *Wild* 6371 (K). Gokwe Distr., about 3 miles N. of Gokwe on road to Chinyenyeni, fr. 18.iv.1963, *Bingham* 608 (SRGH). **Central Div.** Hartley Distr., Poole Farm, fl. & fr. 27.ii.1952, *R. M. Hornby* 3282 (K). Marandellas Distr., fl. & fr. 2.ii.1958, *Corby* 835 (SRGH). **Eastern Div.** Umtali Distr., on granite near Nyamakari River, Burma Farm, Burma Valley, fl. & fr. 22.ii.1962, *Chase* 7632 (K; SRGH).

MALAWI. Central Prov. Lilongwe, fl. 21.ii.1959, *Joan Wright* 240 (K). Southern Prov. Plateau of Mt. Zomba, *Whyte* (K).

MOZAMBIQUE. Niassa. Tambala, fl. 6.iii.1942, *A. J. W. Hornby* 1135 (PRE). Malema Distr., Mutuáli, near road to Malema, fr. 29.v.1947, *Pedro* 3281 (LMJ; PRE). Mutuáli, fl. & fr. 12.v.1948, *Pedro & Pedrógão* 3348 (LMJ). Vila Cabral, fl. 26.ii.1964, *Correia* 153 (LISC). Vila Cabral, Posto Zootécnico, 9 km from town, fl. & fr. 1.iii.1964, *Torre & Paiva* 10935 (LISC). Zambezia. Gurue Distr., monte Currarre, by rio Loussi, fl. & fr. 11.ii.1964, *Torre & Paiva* 10549 (LISC).

7. *Tephrosia malvina* Brummitt, sp. nov.

Tephrosia capensis sensu Cronquist, Fl. Congo Belge 5: 99 (1954) et auctt. Afr. trop., non (Jacq.) Pers.

T. purpureae affinis sed fructibus stramineis latioribus seminibus circiter 6, axibus inflorescentiarum crassis alatis, petiolis quam foliola infima plerumque longioribus differt; a *T. micrantha* et *T. capensi* similiter fructibus et inflorescentiis differt.

Perennis, caudice verticali et caulibus compluribus herbaceis prostratis vel ascendentibus. Caules pilis brevibus appressis vel patentibus vestiti. Folia pinnata, foliolis 3-7(8)-jugis; petiolus 1.0-3.5(4.5) cm longus, par inferius foliolorum (nisi in foliis superioribus) excedens, petiolus et rhachis conjunctim (3)5-8(12) cm; foliola 1.0-2.6 × 0.4-0.8 cm, elliptica usque elliptico-oblonga vel interdum lanceolata usque oblanceolata, basi cuneata usque rotundata, apice subacuta usque rotundata; venae secundariae et tertiariae plerumque in pagina superiore prominentes; pagina superior glabra vel subinde breviter pubescens, pagina inferior tenuiter appresse pubescens; stipulae 3-8 × 0.3-1 mm, lineari-triangulares. Flores in racemis terminalibus et oppositifoliis (5)7-20 cm longis dispositi, axibus crassis, conspicue porcatis vel tenuiter alatis; bracteae 3-7 × 0.5-0.8 mm, lineari-triangulares, plerumque conspicuae; pedicelli 3-6 mm. Calyx (2.5)3-5 mm longus, pilis appressis vel interdum patentibus pubescens;

dentes laterales tubo parum breviores usque sesquilingiores; dentes superiores per longitudinem dimidiam connati. Petala (6) 7-10 mm longa, malvina vel interdum rosea. Tubus staminalis dorsaliter connatus. Ovarium pubescens; stylus glaber; legumina 33-47 × 4.5-5.5 mm, straminea, breviter pubescentia, semina 6(7).

Typus: Zambia, Abercorn District, Katula, top escarpment, fl. & fr. 12.v.1955, *Mrs. Richards* 5674 (K, holotypus).

Burundi, Tanzania, Congo, Zambia and Malawi. In open grassy and sandy places etc.

BURUNDI. Msindosi River near Mukayagoro, 1310-1400 m, fl. & fr. 6.iii.1926, *Peter* 38382 (K).

TANZANIA. **T7. Iringa Distr.** Iringa, fl. 26.vi.1936, *Emson* 566 (K). Iringa, rocky hills N. E. of the town, *Brachystegia-Isobertia-Acacia-Combretum* scrub woodland, 1720 m, fl. & fr. 9.iii.1962, *Polhill & Paulo* 1695 (K; SRGH). **Chunya Distr.**, Road Chunya-Itigi 36 miles from Chunya, fl. 20.iii.1965, *Mrs. Richards* 19763 (EA; K). Kepembawe, path to Muzibini village, miombo woodland, fl. 23.iii.1965, *Mrs. Richards* 19835 (EA; K). **Rungwe Distr.** Uniyiha (Unyika), Lupata, 1220 m, fl. & fr. 12.iii.1932, *R. M. Davies* 384 (K). **T8. Songea Distr.** Between R. Lumecha and R. Luhira about 12 km N. of Songea by roadside through regenerating *Brachystegia* woodland on sand, 1050 m, fl. & fr. 17.iii.1956, *Milne-Redhead & Taylor* 9181 (K). About 10.5 km W. of Songea in sandy soil by roadside in secondary *Brachystegia-Uapaca* woodland, 960 m, fl. & young fr. 19.iii.1956, *Milne-Redhead & Taylor* 9194 (K).

ZAMBIA. **Northern Prov.** Firebreak above Kasulo House, Abercorn, 1525 m, fl. 1.ii.1952, *Mrs. Richards* 609 (K). Mpu-lungu-Abercorn road close to Isoko turning, in bush, 1220 m, fl. & fr. 10.iii.1952, *Mrs. Richards* 1086 (K). Abercorn Distr., Kiwimbi Mission, close to hospital, fl. & fr. 9.ii.1955, *Mrs. Richards* 4369 (K). Abercorn, Kellett's Farm, 1525 m, fl. & fr. 25.ii.1955, *Mrs. Richards* 4678 (K). Firebreak, Kasulo, 1740 m, fl. & fr. 2.iii.1955, *Mrs. Richards* 4758 (K). Firebreak, top of escarpment above Katula, 1555 m, fl. 14.iii.1955, *Mrs. Richards* 4927 (K; SRGH). Firebreak, Katula, top escarpment,

1525 m, fl. & fr. 12.v.1955, *Mrs. Richards* 5674 (K, holotype). Among rocks under cliffs in Ilembwe gorge, Abercorn, 1525 m, fl. & fr. 24.iv.1959, *Miss McCallum-Webster* 918 (K). Abercorn Distr., hill above Mwambe Village, 1800 m, fl. & fr. 15.iii.1960, *Mrs. Richards* 12745 (K; SRGH). **Western Prov.** Luanshya, plateau woodland, fl. & fr. 12.iii.1955, *Fanshawe* 2136 (K; SRGH). Luano, miombo woodland, fl. & fr. 21.ii.1966, *Fanshawe* 9524 (K).

MALAWI. **Southern Prov.** Ncheu Distr., Lower Kirk Range, Chipusiri, 1460 m, fr. 17.iii.1955, *Exell, Mendonça & Wild* 960 (BM; LISC; SRGH).

8. *Tephrosia pumila* (Lam.) Pers., Syn. Pl. 2: 330 (1807). — DC., Prodr. 2: 254 (1825). — Torre in Consp. Fl. Angol. 3: 154 (1962). Type from Madagascar (P, not seen, see note below).

Galega pumila Lam., Encycl. Meth. Bot. 2: 599 (1786). Type as for *Tephrosia pumila*.

Tephrosia purpurea var. *pumila* (Lam.) Bak. in Hook. f., Fl. Brit. Ind. 2: 113 (1876); Fl. Maurit. Seychell.: 71 (1877). — Bak. f., Leg. Trop. Afr. 1: 191 (1926). — Cronquist, Fl. Congo Belge 5: 99 (1954). Type as for *Tephrosia pumila*.

Tephrosia commersonii Scott Elliot in Journ. Linn. Soc. 29: 13 (1891), nom. illegit. Type as for *Galega pumila*.

The species was described from Madagascar. In a note on a specimen from Madagascar at Kew (*Scott Elliot* 2464). Mr. J. B. GILLET has commented that this is a good match for the specimen at Paris thought to be the type and although the pod is rather wider (5.5-6 mm) than in continental African material they appear to be clearly conspecific. Further investigation is required with respect to pod size in Madagascar, but in the absence of further evidence no distinction is made between these plants and the widespread plant in continental Africa.

Var. **pumila**

Tephrosia purpurea var. *pubescens* auctt. Afr. pro parte.

Tephrosia procumbens sensu Morton in Journ. W. Afr. Sci. Ass. 2(1): 71 (1956).

Stems densely spreading-pubescent with brown or greyish hairs. Calyx 3.5-5(6) mm long. Petals 6-8 mm long. Pods 32-42(45) mm long; seeds (9)11-13(15).

Widespread in tropical Africa from Ghana to Ethiopia and Somali Republic and south to Angola and Flora Zambesiaca area, Comoro and Madagascar. Although apparently widespread in the Flora Zambesiaca area it seems to have been seldom collected and very rarely correctly recognised as this species. The following specimens from the area have been seen:

BOTSWANA. Northern Div. Ngamiland, Thamalakane River, Okavanga, 900 m, fl. & fr. 13.iii.1961, *Mrs. Richards* 14694 (K; SRGH).

ZAMBIA. Eastern Prov. Fort Jameson Distr., Luangwa Valley, Lusengazi Camp, fl. & fr. 14.iv.1963, *Verboom* 821 (SRGH) ?**Eastern Prov.** Luangwa Valley, bank of Luangwa River, Mfuwe, fr. 4.xii.1965, *Astle* 4174 (K). Luangwa Valley, *Echinochloa* and *Setaria* grassland, Mfuwe, fl. & fr. 7.ii.1966, *Astle* 4501 (K).

RHODESIA. Western Div. Wankie Distr., Kazungula, fr. iv.1955, *R. M. Davies* 1118 (COI; K). **Eastern Div.** Chipinga Distr., Sabi Valley Expt. Station, fl. & fr. xi.1959, *Soane* (K; LISC; PRE; SRGH).

MALAWI. Northern Prov. Karonga Distr., Lupembe Farm, fl. & fr. 22.iv.1963, *Salubeni* 22 (SRGH).

MOZAMBIQUE. Lourenço Marques. Chobela-Magude, very common, fl. & fr. 10.iii.1942, *Viana* 25 (PRE); 26 (PRE); 27 (PRE). E. E. do Umbeluzi, prox. da propriedade do Sr. Revez Duarte, fl. & fr. 5.iv.1949, *Myre* 422 (LISC).

Var. *aldabrensis* (J. R. Drummond & Hemsley) Brummitt, comb. et stat. nov.

Basionym: *Tephrosia aldabrensis* J. R. Drummond & Hemsley in Journ. Bot. 54 (Suppl. 2): 11 (1916). Type: Aldabra group, fl. & fr. 1906, *Dupont* 11 (κ, chosen here as lectotype).

Stems closely appressed-pubescent to subglabrous. Calyx 3.5-5(6) mm long. Petals 7-9(10) mm long. Pods 25-42 mm long; seeds (9)10-12(13).

Coasts of east Africa from Zanzibar to Kenya, and Aldabra.

KENYA. K7. Lamu Distr. Kui Island of Kiunga, fl. vi.1956, *Rawlins* 17 (κ). **Kilifi Distr.** Malindi, sea cliffs, fl. & fr. x.1951, *Mrs. Tweedie* 974 (κ). Mouth of Miada Creek, 3 m above sea level, fl. & fr. 11.i.1962, *Greenway* 10457 (κ). **Kwale Distr.** Near Mombasa, fl. & fr. 1900, *White* (κ). Twiga, 14 miles south of Mombasa, coastal bushland, fl. 31.i.1958, *Verdcourt* 2138 (κ). Twiga Beach, top of coral cliff, fl. & fr. 30.x.1959, *Miss Napper* 1350 (κ). Bamburi, near factory along road to Mtwapa, fl. & fr. 4.viii.1965, *Williams Sangai* 826 (κ).

TANZANIA. T3. Tanga Distr. Coast near Bomandani 8 miles south of Moa, sandy foreshore, fl. & fr. 10.viii.1953, *Drummond & Hemsley* 3681 (κ). **Zanzibar.** Without precise locality, fl. & fr. 1908, *Last* (κ, 3 sheets); Bweleo, fl. 28.i.1929, *Greenway* 1218 (κ). Mbweni, just above high water mark, fr. 7.ii.1930, *Vaughan* 1053 (κ). Chukwani, fl. & fr. 21.i.1930, *Vaughan* 1115 (κ). Jezani, fl. & fr. 19.ii.1930, *Vaughan* 1252 (κ). Chwaka, fl. 21.xii.1930, *Vaughan* 1737 (κ). Without precise locality, fl. & fr. 1931, *Vaughan* 1355 (κ). Chukwani, scrub land near mangrove swamp, sea level, fl. & fr. 23.iv.1950, *Williams* 22 (κ). Fumba, 14 miles from Zanzibar town on E. side of island, coastal bush, fl. & fr. 10.v.1959, *Mrs. Faulkner* 2253 (κ). Massizine, near Zanzibar town, with coconut palms on foreshore, fl. & fr. 13.v.1959, *Mrs. Faulkner* 2254 (κ).

ALDABRA. Aldabra Island, fl. & fr. x-xii.1892, *Abbott* (κ). Aldabra, comm. 1903, *Thomasset* (κ). Aldabra Group, fl. & fr. 1906, *Dupont* 11 (κ). Aldabra, fl. & fr. iv.1907, *Thomasset* 230 (κ). Aldabra, fl. 1909, *Fryer* 59 (κ).

Var. *ciliata* (Craib) Brummitt, comb. nov.

Basionym: *Tephrosia purpurea* var. *ciliata* Craib, Fl. Siam, Enum. 1(3): 384 (1928). Type. Siam, Bangkok, *Kerr* 11022 (κ).

Galega procumbens Buch.-Ham. in Trans. Linn. Soc. 13: 547 (1822). Type not seen.

Tephrosia timoriensis DC., Prodr. 2: 254 (1825). Type from Indonesia (Timor), not seen.

Tephrosia procumbens (Buch.-Ham.) Gamble, Fl. Presid. Madras 1: 320 (1918), non Macfadyen (1837). Type as for *Galega procumbens*.

Tephrosia parviflora Wight in Wallich, Cat. no. 5462 (1831-2), nom nud.

Stems spreading-pubescent or rarely (Madras) appressed-pubescent, with brown or greyish hairs. Calyx 2-3(4) mm long. Petals 4-6(7) mm long. Pods 25-34(40) mm long; seeds (8)9-11(12).

From India to Indonesia, and also apparently in Mauritius. Although specimens from Madagascar and Comoro Islands seem to agree with those from continental Africa in dimensions of flowers and fruit (apart from breadth of fruit as noted above), the three at Kew from Mauritius seem clearly to correspond with those from Asia. This distribution would then appear to be comparable with that in *T. purpurea* where the Mascarene plants resemble those from Asia rather than from Africa.

The earliest varietal name available for the Asian plant seems to be *T. purpurea* var. *ciliata* Craib, applied originally to a single Siamese gathering. It is unfortunate that the type specimen of var. *ciliata* is the most extreme of all those available from Asia, having a robust habit, calyx 3-4 mm long, and one pod 38 mm long.

9. *Tephrosia coronilloides* Welw. ex Bak. in Oliv., Fl. Trop Afr., 2: 123 (1871).—Bak. f., Leg. Trop Afr. 1: 195 (1926).—Gillett in Kew Bull. 13(1): 120 (1958).—Torre in Consp. Fl. Angol. 3: 155 (1962). Type: Angola, Pungo Andongo, *Welwitsch* 2080 (BM, K — isotypes).

Tephrosia longana Harms in Warburg, Kunene-Samb.-Exped. Baum: 259 (1903).—R. E. Fries, Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped.: 83 (1914) quoad nom., excl. spec. Type: Angola, Napalanca, *Baum* 612 (K, isotype).

Tephrosia pallens (Ait.) Pers. var. *angolensis* Bak. f., Leg. Trop. Afr. 1: 191 (1926). Type: Angola, rio Cassuango-Cuiriri, *Gossweiler* 3681 (BM, holotype; K, isotype).

This species is known mainly from Angola, but one collection from Barotseland, *White* 2001, was recorded by GILLET (loc. cit.). Since then further collections have been made in southern Zambia, and, somewhat surprisingly, in central Rhodesia:

ZAMBIA. **Southern Prov.** Machili, Kalahari sand woodland, fl. & fr. 24. ii.1961, *Fanshawe* 6319 (K; SRGH).

RHODESIA. **Central Div.** Charter Distr., Wiltshire Native Purchase Area, fr. 30. iv. 1965, *Corby* 1312 (K; SRGH).

T. coronilloides has a rather woody tap root, erect habit up to 45 cm high, rather densely brown-pubescent stems and leaf rhachides, and brown pubescent calyx with linear-triangular teeth 2-4 times as long as the tube.

10. *Tephrosia multijuga* R. G. N. Young in Ann. Transvaal Mus. 14(4): 402 (6 July 1932).—Forbes in Bothalia 4(4): 981 (1948), pro parte. Type: S. Africa, Transvaal, Johannesburg, Houghton Ride, *Moss* 7473 (PRE, not seen; photograph K).

Tephrosia capensis var. *angustifolia* E. Mey., Comment. Pl. Afr. Austr.: 110 (1836), quoad lectotypum sensu Burtt Davy. Type: S. Africa, Cape Province, Kei River, *Drege* (K).

Tephrosia woodii Burtt Davy, Fl. Pl. Ferns Transvaal 1(2): xxxii (28 July 1932). Type as for *T. capensis* var. *angustifolia* E. Mey.

Cracca capensis var. *rufoincana* Kuntze, Rev. Gen. Pl. 3(2, pt. 2): 57 (1898). Type: S. Africa, Orange Free State, Bloemfontein, 15.ii.1894, Kuntze (K).

This species, known from Cape Province to the Transvaal in S. Africa, has not previously been recognised from the Flora Zambesiaca area. It differs from *T. polystachya* in its thinly appressed-pubescent to glabrescent pods, usually sparsely appressed-pubescent to glabrous stems, leaf-opposed (not axillary) racemes, and usually very short calyx (1.5)2(3) mm long; it has a rather lax habit, narrowly elliptic to linear-elliptic and often acute leaflets, and very shortly appressed-pubescent pods (27)30-40 × 3-4 mm. The following collections closely resemble the typical S. African plant:

MOZAMBIQUE. **Lourenço Marques.** Between Matola and Umbeluzi, fr. 29.iv.1947, *Pedro & Pedrógão* 866 (LMJ; PRE). Goba, Lebombo Mts., facing N. E., deep ravine, *Androstachys* forest, fl. & fr. 30.iv.1947, *Pedro & Pedrógão* 1040 (LMJ; PRE).

The following two collections are apparently referable to *T. multijuga* but have a prostrate straggling habit unlike any S. African plants of this species seen. Their relationship to group 2 of *T. polystachya* (see above) from the same area requires investigation.

MOZAMBIQUE. **Lourenço Marques.** Libombos, near Namaacha, Mt. Mpondium, 800 m, among rocks, basaltic lava, fl. 22.ii.1955, *Exell, Mendonça & Wild* 498 (LISC; SRGH). Namaacha, near the Canada Dry factory, fl. & fr. 26.iii.1957, *Barbosa & Lemos* 7535 (COI; LISC; LMJ).

Group 3. **TEPHROSIA LEPIDA** AND ALLIED SPECIES

This group of glabristyled species is characterised by the grey or silvery under-surface of the leaflets and usually densely pubescent pods with the margins often contrasting markedly in colour with the surfaces. The following key distinguishes five species in the Flora Zambesiaca area. For discussion of seed characters, which also serve to separate the species, see GILLET in *Kew Bull.* 13(1): 118-119 (1958).

1. Flowers in dense terminal heads 1-3(4) cm long surrounded or exceeded by the upper leaves, with some also in the axils of the uppermost leaves 13. *T. richardsiae*
1. Flowers in elongate, fairly lax racemes exceeding the upper leaves, sometimes with some also in the axils of the uppermost leaves
 2. Leaflets (1)1.5-4(5) × (0.08)0.1-0.4 cm, 9-15 times as long as broad 12. *T. linearis*
 2. Leaflets (0.5)0.7-2.7(3.5) × 0.15-0.6(1.0) cm, 3-5(6) times as long as broad
 3. Petals (10)12-15(16) mm long 11. *T. lepida*
 3. Petals 6-9 mm long
 4. Pods 3-3.5 mm broad, dark brown-pubescent at the margins and grey-sericeous on the surfaces; petioles 0.1-0.3 cm *T. argyrotricha*
 4. Pods 3.5-4.5 mm broad, brown, only thinly pubescent or sometimes densely so at the margins only; petioles (0.2)0.3-1.2 (2.2) cm *T. decora*

11. ***Tephrosia lepida*** Bak. f. in Bull. Soc. Roy. Bot. Belge 57(2): 121 (1925). Types from the Congo.

This species seems to be quite frequent, and in places common, in woodland between 27° and 32° E from central Rhodesia (as far south as Gwelo) through Zambia to Katanga and Ufipa District of Tanzania, with a further more easterly locality known in Njombe District of Tanzania. The most northerly plants, from Abercorn and Mporokoso Districts and Tanzania, differ markedly from others in their much longer, broader and darker pods which are blackish-grey rather than brownish, and to some extent in their habit

and leaflet breadth. It seems necessary to recognise two subspecies.

Subsp. **lepida**

Often perennial and woody towards the base, sometimes almost shrubby, but sometimes \pm slender annual. Leaflets (2)4-8(9) mm broad. Pods 36-48(51) \times (2.5)3-3.5 mm, the margins usually brown and surfaces silvery-brown; seeds 8-10(11).

From central Rhodesia to Katanga and N. Province of Zambia (to Kawambwa and Kasama, but not Abercorn and Mporokoso Districts).

Subsp. **nigrescens** Brummitt, subsp. nov.

Annua, gracilis, erecta. Foliola 2-5(7) mm lata. Legumina (52)60-76 \times 3.5-4 mm, ad margines subnigra, ad paginas grisea vel argentea, quam in subspecie typica obscuriora; semina (9)10-12.

Typus: Zambia, Abercorn Distr., Nmbulu Island, Lake Tanganyika, fl. & fr. 11.iv.1955, *Mrs. Richards* 5398 (κ , holotypus).

Zambia (Abercorn and Mporokoso Districts) and Tanzania.

ZAMBIA. Northern Prov. Abercorn, *Brachystegia* woodland, 1700 m, fl. 8.iii.1950, *Bullock* 2611 (κ). Abercorn Distr., Chisungu Farm, open bush by side of road, fl. 25.ii.1952, *Mrs. Richards* 797 (κ). Abercorn Distr., Chilongowelo, 1460 m, fl. & fr. 5.iii.1952, *Mrs. Richards* 1083 (κ); 10.iv.1952, *Mrs. Richards* 1443 (κ). Abercorn, 1525 m, fl. & fr. 21.iii.1955, *Mrs. Richards* 4598 (κ). Abercorn, «Little Poland», grass by track, 1525 m, fl. 4.iii.1955, *Mrs. Richards* 4764 (κ). Kalambo Falls, fl. & fr. 29.iii.1955, *Exell, Mendonça & Wild* 1275 (BM; LISC; SRGH). Nmbulu Island, Lake Tanganyika, steep side, rocky dry ground, 730 m, fl. & fr. 11.iv.1955, *Mrs. Richards* 5398 (κ , type). Mpulungu-Abercorn road near Chilongowelo, verge of road, 1220 m, fr. 2.v.1955, *Mrs. Ri-*

chards 5458 (K). Abercorn Distr., Kawimbe, everywhere, 1650 m, fl. 1.iii.1957, *Mrs. Richard* 8419 (K; LISC). Abercorn-Mpulungu road, 1500 m, fl. 20.iii.1957, *Mrs. Richards* 8835 (K). Kambole road, 16 km from Abercorn, fl. & fr. 5.iv.1959, *M. McCallum-Webster* 847 (K). Chilongowelo, 1460 m, fl. & fr. 7.iv.1959, *M. McCallum-Webster* 849 (K). Abercorn-Mpulungu road, 1350 m, fl. 16.ii.1960, *Mrs. Richards* 12509 (K). Abercorn Distr., Niamkolo, Lake Tanganyika, stony sandy road on edge of woodland, fl. 22.iii.1960, *Mrs. Richards* 12775 (K). Abercorn Distr., hill above Mwambe Village, near Kawimbe, 1770 m, fl. & fr. 15.v.1960, *Mrs. Richards* 12751 (K). Abercorn-Tsauya road, edge of *Brachystegia* woodland, 1440 m, fl. 3.iii.1962, *Mrs. Richards* 16224 (K; LISC). Mporokoso Distr., 60 km ESE of Mporokoso, *Brachystegia* woodland, fr. 13.v.1962, *Robinson* 5182 (K; SRGH).

TANZANIA. **T4. Ufipa Distr.** Near R. Kalambo above Kalambo falls, *Brachystegia* woodland, fl. & fr. 29.iii.1955, *Exell, Mendonça & Wild* 1319 (SRGH). Escarpment above Kasanga, sandy soil on verge of road, 900 m, fl. & fr. 30.iii.1959, *Mrs. Richards* 11005 (K). **T6. Iringa Distr.** Great North Road between Matanana and Malangali, 85 miles (136 km) S. of Iringa, *Brachystegia* woodland, 1730 m, fl. & fr. 27.iii.1962, *Polhill & Paulo* 1896 (K).

12. *Tephrosia linearis* (Willd.) Pers., Syn. Pl. 2(2): 330 (1807). Type from W. Africa.

Var. *discolor* (E. Mey.) Brummitt, stat. nov.

Basionym: *Tephrosia discolor* E. Mey., Comment. Pl. Afr. Austr.: 111 (1836). Type from S. Africa (Natal).

Synonym: *Tephrosia linearis* subsp. *discolor* (E. Mey.) J. B. Gillett in Kew Bull. 13(1): 119 (1958). Type as for *T. discolor*.

The differences between this and typical *T. linearis*, and relevant synonymy, are given by GILLETT (loc. cit.). Extremes appear very different but there appears to be continuous variation from one to the other and there is a very wide geographical overlap between them. The distinction

between them may in fact often be arbitrary, especially when both are found growing at the same locality. Plants from Mozambique and Madagascar seem particularly difficult to place satisfactorily. There is, however, some difference in overall altitudinal distribution and the geographical overlap is perhaps not complete, all W. African material being probably annual and small-flowered (var. *linearis*). Varietal rank seems most appropriate.

13. **Tephrosia richardsiae** J. B. Gillett in Kew Bull. 13(1): 117 (1958). Type: Zambia, Northern Prov., Mpulungu, Lake Tanganyika, fl. & fr. 8.iii.1952, Mrs. Richards 1079 (K, holotype).

A number of good collections of this species are known from south-western Tanzania and the northern part of the Northern Province of Zambia, with a single recent collection from Eastern Province — Lundazi Distr., mica mine hill, fl. iii.1962, Verboom 610 (K). Three other collections, all of which have at various times been identified with other species, occurring further to the south-west, seem also to be referable to this species but differ markedly in their stem pubescence, and also, significantly in this group of species, in the coloration of the indumentum of the pods. They seem to merit subspecific recognition.

Subsp. richardsiae

Stems with white to grey-brown, appressed to ascending hairs. Calyx with appressed to ascending hairs. Pods (3.5)4-5 mm broad, with hairs uniformly grey or grey-brown, or those at the margin sometimes slightly darker.

South-western Tanzania and north-eastern Zambia.

Subsp. erucifera Brummitt, subsp. nov.

Caules pilis ferrugineis deflexis vel fere patentibus vestiti. Calyx pilis longis irregulariter patentibus vestita. Legumina 3.5-4 mm lata, ad margines pilis fuscis praedita, eis paginarum griseis dissimilibus.

Typus: Zambia, Mpika Distr., low rocky hills by Serenge-Mpika road, 1200 m, fr. 6.iv.1961, *Mrs. Richards* 14978 (K, holotypus).

ZAMBIA. **Northern Prov.** Kaloswe, 62 km SW of Mpika, young fr. 24.vii.1930, *Hutchinson & Gillett* 4064 (K; LISC; SRGH). Mpika Distr., low rocky hills by Serenge-Mpika road, 1200 m, fr. 6.iv.1961, *Mrs. Richards* 14978 (K, type). **Central Prov.** Serenje, plateau woodland, fl. 18.ii.1955, *Fanshawe* 2091 (K).

The subspecific epithet is derived from the latin *eruca*, a caterpillar; the two-coloured pods in this group of species have been likened to caterpillars crawling over the plant.

Group 4. VARIOUS GLABRISTYLED SPECIES WITH FEW LEAFLETS

14. ***Tephrosia elongata*** E. Meyer, *Comment. Pl. Afr. Austr.*: 111 (1835).—Sonder in *Linnaea* 23: 30 (1850).—Harvey in Harvey & Sonder, *Fl. Cap.* 2: 208 (1862).—Forbes in *Bothalia* 4(4): 977 (1948). Type: Natal, between Omsamculo [Umzinkulu] and Omcomas [Umkomaas], *Drège* (not seen, holotype presumed destroyed at Berlin).

This species is frequently confused with *T. longipes* or *T. lurida*, from which it may be distinguished with certainty by its glabrous style and penicillate stigma.

In her revision of the S. African species Miss FORBES recognised a variety with 'leaflets, stems and legumes pubescent'. The pubescence of the stems and leaves is in fact in some specimens conspicuously spreading, unlike the more usual condition where the hairs are closely appressed, but both types are found from northern Transvaal to Natal and might perhaps not be considered to merit taxonomic recognition. However in Rhodesia all available material is of the spreading pubescent type, and it is perhaps useful to maintain the two varieties. Miss FORBES referred the spreading pubescent plants to 'var. *pubescens* E. Mey.' but

it seems that E. MEYER never published this name. *T. elongata* var. *pubescens* Sonder in *Linnaea* 23: 30 (1850) was clearly stated to include the type of the species, and must now be regarded as an illegitimate name. Miss FORBES's var. *pubescens* is nomenclaturally and taxonomically different but a later homonym and not validly published since it had no latin description. A new name is proposed below.

Var. **lasiocaulos** Brummitt, var. nov.

Caules, foliorum petioli et rhachides et paginae inferiores pilis patentis vestiti.

Typus: Rhodesia, Matobo Distr., Farm Chesterfield, fl. x.1958, *O. B. Miller* 5493 (K, holotypus; SRGH, isotypus).

Rhodesia (known only from Matobo and Inyanga Districts) and S. Africa (Transvaal and Natal), probably also in Swaziland (FORBES, 1948). The following have been seen from the Flora Zambesiaca area:

RHODESIA. **Western Div.** Matobo Distr., Farm Besna Kobila, xii.1957, *O. B. Miller* 4865 (K; SRGH). Matobo Distr., Farm Chesterfield, fl. x.1958, *O. B. Miller* 5493 (K; SRGH — types). Matobo Distr., Quariaga Farm, fl. i.1961, *O. B. Miller* 7650 (K; SRGH). **Eastern Div.** Inyanga Mts., Manika, 1830-2130 m, fl. 10.ii.1899, *Cecil* 223 (K). Inyanga Distr., opposite Dannakay turn-off on way to Juliasdale, fl. 25.x.1946, *Rattray* 1025 (K; SRGH). Inyanga Distr., Farm Pamushana, fl. & young fr. xi.1957, *O. B. Miller* 4724 (SRGH). Inyanga Mountains Hotel, fl. 6.iv.1958, *Corby* 876 (K).

Miss FORBES also described a new species, *T. tzaneenensis*, distinguished from *T. elongata* only by its sessile or only shortly petioled leaves. This was known to her only from Pietersburg District in the Transvaal, and these plants tend to be more robust than typical *T. elongata* and have rather broad leaflets rounded at the apex. However, recent collections from the mountains of extreme southern Mozambique have the subsessile or shortly petioled leaves and robust, erect growth of *T. tzaneenensis*, but very long and

narrow, acute leaflets. Petiole length is somewhat variable in *T. elongata* and it seems better to recognise *T. tzaneensis* as only a variety of *T. elongata*. Despite the marked difference in leaflet shape between the Pietersburg and Mozambique plants it does not seem advisable at the moment to separate them taxonomically.

Var. *tzaneensis* (H. Forbes) Brummitt, comb. et stat. nov.

Basionym: *Tephrosia tzaneensis* H. Forbes in *Bothalia* 4(4): 977 (1948). Type: S. Africa, Transvaal, Tzaneen, *Pole-Evans* 4024 (PRE, not seen).

Differs from var. *elongata* in its sessile or shortly petioled (up to 6 mm) leaves. Transvaal (Pietersburg Distr.) and southern Mozambique (Lourenço Marques Prov.). The following have been seen from our area:

MOZAMBIQUE. **Lourenço Marques.** Marracuene, road from Namaacha, 200 m, fl. & fr. 27.xi.1940, *Hornby* 938 (LISC). Serra da Goba, road from Fonte dos Libombos, fl. & fr. 31.iii.1945, *A. E. Sousa* 129 (LISC). Namaacha, near frontier, fl. & fr. 25.iv.1947, *Pedro & Pedrógão* 771 (LMJ). Maputo to Goba, fl. & young fr. 8.i.1947, *Pedro & Pedrógão* 486 (LMJ). Montes da Namaacha, fl. 10.i.1948, *Torre* 7089 (LISC). Namaacha, near the Canada Dry factory, fl. & fr. 27.iii.1957, *Barbosa & Lemos* 7549 (COI; LISC; LMJ). Goba, near the R. Maiuana, fl. & fr. 2.xi.1960, *Balsinhas* 159 (K; LMJ; PRE).

Var. *elongata*

Tephrosia elongata E. Mey. var. *pubescens* Sond. in *Linnaea* 23: 30 (1850). — Harv. in Harv. & Sond., *Fl. Cap.* 2: 208 (1862); *nom. illegit.* Type as for *Tephrosia elongata* E. Mey.

Tephrosia elongata E. Mey. var. *glabra* Sond. in *Linnaea* 23: 30 (1850). — Harv. in Harv. & Sond., *Fl. Cap.* 2: 208 (1862). — Bak. f., *Leg. Trop. Afr.* 1: 183 (1926). Type from S. Africa, not seen.

Tephrosia zambesiaca Taub. in Engl., Bot. Jahrb. 23: 183 (1896). — Bak. f., Leg. Trop. Afr. 1: 182 (1926). Type: Malawi, top of Zomba, *Buchanan* 213 (κ, chosen here as lectotype).

Tephrosia dissitiflora Bak. in Kew Bull. 1897: 257 (1897). Type: Malawi, Mt. Zomba, *Whyte* (κ).

Tephrosia coriacea Benth. ms. in schaed. ined. — Harv. in Harv. & Sond., Fl. Cap. 2: 208 (1862) in synonym. sub *T. elongatam* var. *glabram*.

Tephrosia ensifolia Harv. ms. in schaed. ined.; in Harv. & Sond., Fl. Cap. 2: 208 (1862) in synonym. sub *T. elongatam*

var. *pubescentem*.

The typical variety of *T. elongata* is represented in the Flora Zambesiaca area apparently only by an isolated population on the Zomba Plateau in Malawi, some 1000 km north of the nearest known station in the Transvaal. The Zomba plants are rather more robust than this variety in S. Africa (mostly about 50 cm high), with rather broad leaflets (mostly 8-15 mm broad) but it does not seem advisable to separate them taxonomically without more adequate material. Only the following four collections are known:

MALAWI. Southern Prov. Top of Zomba, fl. & fr. 1881, *Buchanan* 213 (κ, lectotype of *T. zambesiaca* Taub.). Without precise locality, fl. & fr. 1891, *Buchanan* 609 (κ, isotype of *T. zambesiaca* Taub.). Mt. Zomba, 1220-1830 m, fl. & fr. xii.1896, *Whyte* (κ, type of *T. dissitiflora* Bak.). Zomba Plateau, 1830 m, fl. 23.x.1941, *Greenway* 6358 (κ).

15. *Tephrosia pentaphylla* (Roxb.) G. Don in Sweet, Hort. Brit. ed. 3: 170 (1839). — Gamble, Fl. Presid. Madras 1(2): 318 (1918). — Andrews, Fl. Pl. Anglo-Egypt. Sudan 2: 238 (1952). Type: plate 1628 in Roxburgh's unpublished Icones, plant originally from India (κ).

Galega pentaphylla Roxb. [Hort. Bengal.: 57 (1814), nom. nud.] Fl. Ind. 3: 384 (1832). Type as above.

Tephrosia pentaphylla [Roxb.] Sweet, Hort. Brit. ed. 2: 142 (1830), nom. nud. — J. C. Loudon, Hort. Brit.: 303 (1830), nom. nud. — Graham ex Wallich, Cat. 5650 (1831-32), nom. nud.

In recent years the name of this species has generally been cited as *T. pentaphylla* (Roxb.) Sweet ex Gamble. Sweet had used the name in his Hortus Britannicus (1830) prior to publication of the description by ROXBURGH in 1832, but it appeared again in 1839 in the third edition revised by G. DON. The correct citation appears therefore to be *T. pentaphylla* (Roxb.) G. Don.

Although the species is apparently widespread — southern India, Persia, Arabia, Ethiopia, Sudan, Kenya and Tanzania — it seems to have been seldom collected. The following specimen, found among undetermined material of the genus in the Lisbon herbarium, appears to be the first and only record of the species in the Flora Zambesiaca area:

MOZAMBIQUE. Niassa Prov. Cabo Delgado, entre Mucojo e Macomia, fl. 29.ix.1948, *Barbosa* 2265 (LISC).

16. *Tephrosia paniculata* Welw. ex Bak. in Oliv., Fl. Trop. Afr. 2: 122 (1871). — Bak. f., Leg. Trop. Afr. 1: 207 (1926). — Cronquist, Fl. Congo Belge 5: 95 (1954). — J. B. Gillett in Kew Bull. 13(1): 115 (1958). — Torre, Consp. Fl. Angol. 3: 160 (1962). Type: Angola, Cuanza Norte, Pungo Andongo, *Welwitsch* 2075 (BM; K — isotypes).

Cracca paniculata (Welw. ex Bak.) Kuntze, Rev. Gen. Pl. 1: 175 (1891). Type as above.

This species has leaves with usually 1 or 2 pairs of lateral leaflets, and *T. holstii* Taub. has always been maintained as a distinct species having unifoliate leaves. GILLETT (loc. cit.) has however pointed out that some specimens of *T. paniculata*, referred to var. *schizocalyx* (Taub.) Gillett, also have unifoliate leaves, and although *T. holstii* does also have a usually shorter inflorescence than typical *T. pa-*

paniculata the characters separating the two do not seem to be sufficiently clear to maintain specific rank. The two taxa are fairly well geographically separated, typical *T. paniculata* occurring west of the Rift Valley and *T. holstii* to the east, and they seem to form good geographical subspecies (see map, fig. 4).

Subsp. *paniculata*

Tephrosia dimorphophylla Welw. ex Bak. in Oliv., Fl. Trop. Afr. 2: 116 (1871). — Bak. f., Leg. Trop. Afr. 1: 207 (1926). Type: Angola, Huíla, Missão de Montino, *Welwitsch* 2073 (BM; K — isotypes).

Tephrosia eriosemoides Oliv. in Trans. Linn. Soc. 29: 57, t. 32 (1872). — R. E. Fries, Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped. 1: 83 (1914). — Robyns, Fl. Parc Nat. Albert 1: 310 (1948). — Brenan, Tanganyika Check List: 446 (1949). Type: Tanganyika, Bukoba Distr., Karagwe, *Grant* 414 (K, holotype).

Cracca dimorphophylla (Welw. ex Bak.) Kuntze, Rev. Gen. Pl. 1: 175 (1891). Type as for *Tephrosia dimorphophylla*.

Tephrosia preussii Taub. in Engl. Bot. Jahrb. 23: 182 (1896). — Hepper, Fl. W. Trop. Afr. ed. 2, 1: 529, 531 (1957). Type: Cameroun, *Preuss* 629 (BM; K — isotypes).

Tephrosia schizocalyx Taub. in Engl., Bot. Jahrb. 23: 183 (1896). Types: Malawi, Shiri Highlands, 1885, *Buchanan* 494 (K, chosen here as isolectotype); 1891, *Buchanan* 7 (K, isolectoparatype).

Tephrosia melanocalyx Bak. in Kew Bull. 1897: 258 (1897), nom. illegit., non Welw. ex Bak. in Oliv., Fl. Trop. Afr. 2: 106 (1871). Type: Malawi, near Fort Hill, *Whyte* (K).

Tephrosia lelyi Bak. f., Leg. Trop. Afr. 1: 207 (1926). Type: Nigeria, Naraguta, *Lely* 572 (K, holotype).

Tephrosia nigrocalyx Bak. f., Leg. Trop. Afr. 1: 208 (1926). Type as for *Tephrosia melanocalyx* Bak. (1897).

Tephrosia paniculata var. *schizocalyx* (Taub.) J. B. Gillett in Kew Bull. 13(1): 115 (1958). — Torre in Consp. Fl. Angol. 3: 161 (1962). Type as for *Tephrosia schizocalyx*.

Leaves with 1-2(3) pairs of lateral leaflets, or occasionally unifoliolate. Racemes up to 16(22) cm long, with usually

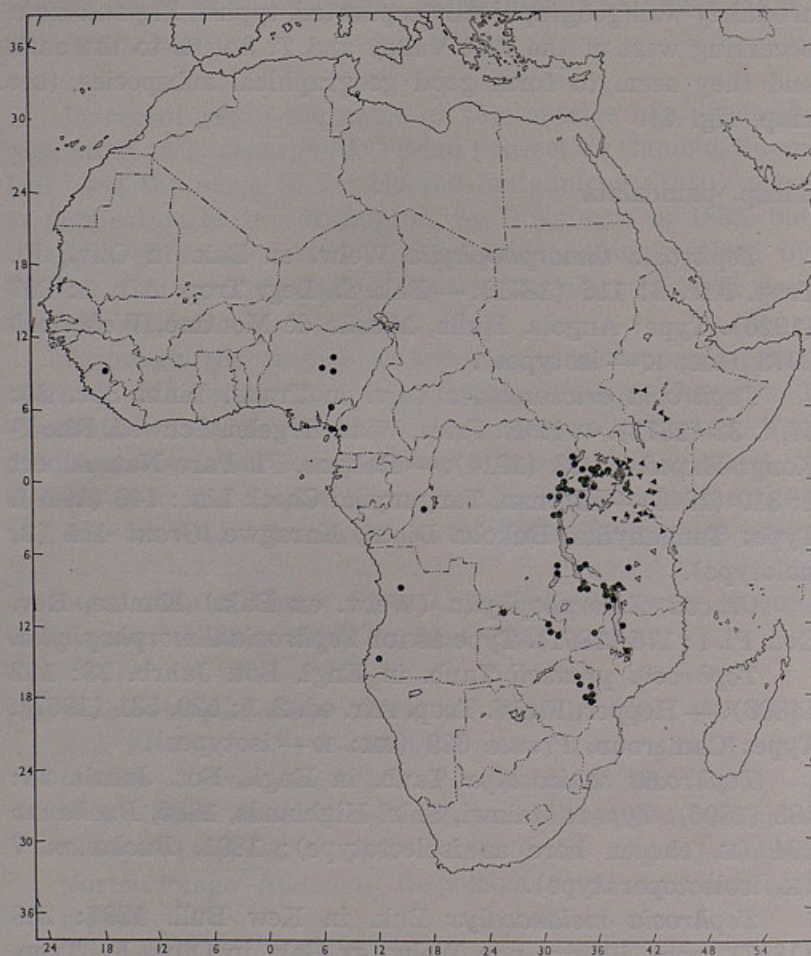


Fig. 4. — Distribution of *Tephrosia paniculata*.

- subsp. *paniculata*
- △ intermediates (var. *schizocalyx*)
- ▲ subsp. *holstii*

more than six distinct nodes. Calyx (7)9-13(14) mm long. Petals (10)12-16 mm long.

West Tropical Africa (to Sierra Leone) to Uganda, Kenya and Tanzania west of the Rift Valley and south to Angola, Rhodesia and northern Mozambique. Unifoliolate

plants of this subspecies are known from central and southwestern Tanzania, southern Malawi — Shiri Highlands, *Buchanan* 494 and 7 (κ) — and adjacent Mozambique — Tete Prov., near Vila Coutinho, *Torre & Paiva* 11124 (LISC). These would be referable to var. *schizocalyx* (Taub.) Gillett, but it is difficult to make a clear distinction of this, some plants having the leaves on the main stem 3-5-foliolate and on the lateral branches unifoliolate. The isotypes seen of *T. dimorphophylla*, referred by Torre to var. *schizocalyx*, have leaves not unifoliolate but 3-foliolate.

Subsp. *holstii* (Taub.) Brummitt, comb. et stat. nov.

Basionym: *Tephrosia holstii* Taub. in Engl., Pflanzenw. Ost.-Afr. C: 211 (1895). Type: Tanzania, Usambaras, *Holst* 2 (chosen here as lectotype — κ, photograph only).

Tephrosia rivae Taub. ex Harms in Annuar. Ist. Bot. Roma 7: 92 (1897). Type: Ethiopia, Giaribuli, *Riva* 1222 (κ, photograph only).

Tephrosia kassneri Bak. f. in Bull. Soc. Roy. Bot. Belge 57(2): 120 (1925). Type: Kenya, Muka, *Kassner* 927 (chosen here as lectotype — κ).

Leaves unifoliolate. Racemes up to 9(16) cm long, with usually fewer than six distinct nodes and often subcapitate at the apex. Calyx 7-10 mm long. Petals 9-13 mm long.

Ethiopia, Kenya and Tanzania, east of the Rift Valley.

17. ***Tephrosia forbesii*** Bak. in Oliv., Fl. Trop. Afr. 2: 116 (1871). — Bak. f., Leg. Trop. Afr. 1: 205 (1926). — Forbes in *Bothalia* 4(4): 956 (1948). Type: Mozambique, Delagoa Bay (Lourenço Marques), *Forbes* (κ, holotype).

This readily recognisable species with unifoliolate leaves and wholly axillary flowers is well known in the coastal area around Lourenço Marques, where the ovary and pod are consistently pubescent. A number of recent collections have been made, however, on Inhaca Island and in inland

areas in the Transvaal and southern Rhodesia, in all of which the ovary and pod are glabrous except on the margins. The Inhaca plants seem to be significantly smaller in most parts than those inland and are here recognised as a distinct subspecies. The inland plants show considerable variation in petal and calyx length and particularly in pedicel length, and may be taxonomically divisible, but until there are more collections available it seems best to include them all in one new subspecies.

Subsp. *forbesii*

Tephrosia junodii De Wild. in Ann. Mus. Congo (Bot.) 1: 261 (1906). Type: Mozambique, Lourenço Marques, *Junod* 168 (BR).

Larger leaves on each plant 3.5-6(7) × 0.4-0.7(0.8) cm, linear-oblong to linear-elliptic. Pedicels 2-5(6) mm. Calyx (4)5-7(8) mm long, the teeth (1½)2-3 times as long as the tube. Petals 8-11 mm, slightly to distinctly exceeding the calyx. Pods 25-40 × 3.5-4(4.5) mm, appressed-pubescent on both surfaces.

Coastal areas of southern Mozambique.

MOZAMBIQUE. **Sul do Save.** Arredores de Vila João Belo, fl. & fr. 10.xii.1940, *Torre* 2307 (LISC). Manjacaze, fl. & fr. 25.iii.1948, *Torre* 7545 (LISC). **Lourenço Marques.** Delagoa Bay, *Forbes* (K, type). Lourenço Marques, fl. & fr. 29.xi.1897, *Schlechter* 11519 (COI; K); fl. & fr. 25.i.1910, *Mrs. Howard* 25 (LISC); fl. & fr. v.1916, *Pimenta* (LISC). Rikatla, fl. & fr. xi.1918, *Junod* 546 (LISC; PRE). Lourenço Marques, Ponta Vermelha, fl. & fr. 25.ix.1945, *Pedro* 134 (LMJ; SRGH). Near Marracuene, 33 km N of Lourenço Marques, fl. 27.ii.1946, *Gomes e Sousa* 3376 (COI; K). Lourenço Marques — Mus. Álvaro de Castro, fl. & fr. 7.iii.1947, *Pedrogão* 94 (LMJ). Lourenço Marques commonage, fl. & fr. 18.i.1948, *Mrs. Faulkner* 183 (COI; K; SRGH).

Subsp. **inhacensis** Brummitt, subsp. nov.

Folia matura 3.5-5.5 × 0.4-0.6 mm, lineari-oblonga. Pedicelli 1-3 (5 in statu fructifero) mm longi. Calyx 4-8 mm longa, dentibus quam tubum 1.5-2.5-plo longioribus. Petala 8-10 mm longa, calycem excedentia vel aequantia. Legumina circiter 3.5 mm lata, marginibus pubescentibus, paginis glabris.

Typus: Mozambique, Lourenço Marques Distr., Inhaca Island, w. coast ridge grassland, fl. & fr. 30.i.1962, *Mogg* 29869 (K, holotypus; SRGH, isotypus).

Known only from Inhaca Island.

MOZAMBIQUE. **Lourenço Marques.** Inhaca Island, S. of station, in forest remnant, fl. & fr. 30.i.1958, *Noel* 98 (K). Inhaca Island, Langani Ridge woodland, fl. & fr. 4.iii.1958, *Mogg* 27757 (K). Inhaca Island, Ponta Rasa fresh water swamp, fl. & fr. 17.vii.1959, *Mogg* 29425 (K; SRGH). Inhaca Island, w. coast ridge grassland, fl. & fr. 30.i.1962, *Mogg* 29869 (K; SRGH — types).

Subsp. **interior** Brummitt, subsp. nov.

Folia matura 5.5-8.0 × (0.6)0.7-1.0 cm, lineari-oblonga vel lineari-lanceolata. Pedicelli 1-15 mm longi. Calyx (6)7-14 mm longa, dentibus quam tubum 3-5-plo longioribus. Petala 7-13 mm longa, calycem excedentia vel aequantia. Legumina circiter 4.5 mm lata, marginibus pubescentibus, paginis glabris.

Typus: Rhodesia, Nuanetsi Distr., Mozambique border, Vila Salazar, 26.iv.1961, *Drummond & Rutherford-Smith* 7543 (SRGH, holotypus; K, isotypus).

Southwestern Rhodesia and adjacent Mozambique and the Transvaal.

RHODESIA. **Southern Div.** Nuanetsi Distr., Mozambique border, Vila Salazar, mixed tree savanna on sandstone, fl. & fr. 26.iv.1961, *Drummond & Rutherford-Smith* 7534 (K; SRGH — types). Nuanetsi Distr., Kapateni, ± 64 km NE

of Malvernia, sandy ground by roadside, fr. 25.iv.1962, *Drummond* 7730 (K; SRGH).

MOZAMBIQUE. **Sul do Save.** Gaza, Rhodesia border, Malvernia, mixed tree savanna on sandstone, fl. & fr. 26.iv.1961, *Drummond & Rutherford-Smith* 7533 (K; SRGH).

SOUTH AFRICA. **Transvaal.** Without locality, 1875-1880, *Rehmann* 4927 (K — syntype of *T. salicifolia* Schinz). Waterberg Distr., Mosdene, Naboomspruit, sandveld, fl. 31.i.1932, *Galpin* 11667 (K). Kruger National Park, 10 m E. by N. of Punda Maria, mopane-veld, 430 m, fl. & young fr. 20.i.1953, *Acocks* 16770 (K). Kruger National Park, Punda Maria distr., 520 m, fl. 20.i.1953, *van der Schyff* 1832 (K).

18. ***Tephrosia uniflora*** Pers., Syn. Pl. 2: 329 (1807). Type: Senegal, *Roussillon* (herb. Lamarck, P, not seen).

Subsp. ***uniflora***. — Gillett in Kew Bull. 13(1): 114 (1958).

Synonym: *Tephrosia mossambicensis* Schinz in Bull. Herb. Boiss., sér. 2, 2: 948 (1902). — Bak. f., Leg. Trop. Afr. 1: 205 (1926). Type: Mozambique, Boruma, *Menyhart* 632 (z, photograph K).

Other synonymy is given by GILLETT (loc. cit.). The type of *T. mossambicensis* was cited by SCHINZ as *Menyhart* 682 in error for 632 (see note attached to specimen at Zurich).

Group 5. **TEPHROSIA REPTANS, T. LONGIPES** AND ALLIED SPECIES

These are barbistyled species with few to numerous pairs of linear to linear-oblong or (*T. reptans*, *T. faulknerae*) oblanceolate leaflets, linear stipules, mostly lax racemes with linear bracts, and linear thinly pubescent pods, usually with 10-22 seeds (except in *T. paucijuga*).

This difficult group has hitherto been in a state of great confusion. Material previously referred to four or five species (the great majority to either *T. reptans* or to *T. longipes*) in the herbaria examined is here redistributed among twelve

species with a further two subspecies and six varieties. Few specimens have been adequately identified, and in view of the widespread confusion all specimens seen are cited in the account below. The following key should allow identification of specimens to the taxa recognized.

1. Stems with spreading hairs, at least in the lower parts
2. Annuals with a \pm slender tap-root, not strongly decumbent.
3. Inflorescence axis terminated by a dense head of flowers with numerous conspicuous and persistent bracts, also often with flowers at 1-3(5) nodes below the terminal head 23. *T. ringoetii*
3. Inflorescence elongate, \pm lax, without a terminal head
4. Plant 20-50(90) cm high, branching in the lower parts only; stem hairs usually brown; pods with long appressed hairs as well as short ones 22. *T. euprepes*
4. Plant usually 60-100 cm high, stems branching rather regularly for most of their length; stem hairs grey; pods shortly pubescent with usually irregular geniculate hairs 24. *T. stormsii* var. *pilosa*
2. Perennials with a woody stock, or if annual then with robust stems strongly decumbent and up to 1 m or more long.
5. Leaves unifoliate or trifoliate 28. *T. lurida* var. *drummondii*
5. Leaves with 5-9 pairs of leaflets
6. Stems erect from a woody stock; stem hairs up to 2.5 mm long; petiole (1.2)2.5-5 cm, petiole and rhachis together (7)12-18(23) cm; pods with long appressed hairs 21. *T. caerulea* subsp. *caerulea*
6. Stems decumbent, up to 1 m or more long; stem hairs up to c. 1 mm long; petiole 0.2-2.4(4.4) cm, petiole and rhachis together 4-11(13) cm long; pods shortly pubescent with irregular or \pm parallel appressed hairs 20. *T. reptans* var. *reptans*
1. Stems glabrous or appressed- to ascending-pubescent.
7. Stems simple or 1(2)-branched, up to 45(75) cm high, from a woody underground stock; stems glabrous to sparsely and shortly appressed-pubescent; leaves with (0)1-3(4) pairs of leaflets, the lower surface subglabrous to sparsely and shortly appressed-pubescent, the veins prominent on both surfaces
8. Pods 3.5-4(5) mm broad, with 8-12(15) seeds 29. *T. laxiflora*
8. Pods 8-9.5 mm broad, with 2-5 seeds 30. *T. paucijuga*
7. Stems regularly branched and up to 140(180) cm high, or decumbent, or if simple or 1(2)-branched then stems and leaflet under-surface \pm densely appressed-pubescent; stems

- glabrous to densely appressed-pubescent; leaves with 1-11 pairs of leaflets, variously pubescent beneath, the veins not prominent on both surfaces
9. Stems subglabrous, robust, erect or often prostrate, about 130-150 cm long, mostly 3-4 mm diameter; leaflets 3.5-6.5 × 0.5-0.8 cm, linear-elliptic (Angola) . . . 26. *T. rigidula*
 9. Stems densely pubescent, or if subglabrous then either always erect and more slender, rarely exceeding 3 mm diameter (see *T. stormsii*, *T. paradoxa*) or leaflets up to 3.2(4.0) cm long (*T. reptans*)
 10. Plant bushy, c. 1.5 m, high; inflorescences short, 7-10 cm, and ± crowded at least in the upper part, on very short peduncles or usually with the lowermost flowers in the axil of the uppermost leaf; stems densely clothed with long appressed to ascending hairs; petioles mostly 0.1-0.4 cm long . . . 19. *T. faulknerae*
 10. Plant decumbent to erect, not bushy, up to 1.5 m high; inflorescences elongate, 7-32 cm, lax, on ± long peduncles 5-18 cm long; stems subglabrous to shortly appressed-pubescent; petioles mostly 0.4-2.5 cm long
 11. Leaflets up to 3.2(4.0) cm long, oblanceolate to elliptic-oblong or linear-oblong; stems decumbent or erect
 12. Perennial with robust stems, decumbent, woody towards the base; seeds 11-13(16) 20. *T. reptans* var. *arenicola*
 12. Annual with rather slender stems, not woody, the main stem ± erect but often with decumbent branches from the base; seeds (12)15-18 20. *T. reptans* var. *microfoliata*
 11. Leaflets (1.5)4-14(18) × (0.1)0.2-1.2(1.4) cm, linear or linear-oblong; stems erect, or if ± decumbent at the base then only up to 40(50) cm long
 13. Leaflets linear-oblong, (3)4-7.5 × (0.3)0.5-1.2(1.4) cm, in 5-9 pairs; petiole and rhachis together (7)12-18(23) cm (S. W. Africa) 21. *T. caerulea* subsp. *otaviensis*
 13. Leaflets linear (1.5)4-14(18) × (0.1)0.2-0.9(1.1) cm, in (1)2-7(8) pairs, or if leaflets linear-oblong (*T. longipes* subsp. *swynnertonii*) then petiole and rhachis together 2-6(8) cm long
 14. Racemes terminal and axillary (sometimes in the axil of a bract); stems glabrous to sparsely appressed-pubescent (peduncles and inflorescence axes sometimes densely pubescent); annual or perhaps biennial

15. Lateral racemes stout (axis 1-2 mm diameter) and rather stiffly erect, all in the axil of a foliage leaf, the axis densely pubescent to tomentose; calyx (4)5-8(10) mm long, densely pubescent to villous; stipules (8)13-18(24) × 1-2 mm; bracts 5-8(11) × 0.7-1.5(2) mm 25. *T. paradoxa*
15. Lateral racemes slender (axis 0.2-1 mm diameter) and usually rather flexuous and curving upwards, often subtended by only a small linear bract, the axis subglabrous to shortly appressed-pubescent; stipules (3)4-12 × 0.3-0.8 mm; bracts 2-4(5) × 0.2-0.5 mm 24. *T. stormsii* var. *stormsii*
14. Racemes all terminal or leaf-opposed; stems densely appressed- or ascending-pubescent; annual or perennial
16. Perennial with a stout woody underground stock giving rise to usually numerous slender stems up to 1.5(2) mm diameter, usually simple or sparingly branched (except in Kenya), up to 40(50) cm high; leaves with up to 3 pairs of leaflets, the lowermost leaves often unifoliate or digitately trifoliate; petiole (1.5)2.5-7.5 cm, usually exceeding the rhachis
17. Pods with short, usually irregular, geniculate hairs 28. *T. lurida* var. *lurida*
17. Pods with long parallel appressed hairs 28. *T. lurida* var. *lissocarpa*
16. Annual or perennial with a stout tap-root, often becoming woody below, with stems 2-3(5) mm diameter, ± regularly branched, up to 100(150) cm high; leaves with (3)4-7(8) pairs of leaflets; petiole (0.5)0.9-4.2(5.5) cm long, usually much shorter than the rhachis
18. Stems with dense, brown, conspicuously ascending hairs, especially on the angles; inflorescence usually short and compact; leaflets linear-oblong, usually truncate to emarginate at the apex 27. *T. longipes* subsp. *swynnertonii*

18. Stems shortly appressed- grey-pubescent, sometimes also with some longer ascending hairs; inflorescence elongate, lax, leaflets linear to rarely linear-elliptic, usually strongly acute at the apex
19. Annual or perennial; pods (62)70-88 mm long, with (16)17-22 seeds; stipules (5)7-14(17) mm long
27. *T. longipes* var. *icosisperma*
19. Perennial; pods (40)50-70(77) mm long, with 10-16(17) seeds; stipules 4-9(11) mm long
27. *T. longipes* var. *longipes*

19. *Tephrosia faulknerae* Brummitt, sp. nov.

T. reptanti probabiliter affinis sed habitu et indumento et proprietatibus ceteris distincta.

Herba robusta, ramosa, annuus vel biennis vel forsan perennis, circa 1.5 m altus. Caules juveniles dense pilis griseis vel brunneis appresse vel ascenderet pubescentes. Folia (6)8-11-jugata; petiolus 0.1-0.4(0.7) cm, petiolus et rhachis coniunctim 5-12 cm, appresse pubescentes vel subtus glabrescentes; foliola 1.0-3.2 × 0.5-1.0 cm, oblongo-oblanco-lata, basi rotundata ad subcuneata, apice plus minusve truncata et valde mucronata; pagina superior glabra, pagina inferior tenuiter et breviter appresse vel irregulariter pubescens; stipulae 6-10 × 1.5-2.5 mm, anguste triangulares, pubescentes. Flores in racemis plerumque terminalibus, breviter pedunculatis vel infimo axillo folii supremi, dispositi; bractee 5-8 × 0.7-1 mm, lineari-triangulares; pedicelli circa 3 mm. Calyx 4-5 mm longus, breviter et aliquantum irregulariter pubescens; dentes superiores per $\frac{3}{4}$ longitudinis connati triangulum acutum formantes. Petala purpurea; vexillum 15-17 mm longum, carinam plus minusve aequans. Tubus staminalis supra connatus. Ovarium appresse pubescens; legumina 50-64 × 4-5 mm, puberula ad brevissime irregulariter pubescentes; semina 12-14.

Holotypus: Mozambique, Zambézia, Namagoa, fl. 23-34. iii.1949, *Mrs. Faulkner* 404 (K, holotypus; COI, SRGH, isotypi).

This species is named after Mrs. HELEN FAULKNER, collector of much valuable material from the Flora Zambesiaca area and East Africa. Known only from two collections from Mozambique (see also notes under *T. repans* var. *microfoliata*).

MOZAMBIQUE. Niassa. Nampula, abundant in woods by roadsides, fl. & fr. 17.ii.1937, *Torre* 1192 (COI; LISC). Zambézia. Namagoa, Mocuba and Moebede road, Lugela, fl. 23-24. iii.1949, fr. 3.iv.1949, *Mrs. Faulkner* 404 (COI; K; SRGH — types).

20. *Tephrosia reptans* Bak. in Oliv., Fl. Trop. Afr. 2: 121 (1871). — Oliv. in Trans. Linn. Soc. 29: 56, t. 27 (1872). — Bak. f., Leg. Trop. Afr. 1: 197 (1926). — Suessenguth & Merxmüller in Trans. Rhod. Sci. Ass. 43: 26 (1951). Type: Tanzania, Tabora Distr., near Tabora, *Speke & Grant* (K).

Tephrosia kirkii Bak. in Oliv., Fl. Trop. Afr. 2: 115 (1871). — Bak. f., Leg. Trop. Afr. 1: 200 (1926). Type: Mozambique, Zambesi land, Luawe [Luabo] River, *Kirk* (K).

Cracca reptans (Bak.) Kuntze, Rev. Gen. Pl. 1: 175 (1891). Type as for *Tephrosia reptans*.

Cracca kirkii (Bak.) Kuntze, Rev. Gen. Pl. 1: 175 (1891). Type as for *Tephrosia kirkii*.

Annual or short-lived perennial with the rootstock often becoming woody, with several stout prostrate or decumbent-ascending, straggling, branched stems up to 1 m or more long, or (var. *microfoliata*) with the main stem \pm erect with usually decumbent branches from near the base. Stems with conspicuous, brown, spreading hairs up to c. 1 mm long, or (var. *arenicola*, var. *microfoliata*) appressed-pubescent to glabrous. Leaves with 4-9 pairs of leaflets; petiole (0.2)0.4-2.4(4.4 rarely on occasional leaves), petiole and rhachis together 4-11(13) cm long, pubescent like the stem; leaflets (1)1.5-4(5.5) \times (0.2)0.5-1.0(1.3) cm, oblanceolate to elliptic-

oblong or rarely linear-elliptic to linear-oblong, rounded to subcuneate at the base, rounded to truncate or emarginate at the apex, mucronate; upper surface shortly pubescent, lower surface rather shortly appressed- or irregularly pubescent; stipules (4)8-13(16) \times 1-1.8 mm, narrowly triangular to linear, \pm persistent. Flowers in terminal and axillary, long-peduncled racemes (4)7-22(32) cm long; bracts 3-7 \times 0.2-0.6 mm, linear-triangular; pedicels 2-4(6) mm. Calyx (3)4-7(8) mm long, shortly spreading- (or appressed- in var. *arenicola* and var. *microfoliata*) pubescent with brown or grey hairs; two upper teeth connate for $\frac{1}{3}$ - $\frac{1}{2}$ length, all teeth long-acute and \pm filiform towards the apex. Petals pink to purple or blue, the keel paler; standard 12-17 mm long, the other petals somewhat shorter. Stamen tube connate above. Ovary shortly pubescent; style pubescent; pods (38)50-65(76) \times 4-5 mm, puberulent to very shortly pubescent with irregular to \pm parallel hairs, straw-coloured to brown; seeds (10)14-16(18), at maturity (seen only in 2 Kenya specimens) \pm rhomboidal, 2.5-3 \times 1.5-2 \times c. 1, with the hilum near the middle of one or the longer sides, brown with dark markings.

This species is typically conspicuously clothed with spreading brown hairs on stems etc. and leaf rhachides. However, two groups of plants with glabrous to appressed-pubescent stems, one group found mainly on sandy lake shores and the other in the grasslands of northern Mozambique, do not seem to be specifically distinct and are here accorded varietal rank. Further investigation of these plants is desirable however. The type of *T. kirkii* Bak., included in synonymy above, appears to be intermediate between var. *reptans* and var. *arenicola* (see below).

Var. *reptans*

Tephrosia carvalhoi ['*carvalhi*'] Taub. in Engl., Bot. Jahrb. 23: 183 (1896). Type. Mozambique, Gorongosa, *Carvalho* (B, holotype \dagger ; COI, isotype).

Tephrosia godmaniae ['*godmanae*'] Bak. f., Leg. Trop. Afr. 1: 194 (1926). Type: Rhodesia, Salisbury, *Miss Godman* 144 (BM, holotype).

Tephrosia granitica Viguier in Not. Syst. (Paris) 14: 63 (1950). Type: Madagascar, Maevatanana, ii.1920, *Perrier* 13046 (chosen here as lectotype — K, isolectype).

Annual to perennial (?), the branches prostrate or decumbent-ascending. Stems and leaf rhachides with hairs conspicuously spreading or (in northern Kenya and Uganda) ascending. Leaves with 4-7(9) pairs of leaflets of varying shape; stipules (4)8-13(16) mm long. Calyx with \pm spreading hairs. Pods with (10)14-16 seeds.

Uganda, Kenya, Tanzania, Zambia, Rhodesia, Malawi, Mozambique, Madagascar.

The northernmost specimens cited below, those from Uganda and from Kenya K1 and K2 are generally less pubescent than others, with short spreading hairs or \pm appressed hairs, and so tend towards var. *arenicola*.

UGANDA. **U1. Karamoja Distr.** Kacheliba Escarpment, 1525-1830 m, fl. & fr. 13.ix.1956, *Hardy & Bally* 10827 (K). Turkana Escarpment, 1430 m, fl. iv.1960, *Wilson* 878 (K).

KENYA. **K1. Northern Frontier Prov.** Near Lake Marsabit, 1898, *Lord Delamere* (BM). Dandu, 825 m, fl. & fr. 5.v.1952, *Gillett* 13064 (K). Dandu, 1035 m, fl. & fr. 14.v.1952, *Gillett* 13194 (K). Moyale, 1100 m, fl. & fr. 2.ix.1952, *Gillett* 13772 (BM; K). **K2. Turkana Distr.** Lorukon, near Turkwell Gorge, fl. & fr. viii.1962, *Wilson* 1266 (K). **West Suk Distr.** West Suk Reserve, 40 miles (64 km) N of Kitale, 1430 m, fl. & fr. 10.vi.1952, *Bogdan* 3445 (K). Foot of Suk Escarpment, 1370 m, fl. iii.1964, *Tweedie* 2784 (EA; FI; K). **K3. Rift Valley.** Mt. Suswa, near summit 1830 m, fl. & fr. 23.iii.1963, *Bally* 12652 (K). **K4. Machakos Distr.** Ngomeni, 1893-94, *Scott Elliot* 6269 (BM; K). 8 miles (13 km) N. of Simba, 1190 m, fl. & fr. 9.ii.1952, *Bogdan* 3363 (K).

TANZANIA. **T4. Tabora Distr.** Near Tabora, 1170 m, fl. & fr., *Speke & Grant* (K, type). **T5. Manyoni Distr.** Manyoni, 1360 m, fl. & fr. 24.iv.1962, *Polhill & Paulo* 2157 (K). **T8. Mikindani Distr.** Mikindani-Lindi road, 45 m, fl. & fr. 11.iii.1963, *Mrs. Richards* 17834 B (K).

ZAMBIA. **Central Prov.** Chakwenga Headwaters, 100-129 km E. of Lusaka, fl. & fr. 27.iii.1965, *Robinson* 6516 (K).

Southern Prov. Mochipapa, near Choma, 1220 m, fl. 10.iii.1962, *Astle* 1497 (K; SRGH). Kasusu, Kalomo, roadside in tsetse clearing in woodland, fl. & fr. 28.iv.1964, *Mitchell* 25/61 (K).

RHODESIA. Northern Div. Trelawney, Tobacco Expt. Station, fl. & fr. 22.ii.1943, *Jack* 67 [SRGH 9587] (K; SRGH); fl. 22.ii.1943, *Jack* 124 [SRGH 9596] (SRGH); fl. 29.iii.1944, *Jack* 67 [SRGH 11940] (K; PRE; SRGH). Darwendale, fr. iv.1953, *Vincent* 149 (K; SRGH). Darwin Distr., Umsengedsi River, fr. 16.v.1955, *Watmough* 117 (K; SRGH). Urungwe Distr., sandy river bank, Urungwe Reserve, 1065-1220 m, fr. iv.1956, *R. Davies* 1898 (SRGH). Gokwe Distr., Gokwe, fl. & fr. 6.iii.1962, *Bingham* 150 (K; SRGH). **Central Div.** Salisbury, 1460 m, fl. & fr. ii.1920 *Eyles* 2107 (K; SRGH). Salisbury, fl. & young fr. 16.iii.1921, *Miss Godman* 144 (BM; type of *T. godmaniae*). Salisbury, 1400 m, fl. & fr. iii.1920, *Eyles* 2107 (PRE). Salisbury, Gatooma road 13 miles (21 km), fl. & fr. 17.xii.1932, *Eyles* 7273 (K; SRGH). Inyazura Distr., fl. & fr. 26.ii.1940, *Hopkins* SRGH 7659 (SRGH). Marandellas, fl. 12.iii.1942, *Dehn* 622 (SRGH). Inyazura, 1370 m, fl. 28.ii.1946, *Hopkins* SRGH 14554 (SRGH); SRGH 14555 for parasite *Striga gesnerioides* (SRGH). Hartley District, Poole Farm, fl. & fr. 4.iii.1948, *R. M. Hornby* 2868 (K; LISC; SRGH). Marandellas, fl. & fr. 17.iii.1949, *Corby* 420 (PRE; LISC); *Corby* 421 (K; SRGH). Makoni Distr., Headlands, fl. & fr. 15.ii.1952, *Corby* 769 (PRE; SRGH). Salisbury, Marirangwe P. A., 1460 m, fl. & fr. ii.1960, *R. M. Davies* 2795 (SRGH). Hartley District, Msengezi P. A. fl. & fr. iii.1961, *R. M. Davies* 2887 (SRGH). **Eastern Div.** Odzani River Valley, fr. 1914, *Teague* 198 (K). Umtali Distr., fl. 25.ii.1940, *Hopkins* SRGH 7642 (SRGH). Umtali Distr., Maranta Reserve, 760 m, fl. & fr. 10.ii.1953, *Chase* 4764 (BM; COI; K; LISC). Umtali Distr., Darlington suburbs, municipal sand pits, 1100 m, fl. & fr. 8.iii.1960, *Chase* 7280 (BM; K; LISC; SRGH).

MALAWI. Southern Prov. Ntondwe, fl. & fr. 1905, *Cameron* 150 (K). Ncheu Distr., Msasa Escarpment, Dedzi-Golomoti road, 1250 m, fl. & fr. 19.iii.1955, *Exell, Mendonça & Wild* 1037 (BM; LISC; SRGH).

MOZAMBIQUE. Niassa. Massangulo, fl. & fr. iv.1933, *Gomes e Sousa* 1350 (BM; COI; K). Malema Distr., Mutuáli, right bank of the R. Nalume, fr. 28.v.1947, *Pedro* 3258 (LMJ). Mutuáli, road to Malema, fr. 28.v.1947, *Pedro* 3262 (LMJ). Ribáuè Distr., 80 km from Nampula towards Ribáuè, 700 m, fl. & fr. 31.i.1964, *Torre & Paiva* 10355 (LISC). Maniamba Distr., Metangula, edges of L. Niassa, 500 m, fl. 29.ii.1964, *Torre & Paiva* 10925 (LISC). Zambézia. Zambesi, fl. xi.1866, *Kirk* (K). Manica e Sofala. Zambesi, 1863, *Stewart* (BM). Gorongosa, fl. 1884-5, *Carvalho* (COI; isotype of *T. carvalhoi*).

MADAGASCAR. Central Madagascar, comm. 1885, *Baron* 4742 (K). Maevatanana, fl. & fr. ii.1920, *Perrier* 13046 (K, lectotype of *T. granitica*).

Var. *microfoliata* (P. Lima) Brummitt, comb. nov.

Basionym: *Cracca bracteolata* (Guill. & Perr.) Kuntze var. *microfoliata* P. Lima in Bol. Soc. Brot. sér. 2, 2: 137 (1924). Type: Mozambique, near Palma, *P. Lima* 34 (PO).

Cracca bracteolata sensu P. Lima in Broteria, sér. bot. 19 (3): 123 (1921).

Tephrosia iringae sensu Cronquist, Fl. Congo Belge 5: 105 (1954) quoad spec. Mossamb. (*Faulkner* 151, 226).

Annual with rather slender stems, not woody, the main stem usually erect but often with decumbent branches from near the base. Stems and leaf rachides shortly appressed-pubescent. Leaves with 4-9 pairs of leaflets; leaflets 1.4×0.2-0.6(0.8) cm, mostly 5-9 times as long as broad, linear-oblong; stipules 5-9(12) cm long. Calyx shortly appressed-pubescent. Pods with (12)15-18 seeds.

Known only from northern Mozambique.

MOZAMBIQUE. Niassa. Near Palma, fr. 24.viii.1916, *Pires de Lima* 34 (PO, type). Road from Palma to Kionga, fl. & fr. 8.xi.1916, *Pires de Lima* 46 (PO). Palma, fl. & fr. 2.iv.1917, *Pires de Lima* 169 (PO). Nampula, fl. & fr. 2.ii.1937, *Torre* 1223 (COI; LISC). Nampula, fl. & fr. 13.iii.1937, *Torre* 1231 (COI). Metangula, fl. & fr. 24.v.1948, *Pedro & Pedrogão* 3866

(LMJ). **Zambézia**. Mocuba Distr., Namagoa, 60 m, fl. iii.1943, Mrs. Faulkner 151 (PRE — mixed, apparently in error, with pieces of var. *reptans*, of which duplicate at SRGH); fl. & fr. i.1945, Mrs. Faulkner 151 (K; SRGH); fl. & fr. 26.ii.1948, Mrs. Faulkner 226 (COI; K; PRE; SRGH).

This taxon was first described as a variant of *T. bracteolata* by PIRES DE LIMA but differs markedly from that species in its linear bracts and in other characters. In its inflorescences, flowers, pods and leaflets it closely resembles *T. reptans*, under which it is here placed, but it differs from typical plants of that species in its appressed pubescence and its slender tap root with apparently usually erect, rather short and slender stems. *Pedro & Pedrógão* 3866 in particular looks most unlike *T. reptans* in its slender erect habit and subglabrous stems, and may be wrongly referred here. Further collections and observations may show that this group should be excluded from *T. reptans*, and its relationship to *T. faulknerae*, with which it is apparently also sympatric (c. f. specimens of both from Nampula and Namagoa), requires investigation. *T. faulknerae* is distinguished by its bushy habit, more compact and short-peduncle or sessile racemes, much denser and longer stem hairs, broader oblanceolate leaflets and broader stipules.

Var. **arenicola** Brummitt & J. B. Gillett, var. nov.

Perennis (?), caulibus robustis, plerumque basim versus lignosis, prostratis usque ad 2 m longis vel caule terminale plus minusve erecto. Caules et rhachides foliorum glabri ad breviter et sparse appresse pubescentes. Folia 5-9-jugata; foliola plerumque 3-5-plo longiora quam lata, anguste elliptica ad oblanceolata; stipulae 4-8 mm longae. Calyx breviter appresse pubescens. Legumina seminis 11-13(16) praedita.

Typus: Tanzania, Mpanda Distr., Kibwesa point, a secondary coloniser of bare sand of dunes, fl. & fr. 17.vii.1958, *Juniper & Jefford* 48 (K, holotypus); 'sub-shrub — erect main stem, prostrate branches — plants from 18" to 3-4 yards diameter, up to 18" high, branches red, flowers pale

lilac, standard green on outer surface, flowers opening in evening, closed during day'.

This variety, which is described jointly with Mr. J. B. GILLET (Nairobi), appears to be the usual one on sandy shores of Lakes Tanganyika and Nyasa and perhaps other lakes, but other plants from elsewhere (e. g. *McClounie* 113 from 2440 m. alt. in Malawi, also *Bogdan* 2295, *Bally* 796) seem to more or less indistinguishable and are included in this variety below.

BURUNDI. Nyanza, Lake Tanganyika, 7.iii.1920, *Shantz* 704 (K).

KENYA. **K4. Machakos Distr.** Kibwezi, on 'Dwa-rock' in bush country, 915 m, fl. & fr. 16.v.1938, *Bally* 8208 (K). Kiboko, tsetse fly exp. area, solid lava rock with grass cover, 915 m, fr. 17.ii.1949, *Bogdan* 2295 (K).

TANZANIA. **T1. Musoma Distr.** Musoma, hillside grassland, fl. & fr. 1933, *Emson* 337 (K). **T4. Mpanda Distr.** Kibweza, lake shore, fl. & fr. 6.vii.1958, *Mahinde* HSM/8 (K). Kibweza Point, bare sand of dunes, fl. & fr. 17.vii.1958, *Juniper & Jefford* 48 (K, type). Kibweza point, sandy raised beach, fl. & fr. 11.vii.1958, *Jefford & Newbould* 1637 (K). **T8. Songea Distr.** Lukoma, Lake Nyasa, viii.1887, *Bellingham* (BM).

ZAMBIA. **Northern Prov.** Kamba Bay, shore of Lake Tanganyika, deep red sand, fl. & fr. 15.iv.1957, *Mrs. Richards* 9196 (K).

MALAWI. **Northern Prov.** Nyika Plateau, Mwanemba, 2440 m, fl. ii-iii.1903, *McClounie* 113 (K). Karonga, sandy foreshore, fl. & fr. 4.vii.1952, *Williamson* 21 (BM). Kaporo, N. Karonga, margin of lake, st. 22.iii.1953, *Jackson* 1176 (BM; LISC).

MOZAMBIQUE. **Niassa.** Metangula, on sands, fr. 24.v.1948, *Pedro & Pedrogão* 3864 (LMJ).

The type of *T. kirkii* is from perhaps as similar habitat but has rather long appressed or ascending hairs on the stem and is more or less intermediate between var. *arenicola* and var. *reptans*: MOZAMBIQUE. **Manica e Sofala.** Luawe (Luabo) River, sandy soil, fl. & fr. 8.ii.1961, *Kirk* (K).

21. *Tephrosia caerulea* Bak. f., Leg. Trop. Afr. 1: 197 (1926).
Type: Zambia, Mazabuka, Mrs. Woods 51 (BM).

Annual ? with a tap root, to perennial with a woody stock and herbaceous robust, rather sparingly branched, erect stems up to 1.4 m high. Stems covered with spreading or appressed, brown or grey hairs (see subspecies). Leaves with 5-9 pairs of leaflets; petiole (1.2)2.5-5 cm long, petiole and rhachis together (7)12-18(23) cm long, with hairs similar to those on the stem; leaflets (3)4-7.4 × (0.3)0.5-1.2(1.4) cm, linear-oblong or linear-elliptic to linear, rounded to subcordate at the base, ± truncate to emarginate at the apex; upper surface glabrous, lower surface covered with longish appressed hairs; stipules (7)8-16(19) × (0.8)1-1.2(1.5) mm, linear or somewhat falcate, ± persistent. Flowers in mostly terminal racemes, (8)12-26(32) cm long; bracts 3-6 × 0.2-0.6 mm, ± linear; pedicels 3-4 (6 in fruit) mm. Calyx 5-6 (7) mm long, with long, brown or grey, ascending to spreading hairs, the tube 2-2.5 mm, equalling or exceeding the lateral teeth; upper teeth connate for $\frac{1}{3}$ - $\frac{1}{2}$ length. Petals pink to pale purplish or bluish, the keel paler; the standard 13-18 mm long, the other petals somewhat shorter. Stamen tube connate above. Ovary appressed-pubescent; style pubescent; pods 55-70(90) × 4.5-5.5 mm; with long appressed hairs overlying much shorter hairs, or with ± geniculate semi-appressed hairs, ± straw coloured; seeds 13-17(19), at maturity (known only in subsp. *caerulea*, *Mutimushi* 73) rhomboidal, c. 2.5 × 2 × 1 mm, with the hilum near the middle of one of the longer sides, dark brown with raised lighter patches radiating from the hilum.

South-western Tanzania, south-western Zambia, western Rhodesia, northern Mozambique, Bechuanaland, S. W. Africa.

Subsp. *caerulea*

Usually perennial with a woody stock. Stems and leaf rhachides with long, spreading, often geniculate, brown hairs 1-2.5 mm long.

Distribution of the species except S. W. Africa.

TANZANIA. **T4. Mpanda Distr.** Rukwa, Sonta, in *Sclerocarya caffra* woodland, 780 m, fl. & fr. 1.xi.1963, *Mrs. Richards* 18321 (K). **Ufipa Distr.** Rukwa, Milepa, fl. & fr. iii.1949, *Burnett* 49/105 A (K).

ZAMBIA. **Barotseland.** Situmpa forest, fl. 24.iii.1937, *Martin* 712 (BM). Sesheke Distr., Sichinga Forest near Sesheke, in open, tall grass, *Combretum* woodland, fringing mukusi mutemwa on Kalahari sands, fl. 28.xii.1952, *Angus* 1057 (FHO; K; PRE). **Central Prov.** Kafue, on banks of the Kafue river upstream from the railway bridge, black clay soil with *Hyparrhenia* and *Sporobolus*, fl. 28.i.1963, *van Rensburg* KBS 1273 (K; SRGH). Herb sward in *Hyphaene* sp. tree savanna on Kafue Flats, Chikupi Extension, Chilanga ICA, Lusaka Distr., fr. 13.ix.1963, *Farrell* 396 (SRGH). **Southern Prov.** Mazabuka, 1220 m, fl. 20.i.1921, *Mrs. Woods* 5 (BM). Mazabuka Distr., Central Research Station ox paddock, 1005 m, fl. 26.iii.1931, *Vet. Officer* CRS 234 (PRE). Mazabuka, loam soils of thorn country, 1100 m, fl. i.1934, *Parsons* 1376 (K). Muckle Neuk, 12 miles (19 km) N. of Choma, drier parts of dambo 1280 m, fl. & fr. 28.ii.1954, *Robinson* 595 (K). Namwala, sandy places, fl. & fr. 19.x.1959, *Mutimushi* 73 (K). Mazabuka Distr., Mochipapa to Sinazongwe mile 39.4, karroo mudstone hills at foot of escarpment, in small gorge, fl. & fr. 2.iii.1960, *White* 7565 (FHO; K). Namwala Distr., Puku Flats, Musa-Kafue confluence, Kafue Nat. Park, fl. 14.i.1963, *Mataundi* 17/57 (SRGH).

RHODESIA. **Western Div.** Bulawayo, 1220 m, fl. & fr. v.1915, *Rogers* 13414 (K). Matabeleland, Glenlatagen, fl. & fr. i.1930, *Miss Cheesman* 74 (BM). Victoria Falls, 885 m, fl. ii.1945, *Martineau* 676 (SRGH). **Without precise locality.** Matabeleland, fr. iii.1929, *Pardy* 5020 (SRGH).

MALAWI. **Southern Prov.** Chipoka, Fort Johnston, sandy lake soils, fl. & fr. 22.iii.1956, *Banda* 235 (BM; LISC; SRGH).

MOZAMBIQUE. **Niassa.** Amaramba, Ngami Valley N of Mandimba, fl. 10.i.1942, *A. J. W. Hornby* 1118 (LISC; PRE).

BECHUANALAND. **Northern Div.** 2 miles (3 km) SE of Shakawe, fl. & fr. 24.i.1956, *de Winter* 4406 (K; M).

Of the above collections two from Zambia, *Farrell* 396 and *Mutumushi* 73, are rather less robust than others, with narrower leaflets and rather soft greyish pubescence.

The following combination is proposed jointly with Dr. ANNELIS SCHREIBER of Munich who has prepared the account of this genus for the Flora of South West Africa.

Subsp. **otaviensis** (Dinter) Schreiber & Brummitt, comb. et stat. nov.

Basionym: *Tephrosia otaviensis* Dinter in Feddes Repert. 30: 204 (1932). Type: Hereroland, Klein Otavi, *Dinter* 5747 (NH, isotype, not seen; photo at K seen).

Tephrosia longipes sensu Schreiber in Mitt. Bot. Staats-samml. München 19: 298 (1957).

?Annual or biennial with a tap root. Stems and leaf rachides with appressed or ascending grey hairs.

Known at present only from S. W. Africa, but may possibly be found in Bechuanaland.

SOUTH WEST AFRICA. Otavi, fl. & fr. 11.iii.1925, *Dinter* (NH, isotype, not seen; K, photogr.) Bei Bobos auf Sandboden, fl. & fr. 2.iv.1934, *Dinter* 7570 (BM; K; M). Beulah, Distr. Outjo, fl. 1953, *H. & E. Walter* 2/176 (M). Andara Mission Station, fl. & fr. 24.ii.1956, *de Winter & Marais* 4832 (K; M).

22. ***Tephrosia euprepes*** Brummitt, sp. nov.

T. reptanti, *T. caeruleae* et *T. stormsii* affinis; a *T. reptante* habitu valde graciliore, radice tenui, foliolis anguste lanceolatis ad linearis, et petiolo longiore differt; a *T. caerulea* typica habitu annuo valde graciliore, radice tenui, foliis plerumque minoribus differt; a *T. stormsii* habitu brevior, caule simplicibus vel tantum in parte inferiore ramoso, pilis patentibus brunneis, et leguminibus pilis longis appressis vestitis differt.

Planta annua gracilis; radix longa tenuis; caules parce ramosi in parte inferiore, 20-50(90) cm alti. Caules pilis

plerumque (saltem in parte inferiore) conspicue patentibus brunneis sparse ad dense pubescentes. Folia pauca in parte inferiore inserta, 1-4(5)-jugata; petiolus (1.5)3-8 cm longus, petiolus et rhachis conjunctim (2)3-15 cm, pilis longis plus minusve sparsis, saltem aliquis conspicue patentibus, vestitis; foliola (1)2-5(7) \times (0.2)0.4-0.9(1.3) cm, anguste lanceolata vel elliptico-oblonga ad linearia, basi rotundata ad subcuneata, apice rotundata ad truncata vel emarginata; pagina superior glabra, pagina inferior pilis plus minusve longis appresse pubescens; stipulae (3)5-11(15) \times 0.3-0.8 (1) mm, lineares plerumque conspicue persistentes post casum foliorum. Flores in racemis simplicibus elongatis laxis ad 25 cm longis dispositis; bractee usque ad 6 \times c. 0.3 mm, lineares, inconspicuae; pedicelli 3-6 mm. Calyx (3.5)4.5-7 mm longus, pilis longis brunneis laxe appressis ad patentibus vestitus; dentes superiores tubum propinque aequantes, $\frac{1}{2}$ - $\frac{2}{3}$ longitudinis connati. Petala rosea vel pallide purpurea; vexillum 15-20 mm longum. Tubus staminalis supra connatus. Ovarium appresse pubescens; stylus pubescens; legumina (42)58-72 \times 4-5 mm, straminea, appresse pubescentia pilis longis pilos breviores indutis.

Typus: Rhodesia, Western Div., Nyamandhlovu Distr., Bongolo, fl. & fr. 12.ii.1948, *West* 2694 (SRGH, holotypus; κ , isotypus).

South-western Zambia, northern Bechuanaland, western Rhodesia; also north-eastern Rhodesia and adjacent Mozambique (Tete).

ZAMBIA. **Barotseland.** Masese, ACT muTemwa [thicket] on Kalahari sand, fl. 14.iii.1961, *Fanshawe* 6424 (SRGH). **Southern Prov.** Livingstone Distr., Katambora, fl. & fr. 13.i.1956, *Gilges* 540 (PRE; SRGH). Livingstone, scrub mopane on basalt, fl. 3.ii.1961, *Fanshawe* 6182 (SRGH). Livingstone Distr., lip of 5th gorge, Victoria Falls Trust Area, basalt soil, mopane savanna, fl. & fr. 2.iii.1963, *Bainbridge* 760 (SRGH).

BECHUANALAND. **Northern Div.** Ngamiland, Kwebe, fl. & fr. i.1897, *E. J. Lugard* 152 (κ). Ngamiland, Kwebe Hills,

fl. & fr. 14.ii.1898, *Mrs. E. J. Lugard* 175 (K). Francistown, fl. & fr. 1926, *Rand* 19, 20 (BM).

RHODESIA. **Western Div.** Victoria Falls, 1924, *Miss Close* (BM). Victoria Falls, fl. & fr. 30.i.1934, *Miss Saunders Davies* (BM). Bulawayo, Hillside, 1370 m, fl. i.1944, *Martineau* 139 (SRGH). Premier Mine, 1220 m, fl. & fr. iii.1944, *Martineau* 221 (SRGH). Nyamandhlovu Distr., Bongolo, fl. & fr. 12.ii.1948, *West* 2694 (K; SRGH — types). Nyamandhlovu Distr., near the Khami River on Fountains, fl. & fr. 23.ii.1949, *West* 2855 (K; SRGH). Nyamandhlovu, Pasture Station, fl. & fr. 10.i.1954, *Plowes* 1669 (K; PRE; SRGH). Wankie Distr., basalt near Matetsi River, fl. & fr. 28.ii.1963, *Wild* 6052 (BM; K; SRGH). **Eastern Div.** Inyanga Distr. north, Lawleys Concession, fl. & fr. 19.ii.1954, *West* 3359 (K; PRE; SRGH).

MOZAMBIQUE. **Tete.** Tete, fl. i.1932, *Sofia Pomba Guerra* 10 (COI).

The last two specimens cited above are from the low-veld area of north-eastern Rhodesia and adjacent Mozambique, somewhat separated geographically from the main area of distribution. The two areas are somewhat similar climatically and edaphically and the discontinuity in distribution is not surprising.

Specimens here referred to *T. euprepes* have previously been confused with *T. reptans* or occasionally *T. longipes*, or in one case with *T. barbiger* (*T. nana*).

23. ***Tephrosia ringoetii*** Bak. f. in Bull. Soc. Roy. Bot. Belge 57: 126 (1925); Leg. Trop. Afr. 1: 197 (1926). Type: Congo, Katanga, Shinsenda, fl. & fr. 29.iii.1912, *Ringoet* 5 (BR).

Tephrosia jelfiae Bak. f., Leg. Trop. Afr. 1: 202 (1926). Type: Zambia, Northern Prov., Luwingu, fl. iv.1922, *Mrs. Jelf* 23 (BM).

Tephrosia longipes Meisn. var. *ringoetii* (Bak. f.) Gillett in Kew Bull. 13: 125 (1958). Type as for *T. ringoetii*.

Tephrosia stormsii sensu Cronquist, Fl. Congo Belge 5: 106 (1954) pro parte.

An annual with a short tap root and branching stem 30-100 cm high. Stems, at least the lower parts, \pm conspicuously clothed with spreading, irregular, usually whitish, geniculate hairs up to 2 mm long. Leaves with (1)2-4(5) pairs of leaflets; petiole 5-9(13) cm long, or sometimes as short as 2 cm in the uppermost leaves, petiole and rhachis together (7)9-20(23) cm, or sometimes as short as 3.5 cm in the uppermost leaves, with spreading whitish hairs like those on the stem; leaflets (2)4-9(10.5) \times 0.2-8(1.0) cm, \pm linear, rounded to subcuneate at the base, acute to rounded at the apex; upper surface glabrous, lower surface appressed- or irregularly pubescent; stipules (4)8-16(18) \times (0.4)1-2.4 mm, linear-triangular, sometimes falcate, persistent. Each inflorescence axis terminated by a dense capitulum of flowers surrounded by conspicuous bracts which usually equal or exceed the calyces of the flowers, also often with flowers at 1-3(5) nodes below the terminal capitulum; bracts (4)6-8(9) \times 0.5-1 mm, linear-triangular, purplish with villous whitish hairs, conspicuous and persistent; pedicels 3-5(7) mm long. Calyx 3.5-6 mm long, usually purplish with villous greyish spreading hairs; upper teeth connate for not more than $\frac{1}{2}$ their length; upper and lateral teeth about equaling the tube in length, the lower tooth up to 1.5 mm longer. Petals pale to deep pink or occasionally purplish; standard (10)11-15(16) mm long, \pm cuneate at the base. Staminal tube connate above. Ovary pubescent, particularly on the sutures; style pubescent; pods 48-65 \times (3.8)4-5 mm, usually minutely puberulent as well as having short, irregular or loosely appressed, usually geniculate hairs; seeds 11-15(16).

Congo (Katanga) and Zambia.

CONGO. **Katanga**. Shinsenda, fl. & fr. 29.iii.1912, *Ringoet* 5 (BR, type). Elisabethville Distr., near Likasi Road, fl. 7.ii.1926, *Hirschberg* 77 (K). Kambove, 1400 m, fl. & fr. 17.iii.1926, *Robyns* 1714 (BR). Environs Kipushi, route d'Elisabethville, fl. & fr. 29.iii.1926, *Robyns* 1814 (BM; BR, K). Munama, fr. v.1928, *Quarré* 1187 (BR). École des R. R. P. P. Salésiens, Elisabethville, young fr. 1937, *Schrooten* 13 (BR); fl. 28.iv.1939, *Schrooten* 1097 (BR). Jadotville, fl. xii.1945,

Hoffman (BR). 12 km au N. W. d'Elisabethville, open forest, 1300 m, fl. 9.iv.1958, *Gathy* 582 (K; SRGH).

ZAMBIA. **Northern Prov.** Luwingu, 1370 m, dry sandy soil in bush country, fl. iv.1922, *Mrs. Jelf* 23 (BM, type of *T. jelfiae*). Mpika Distr., low rocky hills by Serenge-Mpika road, damp sand between rocks, 1200 m, fl. & fr. 5.iv.1961, *Mrs. Richards* 14983 (K). **Western Prov.** Mufulira, open forest, 1220 m, fl. & fr. 4.v.1934, *Eyles* 8254 (K; SRGH). Mufulira, *Brachystegia* woodland, 1220 m, fl. & fr. 18.iv.1948, *Cruse* 324 (K); fl. & fr. 29.iii.1949, *Cruse* 510 (K). Kitwe, plateau woodland, fl. & fr. 21.iii.1954, *Fanshawe* 991 (K). Ndola, open grassy places, fl. & fr. 6.iv.1954, *Fanshawe* 1072 (K; SRGH). Kitwe, mushitu fringe in shade, fl. & fr. 18.iii.1955, *Fanshawe* 2151 (K). Nkana, Kitwe sewage works, surrounding bush area, loam on laterite, fl. & fr. 2.iv.1959, *Shepherd* 56 (K); *ibid.* fl. 10.iv.1959, *Shepherd* 63 (K). Solwezi, dry *Brachystegia* woodland, 1350 m, fl. 9.iv.1960, *Robinson* 3492 (K; SRGH). Lwano FR, Chingola, plateau woodland, fl. 13.iii.1961, *Mutimushi* 113 (K; SRGH). Mile 36 Ndola to Mufulira, ground layer in well grown *Brachystegia* woodland, fr. 12.iv.1961, *Angus* 2833 (K; SRGH). Mwini-lunga Distr., Kabompo Gorge, fl. & fr. 19.iv.1965, *Robinson* 6638 (K).

CRONQUIST (loc. cit.) regarded *T. ringoetii* as merely an extreme form of *T. stormsii* with a condensed raceme and spreading hairs, commenting that in some specimens the correlation is not clearly marked, and GILLET (loc. cit.) regarded it as a variety of *T. longipes* sens. lat. The present author finds, however, that the character of the inflorescences is constant and unmistakable; the main axis is always terminated by a compact head of flowers whether or not there are flowers at other nodes below the head, the terminal head developing more or less simultaneously with the lower nodes. In all other species of this group the inflorescence tapers gradually to the apex. The indumentum of stem, rhachides, bracts and calyces seem to be constant throughout *T. ringoetii*, being matched only in *T. stormsii* var. *pilosa*, and together with the purplish coloration of

the bracts and calyces gives the species an unmistakable appearance.

24. *Tephrosia stormsii* De Wild. in Ann. Mus. Congo, sér. 4, 1: 189 (1903). — Bak. f., Leg. Trop. Afr. 1: 203 (1926). — Brenan, Check List For. Tr. Shr. Brit. Emp. 5, Tang. Terr.: 444 (1949). — Cronquist, Fl. Congo Belge 5: 106 (1954) pro parte excl. *T. ringoetii*. Type: Tanzania, Western Prov., Mpanda Distr., Karema, *Storms*, without date or number (BR).

Tephrosia longipes sensu Gillett in Kew Bull. 13: 125 (1958) pro parte.

Annual with a tap root and rather slender, branched stems (40)60-140(180) cm high. Stems glabrous or with sparse appressed hairs in parts, or (var. *pilosa*) with rather conspicuous grey spreading hairs. Leaves with (1)2-4(6) pairs of leaflets; petiole (0.3)2-7(10) cm, petiole and rhachis together 5-18 cm, glabrous to pubescent like the stem; leaflets (2.5)4-11(14) × (0.1)0.2-9(1.1) mm, linear to linear-oblong, or the lower ones sometimes (particularly in var. *pilosa*) sometimes ± elliptic, the apex acute to rounded or occasionally emarginate; upper surface glabrous, lower surface appressed-pubescent; stipules (3)4-12 × 0.3 × 0.8 mm, or up to 17 mm in var. *pilosa*, linear, sometimes falcate. Flowers in lax terminal and axillary racemes up to 18(25) cm long, the upper branch racemes often subtended by only a bract instead of a foliage leaf and so forming a compound inflorescence, the branches usually forming an angle of about 45° or more, their axis slender (0.2-1 mm diameter) and usually rather flexuous and curving upwards, glabrous to shortly appressed-pubescent; bracts 2-4(5) × 0.2-0.5 mm, linear-triangular, rather inconspicuous and usually caducous; pedicels 3-6 mm. Calyx 3-5.5 mm long, usually shortly appressed-pubescent with greyish hairs, or (var. *pilosa*) with longer spreading hairs; upper teeth usually connate for most of their length to form an obtuse or acute triangle, or (particularly var. *pilosa*) free for more than half their

length; lateral teeth usually about equalling the tube. Petals pink to sometimes purplish, or the keel much paler and often white; standard 12-16(18) mm long. Stamen tube connate above. Ovary pubescent; style pubescent; pods 48-70 × 4-5 mm, shortly pubescent with usually irregular geniculate hairs, sometimes with rather short appressed hairs; seeds 10-16(17), at maturity oblongoid to subdiscoid, c. 2.3 × 1.5-2 × c. 1 mm, brown or blackish, rather smooth.

Congo (Katanga) south-eastern Kenya, Tanzania, Zambia, Rhodesia, Malawi, northern Mozambique.

Var. *stormsii*

Tephrosia eylesii Bak. f., Leg. Trop. Afr. 1: 200 (1926). Type: Rhodesia, Mazoe Distr., Bernheim Hill, *Eyles* 265 (BM, holotype; SRGH, isotype).

Tephrosia lurida sensu Eyles in Trans. Roy. Soc. S. Afr. 5(4): 375 (1916) pro parte quoad spec. *Eyles* 265.

Stems glabrous to sparsely and shortly appressed-pubescent. Leaflets (2.5)4-11(14) × (1)2-6(9) mm, linear to linear-oblong; lower surface shortly and closely appressed-pubescent. Calyx appressed-pubescent with usually short greyish hairs; upper teeth usually connate for most of their length.

Distribution of the species.

CONGO. **Katanga.** Ecole des R. R. P. P.-Salésiens, Elisabethville, 1937, *Schrooten* 737 (BR). Route de Bunkeya, près des chutes de la Bunkeya, fl. & fr. iv.1947, *Hoffman* 883 (BR; K). Bord de la Panda, fl. & fr. iii.1949, *Hoffman* 906 (BR).

KENYA. **K7. Kwale Distr.** Nwachi, fl. & fr. 15.xi.1921, *Butler* 25 (K). **Mombasa Distr.** Miritini, fr. 2.i.1931, *Thorold* 1579 (K). Port Tudor, fl. & fr. 1932, *MacNaughton* 53 = *For. Dept.* 2634 (K).

TANZANIA. **T4. Tabora Distr.** Mburu, steppe, fr. 18.x.1932, *Geilinger* 3165 (K). **Mpanda Distr.** Karema, fl. & fr., *Storms* (BR, type). Selambula, cultivated miombo, 825 m, fl. & fr. 14.ix.1958, *Jefford & Newbould* 2411 (K). Kasoje, *Afzelia* woodland near lake shore, 790 m, fl. & fr. 28.vii.1959;

Harley & Newbould 4797 (K). **Ufipa Distr.** Ilemba Gap, road to Rukwa, 1500 m, fl. 12.iii.1959, *Mrs. Richards* 11154 (BM; K). **T5. Dodoma (Manyoni) Distr.** Mile 33.7 S. of Itigi Station on the Chunya road, ant heap in closed *Brachystegia spiciformis-Julbernardia-Combretum-Pterocarpus-Strychnos* woodland, 1460 m, fl. 22.iv.1964, *Greenway & Polhill* 11698 (K). **T6. Morogoro Distr.** Morogoro, tall mountain grassland, 640 m, fl. & fr. 3.ix.1930, *Greenway* 2504 (K). Morogoro, 1065 m, fl. & fr. 15.v.1935, *Rounce* 363 (K). Morogoro, 1.vii.1935, *Rounce* 457 (K). **T7. Mbeya Distr.** Mbosi, 1525 m, fl. & fr. 8.iv.1932, *Davies* 547 (K); 600 (K). **Rungwe Distr.** Kyimbila Distr., Mwasukuluwald, fl. 1.vi.1911, *Stolz* 731 (K). **T8. Songea Distr.** Lukoma, Lake Nyassa, fr. viii.1887, *Bellingham* (BM). Near R. Luhira E. of Songea, by roadside in *Brachystegia-Uapaca* woodland, fl. 20.iii.1956, *Milne-Redhead & Taylor* 9258 (K). Near R. Likuyu at bottom of Mkuanga Hill in *Brachystegia-Uapaca* woodland, 900 m, fl. & fr. 11.iv.1956, *Milne-Redhead & Taylor* 9582 (K). About 3 km NE of Kigonsera, in cultivation on red loam, 975 m, fl. & fr. 12.iv.1956, *Milne-Redhead & Taylor* 9623 (K). **Tunduru Distr.** Road 60 miles (96 km) from Masasi, granite rocks in hill country, 900 m, fl. 20.iii.1963, *Mrs. Richards* 17991 (K). **Lindi Distr.** Tendaguru, fl. 19.iv.1926, *Migeod* 185 (BM); fl. & fr. 28.v.1929, *Migeod* 541 (BM). Lutamba-See, open woodland, 240 m, fl. 30.viii.1934, *Schlieben* 5199 (K; SRGH). **Newala Distr.** Newala, edge of road, red soil, fl. & fr. 12.v.1959, *Hay* 64 (K).

ZAMBIA. **Northern Prov.** Shambo, Chilongowelo, fl. & fr. ii.1952, *Mrs. Richards* 843 (K). Mpulungu, road from Mission, 850 m, fl. 6.iii.1952, *Mrs. Richards* 906 (K). Woodland track to Cascalawe, sandy red soil, fl. 18.iii.1955, *Mrs. Richards* 5018 (K). Kalambo Gorge, Saisi Valley, among rocks, 1830 m, fl. & fr. 24.iii.1955, *Mrs. Richards* 5120 (K). Mpulungu-Abercorn road, close to turn to Chilongowelo, red sandy soil, 1220 m, fl. & fr. 5.iv.1955, *Mrs. Richards* 5306 (K). Nmbulu Island, Lake Tanganyika, dry rocky ground, 730 m, fl. & fr. 11.iv.1955, *Mrs. Richards* 5401 (K). Crocodile Island, Mpulungu, Lake Tanganyika, pebbly beach, 730 m, fl. & fr. 17.iv.1955, *Mrs. Richards* 5442 (K). Abercorn-

Mpulungu road close to Chilongowelo turning, red soil, 1220 m, fl. & fr. 2.v.1955, *Mrs. Richards* 5453 (K; SRGH). Chilongowelo, 1370 m, fr. 23.v.1955, *Mrs. Richards* 5833 (K). Casawa sand dunes, Lake Tanganyika, 1050 m, fl. & fr. 14.iv.1957, *Mrs. Richards* 9223 (K). Kambole road 10 miles (16 km) from Abercorn, fl. 5.iv.1959, *Miss McCallum Webster* 844 (K). Chilongowelo, 1460 m, fl. 7.iv.1959, *Miss McCallum Webster* 855, 856 (K). Road to the water works, Abercorn, fr. 12.iv.1959, *Miss McCallum Webster* 845 (K). Forestry plantation near Kasama, woodland, long grass, 1300 m, fl. 1.iii.1960, *Mrs. Richards* 12653 (SRGH). Abercorn Distr., Niamkolo, sandy stony road, 780 m, fl. 22.iii.1960, *Mrs. Richards* 12785 (K; SRGH). Misamfu, N of Kasama, sandstone, fr. 4.iv.1961, *Angus* 2654 (K). Luwingu Distr., 21 miles (34 km) N of Nsombo, *Brachystegia* woodland, fl. iv.1961, *Angus* 2736 (K; SRGH). Kasama Distr., near Chibutubutu, c. 20 miles (32 km) S of Kasama, 1200 m, fl. & fr. 8.iv.1961, *Mrs. Richards* 15034 (K; SRGH). **Western Prov.** Kitwe, bush beyond end of Kent Avenue, Parklands, fl. 10.iii.1961, *Linley* 98 (SRGH). Kitwe, rocky miombo woodland, fl. & fr. 10.iii.1963, *Fanshawe* 7742 (K). **Central Prov.** Between Kafue and Lusaka, fr. 17.viii.1946, *Gouveia & Pedro* 1687 (LMJ). 10 km S of Kapiri Mposhi, *Brachystegia* woodland, fr. 27.iii.1955, *Exell, Mendonça & Wild* 1220 (BM; LISC; SRGH). 10 miles (16 km) SE of Lusaka, fl. 22.ii.1957, *Noah* 125 (K; SRGH). Chilanga, stony hillside, 1370 m, fl. & fr. iv.1958, *Benson* 233 (K). 40 km N of Broken Hill, *Brachystegia* woodland, fl. & fr. 2.iii.1962, *Robinson* 4985 (K; SRGH). Kafue Gorge, *Brachystegia* woodland and *Hyparrhenia-Andropogon* grassland, fl. 9.ii.1963, *van Rensburg* KBS 1367 (K). Between Kafue bridge and gorge, *Brachystegia-Uapaca* woodland, fl. 2.iii.1963, *van Rensburg* KBS 1566 (K; SRGH). **Eastern Prov.** Lunkwakwa Valley, *Brachystegia boehmii-Isobertinia* woodland, fl. & fr. 23.iii.1955, *Exell, Mendonça & Wild* 1140 (BM; LISC; SRGH). Katete, St. Francis' Hospital, open bush, 1065 m, fr. 1.x.1955, *Joan M. Wright* 23 (K); fl. 19.iii.1956, *Wright* 87 (K). Fort Jameson Distr., Chipangali area, woodland, fl. & fr. ii.1962, *Verboom* 483 (K; SRGH). **Southern Prov.** Mazabuka Distr., Mochipapa to Sinazongwe mile 19, Mabwin-

gombe Hills, *Uapaca kirkiana* regrowth, fl. & fr. 2.iii.1960, White 7531 (K; SRGH). Mazabuka Distr., Kafue gorge above the road, pathway in *Brachystegia* woodland, fl. 9.ii.1963, van Rensburg 1367 (SRGH). Kalomo, Siantambo, fr. 6.iv.1964, Mitchell 25/18 (K).

RHODESIA. **Northern Div.** Mazoe Distr., Bernheim Hill, 1430 m, fl. & fr. iii.1906, Eyles 265 (BM; SRGH—type of *T. eylesii*). Darwin Distr., Umsengedsi River, fl. 16.v.1955, Watmough 118 (K; SRGH). **Western Div.** Wankie District, Zambesi River between Matetsi and Deka Rivers, fl. & fr. 28.ii.1963, Wild 6084 (K; SRGH).

MALAWI. **Northern Prov.** Likoma Island, fl. & fr. 24.v.1901, Miss Kenyon 51, comm. Riddelsdell (K). Kaningina, fl. & fr. 1954, Chapman 281 (BM). **Central Prov.** Nisasadzi, S. Kasungu, *Brachystegia burttii* woodland on sandy soil, fl. 11.iii.1953, Jackson 1137 (K; SRGH). **Southern Prov.** Shiri Highlands, comm. xii.1881, Buchanan 400 (K).

MOZAMBIQUE. **Niassa.** Aldeia indígena de Boronengo, fl. & fr. 14.ix.1934, Torre 274 (BM; COI; K; LISC). Nampula, fl. & fr. 13.iii.1937, Torre 1231 (LISC). Malema Distr., Mutuáli, near the Malema road, *Brachystegia* woodland, fl. & fr. 29.v.1947, Pedro 3367 (LMJ). Cuamba, fl. & fr. 13.v.1948, Pedro & Pedrógão 3371 (LMJ). 5 miles (8 km) S of Massangulo, *Brachystegia-Uapaca* woodland, fl. & fr. 26.v.1961, Leach & Rutherford-Smith 11023 (K; LISC; SRGH). Malema Distr., Murralelo, foot of serra Inago, *Brachystegia* woodland on red clay soil, fl. & fr. 19.iii.1964, Torre & Paiva 11249 (LISC). Nampula Distr., Namaita, between Nampula and Murrupula, Galaria area, *Brachystegia* woodland on red sandy-clay soil, fl. 26.iii.1964, Torre & Paiva 11388 (LISC). Montepuez Distr., 23 km from Montepuez towards Nantulo, open *Brachystegia* woodland on red sandy-clay soil, 400 m, fl. 8.iv.1964, Torre & Paiva 11768 (LISC). Macondes Distr., 83 km from Nantulo towards Mueda, open *Brachystegia-Julbernardia* woodland on red sandy soil, 300 m, fl. & fr. 10.iv.1964, Torre & Paiva 11862 (LISC). Macondes Distr., 37 km from Mueda towards Mocímboa do Rovuma, open *Parinari* woodland on red sandy soil, 800 m, fl. 15.iv.1964, Torre & Paiva 12013 (LISC). **Zambézia.** Between Quelimane and Mocuba, open woodland, fl.



& young fr. 20.iii.1943, *Torre* 4969 (LISC). Between Ile and Alto Molócuè, *Brachystegia-Isobertlinda* woodland, fl. & fr. 21.vi.1943, *Torre* 5535 (LISC).

Var. *pilosa* Brummitt, var. nov.

Planta quam var. *stormsii* plerumque brevior (usque ad 100 cm) et minus ramosa. Caules pilis longis griseis patentibus vestiti. Foliola $2.5-9 \times (0.3)0.6-0.9(1.1)$ mm, illa foliorum inferiorum plerumque elliptica ad oblonga, illa foliorum superiorum lineari-oblonga ad linearia; pagina inferior laxe vel valde appresse pubescens. Calyx pilis ascendentibus vel patentibus pubescens; dentes superiores nonnquam per maximam partem longitudinis liberi.

Typus: Tanzania, Ufipa Distr., escarpment above Kasanga, 1050 m, fl. & fr. 30.iii.1959, *Mrs. Richards* 11008 (K, holotypus; SRGH, isotypus).

Tanzania, Zambia, usually collected in disturbed habitats.

TANZANIA. **T4. Ufipa Distr.** Escarpment above Kasanga, verge of road, 1050 m, fl. & fr. 30.iii.1959, *Mrs. Richards* 11008 (K; SRGH — types); *ibid.* 1200 m, 30.iii.1959, *Mrs. Richards* 11011 (K; SRGH). **T5. Kondoa Distr.** Sambala Hills, 1700 m, *Brachystegia microphylla* zone, fl. & fr. 23.iv.1929, *Burt* 2131 (BM; K). **T7. Mbeya Distr.** Unyamwanga, old cultivations, 1370 m, fl. 5.iv.1932, *Davies* 195 (K). Great North Road, Iyayi, 140 ml. (224 km) S of Iringa, pale brown sandy soil, roadside in scattered *Acacia*, *Parinari*, *Isobertlinda*, 1430 m, fl. & fr. 31.iii.1962, *Polhill & Paulo* 1955 (K). **Njombe Distr.** Great North Road, Makumbako, 125 miles (200 km) S of Iringa, old cultivations, red sandy soil, degenerate scrub woodland, 1280 m, fl. & fr. 28.iii.1962, *Polhill & Paulo* 1921 (K).

ZAMBIA. **Northern Prov.** Mporokoso Distr., Nsama, woodland on gritty soil, 1200 m, fl. & fr. 4.iv.1957, *Mrs. Richards* 9019 (K). Kasama, weed of disturbed ground, fl. 24.iii.1960, *Angus* 2166 (K; SRGH). Kasama Distr., Mungwi, *Brachystegia* woodland, fl. & fr. 4.iii.1962, *Robinson* 5016 (K; SRGH). Misamfu, 4 miles N of Kasama, fl. & fr. 4.iv.1964, *Angus* 2654 (SRGH).

Two further collections must be mentioned in connection with *T. stormsii*: RHODESIA. Northern Div. Sebungwe Distr., Kavira Hot Springs, fl. & fr. vi.1956, *R. M. Davies* 2014 (K; SRGH). Darwin Distr., Umsengedsi River, fl. 18.v. 1955, *Watmough* 1174 (SRGH). The first of these, *Davies* 2014, is somewhat similar to *T. stormsii* but has a low (15-30 cm), branching, almost bushy habit and appears, at least in the Kew sheet, to be a perennial. One of the two plants of this at Kew has a more or less woody base, 5 mm thick, though the other is more slender (2.5 mm) and the Salisbury specimen looks more like an annual. The stems are sparsely appressed-pubescent to subglabrous, and the leaflets are linear-oblong, mostly less than 2 cm long apart from the terminal ones. *Watmough* 1174 is also a low plant, 15-30 cm, branching only at the base, apparently annual or biennial, and more or less intermediate between *Watmough* 118 from the same area (cited above as *T. stormsii* var. *stormsii*) and *Davies* 2014.

25. *Tephrosia paradoxa* Brummitt, sp. nov.

Tephrosia longipes auct. sens. lat. pro parte.

Tephrosia paucijuga sensu Cronquist, Fl. Congo Belge 5: 106 (1954) pro parte quoad spec. *Lebrun* 9721.

T. stormsii affinis sed racemis robustis subtomentosis, calycibus longioribus et longe pubescentibus, stipulis et bracteis majoribus differt.

Planta ? annua vel biennis; caules erecti, aliquandem robusti, herbacei, ramosi, 60-140 cm alti. Caules in partibus inferioribus glabri ad sparse appresse pubescentes, in partibus superioribus ad pedunculos sensim pubescentiores. Folia 2-6-jugata; petiolus 5-13 cm, petiolus et rhachis coniunctim 8-26 cm, subglabri ad tenue appresse pubescentes; foliola 9-14(18) × 0.2-0.6(0.9) cm, lineares (vel raro in speciminibus Mossambicensibus foliola foliorum infimorum usque ad 1.6 cm lata et lineari-oblonga), apice acuta ad obtusa; pagina superior glabra, pagina inferior tenuiter appresse pubescens; stipulae (8)13-18(24) × 1-2 mm, lineares, nonnunquam falcatæ. Flores in racemis terminalibus et axillaribus, laxis, ad

30 cm longis; racemi axillares semper a foliis (non bracteis) subtenti, angulum angustum circa 30° axibus robustis formantes, plus minusve rigide erectis, dense pubescentibus ad tomentosum; bracteeae 5-8(11) × 0.7-1.5(2) mm, lineari-triangularis, aliquantum conspicuae, tarde caducae; pedicelli (4)5-8 mm. Calyx (4)5-8(10) mm longus, dense pubescens ad villosus plerumque pilis longis albis inter pilos breviores brunneos interspersis; dentes superiores 1/2-3/4 longitudinis liberi, dentes laterales tubum plus minusve aequantes. Petala purpurea vel rubro- aut brunneo-purpurea, vel carina pallidior; vexillum (14)15-19 mm longum. Tubus staminalis supra connatus. Ovarium pubescens; stylus pubescens; legumina 52-75 × 4.5-5 mm, pilis plerumque irregularibus geniculatis breviter pubescentia; semina (14)16-19.

Typus: Zambia, Abercorn Distr., Ndundu, road outside the drive, 1740 m, fl. & fr. 22.ii.1959, *Mrs. Richards* 10969 (K).

Congo (Katanga), Ruanda, Tanzania, northern Zambia, Malawi, northern Mozambique, with a single record apparently referable to this species from northern Rhodesia.

CONGO. **Katanga.** Lukafu, fl. & fr. 17.iii.1908, *Kassner* 2641a (BM).

RUANDA. Parc Nat. Kagera, Mt. Gabiro, savanna, 1500-1700 m, fl. & fr. i.1938, *Lebrun* 9721 (BR).

TANZANIA. **T1. Bukoba Distr.** Nyashozi, Karagwe, 1525 m, fl. & fr. xii.1931, *Haarer* 2382 (K). **Shinyanga Distr.** Shinyanga, foot of Shinyanga Hill, old cultivation, 1155 m, fl. & fr. 3.iv.1932, *Burt* 3786 (BM). **District uncertain.** South of Lake [Victoria], fl. 1883, *Hannington* (K). **T4. Tabora Distr.** Unyamwesi, near Kombe, eastwards km 991.6, 1100 m, fl. 28.i.1926, *Peter* 35755 (K). **T7. Iringa Distr.** Signal Hill, Iringa, *Brachystegia* woodland, 1645-1830 m, fl. 20.ii.1932, *St. Clair-Thompson* 489 (K). **T8. Lindi Distr.** Lutamba See, fl. 30.viii.1934, *Schlieben* 5199 (K).

ZAMBIA. **Northern Prov.** Abercorn, grass by path, 1525 m, fl. 29.ii.1952, *Mrs. Richards* 1022 (K). Abercorn, firebreak above Kasulo House, sandy soil, 1525 m, fl. 1.ii.1952, *Mrs. Richards* 610 (K). Abercorn Distr., Chilongowelo, grass field, 1460 m, fl. 14.ii.1952, *Mrs. Richards* 731 (K). Chilongowelo,

rough grass by hayfield, 1460 m, 4.iii.1952, *Mrs. Richards* 868 (K). Abercorn, sand verge of rough road between pans, 1525 m, fl. 20.i.1955, *Mrs. Richards* 4170 (K). Abercorn, tall grass on bank between road and pans, 1525 m, fl. 18.ii.1955, *Mrs. Richards* 4575 (K). Abercorn Distr., Ndundu, among grass under tall trees close to house, 1525 m, fl. & fr. 10.iii.1955, *Mrs. Richards* 4857 (K). Abercorn Distr., Ndundu, side of road outside the drive, among long grass in sandy soil, 1740 m, fl. & fr. 22.ii.1959, *Mrs. Richards* 10969 (K). Near bridge over Lunzua River on Kambole road, c. 32 km from Abercorn, roadside verge, fl. & fr. 5.iv.1959, *Miss McCallum Webster* 846 (K). Abercorn, Kanyika, 1500 m, outcrop of laterite rock, woodland, fl. 25.ii.1965, *Mrs. Richards* 19711 (K).

RHODESIA. Northern Div. Trelawney, Tobacco Expt. Station, fl. & fr. 27.iii.1943, *Jack* 86 (K; PRE; SRGH).

MALAWI. Northern Prov. Rumpi Distr., near Katumbi's village, *Isoberlinia* woodland, fl. & fr. 1.v.1952, *White* 2546 (K).

MOZAMBIQUE. Niassa. Ribáuè Distr., 16 km from Ribáuè towards Nampula, *Brachystegia* woodland on red sandy clay soil, 570 m, fl. 31.i.1964, *Torre & Paiva* 10346 (LISC). Marrupa Distr., 36 km from Maúa towards Marrupa, *Uapaca-Brachystegia-Julbernardia* woodland, black sandy-clay soil, 600 m, fl. 19.ii.1964, *Torre & Paiva* 10663 (LISC). Marrupa Distr., 25 km from Marrupa towards Maúa, *Brachystegia* woodland, red clay soil, 720 m, fl. & fr. 19.ii.1964, *Torre & Paiva* 10687 (LISC).

This species is closely allied to *T. stormsii* and a few collections are somewhat difficult to assign with complete confidence to either one or the other. There are, however, a number of correlated characters in which the two differ, and most specimens can be identified readily at sight. In the numerous excellent collections of Mrs. RICHARDS from Abercorn District there is no difficulty at all in separating them. If the two taxa were more distinct geographically it would be perhaps most satisfactory to regard them as subspecifically distinct, but they are apparently sympatric

over a wide area and specific rank is here considered most appropriate. The few somewhat doubtful specimens may perhaps be the result of hybridisation.

26. *Tephrosia rigidula* Welw. ex Bak. in Oliv., Fl. Trop. Afr. 2: 112 (1871). — Bak. f., Leg. Trop. Afr. 1: 198 (1926). — Rossberg in Fedde, Repert. 39: 162 (1936). — Brenan, Check List Tr. Shr. Brit. Emp. 5. Tang. Terr.: 445 (1949) quoad nom. excl. spec. — Torre, Consp. Fl. Angol. 3: 157 (1962). Type: Angola, Huíla, Várzeas de Catumba, fl. v.1960, *Welwitsch* 2106 (BM, K — isotypes).

Tephrosia secunda Welw. ex Bak. in Oliv., Fl. Trop. Afr. 2: 115 (1871). — Bak. f., Leg. Trop. Afr. 1: 199 (1926). Type: Angola, Cuanza Norte, entre Condo e Quisonde, fl. & fr. iii.1857, *Welwitsch* 2107 (BM, K — isotypes).

Cracca rigidula (Welw. ex Bak.) Kuntze, Rev. Gen. Pl. 1: 175 (1891) — Hiern, Cat. Afr. Pl. Welw. 1: 220 (1896). Type as for *T. rigidula*.

Cracca secunda (Welw. ex Bak.) Kuntze, Rev. Gen. Pl. 1: 175 (1891). — Hiern, Cat. Afr. Pl. Welw. 1: 221 (1896). Type as for *T. secunda*.

Tephrosia longipes var. *longipes* sensu Gillett in Kew Bull. 13(1): 125 (1958) pro parte quoad syn. *T. secunda*.

Tephrosia longipes var. *longipes* and var. *lurida* and *T. bracteolata* sensu Torre, Consp. Fl. Angol. 3: 157-159 (1962) pro parte.

Annual (? sometimes biennial) with robust, erect or prostrate, branching stems about 130-150 cm long, mostly 3-4 mm diameter. Stems subglabrous (minutely appressed-pubescent in parts), smooth. Leaves with (1)3-9 pairs of leaflets; petiole 1.2-3(6) cm, petiole and rhachis together (3)9-16 cm, sparsely appressed-pubescent; leaflets (2.5)3.5-7(9) × (0.2)0.4-0.8 cm, ± linear-oblong, subcuneate at the base, acute to obtuse at the apex; upper surface glabrous, lower surface sparsely appressed-pubescent; stipules 7-10 × 0.8-1 mm, linear, sometimes falcate. Flowers in terminal and axillary racemes up to 30 cm long; bracts quickly cadu-

cous; pedicels 4-8 mm. Calyx 3-5 mm long, fairly densely pubescent; upper teeth free for most of their length. Petals reddish or purplish; standard 14-16 mm long. Stamen tube connate above. Ovary densely pubescent; style pubescent; pods 60-75 × c. 5 mm, rather sparsely to densely pubescent with ± irregular loosely appressed hairs; seeds 11-15, rhomboidal, brown with a conspicuous pattern of raised lighter-coloured patches radiating from the hilum.

Known only from Angola.

ANGOLA. **Cuanza Norte.** Pungo Andongo Distr., near Banza do Soba Quitage, fl. & fr. iii.1857, *Welwitsch* 2108 (BM; K). Pungo Andongo Distr., between Condo and Quisondo, fl. & fr. iii.1857, *Welwitsch* 2107 (BM; K — isotypes of *T. secunda*). **Benguela.** Near Loudingo-Kaconga, fl. 5.iii.1907, *Gossweiler* 4260 (BM). Between Ganda and Caconda, 1700 m, fl. & young fr. v.1934, *Hundt* 964 (BM). Huambo, Chianga, 1700 m, fl. & fr. 196?, *Teixeira & Figueira* 6706 (LISC). **Huíla.** Várzeas de Catumbe, fl. v.1860, *Welwitsch* 2106 (BM, K — isotypes). Between Catumbe and Hay, fl. & fr. iv.1860, *Welwitsch* 2105 (BM; K). Humpata, Quilemba, 1900-1950 m, fl. 4.vi.1937, *Exell & Mendonça* 2502 (BM). Calutato (Namuculungo), sandy places, 1100 m, 25.iii.1957, *Teixeira* 2452 (LISC). Between Humpata and Caholo, red clay soil, 1900 m, fl. & fr. 21.iii.1958, *Teixeira* 3303 (LISC).

Teixeira & Figueira 6706 and *Teixeira* 3303 are described as prostrate, while *Teixeira* 2452 and the types of *T. rigidula* and *T. secunda* are said to be erect. Apart from this the specimens above appear to form a fairly natural unit, although they were variously referred to four different taxa in *Conspectus Florae Angolensis*, with *Hundt* 964 being referred at the same time to both *T. rigidula* and *T. longipes* var. *lurida*. The affinities of these plants to other species, however, are not clear. The robust, subglabrous, smooth stems mostly 3-4 mm diameter look unlike those of any other species of this group, and the seeds (as described above from *Teixeira* 2452) are unlike those of *T. stormsii* which is probably the closest species. It seems best, for the moment at least, to regard these Angolan

plants as a distinct species, though their relationship to other species requires further investigation when more Angolan material is available. It may eventually prove more satisfactory to regard this as a subspecies of *T. stormsii*.

27. ***Tephrosia longipes*** Meisn. in Hook., Lond. Journ. Bot. 2: 87 (1843). — Harv. in Harv. & Sond., Fl. Cap. 2: 208 (1862). — Bak. in Oliv., Fl. Trop. Afr. 2: 120 (1871) *quoad* nom. excl. spec. — Burt Davy, Fl. Pl. Ferns Transv. 1(2): 378 (1932). — Young in Ann. Transv. Mus. 14: 398, photogr. 2 (1932). — Forbes in Bothalia 4: 980 (1948). — Martineau, Rhod. Wild Fl.: 26, t. 11(1) (1953). — Gillett in Kew Bull. 13: 125 (1958) *sensu lat.* Type: S. Africa, Port Natal, *Krauss* 20 (K).

Cracca longipes (Meisn.) Kuntze, Rev. Gen. Pl. 1: 175 (1891). — Hiern, Cat. Afr. Pl. Welw. 1: 222 (1896) *quoad* nom. excl. spec. Type as above.

Annual to probably short-lived perennial, with a stout tap root or sometimes becoming woody at the base, and \pm erect, fairly robust stems, 2-3(5) mm in diameter in the lower parts, usually fairly regularly branched, up to 1(1.5) m high. Stems usually shortly but densely greyish-appressed-pubescent or perhaps sometimes glabrescent in the lower parts, or sometimes (in var. *icosisperma* and subsp. *swynnertonii*) with longer ascending hairs, or sometimes (in var. *icosisperma*) rather sparsely appressed-pubescent. Leaves (at least the larger ones) with (3)4-7(8) pairs of leaflets (or in S. Africa sometimes with only 2 or 3 pairs); petiole (0.5)0.9-4.2(5.5) cm, usually much shorter than the rhachis except perhaps in the lower leaves, the petiole and rhachis together (2)3-13(18) cm long, pubescent like the stem; leaflets (1.5)2.5-8(10.5) \times (0.1)2-7(8) cm, linear or rarely linear-oblong or linear-elliptic, terminated by a stout, blackish, often somewhat curved mucro; upper surface glabrous, lower surface appressed-pubescent; stipules 4-14(17) \times (0.1)0.3-1 mm, linear, blackish. Flowers in terminal and leaf-opposed long-peduncled racemes (5)8-25(30) cm long; bracts

(2)3-7(9) × 0.3-1 mm, blackish, persistent and often forming a conspicuous tuft at each node of the inflorescence after flowering; pedicels 3-7(8) mm. Calyx 3-6(8) mm long, shortly appressed- or ascending-, grey or brown-pubescent or villous; upper teeth connate for $\frac{1}{3}$ - $\frac{2}{3}$ length; lateral teeth about equalling or slightly exceeding the tube. Petals purple to pink; standard 13-18(23) mm. Stamen tube connate above. Ovary pubescent; style pubescent; pods (40)50-88 × 4-5 mm, pubescent with irregular, geniculate hairs, or rarely with ± regular, straight, appressed hairs; seeds 10-22, at maturity more or less rhomboidal, c. 3 × 2-2.5 × 1-1.5 mm, with the hilum about at the middle of one of the longer sides, brownish.

Angola, central and southern Zambia, Rhodesia, Mozambique, S. Africa.

Subsp. *longipes*

Stems appressed-pubescent, occasionally (in var. *icosisperma*) also with longer ascending hairs. Leaflets linear to linear-elliptic, ± acute at the apex. Racemes (5)8-25(30) cm long, lax.

Var. *longipes*

Tephrosia pseudolongipes Bak. f., Leg. Trop. Afr. 1: 199 (1926). Type: Rhodesia, Central Div., Bromley, Walters 2207 (κ, holotype; SRGH, isotype).

Tephrosia lurida sensu Suessenguth & Merxmuller in Trans. Rhod. Sci. Ass. 43: 26 (1951).

Probably short-lived perennial, usually woody towards the base. Stems shortly but densely appressed-pubescent. Leaflets (1.5)2.5-6.5(9) × (0.1)0.2-0.5(0.6) cm, linear; stipules 4-9(11) mm long. Bracts persistent, but seldom forming very large tufts after flowering. Pods (40)50-70(77) mm long; seeds 10-16(17).

Angola, Zambia, Rhodesia, S. Africa.

ANGOLA. Bié-Cuando-Cubango. Menongue Distr., Vila Serpa Pinto, margem do rio Cuebe, 1420 m, fl. & fr. 14.ii.

1960, *Mendes* 2570 (BM; LISC). Menongue Distr., Vila Serpa Pinto, vale do Cambumbe, 1420 m, fl. & fr. 28.ii.1960, *Mendes* 2792 (LISC). Vila de Serpa Pinto, margens do rio Cueba, fr. 14.i.1962, *Barbosa & Moreno* 9961 (LISC). **Moçâmedes**. Apeadeiro do C. F. Dois Irmãos, Caraculo, fl. & fr. 21.ii.1956, *Torre* 8858 (BM; LISC). **Without locality or date.** *Dekindt* 961 (LISC).

ZAMBIA. Central Prov. Between Kafue and Lusaka, fl. & fr. 17.viii.1946, *Gouveia & Pedro* 1683 (LMJ). Between Lusaka and Rufunsa, Maswero [?] Hills, fl. & fr. 20.viii.1946, *Gouveia & Pedro* 1716 (LMJ). Chakwenga Headquarters, 100-129 km E of Lusaka, rocky hill in *Brachystegia* woodland, fl. & fr. 14.ii.1965, *Robinson* 6638 (K). **Southern Prov.** Mazabuka Distr., near Choma, stunted woodland, fl. & fr. 7.iii.1952, *White* 2217 (K). Livingstone Distr., Great North Road 7.3 miles north of Livingstone, mopane woodland on karroo basalt, fl. & fr. 18.iii.1952, *White* 2280 (K). Mapanza, 10 miles SW, fl. & fr. 26.ii.1955, *Robinson* 1115 (K). Mazabuka Distr., Yates Jones Farm near Choma, woodland, fl. & fr. 27.i.1960, *White* 6506 (FHO; K). Mazabuka, escarpment miombo, fl. & fr. 20.v.1961, *Fanshawe* 6596 (K; SRGH).

RHODESIA. Northern Div. Shamva, fl. & fr. 20.xi.1932, *Leviscur* Tv. Mus. 32892 (PRE). Trelawney, Tobacco Expt. Station, fl. & fr. 23.xii.1942, *Jack* 59 (PRE; SRGH). Gokwe Distr., Charama Escarpment, near turn-off on Gokwe Charama road, fl. & fr. 18.iii.1962, *Bingham* 177 (K; LISC; SRGH). **Western Div.** Bulawayo, fl. v.1914, *Rogers* 13802 (K). Matopos, fl. & fr. iii.1931, *Brain* 7620 (SRGH). Matopos, fl. & fr. 11.iv.1931, *Miss Stent* 3954 (SRGH). Matobo, Besna Kobila, fl. & fr. i.1953, *O. B. Miller* 1522 (SRGH). Besna Kobila, fl. & fr. ix.1954, *O. B. Miller* 2468 (SRGH — «woody scandent plant»). Besna Kobila, fl. & fr. i.1955, *O. B. Miller* 2615 (K; SRGH). Besna Kobila, fl. & fr. i.1959, *O. B. Miller* 5736 (K; SRGH). **Central Div.** Without locality, comm. 1914, *Mrs. Craster* 7 (K). Near Salisbury, fl. & fr. 1915, *Mrs. Craster* xxiv (K). Bromley, fl. & fr. i.1917, *Walters* 2207 (K; SRGH — type of *T. pseudolongipes*). Salisbury, fl. & fr. iv.1920, *Eyles* 2170 (K; PRE; SRGH). Marandellas, Ruzawi, fr. 18.iv.

1924, *Eyles* 7041 (K; SRGH). Marandellas, xi.1925, *Daphne King* 5237 (K; SRGH). Marandellas, govt. farm, fl. & fr. 26.ix.1931, *Rattray* 349 (PRE). Hunyani, fl. 3.i.1932, *Stent* 5697 (SRGH). Marandellas, Pasture Station, fl. & fr. 15.i.1932, *Stent* 5445 (SRGH). Marandellas, fl. & fr. 26.iii.1942, *Dehn* 166 (SRGH). Injina, Marandellas, fl. & fr. i.1946, *W. F. Collins* 14 (K; SRGH). Lalapanzi, bud 22.i.1948, *Mrs. Ingle* 4 (SRGH). Marandellas Distr., Digglefold, fl. & fr. 28.xii.1948, *Corby* 316 (K; SRGH). Rusapi Distr., Chiduku Reserve, fl. & fr. ii.1961, *Davies* 2883 (SRGH). Hartley Distr., Msengezi P. A. fl. & fr. ii.1961, *Davies* 2897 (K; SRGH). Salisbury, Ruwa Rocks, Epworth Mission, fl. 4.iii.1961, *Richards* 1452 (K). Beatrice, fl. & fr. 31.i.1962, *Lady Drewe* 12 (SRGH). S Marandellas, without date, *Miss Myres* 300 (K). Without locality or date, *Hislop* 153 (K). **Eastern Div.** Odzani River Valley, fl. & fr. 1914, *Teague* 17 (K). Nyumquarara Valley, fl. ii.1935, *Gilliland* 1586 (K). Odzi, fl. & fr. 23.v.1936, *Eyles* 8605 (K). Odzi, fl. v.1937, *Brain* 10890 (SRGH). Umtali commonage, roadside near reservoir, fl. 7.xi.1948, *Chase* 1513 (K; LISC; SRGH). Chipinga Distr., Sabi River — East Makosa, near Mahenyas, fl. 18.v.1959, *Savory* 472 (SRGH). **Southern Div.** Victoria Distr., Makoholi Expt. Farm, fl. & fr. 23.iii.1948, *D. A. Robinson* 309 (K; SRGH). Ndanga Distr., Chiredzi River bed, fl. & fr. 14.x.1951, *Thompson* 115/51 (SRGH). Nuanetsi Dist., Lundi R., fl. & fr. xi.1955, *Davies* 1625 (K; SRGH). Chibi Distr., Rhino Hotel, Lundi R., fl. xii.1925, *Davies* 1762 (K; SRGH). Victoria Distr., grassland outside Fort Victoria, fl. xii.1957, *O. B. Miller* 4889 (PRE; SRGH). Chibi Distr., kopje near Madzivire Dip, fl. & fr. 30.xii.1962, *Mall* 485 (SRGH).

SWAZILAND. Mbabane Distr., 3 mls SE of Komali River, fr. 10.ii.1962, *Schlieben* 9470 (PRE).

SOUTH AFRICA. **Transvaal.** Macalisberg, fl. 1848, *Burke* (K). Houtbosh, fl. 1875-80, *Rehmann* 6235 (K). Pretoria, hills above Aapiesriver, fr. 1875-80, *Rehmann* 4393 (K). Barberton Distr., Queen's River Valley, Roartey's Luck, fl. i.1890, *Galpin* 759 (PRE). Wonderboom bei Pretoria, fl. & fr. 24.xi.1913, *Peter S* 40 (K). Pietersburg, Modjadjis, fr.

xii.1915, *Rogers* 18129 (K). Pretoria Div., Premier Mine, st. 13.x.1917, *Moss* (K). Geelhoutkop, fl. & fr. i.1918, *Breyer* 18139 (PRE). Zoutpansberg Range, fl. & fr. i.1925, *Smuts* (PRE). Pretoria, Meintjies Kop range, fr. 21.xi.1926, *Smith* 3447 (PRE). Pretoria reg., Wonderboom poort, fr. iv.1932, *Smith* 6190 (PRE). Pretoria Distr., Donkerhack, fl. & fr. 31.i.1937, *Repton* 814 (PRE). Zoutpansberg, Laatstegevonden B74, fl. & fr. 12.i.1938, *van der Berg* 21 (PRE). Wonderboom Reserve, fl. & fr. 17.xi.1944, *Repton* 1914 (PRE). Wonderboom Res., N slope, fr. 21.ii.1946, *Collett & Pedro* 786 (LMJ). Waterberg Distr., 19 miles east of Vaalwater, 6 m beyond Twentyfour Rivers, fl. 12.iii.1946, *Codd* 989 (PRE). Warmbaths, Nylstroom, fr. 22.iii.1947, *Maguire* 26580 (PRE). Warmbaths, Towoomba PRS, fl. & fr. 19.i.1948, *Sidey* 1403 (PRE). Pretorius Kop, fl. 9.ix.1952, *van der Schyff* 441 (K). Pretorius Kop, fl. 26.xi.1952, *van der Schyff* 1479 (PRE). 10 miles E by N of Punda Maria, 430 m, fl. & fr. 20.i.1953, *Acocks* 16763 (K; PRE). Punda Maria, 530 m, fl. & fr. *van der Schyff* 1825 (K). Pretorius Kop, Numbi, fl. & fr. 15.i.1954, *van der Schyff* 3429 (PRE). Pretoria Distr., S side of ridge at Lynnwood Manor, fl. & fr. 15.iii.1962, *de Winter* 7703 (K; PRE). **Cape Province.** Vryburg, B. Bech., fr. 11.iv.1921, *Mogg* 8494 (PRE). Mafeking Div., 'Moshesh' near Mosila, fl. & fr. 10.iv.1945, *Brueckner* 271 (PRE). **Orange Free State.** Hoopstad Distr., De Rots, hill on banks of Vaal river, fl. & fr. 1.ii.1933, *R. P. Goosens* 1288 (PRE). **Natal.** Port Natal, fl. & fr. 1840, *Krauss* 20 (K—type). Port Natal, *Gueinzius* (K). Without locality, comm. 1865, *Gerrard* (K). Inanda, comm. 1881, *Wood* 1202 (K). Near Hay Paddock, Maritzburg, fl. 28.x.1945, *Allsupp* 935 (PRE). Vryheid Distr., 5½ miles SSW of Swartfolosi P. O., fl. & fr. 13.viii.1946, *Acocks* 12836 (PRE). 4 miles S of Hlabisa, fl. & fr. 13.x.1946, *Codd* 1999 (PRE). Hlabisa Distr., W of Francis Island, Charter's Creek area, fl. 24.xi.1955, *Ward* 2755 (PRE). Hlabisa Distr., near Hluhluwe Game Reserve, fl. 5.v.1961, *Hitchens* 15 (PRE). Ubombo Distr., Mkuzi Game Reserve, fl. 29.i.1962, *Ward* 4002 (PRE). Ubombo Distr., Mpangazi, fl. 10.i.1964, *Strey* 5096 (PRE).

Of the above specimens two from near Punda Maria in the northern Transvaal, *Acocks* 10763 and *van der Schyff* 1825, have a particularly robust appearance, linear-elliptic leaflets mostly about 8 mm broad, and longer flowers than normal (23 mm).

Var. *icosisperma* Brummitt, var. nov.

Planta annua vel per paucos annos perennis. Caules pilis brevibus griseis appressis, et interdum etiam pilis longioribus brunneis ascendentibus, vestiti. Foliola 1.8-8 × 0.2-0.7 (0.8) cm, lineares ad raro lineari-elliptica; stipulae (5)7-14 (17) mm longae. Bracteae persistentes et saepe post anthesin conspicuae 12-15 ad nodos fasciculatae. Legumina (62) 70-88 mm longa; semina (16)17-22.

Holotypus: Floresta de Nhamissanguere próximo do caminho de Gondola, Chimoio, fl. & fr. 17.ii.1948, *Garcia* 262 (LISC).

Mozambique and extreme eastern Transvaal.

MOZAMBIQUE. **Manica e Sofala.** Beira, open woods, fl. 25.xii.1906, *Swynnerton* 1445 (BM; K). Beira, fl. & fr. 25.ii.1912, *Rogers* 4534 (SRGH). Moribane, fl. 17.xi.1942, *Salbany* 88 (LISC). Savana de Maronga, fl. & fr. 2.viii.1945, Simão 427 (LISC). Cheringoma, between Beira and Inhaminga, 98 km from Beira, fr. 5 or 6.xi.1946, *Pedro & Pedrógão* 39 (LMJ; PRE). Dense bush by Busi Drift, fl. 5.ix.1947, *Whellan* 106 (SRGH). Near serração Braunstein, Amatongas, Chimoio, fr. 27.i.1948, *Mendonça* 3735 (LISC). Between Rutanda and Mavita, Manica, fl. & fr. 16.ii.1948, *Barbosa* 965 (LISC). Nhamissanguere, near the road from Gondola, Chimoio, fl. & fr. 17.ii.1948, *Garcia* 262 (LISC, type). East side of serra do Garuzo, Chimoio, fl. & fr. 24.ii.1948, *Garcia* 332 (LISC). Garuso, Chimoio, fl. & fr. 2.iii.1948, *Pedro* 3600 (LMJ). Foot of serra do Garuzo, Chimoio, fr. 3.iii.1948, *Barbosa* 1074 (LISC). Manica, Mavita, Rutanda, fl. & fr. 12.iv.1948, *Barbosa* 1443 (LISC). Mavita, near the settlement Chinacata, fl. & fr. 17.iv.1948, *Barbosa* 1411 (LISC). **Sul do Save.** Distr. Guija, along Limpopo River, fl. & fr. vii.1915, *Gaza-*

land Exped. 15798 (PRE). Inharrime Distr., Nhacoongo, between Lagoa Dongane and the railway, fl. 9.x.1945, *Pedro* 272 (K; LMJ; PRE). Nhacoongo, Camp. Exp. CICA, fl. 9.x.1945, *Pedro* 278 (PRE). Chidenguel, near the lagoon, old sand dunes, fl. & fr. 18.viii.1947, *Pedro & Pedrógão* 1829 (PRE). Near Guijá, Limpopo, fl. & fr. 14.iii.1948, *Torre* 7499 (LISC). Panda, fl. 25.ii.1955, *Exell, Mendonça & Wild* 585 (LISC; SRGH). Chibuto, road towards Alto Changane, fl. & fr. 12.ii.1959, *Barbosa & Lemos* 8381 (COI; K; LISC; LMJ).

Lourenço Marques. Delagoa Bay, fr. 1822, *Forbes* (K — herb. Benth. & herb. Hook.). Lourenço Marques, Pessene, fr. v.1893, *Quintas* 79 (COI). Lourenço Marques, fl. & fr. 1.xii.1897, *Schlechter* 11580 (COI; K; PRE). Near L. Marques, fl. & fr. ii.1916, *Lab. Químico* 2035 (PRE). Marracuene, Ricatla, fl. vii.1917, *Junod* (LISC). Lourenço Marques, fl. & fr. 11.i.1920 *Borle* 243 (PRE). Between Bilene and L. Marques, fl. & fr. 14.xii.1940, *Torre* 2413 (LISC). Lourenço Marques, fl. 5.i.1941, *A. J. W. Hornby* 850 (BM). Near Lourenço Marques, fl. & fr. ii.1946, *Pimenta* 17304 (LISC; SRGH). Goba, st. 8.i.1947, *Barbosa* 38 (LISC); *Barbosa* 49 (LISC); *Pedro & Pedrógão* 397 (LMJ); *Pedro & Pedrógão* 461 (LMJ). Namahacha, fr. 10.i.1947, *Pedro & Pedrógão* 543 (LMJ). Between Boane and Goba, Cabero dos Pedreiras, fl. & fr. 29.iv.1947, *Pedro & Pedrógão* 951 (LMJ; PRE). Maputo, fl. & fr. 16.v.1947, *Pedro* 3202 (LMJ). Montes de Goba, fl. & fr. 11.i.1948, *Torre* 7113 (LISC). Near Bela Vista, fl. & fr. 27.iv.1948, *Torre* 7729 (LISC). Maputo, between Catembe and Mogazine, 5 km from Catembe, fl. & fr. 18.ii.1952, *Barbosa & Balsinhas* 4748 (LMJ). Goba, fl. & fr. 23.ii.1955, *Exell, Mendonça & Wild* 554 (LISC; SRGH). Inhaca Island, W coast sand dunes, fl. & fr. 20.xii.1956, *Mogg* 26900 (K; SRGH). Inhaca Island, W coast, open woodland, fr. 24.ix.1957, *Mogg* 27532 (K; SRGH). Inhaca Island, Hlanganyani Hill, fl. 1.ix.1957, *Mogg* 27610 (SRGH). Vila Luiza, Campo Exp. Estud. Arbor., fl. & fr. 1.x.1957, *Barbosa & Lemos* 7879 (COI; K; LISC; LMJ). Inhaca Island, fr. viii.1959, *Brewer* CAH 3525 (K; SRGH). Polana, fl. & fr. 3.x.1963, *Balsinhas* 646 (LMJ).

SOUTH AFRICA. Transvaal. Komati Poort, fr. xii.1917, *Moss & Rogers* 523 (K).

The diagnostic characters of this variety, pods and habit, are not always visible in herbarium material. It appears, however, that the material from Mozambique is fairly uniform, and in the above citations all material seen from Mozambique has been included with the exception of one specimen: Lourenço Marques, montes de Goba, fl. & fr. 9.xii. 1944, *Mendonça* 3454 (LISC). This has a much shorter pod (52 mm) with only about 12 seeds, and a probably perennial habit, so more closely resembling var. *longipes* or even possibly *T. lurida*.

Subsp. *swynnertonii* (Bak. f.) Brummitt, comb. et stat. nov.

Basionym: *Tephrosia swynnertonii* Bak. f., Leg. Trop. Afr. 1: 202 (1926). Type: Rhodesia, near Chirinda, 3800 feet, *Swynnerton* 369 (BM, holotype; K, isotypes).

Tephrosia grandiflora sensu Bak. f. in Journ. Linn. Soc. 40: 54 (1911).—Sensu Eyles in Trans. Roy. Soc. S. Afr. 5(4): 375 (1916).

Described as a perennial tall herb or shrub up to 1.7 m high. Stems densely ascending-pubescent, at least on the angles, the hairs usually brown. Leaflets (1.5)2.5-5.5(7) × (0.3)0.4-0.7(0.8) cm, linear-oblong, broadly rounded to truncate or emarginate at the apex; stipules 7-13 mm long. Racemes 2-7(13) cm long, usually compact or with only one or two lower nodes remote. Bracts not very conspicuous. Pods 62-80 mm long; seeds 13-17.

Known only from eastern Rhodesia.

RHODESIA. **Eastern Div.** Near Chirinda, 1155 m, fl. & fr. 21.vi.1906, *Swynnerton* 369 (BM; K, types). Chirinda, Mt. Silinda, fr. xi.1944, *Hack* 96 (SRGH). Chirinda area, fl. & fr. 29.iii.1950, *Hack* 175/50 (SRGH). Chipinga Distr., Gungunya Forest Reserve, fl. & fr. ii.1962, *Goldsmith* 42/62 (EM; K; LISC; SRGH); *Goldsmith* 51/62 (K; SRGH).

A number of specimens from Manica e Sofala referred above to var. *icosisperma* seem to approach these Chirinda plants either in pubescence (see for example *Simão* 427)

or in leaf shape (see for example *Barbosa* 1443) and it does not seem possible to maintain *T. swynnertonii* as a distinct species. Furthermore a single specimen from Rhodesia, **Southern Div.**, Ndanga Distr., W Sabi Chionja granite ridge, fl. 29.i.1957, *Phipps* 213 (K; SRGH), has a very compact inflorescence somewhat similar to that of the type of *T. swynnertonii*, though it has longer peduncles, acute leaves and a conspicuous grey appressed pubescence. Further collections from this area, and from Chirinda, are required.

Tephrosia longipes Meisn. var. *uncinata* Harvey in Harvey & Sonder, Fl. Cap. 2: 209 (1862). Type: *Zeyher* 455 (see below).

This variety was originally distinguished by HARVEY with the description 'leaflets 2 lines wide, obtuse, recurvo-mucronate', and a single collection, *Zeyher* 455, cited. More recently it was again recognised by Miss FORBES in *Bothalia* 4(4): 981 (1948) with a similar diagnosis 'Leaflets obtuse, recurvo-mucronulate', and a number of collections from the Transvaal were included. The majority of these appear to the present author to be not taxonomically separable from typical *T. longipes*, but the type collection of var. *uncinata* and three other early 19th century collections do appear to be distinct. They appear to be probably suffrutices with fairly stout stems, simple or with short axillary shoots, up to 40 cm high. The stems are only sparsely and shortly appressed-pubescent, 2-3 mm diameter and mostly strongly ridged. The leaves have usually more leaflets (mostly 4-6 pairs) than most *T. longipes* in S. Africa, and, as the previous authors have said, the leaflets are strongly obtuse with the tip recurved below. In general appearance they are somewhat similar to *T. laxiflora* from Zambia and Katanga. The specimens are *Zeyher* 455 (BM; K — herb. *Benth.*) — said by Miss FORBES to be from Pretoria District, Aapies River; Orange River, *Burke* s. n. (K — herb. *Hook.*); Aapges River, October, *anon.* (K — mounted with previous spec.); Aapges river, October, *anon.* 373 (K — herb. *Hook.*). The labelling of these collections is unsatisfactory (note

that Miss FORBES quotes *Zeyher* 373 as from Magaliesberg and Vaal River); the evidence points to some being from near Pretoria but one at least from the Orange River much further south. It is strange that no recent material has been traced to match these early collections and further investigation of the status of var. *uncinata* is required.

Tephrosia longipes* × *reptans

A remarkable recent collection from Zambia, **Central Prov.**, Chakwenga Headwaters, 100-129 km E of Lusaka, *Brachystegia* woodland, fl. & fr. 27.iii.1965, *Robinson* 6515 (K), closely resembles typical *T. longipes* except that it has a conspicuously spreading indumentum of brownish hairs on leaf rhachides and younger stems and greyish hairs on leaflet underface and older stems, and is apparently an annual though somewhat woody in the lower parts. It seems that this is very probably a hybrid between *T. longipes* and *T. reptans*, both of which have been collected at this locality by Mr. ROBINSON.

28. ***Tephrosia lurida*** Sonder in *Linnaea* 23: 30 (1850). — Harvey in Harvey & Sonder, *Fl. Cap.* 2: 208 (1862). — Eyles in *Trans. Roy. Soc. S. Afr.* 5(4): 375 (1916) quoad nom., excl. plur. spec. — Baker f., *Leg. Trop. Afr.* 1: 200 (1926) quoad nom. — Burt Davy, *Fl. Pl. Ferns Transv.* 1(2): 378 (1932). — Young in *Ann. Transv. Mus.* 14: 402 (1932). — Wilman, *Check List Griqualand West*: 65 (1946). — Forbes in *Bothalia* 4(4): 980 (1948). — Suessenguth & Merxmüller in *Trans. Rhod. Sci. Ass.* 43: 26 (1951) quoad nom., excl. spec. — Martineau, *Rhod. Wild Fl.*: 37, t. 11(2) (1953). Type: S. Africa, Transvaal, Mooirivier, Magaliesberg, xi; Crocodillrivier, xii, *Zeyher* 456 (K, isosyntypes).

Cracca lurida (Sonder) Kuntze, *Rev. Gén. Pl.* 1: 175 (1891). Type as for *T. lurida*.

Tephrosia longipes Meisn. var. *lurida* (Sonder) Gillett in *Kew Bull.* 13(1): 125 (1958) pro parte excl. *T. laxifloram*

et *T. paucijugam* sensu Cronquist. — Torre, Consp. Fl. Angol. 3: 158 (1962) quoad syn., excl. spec. Type as for *T. lurida*.

Perennial suffrutex with a stout woody underground stock and usually numerous rather slender herbaceous stems up to 1.5(2) m diameter, usually somewhat decumbent at the base, sparingly branched with branches ascending at a rather narrow angle, or sometimes unbranched, up to 40(50) cm high. Stems sparsely to densely appressed-pubescent, or very rarely (var. *drummondii*) spreading-pubescent to tomentose. Leaves with 1-3 pairs of leaflets or the lower leaves sometimes unifoliolate or digitately trifoliolate; petiole (1.5)2.5-7.5 cm, usually much longer than the rachis but sometimes about equalling it, the petiole and rachis together (1.5)2.5-9 cm, appressed-pubescent or very rarely (var. *drummondii*) spreading-pubescent; leaflets (2)4-9 × 0.1-0.4(0.5) cm, linear (or in var. *drummondii* up to 14 mm broad, linear-elliptic), terminated by a stout, blackish, usually slightly curved mucro; upper surface glabrous, lower surface appressed-pubescent (except in var. *drummondii*); stipules (3)5-10(13) × 0.3-0.8 mm, linear, blackish. Flowers in terminal racemes 2-15(20) cm long; bracts 3-7 × 0.2-0.8 mm, ± linear, blackish, persistent; pedicels 3-5 mm. Calyx 3.5-6(7) mm long, appressed- to ascending- (or spreading- in var. *drummondii*), grey- or brown-pubescent; upper teeth connate for $\frac{1}{3}$ - $\frac{2}{3}$ length, upper and lateral teeth about equaling the tube. Petals usually pink, but sometimes purplish; standard 12-18 mm long. Stamen tube connate above. Ovary pubescent to tomentose; style pubescent; pods (40)50-70 × 4-5 mm, loosely appressed-pubescent with usually rather irregular geniculate hairs; seeds 10-14.

Var. *lurida*

Tephrosia angustissima Engler, Bot. Jahrb. 10: 29 (1888). — Forbes in *Bothalia* 4(4): 979 (1948). — Torre, Consp. Fl. Angol. 3: 158 (1962) quoad nom., ? spec. Type: S. Africa, British Bechuanaland, near Kuruman, summit of Ga Mhana Peak, fr. ii.1886, *Marloth* 1086 (PRE, isotype).

Tephrosia dowsonii Bak. f., Leg. Trop. Afr. 1: 190 (1926). Type: Kenya, Nairobi, 1675 m, 1916, *Dowson* 519 (K).

Stem, leaf petiole and rhachis, leaflet lower surface, inflorescence axis and calyx appressed-pubescent. At least the upper leaves with 2-3 pairs of leaflets; leaflets up to 5 mm broad. Pods (40)50-70 mm long, with brownish irregular geniculate hairs; seeds 10-14.

KENYA. K4. Kiambu Distr. Kiambu, 1800-1830 m, fl. 12.ii.1930, *Miss Napier* 97 (K). **Nairobi Distr.** Nairobi, 1705 m, fl. & fr., comm. 1912, *Battiscombe* 451 (K). Nairobi, 1675 m, fl. & fr. 22.ix.1916, *Dowson* 519 (K, type). Archer's Farm, fl. & fr. 21.v.1933, *C. G. Rogers* 626 (K). Mbagathi Game Reserve, fl. 22.vi.1947, *Bally* 5106 (K). Nairobi, Dagereth Corner, 1675 m, fl. & fr. 1949, *Mrs. Hale* 20 (K). **Distr. uncertain.** Naivasha or Kiambu Distr., Kukui, 12.vi.1902, *Kassner* 1012 (BM). Thika, 1525 m, fl. & fr. 25.vi.1947, *Bogdan* 789 (K); fl. 28.vi.1947, *Bogdan* 819 (K). Without locality, *Miss Napier* 816 (K).

RHODESIA. Northern Div. Darwendale, c. 1370 m, fl. 2.x.1946, *Wild* 1344 (K; SRGH). Umvukwe Mt., 1380 m, fl. & fr. 5.iii.1961, *Mrs. Richards* 14566 (K; SRGH). **Western Div.** Bulawayo, 1400 m, fl. & fr. ii.1906, *Eyles* 1206 (PRE; SRGH). Matobo, Matopos Dam, fr. 15.i.1950, *West* 3068 (K; SRGH). Matobo Distr., farm Besna Kobilu, fl. & fr. ii.1960, *O. B. Miller* 7141 (K). **Central Div.** Marandellas, msasa top-land, fr. 5.vi.1947, *Newton* 60 (SRGH). Salisbury Distr., Chindamora, 1490 m, young fr. vi.1953, *Davies* 495 (SRGH). **Eastern Div.** Inyanga Distr., Pungwe Falls Farms, 1830 m, fl. & fr. xi.1957, *O. B. Miller* 4691 (K; SRGH). Melsetter Distr., below hut, Chimanimani Mts., *Brachystegia* woodland, fl. & fr. 29.v.1959, *Noel* 2158 (SRGH).

SOUTH AFRICA. Transvaal. Mooirivier, Magaliesberg, xi; Crocodillrivier, xii, *Zeyher* 456 (K, types). Mooie River, 1848, *Burke* (K). Aapjes River, 1848, *Burke* (K). Vaal River, 1848, *Burke* (K). Wonderboompoort, fl. & fr. 1875-1880, *Rehmann* 4611 (K). Mooie River, 1880, *Nelson* 337 (K). Without locality, comm. 1883, *Holub* (K). Lydenburg Distr., Spitzkop Goldmine, fl. & fr. ii.1888, *Wilms* 402 (K). Jeppes Ridge, Johan-

nesberg, fl. & fr. x.1898, *Gilfillan* 26 & 52a (PRE). Lydenburg Distr., near the town Lydenburg, fl. xi.1895, *Wilms* 401 (K). Rustenburg Distr., fl. 14.i.1904, *Nation* 58 (K). Aapjes River, near Pretoria, fl. ii.1904, *Bolus* 10833 (K). Pretoria, fl. & fr. 11.ix.1904, *Leendertz* 8390 (PRE). Krugersdorp, fl. & fr. i.1911, *Jenkins* 10029 (PRE). Zeerust, fl. i.1912, *Leendertz* 4277 (PRE). Barberton, fl. & fr. xii.1916, *Pott* 5328 (PRE). Pretoria, Curtis Hills, fl. & fr. 8.ii.1917, *Pole-Evans* 110 (K). Godwan River, fl. & fr. i.1919, *F. A. Rogers* 22650 (K). Pretoria Distr., Waterkloof, fl. 18.xi.1919, *Verdoorn* 31 (PRE). Observatory Ridge, Johannesburg, fl. 28.iii.1920, *Burt Davy* 18896 (K). Piet Retief, fl. xii.1921, *Leipoldt* (PRE). Waterval Boven fl. 1922, *Miss Mason* 38 (K). Malelane, fl. xii.1924, *Miss Murphy* 26220 (PRE). Pretoria, behind zoo grounds, fl. & fr. 12.iii.1925, *C. A. Smith* 20 (PRE). Lichtenburg Distr., Witstinkhoutboom, 28.i.1926, *Liebenberg* 53 (PRE). Lichtenburg Distr., Townlands, Klipveld, fl. 29.i.1926, *Liebenberg* 79 (PRE). Pretoria, Fountains Valley, fl. & fr. 18.xi.1928, *Repton* 127 (PRE). Doornkloof, Irene, fl. 1.i.1929, *Hutchinson* 2352 (K). Pretoria, Sunnyside, fl. 22.ix.1930, *Goosens* 107 (PRE). Boskop, Potchefstroom, fl. 11.xi.1939, *Louw* 459 (PRE). Rietvlei, fl. 6.ii.1948, *Sidery* 1439 (PRE). Pretoria, Fountains Valley, fl. 4.x.1948, *de Winter* 400 (K). Nelspruit Distr., 1 1/2 miles N of Pretorius Kop, fl. 4.ii.1949, *Codd & de Winter* 4943 (K). Krugersdorp Distr., Giloolies Farm, Jo'burg, fl. & fr. 11.ii.1950, *Mogg* 18648 (SRGH). Marico Distr., 15 miles W of Zeerust, fl. 14.ii.1956, *Leistner* 547 (K). 14 miles out of Pretoria on Hartebeestpoort Dam road, fl. ii.1961, *van der Schyff* 5280 (K; PRE). **Cape Province** Kosi Fontein, fl. & fr. 25.xii.1812, *Burchell* 2600 (K). Near Kuruman, summit of Ga Mhana, fl. & fr. ii.1886, *Marloth* 1086 (PRE — type of *T. angustissima*).

Var. *lissocarpa* Brummitt, var. nov.

A varietate typica leguminibus pilis pallidis valde appressis vestitis, saepe brevioribus (nonnunquam 28 mm) et saepe seminis paucioribus (nonnunquam 5 pro legumine) praeditis, differt.

Holotypus: Transvaal, Zoutpansberg Distr., c. 9 miles E of Louis Trichardt, farm Rustfontein, fr. 9.x.1955, *Schlieben* 7339 (K).

This variety appears to be found mainly to the extreme west of the distribution area of the species.

RHODESIA. **Western Div.** Matobo Distr., farm Besna Kobil, fl. & fr. iii.1954, *O. B. Miller* 2284 (K; SRGH).

SOUTH AFRICA. **Transvaal.** Zoutpansberg Distr., c. 9 miles E of Louis Trichardt, farm Rustfontein, fr. 9.x.1955, *Schlieben* 7339 (K). **Cape Province.** Between Kosi Fontein and Knegt's Fountain, fl. & fr. 25.xii.1812, *Burchell* 2603 (K). Hay Div., Dunmarry, fl. & fr. vii.1923, *Mrs. Eyre Coote* 2325 (K). Hay, Jasper hills at Groenwater (A 20), fr. 15.i.1938, *Acocks* 8566 (K).

The pubescence of the pods of all the above specimens is quite unlike that of typical *T. lurida*. The type of the variety, *Schlieben* 7339, has three pods all about 28 mm long and with only 5 or 6 seeds and is the most extreme variant. *Acocks* 8566, however, has pods up to 70 mm long with 12 seeds and differs from typical *T. lurida* only in the pubescence of the pods.

Type of *T. angustissima* is from near Kuruman not far from the type locality of this variety, but its pods are clearly like those of typical *T. lurida*. There appears in fact to be no significant difference between these species and although they were tentatively kept apart by Miss FORBES (loc. cit.) *T. angustissima* is here reduced to synonymy.

Var. **drummondii** Brummitt, var. nov.

A varietate typica et var. *lissocarpa* habitu robustiore, pilis patentibus conspicuis in caulibus, petiolis, rhachidibus, axibus inflorescentiarum et calycibus, etiam foliis saepius trifoliolatis vel unifoliolatis, foliolis usque ad 14 mm latis, differt.

Typus: Rhodesia, Melsetter Distr., Glencoe Forest Reserve, steep grassy slope, fl. & fr. 23.xi.1955, *R. B. Drummond* 4976 (K, holotypus; PRE, SRGH, isotypi).

Only the type collection, *Drummond* 4976, is known from Rhodesia. This differs conspicuously from typical *T. lurida*, and further collections may show that it would be better regarded as a distinct species. It has a similar habit to typical *T. lurida*, producing numerous stems about 35 cm high from a woody stock, but it differs markedly in having a conspicuous indumentum of spreading brown hairs. The leaves are longpetioled (up to 8 cm) and all either trifoliate (digitately so or with a very short rhachis) or unifoliate, some stems having only unifoliate leaves. The leaflets are mostly broader than in typical *T. lurida*, up to 14 mm broad. There are, however, two collections from the Transvaal which approach DRUMMOND's collection from Rhodesia, and these are probably best included in the same taxon:

SOUTH AFRICA. **Transvaal.** Nelspruit Distr., Schagen (farm of J. J. van Niekerk), fl.xii.1934, *Liebenberg* 3313 (PRE). Pretoria Distr., Byerespoort, sandveld, fl. & fr. 8.xii. 1959, *Strey* SKF 896 (κ). Both of these have spreading pubescence, but shorter and less conspicuous than in *Drummond* 4976. The leaves are also similar, though the leaflets are only up to 8 mm broad and *Strey* 896 has some leaves with two pairs of leaflets. The latter specimen is more robust than is usual in *T. lurida*, having the stem about 3 mm diameter. Further investigation is required.

One further collection from the Transvaal, near Trichoordts Poort, fl. 24.xi.1924, *Smith* 3464 B (PRE) has the suffruticose short-stemmed habit of *T. lurida*, with few leaflets, but has fairly broad (8 mm), obtuse leaflets and has been referred by Miss FORBES to *T. longipes* var. *uncinata*. Its affinity is in doubt.

T. lurida is sometimes very difficult to distinguish in the herbarium from *T. longipes*, and has been regarded as only a variety of the latter by GILLET (loc. cit.). This may prove to be the best treatment, but extremes seen to be very different in habit, and as the two are sympatric

over a wide area they are here maintained, somewhat tentatively, as species. YOUNG (loc. cit.: 398) reports that the two hybridise in the Transvaal, which may possibly explain the difficulty in drawing a clear distinction between them. The following cannot be referred by the present author with any confidence one way or the other to *T. lurida* or to *T. longipes*:

RHODESIA. Western Div. Bulawayo, fl. i.1898, *Rand* 41 (BM). Bulawayo, fl. xii.1902, *Eyles* 1206 (BM). Bulawayo, fl. & fr., *Gardner* 95, comm. 1905 *Barthelemy* (K). Bulawayo, Matopos, fl. & fr. 18.ii.1912, *Rogers* 5682 (BM; K; PRE; SRGH). Essexvale, fl. & fr. 15.i.1921, *Borle* 86 (K; SRGH). Hillside, fl. ii.1944, *Martineau* 145 (SRGH). **Central Div.** Hartley Distr., Poole, fr. 4.iii.1948, *Mrs. R. M. Hornby* 2867 (K; PRE; SRGH).

SWAZILAND. Palata, Stegi Distr., fl. & fr. 11.i.1962, *Compton* 31203 (PRE).

SOUTH AFRICA. Transvaal. Benoni, fr. 3.xi.1934, *Bradfield* 269 (PRE). Pretoria Distr., Saltpan, fr. 2.iv.1946, *Codd* 1138 (K). Krugersdorp Distr., Strubens Valley, 9 R. miles NW of Jo'burg, fl. & fr. 6.i.1954, *Mogg* 24304 (SRGH). **Orange Free State.** Bloemfontein, in kopje facing Tempe Farm, fl. & fr. ii.1917, *Potts* 2808 (K). **Cape Province.** 2 miles W by N of Kuruman, quartzite outcrop and lime, fl. 13.xii.1957, *Leistner* 1055 (K).

Critical field observations and perhaps experimental studies are required on *T. lurida* and *T. longipes*.

Other plants from Melsetter District. Apart from var. *drummondii* described above, some other collections from Melsetter District appear to be anomalous and require further investigation: Chimanimani, gully above Haroni, among grass and trees, 1310-1460 m, fl. & fr. 3.ii.1957, *Phipps* 444 (K; SRGH). On ridge facing east over Haroni R., near Dragon's Tooth, 915 m, fl. & fr. 16.ii.1958, *A. V. Hall* 484 (SRGH). Junction — Cashel Road, bud & fr. 31.i.1963, *Lady Drewe* 87 (SRGH). The first of these, *Phipps* 444, has spreading brown hairs on stems and leaf rachides, so resembling

T. lurida var. *drummondii*, but has leaves with (1)2-4 pairs of linear-oblong to linear leaflets up to 5×0.5 cm. The stems appear to be decumbent-ascending, and it is described as a perennial herb 30 cm high from a woody stock. The pods are about 62×4.5 mm, 13-seeded. *Hall* 484 is rather similar but has appressed, not spreading, hairs, and more or less oblong leaflets somewhat like those of *T. longipes* subsp. *swynnertonii*. The other, *Drewe* 87, is a rather incomplete specimen but probably referable to either *T. longipes* var. *longipes* or to *T. lurida* var. *lurida*.

29. *Tephrosia laxiflora* R. E. Fries, *Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped.* 1: 83, t. 8(6) (1914).—Bak. f., *Leg. Trop. Afr.* 1: 199 (1926). Type: Zambia, Malolo near Luvingo, fl. & young fr. 25.x.1911, *R. E. Fries* (UPS).

Tephrosia lurida sensu R. E. Fries, *Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped.* 1: 83 (1914).

Tephrosia paucijuga sensu Cronquist, *Fl. Congo Belge* 5: 106 (1954).

Tephrosia longipes Meisn. var. *lurida* (Sonder) Gillett in *Kew Bull.* 13: 125 (1958) pro parte.

Perennial with a woody underground stock and herbaceous, erect, simple or (1)2-branched stems up to 45 (75) cm high, with 2-5 leaves per stem. Stems glabrous to sparsely and very shortly appressed-pubescent. Leaves with (0)1-3(4) pairs of leaflets; petiole 2-5(6.5) cm, petiole and rhachis together 2-9(12) cm, glabrous or subglabrous; leaflets 3-8(11) \times (0.2)0.3-0.8(1.4) cm, linear-elliptic to linear, \pm cuneate at the base, acute to rounded at the apex, the veins \pm conspicuously prominent on both surfaces; upper surface glabrous, lower surface sparsely and shortly appressed-pubescent to subglabrous; stipules 6-13 \times 0.7-1.2 mm, linear-triangular, sometimes falcate. Flowers in \pm lax terminal racemes mostly 10-27 cm long; bracts c. 6-7 \times 1 mm, quickly caducous; pedicels 3-7(11) mm long. Calyx 3.5-5 mm long, fairly densely shortly appressed-pubescent; upper teeth connate for $1/2$ - $5/6$ length, to form a rather broad trian-

gle, the upper and lateral teeth usually slightly shorter than the tube, the lower tooth about equalling the tube. Petals pale purplish or pink, or yellow with pink markings; standard (10)12-18 mm long, cuneate to subcordate at the base. Staminal tube connate above. Ovary pubescent; style pubescent; pods $35-60 \times 3.5-4(5)$ mm, shortly pubescent with appressed or irregular hairs; seeds 8-12 (but see note on Tanzania collection).

Congo (Katanga) and Zambia, apparently also in Tanzania (see note below).

CONGO. **Katanga.** Kafuba, fl. 28.ix.1927, *Quarré* 485 (BR). [Without details] *Quarré* 698 (BR). Kafuba, fr. 21.x.1927, *Quarré* 707 (BR). Vallée de Kisanga, fl. viii.1933, *Quarré* 3482 (BR). Kafuba, fl. xi.1934, *Quarré* 4262 (BM; BR).

ZAMBIA. **Barotseland.** Mankoya Distr., 50 miles (80 km) E of Mankoya on road to Kafue Hoek, *Brachystegia* woodland, fl. & fr. 21.xi.1959, *Drummond & Cookson* 6719 (K; PRE; SRGH). **Northern Prov.** Malolo near Luvingo, fl. & young fr. 25.x.1911, *R. E. Fries* 1115 (UPS, type). **Western Prov.** Ndola, fr. x.1906, *Allen* (K; PRE). Bwana Mkubwa, fl. viii. 1911, *R. E. Fries* 463 (UPS). Solwezi Distr., R. Mutana W of Boma, burnt ground in *Brachystegia* woodland, fl. 17.ix. 1930, *Milne-Redhead* 1142 (K). Solwezi Distr., chipya vegetation at edge of Solwezi Dambo, fl. 10.ix.1952, *White* 3200 (K). Solwezi, dambo margin, fl. & fr. 12.x.1953, *Fanshawe* 400 (K; SRGH). Kitwe, plateau woodland, fl. & fr. 20.ix.1955, *Fanshawe* 2447 (K). Kasempa, miombo woodland, fl. & young fr. 10.viii.1961, *Fanshawe* 6670 (K). Solwezi, Boma environs, open *Brachystegia* woodland on orange soil, fl. ix.1962, *Holmes* 1540 (K; SRGH). **Southern Prov.** Mumbwa, comm. 1912, *Mrs. Macaulay* 1145 (K); 1156 (K). Mumbwa-Chanobi, *Julbernardia-Brachystegia* woodland on reddish brown stony loam, 1155 m, fl. 15.ix.1947, *Greenway & Brenan* 8085 (EA; K; PRE). Mumbwa, Distr., Chunga Kafue Nat. Park, savanna woodland, fl. & fr. 14.xi.1961, *Mitchell* 10/97 (SRGH). Mumbwa, miombo woodland, fl. & fr. 10.x. 1963, *Fanshawe* 8044 (K).

T. laxiflora is closely allied to *T. paucijuga* which is distinguished mainly by its much broader, few-seeded pod. Plants from the Congo and Zambia seem to be all clearly referable to *T. laxiflora*, while *T. paucijuga* is apparently restricted to southern Tanganyika. Two collections from Tanzania, however, matching both these species in habit and leaf characters, have linear pods (3.5 mm broad in the one with pods mature) with 12-15 seeds and long racemes (up to 22 cm) and so are apparently referable not to *T. paucijuga* but to *T. laxiflora*:

TANZANIA. **T7. Chunya Distr.** Sinipala, fl. & young fr. 15.x.1932, *Geilinger* 3070 (K). Lupa Forest Reserve, 95 miles (152 km) N of Mbeya on Itigi road, 1310 m, fl. & fr. 15.ix. 1962, *Boaler* 675 (K).

These localities are somewhat further north than *T. paucijuga* is at present known to occur (see below). The leaves of *Boaler* 675 are all either unifoliolate or trifoliolate, and the pubescence is somewhat different from Zambian material, the stems having in places moderately dense, rather loosely appressed, greyish hairs, and the calyx and leaflet undersurfaces more or less spreading greyish hairs. *Geilinger* 3070, however, closely resembles specimens of *T. laxiflora* from Zambia. The relationships of these plants to *T. paucijuga*, particularly with reference to the constancy of the pod characters separating the species, requires further investigation.

A further similar specimen at Kew, collected by *Bullock*, unfortunately without any data at all but said by the collector to be probably from the Ufipa Plateau, must also be mentioned here. It is a suffrutex with robust (5 mm diameter) stems burnt off and more slender (1.5 mm) stems sprouting from the base. These flowering shoots resemble *T. laxiflora* except that they are densely and conspicuously covered with soft, grey, spreading hairs. The pods (immature) are linear with more than 12 seeds. No other collections matching this are known.

30. **Tephrosia paucijuga** Harms in Engl., Bot. Jahrb. 30: 326 (1901). — Bak. f., Leg. Trop. Afr. 1: 196 (1926). — Brenan, Check List Tr. Shr. Brit. Emp. 5. Tang. Terr.: 445 (1949). — Cronquist, Fl. Congo Belge 5: 106 (1954) quoad nom. spec. — Gillett in Kew Bull. 13(1): 125 (1958). Type: Tanzania, Mbeya Distr., Unyika, Umalili, Uwurungu, 2200 m, *Goetze* 1457 (BM, isotype).

Very similar to *T. laxiflora*, differing as follows: leaflets often broader, particularly in the distal half, 5-13 (17) mm broad, linear-elliptic to linear-oblongate; inflorescences usually shorter, 3-10 (15) mm long; calyx densely appressed- to spreading-pubescent to tomentose; pods broader, 40-50 × 8-9.5 mm, with only 2-5 seeds.

Southern Tanzania.

TANZANIA. **T7. Mbeya Distr.** Unyika, Umalili, Uwurungu Mountain, grassy slopes, 2200 m, fl. xi.1899, *Goetze* 1457 (BM — type). Mbosi, 1585 m, fl. xi.1928, *Haarer* 1637 (K). Mbosi, 1705 m, fl. 25.iii.1932, *Davies* 116 (K). Mbosi, Zambzi, 1620 m, fl. 19.xi.1932, *Davies* 676 (K; SRGH). Mbosi, open paths of *Brachystegia-Uapaca* woodland, 1570 m, fl. & fr. 27.viii.1933, *Greenway* 3610 (K). Mbosi-Mbeya road, edge of woodland, burnt grassland, 1350 m, fl. 14.x.1956, *Mrs. Richards* 6444 (K). Mbimbe-Mbosi, fl. 18.vi.1958, *Reakes-Williams* 114 (K). 20 m (32 km) N of Tunduma on Mbeya road, recently burnt *Brachystegia* thicket, fl. 17.xi.1958, *Napper* 936 (K). Mbosi Circular Road, short rough grass, 1500 m, fl. 12.i.1961, *Mrs. Richards* 13883 (K). **T8. Songea Distr.** Near Lipumba, grassy bank near upper limit of *Brachystegia* woodland, 1230 m, fl. 28.ii.1956, *Milne-Redhead & Taylor* 8893 (K). Near R. Mkako, c. 6.5 km SW of Kitai, edge of *Brachystegia* woodland and riverside grassland, 900 m, fl. 15.iv.1956, *Milne-Redhead & Taylor* 9734 (K). Matengas, fl. & fr. 3.x.1956, *Semsei* 2501 (PRE; SRGH).

Only three of the above specimens have pods, which provide the main distinguishing character from *T. laxiflora*. The other specimens seem to agree with these in other characters, such as the densely pubescent or tomentose

calyx, and are very probably correctly referred to *T. paucijuga*, but in view of the specimens from Chunya Distr. discussed under *T. laxiflora* some slight doubt remains in the absence of fruit.

Group 6. **TEPHROSIA ELATA** AND ALLIED SPECIES

This group of species are similar to *T. longipes* and its allies but generally do not have linear leaflets, often have broader stipules and bracts, and sometimes have more densely pubescent pods. The following key distinguishes seven species which are frequently confused:

1. Stipules 0.5-1 mm broad; petals 8-12 mm long; pods 40-65 × 3-5 mm
2. Leaves with (5)6-10(14) pairs of leaflets; pods with (9)10-12(13) seeds 34. *T. elata*
2. Leaves with 4-6 pairs of leaflets; pods with (6)7-10 seeds
3. Calyx 2-3 mm long, the ventral part with pellucid gland dots; pods with 8-10 seeds 37. *T. punctata*
3. Calyx 3.5-5(6) mm long, without pellucid gland dots; pods with (6)7-8 seeds 36. *T. kasikiensis*
1. Stipules 1-4.5 mm broad; petals (10)12-24(28) mm long; pods (35)58-100(110) × 4.5-8 mm
4. Flowers in large dense heads, either all terminal or up to 12 lateral (simulating a much interrupted raceme), each head including broadly elliptic to lanceolate bracts 2-7 mm broad among the flowers; calyx 5-10(13) mm long
5. Heads all or mostly terminal, including lanceolate bracts up to 16 × 3 mm *T. interrupta* subsp. *mildbraedii*
5. Heads terminal and up to 12 lateral, each including broadly elliptic-acuminate bracts up to 7 × 7 mm *T. interrupta* subsp. *interrupta*
4. Flowers in 'racemes' with small few-flowered clusters at each node; bracts all linear-triangular or sometimes the subtending bract at each node ovate to lanceolate, or if more than one bract at each node ovate (*T. bracteolata*) then calyx 3-4 mm
6. Style 7-9 mm; petals 18-22 mm; calyx 5-8 mm *T. interrupta* subsp. *elongatiflora*
6. Style 4-7 mm; petals (10)11-16(18) mm, or if up to 19 mm then calyx 3-5 mm
7. Calyx 7-10 mm long
8. Pods 5-7.5 mm broad, light brown but covered with spreading dark brown hairs 33. *T. nyikensis*

8. Pods 4.5-5 mm broad, pale straw-coloured, thinly pubescent or glabrescent 34. *T. elata* var. *abercornensis*
7. Calyx 3-6(7) mm long
9. Calyx shortly and closely appressed-pubescent, the tube c. 2.5 mm long; pods pale straw-coloured with (9)10-12(13) seeds 34. *T. elata*
9. Calyx conspicuously shaggy-pubescent to villous, the tube 1-2 mm long; pods brown with 12-19 seeds
10. Bracts 0.4-1 mm broad, linear-triangular, inconspicuous; leaflets (0.5)0.7-1.8(2.0) mm broad, elliptic to oblanceolate or sometimes \pm linear-oblong . . . 31. *T. nana*
10. Bracts 1-3 mm broad, ovate, conspicuous, purplish; leaflets 0.3-0.7(1.1) mm broad, linear-oblong to linear 32. *T. bracteolata*

31. **Tephrosia nana** Kotschy in Schweinfurth, Reliq. Kotschy.: 20, t. 16 (1868). Types: Sudan, Fesoglu, *Boriani* 109 (w, syntype, not seen); Sudan or Ethiopia, Matamma, Gallabat area, *Schweinfurth* 1871 (K; BM-isotypes).

GILLETT in *Kew Bull.* 13(1): 129-130 (1958) has pointed out that the species long known as *T. barbiger* Welw. ex Bak. seems to be inseparable from the earlier described *T. nana*. It is not necessary here to repeat the extensive synonymy involved. It is preferred here to attribute the name *T. nana* solely to KOTSCHY since it is clear that it was his description, as well as epithet, which was published posthumously in a work edited by SCHWEINFURTH.

T. nana, as now defined, is a somewhat variable species. The dwarf plants such as the syntype *Schweinfurth* 1871 seem to be restricted to the Sudan and Uganda, but as GILLETT has pointed out these may well be merely stunted by the more arid conditions and despite their markedly different facies probably do not merit taxonomic recognition. GILLETT has also referred to the variation in pubescence of the leaflet upper surface. In West Africa the upper surface is glabrous except in three specimens seen from Nigeria (*Rowland* s. n., *Jones* 2126, *Killick* 45, all at Kew). In East Africa, on the other hand, the great majority are pubescent above, but a few are glabrous (e. g. *Purseglove* 998, *Chandler* 331 both from Uganda, the dwarf plant *Scott* EA 11816 also from Uganda, *Schlieben* 1937 from Tanzania).

In the Congo the majority are pubescent as in East Africa, but, surprisingly, all those seen from extreme southern Congo, and those from adjacent Zambia, are glabrous. The distribution of the two pubescence states is shown in the map, fig. 5.

The West African plants differ furthermore from others in their generally smaller flowers, the petals being (10)12-15 mm long compared with 14-19 mm elsewhere. The pods

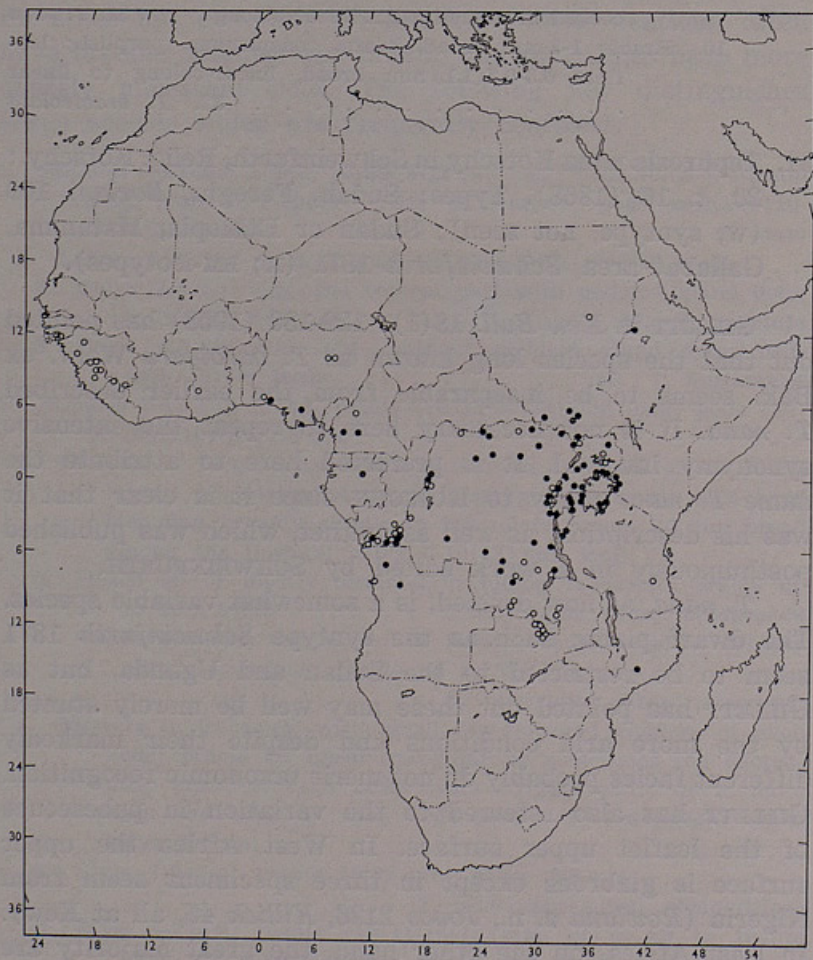


Fig. 5. — Distribution of *Tephrosia nana*.

- leaflets glabrous above
- leaflets pubescent above

also tend to be smaller in West Africa than in East Africa, $38-54 \times 4-5$ mm compared with $(42)50-70 \times (4.5)5-6$ mm, but in the Congo the range is more or less intermediate, $(32)40-60(65)$ mm. Leaflet shape also seems to show some regional variation, the few specimens available from western Zambia being exceptional in this case. Through most of the area of the species the leaflets are more or less oblanceolate to linear-oblong, 7-12(18) mm broad and about 5 times as long as broad, but in the western Zambian material they are elliptic or obovate to oblanceolate, $(8)13-18(20)$ mm broad and only about 2-3(4) times as long as broad. The one from northern Zambia, however, has linear-oblong leaflets as in Congo plants. The following collections from our area have been seen:

ZAMBIA. **Northern Prov.** Kamindas, fl. 5.x.1911, *R. E. Fries* 889 (UPS). **Western Prov.** Mufulira, river bank, fl. & fr. 17.iii.1956, *Fanshawe* 2848 (K; SRGH). Kitwe, small colonies in woodland after felling, fl. 15.iii.1957, *Fanshawe* 3047 (K). Kitwe, fr. 8.iv.1957, *Fanshawe* 3153 (K). Nkana, Kitwe (Sewage Works), fl. & fr. 17.iii.1959, *Shepherd* 15 (K).
MOZAMBIQUE. **Zambézia.** Near Ile, beside roads, fl. 1.iv.1943, *Torre* 5037 (LISC).

As will be seen from the map, fig. 5, the last of the above seems to be somewhat removed from the main area of the species. Unlike the Zambian specimens its leaflets are pubescent above.

32. ***Tephrosia bracteolata*** Guill. & Perr., Fl. Senegamb. Tent.: 194 (1832). — Bak. in Oliv., Fl. Trop. Afr. 2: 116 (1871). — Bak. f., Leg. Trop. Afr. 1: 201 (1926). — Chevalier, Fl. Archip. Cap Vert in Rev. Bot. Appl. 15: 971 (1935). — Andrews, Fl. Pl. Anglo-Egypt. Sudan: 240 (1952). — Cronquist, Fl. Congo Belge 5: 112, t. 8 (1954). — Cufodontis, Enum. Pl. Aethiop. Spermat., in Bull. Jard. Bot. Brux. 25(3 suppl.): 279 (1955). — Hepper in Fl. W. Trop. Afr. ed. 2, 2: 529, 530 (1958). — Torre in Consp. Fl. Ang. 3: 158 (1962) excl. spec. *Gossow*. 4260. Type: Senegal, Lamsar near St. Louis.

Tephrosia fasciculata Hook. f., Niger Fl.: 298 (1849). Type: Nigeria, on the Quorra (Niger), Vogel 23 (κ).

Cracca bracteolata (Guill. & Perr.) Kuntze, Rev. Gen. Pl. 1: 174 (1891). — Hiern, Cat. Afr. Pl. Welw. 1: 221 (1896). — Pires de Lima in Brotéria sér. bot. 19(3): 123 (1921) et Bol. Soc. Brot. sér. 2, 2: 137 (1924) quoad syn. excl. spec. (vide *T. reptans* var. *microfoliata*). Type as for *T. bracteolata*.

Tephrosia kotschyana Hochst. in Schaed. Kotschy et Schimper, nomen nudum.

A variation pattern somewhat similar to that found in *T. elata* and *T. nyikensis* seems to allow recognition of two varieties differing conspicuously in the type of pubescence. They appear to be more or less disjunct geographically (see map, fig. 6), but in this case no other correlated characters have been found and varietal rather than subspecific rank is preferred.

Var. *bracteolata*

Tephrosia elongata Hook. f., Niger Fl.: 298 (1849) non E. Meyer (1835). Type: Nigeria, on the Kworra (Niger), Vogel 147 (κ).

Tephrosia concinna Bak. in Oliv., Fl. Trop. Afr. 2: 112 (1871). — Bak. f., Leg. Trop. Afr. 1: 190 (1926). Type: Nigeria, on the Niger, Baikie (κ).

Tephrosia nigerica Bak. f., Leg. Trop. Afr. 1: 198 (1926). Type as for *T. elongata* Hook. f. non E. Meyer.

Stems and leaf rhachides more or less closely appressed-pubescent.

From West Africa (Senegal) to western Congo, (Boma etc.), Ethiopia, Uganda, northern Tanzania and northern Angola (Cuanza Norte, Welwitsch 2109) (see map 6). The west African material is very uniform with the exception of one specimen, the type of *T. fasciculata* Hook. f., which has rather soft spreading hairs and broad pods, 52-60 × 6-6.5 mm.

Var. **strigulosa** Brummitt, var. nov.

Caules et rhachides foliorum pilis angulo circa 45° plus minusve rigide ascendentibus vestiti.

Typus: Zambia, Mpulungu, Lake Tanganyika, pebbly beach and grit, fl. & fr. 8.iii.1952, Mrs. Richards 1049 (K).

Northern and south-central Congo, southern and central Tanzania, northern Zambia and northern Malawi.

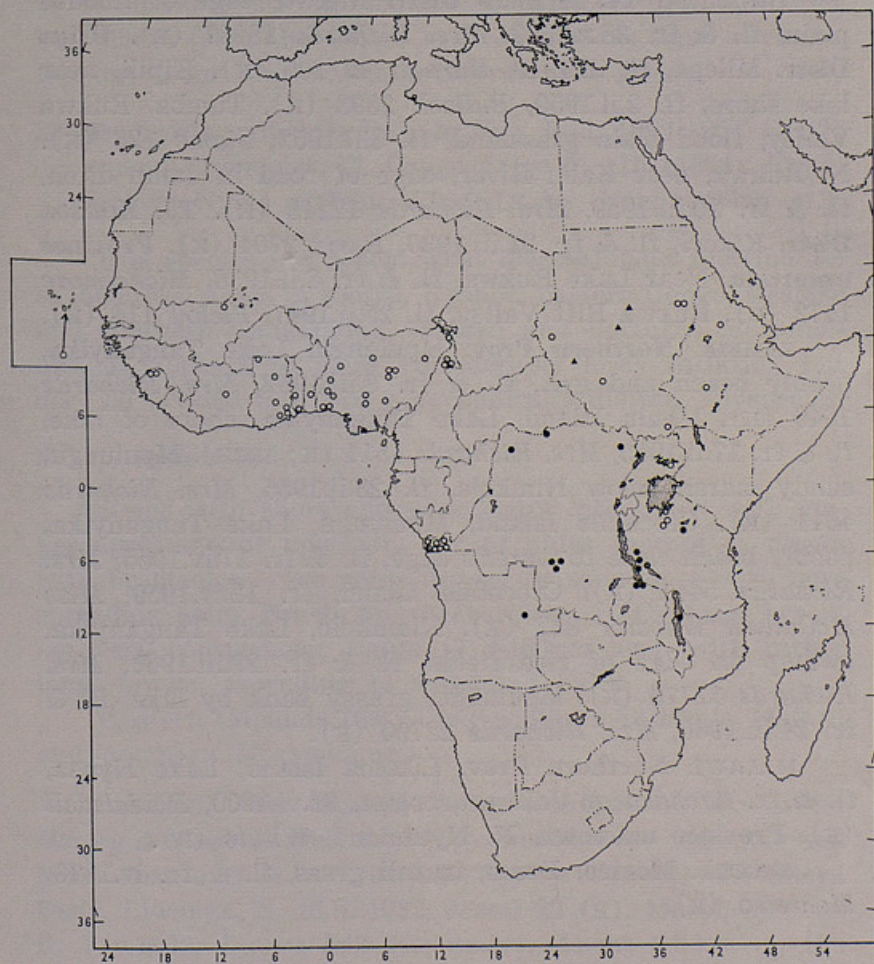


Fig. 6. — Distribution of *Tephrosia bracteolata*.

- *var. bracteolata*
- *var. strigulosa*
- ▲ intermediates

CONGO. **Equateur.** Gemena Terr., Bodangabo, *Imperata* savanna, fl. 16.v.1955, *Evrard* 1010 (BR; K). Kutubongo, *Imperata* savanna, fl. & fr. 24.v.1955, *Evrard* 1053 (BR). **Orientale.** Monga (Uele-Itimbiri), fl. ii.1931, *Lebrun* 2241 (BR). **Kasai.** Dibaya Terr., Badibanga, savanna, 20.x.1956, *Liben* 1771 (K). Gandajika, *Loudetia* savanna, fr. 28.iii.1959, *Devred* 3936 (BR; K).

TANZANIA. **T4. Mpanda Distr.** Rukwa, edge of flooded plain, fl. & fr. 28.x.1963, *Mrs. Richards* 18287 (K). **Ufipa Distr.** Milepa, fl. iii.1949, *Burnett* 49/105 (K). Kipili, near lake shore, fl. 2.ii.1950, *Bullock* 2393 (K). Tumba, Rukwa Valley, flood plain grassland, fl. 3.ii.1952, *Siame* 126 (K). N. Rukwa, near Kabu River, edge of road in damp ditch, fl. & fr. 20.iii.1959, *Mrs. Richards* 12248 (K). **T5. Kondoa Distr.** Kikori, fl. & fr. 21.iii.1930, *Burt* 2704 (K). **Province uncertain.** Near Lake Rukwa, fl. & fr. 8.ii.1938, *Michelmores* 1472 (K). Rukwa Rift Valley, fl. 25.ii.1947, *Pielou* 114 (K).

ZAMBIA. **Northern Prov.** Mpulungu, Lake Tanganyika, pebbly beach and grit, fl. & fr. 8.iii.1952, *Mrs. Richards* 1049 (K). Mbulu Island, Lake Tanganyika, shore of lake, fl. & fr. 17.ii.1955, *Mrs. Richards* 4514 (K; SRGH). Mpulungu, sandy marsh below Nimkola, fl. 23.ii.1955, *Mrs. Richards* 4611 (K). Crocodile Island, Mpulungu, Lake Tanganyika, pebbly beach close to water's edge, fl. & fr. 17.iv.1955, *Mrs. Richards* 5441 (K). Crocodile Island, fr. 12.iv.1959, *Miss McCallum Webster* 842 (K). Niamkolo, Lake Tanganyika, swamp on edge of rice fields, fl. & fr. 22.iii.1960, *Mrs. Richards* 12776 (K). Mpulungu, grassy bank by lake, fl. & fr. 24.iii.1960, *Mrs. Richards* 12790 (K).

MALAWI. **Northern Prov.** Likoma Island, Lake Nyasa, fl. & fr. *Archdeacon Johnson*, comm. 28.vi.1900, *Riddelsdell* (K). **Province unknown.** N. Nyasaland, *Whyte* (K).

ANGOLA. **Moxico.** Boma, in tall grass, fl. & fr. iv.1873, *Monteiro* (K).

A series of collections from the Congo, Orientale, Lac Albert, Mahagi Port, ix.1934, *Bredo* 1621, 1622, 1696 and 1770 (BR) are more or less intermediate between the two varieties, having rather stiff hairs varying from appressed

to ascending. Five collections seen from the Sudan — *Kotschy* 257, *Andrews* 3112, *Wickens* 327, *Jackson* 3269 and *Schweinfurth* 1692 (all κ) — do not match var. *bracteolata* as they might be expected to do. They have more or less spreading, often geniculate or soft hairs on the stem and leaf rachis. Their position is uncertain.

In Tanzania, Zambia and Malawi var. *strigulosa* appears to be characteristic of wet places, particularly lake shores, but plants from the Congo are recorded as from savanna, the one from Angola similarly from tall grass.

33. **Tephrosia nyikensis** Bak. in Kew Bull. 1892: 257 (1892) emend. Cronquist, Fl. Congo Belge 5: 115 (1954). Type: Malawi, Nyika plateau, *Whyte* (κ , see Cronquist, loc. cit.).

This species has a somewhat discontinuous distribution in mountain areas in Kenya, Uganda, eastern Congo, western and southern Tanganyika, Malawi and northern Mozambique. It appears to show considerable local variation but may be divided into two geographically distinct subspecies.

Subsp. **nyikensis**

Stems with short appressed hairs intermixed with longer spreading or upwardly curved hairs (except in plants with bracteoles — see notes below) or sometimes with only spreading hairs. Bracts linear-lanceolate, 1-2(2.5) mm broad, not very conspicuous. Calyx (7)8-10 mm long, with rather long, brown, ascending to spreading hairs.

Western (Mpanda Distr.) and southern Tanzania, Malawi and northern Mozambique.

TANZANIA. **T4. Mpanda Distr.** Kahoko, fr. 22.vii.1949, *Harley & Newbold* 4537 (κ). Highland between Pasagulu and Musenabantu, fl. & fr. 8.viii.1959, *Harley* 9231 (κ). **T7. Mbeya Distr.** Liwanga, fl. 16.iii.1932, *Jessel* 22 (κ). Mbosi, Mkoma, fl. 7.iv.1932, *Davies* 543 (κ ; SRGH). About 6.5 km up the Tukuyu road S of Utengule, fl. & fr. 12.v.1956, *Milne-Redhead & Taylor* 10087 (κ). Mbeya, fl. & fr. 23.iv.1959, *Gaetan* 149 (κ). Below Umalila Forest Reserve, fl. & fr. vi.1961, *Procter* 1890 (κ). **Rungwe Distr.** Kyimbila District, fl. 21.viii.

1911, *Stolz* 838 (K); *Stolz* 842 (K). Tukuyu, fl. 20.vii.1932, *Davies* 399 (K). Rungwe fl. 13.ix.1932, *Geilinger* 2208 (K). Rungwe, fl. 20.ix.1932, *Geilinger* 2491 (K). Rungwe Distr., fl. & fr. 3.x.1932, *Davies* 209 (K; SRGH). Rungwe Distr., fl. 13.x.1932, *Davies* 208 (K; SRGH). Poroto Village, 2100 m, fl. & fr. 20.v.1957, *Mrs. Richards* 9828 (K). **Njombe Distr.** Ruhudje, Lupembe, fl. 21.vi.1931, *Schlieben* 1058A (K); 1.vii.1931, *Schlieben* 1073A (K). **Distr. uncertain.** Mporotos, fl. & fr. 16.vii.1932, *Davies* 763 (K). **T8. Songea Distr.** About 10.5 km N of Miyau, fl. & fr. 21.v.1956, *Milne-Redhead & Taylor* 10407 (K).

MALAWI. Northern Prov. Nyika Plateau, 2000-2330 m, fl. & fr. vi.1896, *Whyte* 465 (K, type). Nyika Mountain, 1330-2000, fl. 1896, *Whyte* s. n. (K). Masuku Plateau, fl. vii.1896, *Whyte* s. n. (K). Nkata Bay escarpment, fl. & fr. 7.vii.1952, *Jackson* 930 (K). **Southern Prov.** Chipata and Nchisi Mts., fl. & fr. 4.v.1963, *Verboom* 869 (K; SRGH).

MOZAMBIQUE. Niassa. Near Vila Cabral, fl. v-vi.1934, *Torre* 259 (COI; LISC). Maniamba, Serra Geci, fl. & fr. 29.v.1948, *Pedro & Pedrógão* 4110 (LMJ); 4081 (LMJ).

This subspecies itself shows considerable variation. The specimens cited from Mpanda Distr., Tanzania, have narrower pods (4.5 mm) than others, with rather conspicuous spreading grey pubescence. Those from the Nyika Plateau (including the type) and Masuku Plateau in Malawi and some from the Rungwe Plateau in Tanzania (*Davies* 209, 399, 763; *Geilinger* 2208, 2491; *Stolz* 838) seem generally to have a denser, ovoid, often capitate, head and usually shorter leaves than have others from Southern Highlands (T7) Province of Tanzania, but others from Rungwe (*Davies* 208, 543; *Richards* 9828) have a fairly elongate raceme. Those from Southern Province (T8) of Tanzania (*Milne-Redhead & Taylor* 10407) and Maniamba in northern Mozambique (*Pedro & Pedrógão* 4110) have very large broad pods (7-7.5 mm broad). The two specimens from southern Tanzania which have been observed to have bracteoles present (*Gaetan* 149; *Milne-Redhead & Taylor* 10087) are further peculiar in this subspecies in having

only appressed pubescence on the stem. Of the specimens from Malawi other than those already mentioned, the one from Nkata Bay (*Jackson* 930) has an elongate inflorescence resembling most from Southern Highlands of Tanzania, while *Verboom* 869 from southern Malawi is peculiar in having a short stiffly spreading brown tomentum unlike any other plant of this species seen. It does not seem advisable to attempt any further subdivision of the species until more material is available.

Subsp. *victoriensis* Brummitt & J. B. Gillett, subsp. nov.

Caules breviter appresso-pubescentes. Bractee ovato-acuminatae ad lanceolatae, 3-5 mm latae, flores juveniles occultentes. Calyx 5-8(9) mm, pilis griseis ascendentibus vel appressis, vel dentium brunneis.

Typus: Kenya, S. Elgon, fl. & fr. ix.1939, *Mrs. Tweedie* 465 (K, holotypus).

Eastern Congo, Burundi, Uganda, Kenya and northern Tanzania. The following specimens have been seen:

CONGO. **Oriente**. Mahagi (Ituri), fr. 1931, *Lebrun* 3855 (K). Nioka, fl. & fr. 27.x.1934, *De Craene* 227 (K). Nioka, 1700 m, fl. 20.viii.1957, *Froment* 210 (K). **Without locality**. *Scaetta* 1323 (FI).

BURUNDI. Kisozi, fl. & fr. 3.vii.1934, *Lejeune* 108 (K).

UGANDA. **U2. Toro Distr.** Near Butiti, 1525 m, fl. & fr. 15.vii.1938, *Thomas* 2276 (K). **Ankole Distr.** Igana, 1645 m, fl. & fr. ix.1938, *Purseglove* 367 (K). **U4. Mengo Distr.** Kampala, fl. & fr. 12.vii.1920, *Shantz* 892 (K). Tondola, Gomba, fl. vi.1925, *Maitland* 797 (K). Kip Lake, Kampala, fl. iii.1936, *Hancock* 169 (K).

KENYA. **K3. Uasin Gishu.** Kipkarren, *Mrs. Brodhurst Hill* 503, 556 (K). **K5. North Kavirondo.** S. Elgon, 2040 m, fl. & fr. ix.1939, *Mrs. Tweedie* 465 (K, type). **South Kavirondo.** Kisii, 1735 m, fl. & fr. ix.1933, *Napier* 5308 (K). **Kericho Distr.** North-Sotik, Coxon's Farm, fl. 11.ix.1949, *Mrs. Royston* in *Bally* 7435 (K).

TANZANIA. **T4. Buha Distr.** Kasulu, Heru Chini, 1370 m, fl. 15.iv.1931, *Rounce* 47 (K).

This subspecies probably includes the type of *T. congestiflora* Harms in Mildbraed, Wiss. Ergebn. Deutsch Zent.-Afr.-Exp. 1907-8, 2: 255 (1911), type from Ruanda, *Mildbraed* 390 (not seen, presumed destroyed at Berlin). As this name has very seldom been adopted since and the epithet would be most inappropriate for the subspecies, the races being considerably more elongate than the type of *T. nyikens*, a new epithet and new type are proposed above.

34. *Tephrosia elata* Deflers, Voy. Yemen: 130 (1889). Type: Yemen, El Mekhader, 1800 m, *Deflers* 653 (P).

CRONQUIST, in Fl. Congo Belge 5: 115 (1954), adopted a broad concept of *T. heckmanniana* Harms, including plants from eastern Congo, East Africa and Flora Zambesiaca area, with no recognition of infraspecific variants. In preparing the account for the Flora of Tropical East Africa (unpublished) GILLET has established that the plant from Arabia described by DELFERS as *T. elata* is conspecific with CRONQUIST's concept of *T. heckmanniana*. *T. elata* is in fact the earliest available specific name and must now be adopted for this species. It seems possible, however, to recognise two subspecies, each with two varieties (see map, fig. 7), distinguished in the following key:

1. Pods (35)40-60(65) mm long, with longish, \pm villous, irregular or loosely appressed hairs; stems usually strongly ridged, appressed- to spreading-pubescent; inflorescence axis usually spreading pubescent (subsp. *elata*)
 2. Stems with closely appressed hairs var. *elata*
 2. Stems with rather conspicuous, soft, spreading hairs var. *tomentella*
1. Pods (40)55-70(80) mm long, with very short, irregular, geniculate hairs; stems smooth, minutely and closely appressed-pubescent; inflorescence axis appressed-pubescent (subsp. *heckmanniana*)
 3. Stipules 0.8-1.4 mm broad; bracts 0.2-1(1.5) mm broad; calyx 4-6 mm long, the lateral teeth shorter than to about equalling the tube var. *heckmanniana*
 3. Stipules 2-2.5 mm broad; bracts c. 2 mm broad; calyx 6-8 mm long, the lateral teeth longer than the tube var. *abercornensis*

Subsp. *elata*

Stems usually strongly ridged, appressed- or spreading-pubescent. Leaflets $(1.7)2.5-6(7.5) \times (0.4)0.5-1.4(1.8)$ cm, linear-oblongate to linear-elliptic or linear-oblong, or (in var. *tomentella*) obovate; lower surface with loosely or closely appressed, longish hairs; stipules $6-12(15) \times 1-2$

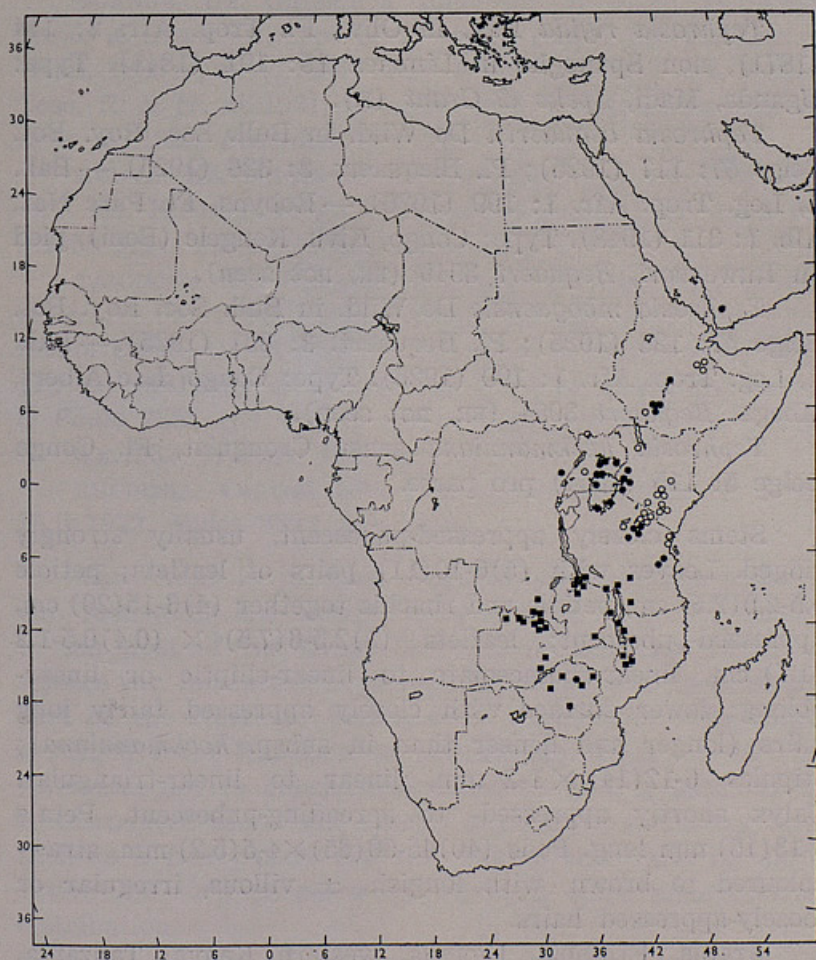


Fig. 7. — Distribution of *Tephrosia elata*.

- subsp. *elata* var. *elata*
- subsp. *elata* var. *tomentella*
- subsp. *heckmanniana* var. *heckmanniana*
- subsp. *heckmanniana* var. *abercornensis*

(2.3) mm, linear to linear-triangular. Calyx shortly appressed- to spreading-pubescent. Petals (8)9-13(16) mm long. Pods (35)40-60(65) mm long, with appressed or irregular, \pm villous hairs.

Var. **elata**

Tephrosia rigida Bak. in Oliv., Fl. Trop. Afr. 2: 114 (1871), non Spanoghe in Linnaea 15: 191 (1841). Type: Uganda, Madi, *Speke & Grant* (K).

Tephrosia bequaertii De Wild. in Bull. Soc. Roy. Bot. Belge 57: 117 (1925); Pl. Bequaert. 3: 326 (1925). — Bak. f., Leg. Trop. Afr. 1: 199 (1926). — Robyns, Fl. Parc Nat. Alb. 1: 311 (1948). Type: Congo, Kivu, Kengele (Beni), pied du Ruwenzori, *Bequaert* 3949 (BR, not seen).

Tephrosia mbogaensis De Wild. in Bull. Soc. Roy. Bot. Belge 57: 123 (1925); Pl. Bequaert. 3: 331 (1925). — Bak. f., Leg. Trop. Afr. 1: 199 (1926). Type: Congo, Lac Albert, Mboga, *Bequaert* 3084 (BR, not seen).

Tephrosia heckmanniana sensu Cronquist, Fl. Congo Belge 5: 115 (1954) pro parte.

Stems closely appressed-pubescent, usually strongly ridged. Leaves with (5)6-10(11) pairs of leaflets; petiole 0.5-2.0(2.5) cm, petiole and rhachis together (4)6-15(20) cm, appressed-pubescent; leaflets (2)2.5-6(7.5) \times (0.4)0.5-1.2 (1.7) cm, linear-oblong to linear-elliptic or linear-oblong; lower surface with closely appressed fairly long hairs (longer and denser than in subsp. *heckmanniana*); stipules 6-12(14) \times 1-2 mm, linear to linear-triangular. Calyx shortly appressed- to spreading-pubescent. Petals 9-13(15) mm long. Pods (40)45-60(65) \times 4-5(5.2) mm, straw-coloured to brown, with longish, \pm villous, irregular or loosely-appressed hairs.

Arabia, Ethiopia, Uganda, western Kenya, Tanzania, eastern Congo; also Rhodesia, probably cultivated. A representative selection of specimens seen is cited below:

YEMEN. El Mekhader, 1800 m, 3.viii.1887, *Deflers* 653 (P) — only specimen from Arabian Peninsula seen.

ETHIOPEA. **Begemdir.** Addi Arcai [Adi Arkai] to Deb-bivar, on road ascending from Tacazze crossing to Wolkefit pass, fl. 7.xi.1952, *Scott* 241 (K). **Shoa.** Adis Abeba [Addis Ababa], fl. 1.1914, *Mrs. Armbruster* (K). **Kaffa.** Giren, farm of Jimma Agricultural school, edge of coffee plantation, 1700 m, fr. 4.i.1962, *Meyer* 7909 (K).

UGANDA. **U1.** Outside a Madi Vil., fl. & fr. 14.ii.1862, *Speke & Grant* (K, type of *T. rigida* Bak.). **U2.** Ruwenzori, Wimi, 1830 m, fl. vi.1894, *Scott Elliot* 7925 (K). **U3.** Serere, Teso, fl. & fr. xii.1931, *Chandler* 249 (K). **U4.** Kampala, fl. & fr. 6.i.1922, *Snowden* 745 (K).

KENYA. **K3.** Kitale, fl. & fr. iv.1934, *Mrs. Beckley* 6317 (K). **K5.** Kisumu, rocky grassy slope above lake, fl. & fr. v.1958 *Mrs. Tweedie* 1548 (K).

TANZANIA. **T1.** Ukerewe Island or Mwanza to Musoma, fl. & fr. 9.iv.1929, *Father Conrads* EAH 10392 (K). **T2.** Mbulu Distr., Great North Road between Babati and Bonga 113 ml (181 km) S of Arusha, fl. & fr. 6.v.1962, *Polhill & Paulo* 2353 (K) **T6.** Morogoro Distr., cult. slopes, 610 m, fl. 16.x.1932, *Wallace* 129 (K).

RHODESIA. **Central Div.** Chindamora Reserve, fl. & fr. 15.iv.1922, *Eyles* 3384 (K; SRGH).

Var. *elata* is in most respects intermediate between var. *tomentella* and subsp. *heckmanniana*. It occurs mainly to the west of the Great Rift Valley, but also seems to replace var. *tomentella* in Morogoro District and the southern part of the Northern Province of Tanganyika. The single specimen from Rhodesia is undoubtedly referable to var. *elata* and not to subsp. *heckmanniana* and is assumed to be introduced there. The species is recorded as having been used as a fish poison and for making rope, and its cultivation for such purposes may explain some anomalies of distribution.

Var. *tomentella* Brummitt, var. nov.

Caules pilis mollibus patentibus conspicue dense pubescentes ad tomentelli, plerumque striati. Folia 4-10-jugata; petiolus 0.2-1.0 (1.7) cm, petiolus et rhachis coniunctim

(2.5)4-13 cm, ut in caulibus pubescentes; foliola (1.7)2.5-6 (7.5) × (0.5)0.8-1.4(1.8) cm, obovata ad lineare-oblongata vel lineare-elliptica; pagina inferior pilis longis saepe sericeis arte ad laxe appresse-pubescentibus; stipulae (6)8-12(15) × 1-2(2.3) mm lineare-triangulares. Calyx pilis mollibus patentibus breviter pubescens. Petala (8)9-13(16) mm longa. Legumina (35)40-58 (65) × 4-5(5.5), brunnea, pilis irregularibus vel laxe appressis villosa.

Typus: Kenya, N-E slopes of Kilimanjaro, Laitokitok, 1765 m, edge of forest in high grass, fl. & fr. 28.viii.1956, *Bally* 10698 (K, holotypus).

Ethiopia, southern Sudan, Kenya, north-eastern Tanzania. A representative selection of specimens is cited below:

ETHIOPIA. **Harar.** Mulka jibri, 9° 24' N, 42° 16' E, 1645 m, fl. 21.ii.1933, *Gillett* 5103 (K). **Kaffa.** Near Gojeb River bridge, Bonga road, 7° 25' N, 36° 26' E, 1100 m, fr. 2.i.1962, *Meyer* 7901 (K).

SUDAN. [cult. at Bell, Md., U. S. A., from seeds from] Nimule, 22.vii.1920, *Shantz* 1316 (K).

UGANDA. **U4.** Kabamiro, Mubende, fl. & fr. 17.x.1945, *Thomas* 4322 (K).

KENYA. **K1.** Kuwalath, Lodwar Area, fl. & fr. 27.ix.1963, *Paulo* 1052 (K). **K4.** Lukenya, near Nairobi, 1525 m, fr. 22.viii.1953, *Bally* 9054 (K). **K6.** Oloibortoto about 25 miles W of Lake Magadi in the foothills of the Nguruman Escarpment, river bed, 850 m, fr. 6.viii.1962, *Glover & Samuel* 3260 (K).

TANZANIA. **T2.** Kilimanjaro, Alt Marchi, fl. 10.ii.1914, *Peter* 51980 (K). **T3.** Muhesa, *Zimmermann* 5798 (K).

Var. *tomentella* is found mainly to the east of the Great Rift Valley, though *Meyer* 7901, *Thomas* 4322 and *Shantz* 1316, cited above, in particular are from further west where var. *elata* would be expected. These apparent anomalies of distribution suggest that varietal rank (as adopted here) is preferable to subspecific rank, though it is possible that cultivation of this plant has now obscured its natural distribution pattern.

A specimen from north-western Tanzania, Buha Distr. Gombe Stream Reserve, valley forest, 800 m, fl. 23.iii.1969, *Pirozynski* 585 (K), has conspicuous spreading or ascending hairs, so more or less resembling subsp. *tomentella*, but it differs rather strikingly in its more or less elliptic leaflets up to 1.8 cm broad and is exceptional in the species in its very long peduncles up to 23 cm and stipules up to 3.5 mm broad.

Subsp. *heckmanniana* (Harms) Brummitt, comb. et stat. nov.

Basionym: *Tephrosia heckmanniana* Harms in Engl., Bot. Jahrb. 30: 326 (1901). — Bak. f., Leg. Trop. Afr. 1: 196 (1926). — Brenan, Check List Tr. Shr. Brit. Emp., 5., Tang. Terr.: 445 (1949). — Cronquist, Fl. Congo Belge 5: 115 (1954) pro parte. — Torre in Consp. Fl. Angol. 3: 156 (1962). Type: Tanzania, Njombe Distr., 'Kondeland, Ukangu-Berg', *Goetze* 889 (K, isotype).

Tephrosia emarginato-folilata De Wild., Pl. Bequaert. 3: 328 (1925). Type: Congo, Katanga, near Elisabethville, *De Giorgi* (BR, not seen; K, fotogr.).

Tephrosia multinervis Bak. f., Leg. Trop. Afr. 1: 201 (1926). Type: Congo, Katanga, Kundelungu Mt., *Kassner* 2736 (K, isotype).

Var. *heckmanniana*

Stems minutely appressed-pubescent, usually not or only slightly ridged. Leaves with (5)6-10(14) pairs of leaflets; petiole (0.5)1.0-2.6(4.5) cm, petiole and rhachis together (5)8-15(21) cm, minutely appressed-pubescent; leaflets (2.5)3-6(7.5) × (0.6)0.8-1.7(2.5) cm, oblanceolate or elliptic to linear-elliptic; lower surface shortly and thinly closely appressed-pubescent; stipules (6)9-16 × (0.5)0.8-1.4 mm, linear. Bracts (4)6-11 × 0.2-1(1.5) mm, linear. Calyx shortly and closely appressed-pubescent, the lateral teeth shorter than to about equalling the tube. Petals (10)12-15(18) mm long; standard truncate to cordate at the base. Pods (40)55-70(80) × 4-5(5.2) mm, pale straw-coloured, with very short irregular usually geniculate hairs.

South-western Tanzania, south-eastern Congo, Zambia, Rhodesia, Malawi, northern Mozambique, Angola. Representative specimens only are cited below:

CONGO. Katanga. Binga, fl. 15.iii.1908, *Kassner* 2626 (K). Kundelungu Mt., fl. 14.v.1908, *Kassner* 2736 (K). Near Elisabethville, Valle de la Lubumbashi, fl. 9.iii.1926, *Robyns* 1608 (K). Kisanga, fl. 22.ii.1927, *Quarre* 172 (BR). Keyberg, fr. 19.iii.1947, *Schmitz* 364 (K). Keyberg-Kisanga, fl. 21.ii.1957, *Detilleux* 565 (BR).

TANZANIA. T7. Mbeya Distr., Great North Road between Igawa and Chamala, 163 miles (261 km) S of Iringa, fl. & fr. 2.iv.1962, *Polhill & Paulo* 1985 (K). **T8.** Songea Distr., about 1.5 km W of Ruanda turn off at foot of Mkuanga Hill, 900 m, fl. 11.iv.1956, *Milne-Redhead & Taylor* 9611 (K).

ZAMBIA. Northern Prov. Abercorn Distr., Ndundu, road outside drive, 1740 m, fl. 22.ii.1959, *Mrs. Richards* 10970 (K). **Western Prov.** Ndola, fl. & fr. 13.iii.1954, *Fanshawe* 953 (COI; K). **Central Prov.** Lusaka Distr., 8 km E of Lusaka, fl. 8.ii.1957, *Noah* 95 (SRGH). **Eastern Prov.** Lunkwakwa Valley, fl. 23.iii.1955, *Exell, Mendonça & Wild* 1143 (BM; LISC; SRGH). **Southern Prov.** Gwembe Distr., Zambesi escarpment, 50 miles (80 km) from Mochipapa, fl. & fr. 13.iii.1962, *Astle* 1509 (K; SRGH).

RHODESIA. Northern Div. Gokwe Distr., near the source of the Guy river in *Brachystegia tamarindoides*, fr. 28.iii.1962, *Bingham* 203 (K; LISC; SRGH). **Central Div.** Salisbury Distr., Rumani, fl. & fr. 22.ii.1952, *Wild* 3762 (K; SRGH). **Eastern Div.** Melsetter Distr., Junction Tea Room, Cashel Road, fl. & fr. 31.i.1963, *Lady Drewe* 86 (SRGH). **Southern Div.** Buhera, fl. 7.ii.1954, *Mrs. Masterson* 37 (SRGH).

MALAWI. Without locality, *Buchanan* 361, 1128, 1129 (K). **Northern Prov.** Likoma Island, Lake Nyasa, *Archdeacon Johnson* 14, comm. *Riddelsdell* (K). **Southern Prov.** Mlanje, fl. & fr. 21.iii.1958, *Chapman* 540 (K; PRE).

MOZAMBIQUE. Niassa. Mandimba, fl. 14.v.1948, *Pedro & Pedrógão* 3426, 3428 (LMJ). **Zambézia.** 16 km SW of Gurué, fr. 7.vii.1942, *A. J. W. Hornby* 1162 (PRE).

A single collection has been seen with spreading pubescence, apparently otherwise typical of subsp. *heckmanniana*: ZAMBIA. **Western Prov.** Lwano FR, Chingola, fl. & fr. 13.iii.1961, *Mutimushi* 114 (SRGH).

Var. **abercornensis** Brummitt, var. nov.

Stipulae 2-2.5 mm latae. Bracteae 7-9 × c. 2 mm, anguste lanceolatae. Calyx 6-8 mm longus; dentes laterales tubum parum excedentes, dens inferior tubum valde excedens. Petala 15-16 mm longa; vexillum basi plus minusve cuneatum.

Typus: Zambia, Abercorn Distr., steep path from Chisungu home to Firebreak, fl. 14.iv.1952, *Mrs. Richards* 1470 (K, holotypus).

Known only from Abercorn District. Other specimens seen:

ZAMBIA. **Northern Prov.** Nindi Still, Chilongowelo, 10.iv.1952, *Mrs. Richards* 1375 (K). Kloof D'hulmiti, 1525 m, fl. & fr. 6.v.1955, *Mrs. Richards* 5554 (K). Chilongowelo, woodland below escarpment, 1440 m, fl. 12.iv.1963, *Mrs. Richards* 18075 (K).

These specimens from Abercorn District referred to var. *abercornensis* appear to be referable to *T. elata* subsp. *heckmanniana*, but in their broader stipules and bracts and longer calyx teeth they tend towards *T. nyikensis*. The latter is known from mountains of Malawi and southern Tanzania (see above) but has not been recorded from Zambia. It is possible, however, that it may have occurred in Abercorn District and that plants here referred to var. *abercornensis* represent the result of introgression between *T. nyikensis* and *T. elata* subsp. *heckmanniana*.

A specimen from Mozambique, **Tete**; Moatize, 65 km from Vila Coutinho towards Zóbuè, fl. & fr. 10.iii.1964, *Torre & Paiva* 11123 (LISC), is probably also referable to *T. elata* subsp. *heckmanniana*, but has conspicuously longer

peduncles (up to 24 cm), broad stipules (2.5 mm) and broader pods (70 × 6 mm). Another from Mozambique, Niassa; Malema Distr., Murralelo, propriedade dos Morgados, foot of serra Inago, fl. 19.iii.1964, Torre & Paiva 11252 (LISC) appears to be very similar. Further collections from Mozambique are required.

T. kasikiensis has hitherto been thought to be restricted to the eastern Congo. It seems, however, that a number of specimens which have been identified with *T. sengaensis* Bak. f. from Zambia and south-western Tanzania are best referred here rather than to *T. sengaensis*. The two species are contrasted below.

<i>T. sengaensis</i>	<i>T. kasikiensis</i>
Perennial, probably with a stout woody stock.	Probably annual or perhaps sometimes biennial.
Stems weak, procumbent to ascending, often trailing or hanging over rocks.	Stems robust, erect, 1-2.3 m high.
Leaf petiole and rhachis together 2.5-7 cm.	Leaf petiole and rhachis together (4)5-12.5 cm.
Leaflets 1-2.2 × 0.2-0.6 cm.	Leaflets (1.5)2-5 × (0.4)0.8-1.5 cm.
Upper calyx teeth about 2 mm long, free from each other for 1-1.3 mm.	Upper calyx teeth very short, represented only by a pair of mucros 0.2-0.5 mm long.

35. **Tephrosia sengaensis** Bak. f., Leg. Trop. Afr. 1: 192 (1962). — Cronquist, Fl. Congo Belge 5: 105 (1954).
Type: Congo, Mt. Senga, Kassner 2983 (BM, holotype; K, isotype).

This species seems to be closely allied to *T. iringae* Bak. f. which has a similar procumbent, perennial habit and is confined to southern Tanzania. [The latter species was misunderstood by Cronquist, Fl. Congo Belge 5: 105 (1954) whose reference to Mozambique in the distribution was apparently based on specimens of *T. reptans* var. *microfoliata* (Faulkner 151, 226)]. The following specimens of *T. sengaensis* have been seen:

CONGO. **Katanga**: Mt. Senga, west of Baudouinville, fl. 15.v.1908, *Kassner* 2983 (BM; K — types).

TANZANIA. **T4. Ufipa Distr.**: Ilemba, alt. 2100 m, creeping and hanging over rocks on side of mountain, fl. & fr. 18.iii.1957, *Richards* 8811 (K); Nsanga Mts., Malonje Plateau, growing on rocks, a low bushy creeping plant, fl. 13.iii.1959, *Richards* 11199 (K).

A further specimen appears to match the above collections of *T. sengaensis* though it is described by the collector as a 'herb, \pm 4' (130 cm), yellow': Summit of Ufipa Range near Sumbawanga, fl. & fr. 23.v.1936, *Webb* 122 (K).

36. ***Tephrosia kasikiensis*** Bak. f. in Rev. Zool. Bot. Afr. 21(4): 301 (1932). — De Wild. & Staner, Contr. Fl. Katanga, suppl. 4: 24 (1932). — Cronquist, Fl. Congo Belge 5: 116 (1954), pro parte, excl. spec. *Ritschard*. Type: Congo, Haut Katanga, Kasiki, *de Witte* 382 (BM).

T. kasikiensis, as here defined, shows considerable variation and may well be divisible into several subspecies. Here one very striking geographically isolated variant is described as a new subspecies, but it seems desirable to have more material available before other taxa can be satisfactorily defined.

Subsp. ***chinsaliana*** Brummitt, subsp. nov.

Caules conspicue patenter griseo-pubescentes. Flores in capitula densa ad 2 cm longa aggregati.

Typus: Zambia, N. Prov., Chinsali Distr., Shiwa Ngandu, fl. 5.vi.1956, *Robinson* 1609 (K, holotypus; SRGH, isotypus: — shrub 7' (2.3 m) tall, fls. bright purple).

Known only from the type collection.

Although the capitulate inflorescence is strikingly different from the racemes of other plants referred to this species, no significant difference can be found in the leaves or flowers, and it seems best at the moment to adopt sub-specific rather than specific rank.

Other specimens of *T. kasikiensis* have stems appressed- or sometimes shortly spreading-pubescent, and flowers in racemes 8-16 (24) cm long. They appear to fall into three groups which may perhaps be subspecifically distinct.

Group a. Middle and lower stems closely appressed-pubescent or sparsely spreading-pubescent, the peduncles and inflorescence axes spreading pubescent. Petiole 8-15 (20) mm. Leaflets up to 8 mm broad, the secondary veins not prominent. Pedicel and calyx grey-pubescent, standard light brown-pubescent. Racemes dense. Lateral calyx teeth subacute to subobtuse, upper teeth c. 0.1 mm.

CONGO. Katanga: Kasisi, fl. vi.1931, *de Witte* 381 (BM); 382 (BM, holotype); 450 (BM).

Group b. Stems, peduncles and inflorescence axes shortly appressed-pubescent. Petiole (20)24-45(50) mm. Leaflets 9-14 mm broad, the secondary veins not prominent. Pubescence on pedicel, calyx, standard and pods dark chocolate brown. Racemes dense. Lateral calyx teeth strongly acute; upper teeth 0.1-0.2 mm.

TANZANIA. T4. Ufipa Distr.: Mbizi, 2100 m, fl. & young fr. 6.vii.1957 *Whellan* 1313 (K; SRGH); Nsanga Forest, 1800 m, fl. & fr. 6.viii.1960, *Richards* 12957 (K; SRGH); Mbisi Forest, 2100 m, fl. & fr. 11.vii.1960, *Richards* 13072 (K).

ZAMBIA. Northern Prov.: Abercorn Distr., Ndundu, 1740 m, fl. & fr. 6.v.1959, *Richards* 11370 (K).

Group c. Stems, peduncles and inflorescence axes appressed- or spreading-pubescent. Petiole (16)20-35 mm. Leaflets 6-14(16) mm broad, the primary and secondary veins prominent on both upper and lower surfaces. Pubescence on pedicels, calyx, standard and pods light brown to grey. Lateral calyx teeth strongly acute; upper teeth c. 0.5 mm.

ZAMBIA. Northern Prov.: Kawambwa, fl. & fr. 26.viii.1957, *Fanshawe* 3644 (K); Luwingu, fl. & young fr. 7.v.1958, *Fanshawe* 4423 (K). Western Prov.: Chingola, fl. & fr. 25.viii.1954, *Fanshawe* 1483 (K).

37. **Tephrosia punctata** J. B. Gillett in Kew Bull. 13: 126 (1958). Type: Zambia, Abercorn, *Bullock* 3792 (κ).

Subsp. **punctata**

Plant usually with copious ascending axillary inflorescences forming a pseudopanicule, producing abundant flowers. Leaf petiole and rhachis together 4-6.5(11) cm long; leaflets (3)4-7(10) mm broad.

Now known from numerous collections from Abercorn Distr., Zambia, and from Sumbawanga in S. W. Tanzania.

Subsp. **redheadii** Brummitt, subsp. nov.

Planta parce ramosa racemis axillaribus laxis minus floriferis quam in subsp. *punctata*. Folia petiolus et rhachis coniunctim 5-9 cm longi; foliola (5)8-12(14) mm lata.

Holotypus: Zambia, Mwinilunga Distr., just S. of Matonchi Farm, *Milne-Redhead* 4636 (κ).

Known from Kasama Distr., northern Zambia, through Katanga to Mwinilunga Distr. to western Zambia.

ZAMBIA. **Northern Prov.:** Kasama Distr., Chishimba Falls, *Brachystegia* woodland, fr. 20.v.1962, *Robinson* 5189 (κ; SRGH). Kasama Distr., Mungwi, *Brachystegia* woodland in escarpment valley, fl. & fr. 14.iii.1962, *Robinson* 5017 (κ; SRGH). **Western Prov.:** Mwinilunga Distr., just S. of Matonchi Farm, in *Brachystegia* woodland, fl. 19.ii.1938, *Milne-Redhead* 4636 (κ, holotype).

CONGO. **Katanga:** 12 km au N. W. d'Elisabethville, fl. & fr. 2.iv.1958, *Gathy* (κ).

This subspecies is named after Mr. E. MILNE-REDHEAD, Kew, whose pioneer collections in western Zambia between 1930 and 1938 contributed so much to our knowledge of the Flora of the area.

Group 7. **TEPHROSIA AEQUILATA, T. GRAN-**
DIBRACTEATA AND ALLIED SPECIES

These are shrubby, barbistyled species with usually compact inflorescences and often very conspicuous broad bracts, and with densely pubescent to villous pods. Apart from *T. aequilata* they are mostly confined to higher mountain areas of the Flora Zambesiaca area.

1. Bracts up to 3(4) mm broad, linear-lanceolate to ovate
 2. Leaves with 4-6 pairs of leaflets; young stems, leaf rachides, bracts and calyces with appressed grey hairs 39. *T. robinsoniana*
 2. Leaves with 6-14 pairs of leaflets; young stems, leaf rachides, bracts and calyces tomentose to villous with at least some hairs spreading and usually brown
 3. Young stems and leaf rachides shortly brown-tomentose; pods 70-80 × 7 mm, brown-tomentose 41. *T. montana*
 3. Young stems and leaf rachides not shortly brown-tomentose, though often with long villous brown hairs; pods 26-60 × 5-7 mm, appressed pubescent to villous
 4. Inflorescences fairly lax, with several distinct nodes clearly visible; bracts and stipules quickly caducous 40. *T. whyteana*
 4. Inflorescences very crowded, the separate nodes not easily visible; bracts and stipules persistent 38. *T. aequilata*
1. Bracts 4-13 mm broad, obtriangular or broadly elliptic to suborbicular-acuminate, or sometimes ovate
 5. Young stems, leaf rachides and bracts clothed with short, fine, closely appressed, golden-brown hairs; pods closely appressed-pubescent 45. *T. grandibracteata*
 5. Young stems, leaf rachides and bracts variously densely pubescent to tomentose, but not with short, fine, closely appressed, golden-brown hairs; pods (as far as known) tomentose to villous
 6. Bracts and calyces villous with long, spreading hairs; two upper calyx teeth free for most of their length 44. *T. chimanimaniana*
 6. Bracts and calyces shortly tomentose; two upper calyx teeth connate for most of their length to form a broad triangle
 7. Bracts broadly obtriangular and slightly apiculate; calyx 6-9 mm; petals 21-22 mm; pods 72-78 × 7-8 mm, shortly brown-tomentose 42. *T. praecana*

5. Leaflets often glabrous or glabrescent above, whitish grey beneath; flowers (10)12-16 mm; standard truncate at the base subsp. *aequilata*
5. Leaflets appressed-pubescent above, grey-green and often subsericeous beneath; flowers 17-20 mm; standard cuneate at the base subsp. *mlanjeana*

Subsp. *aequilata*

Young stem greyish-tomentose or -villous, often with long spreading hairs intermixed with shorter tomentum. Leaves with 7-11 pairs of leaflets; indumentum of petiole and rhachis similar to that of the stem; leaflets up to 42(50) × 13(17) mm, the upper surface usually glabrous or fairly quickly glabrescent, the lower surface densely whitish- or greyish- appressed-pubescent but usually not subsericeous; stipules 2-5(8) mm broad. Bracts 4-9 × 1-3 mm, ovate-acuminate; pedicels 3-10(13) mm, greyish-tomentose to -villous. Calyx (5)7-11 mm, ascending- to spreading- grey-villous. Petals (9)11-16 mm; standard truncate at the base. Pods (26)28-40(46) × 5-7 mm, villous.

Var. *aequilata*

Stems pubescent to tomentose or villous with hairs up to about 1.5 mm long. Stipules 2-4(5) mm broad.

Southern Uganda, Kenya, eastern Congo, Tanzania, northern Zambia and northern Mozambique.

The following have been seen from Flora Zambesiaca area:

ZAMBIA. **Northern Prov.**, Abercorn Distr., upper end Lake Chila, fl. 9.iii.1952, *Richards* 1009 (K). Firebreak above Chilongwelo, fl. 3.iv.1952, *Richards* 1257 (K). Lake Chila, fl. & fr. 23.v.1952, *Richards* 182 (K). Sunzu Hill, st. 18.xi.1952, *Angus* 793A (FHO). Near source of Lunzua R., Lunzua Agr. Coll., fl. & young fr. 25.iii.1955, *Richards* 5141 (K). Without precise locality, *Richards* 5651A (K). Itembwe Gorge, fl. 24.iv.1959, *McCallum Webster* 917, *Richards* 11333 (K; SRGH). Ningi Pans, fl. 12.iii.1960, *Richards* 12725 (K). Sumbawanga Road 5 mls. from Kawimbe, fl. & fr. 8.vi.1961, *Richards* 15229 (K; SRGH).

MALAWI. **Northern Prov.** Vipya, top of hill above Rumpi Drift, fl. 24.vi.1960, *Chapman* 783 (FHO; SRGH).

MOZAMBIQUE. **Niassa:** Massangulo Mountain, 41 miles N. of Mandimba, fl. 26.v.1961, *Leach & Rutherford-Smith* 11040 (K; LISC; SRGH).

The specimens cited above from Malawi and Mozambique differ somewhat from specimens from Abercorn Distr., having a more compact branching, smaller leaflets [up to 22(27) mm] and rather denser heads with smaller flowers (calyx 5-8 mm, petals 9-12 mm). However, they are matched by some plants from Tanganyika where all intermediates occur, and formal taxonomic separation seems undesirable.

Var. **meyeri-johannis** (Taub.) Brummitt, stat. nov.

Basionym: *Tephrosia meyeri-johannis* Taub. in Engl., Hochgebirgsfl. Trop. Afr.: 260 (1892). Type: Tanzania, Kilimanjaro, *Meyer* 39 (B †, not seen).

Growth of young stems more robust than in var. *aequilata*. Stems with a close indumentum of dense grey hairs overlaid by conspicuous villous dark brown hairs mostly 2-3 mm long. Stipules (4)5-8 mm broad.

This variety is apparently confined to Kilimanjaro, N. E. Tanzania, though plants from the nearby Pare Mountains of Tanzania and Teita Hills of adjacent Kenya approach it.

TANZANIA. **T2. Moshi Distr.** Kilimanjaro, fl. viii.1871, *Kirk* s. n. (K). Upare Country, fl. & fr. 1925, *Haarer* s. n. (K). Kilimanjaro, fl. vi.1927, *Haarer* 542 (K). Kilimanjaro, between Umbwe and Weru Rivers, fl. 1.ix.1932, *Greenway* 3227 (K). Machame Nkuu, Kilimanjaro Forest Reserve, fr. xi.1960, *Steele* 115 (K).

Subsp. **nyasae** (Bak. f.) Brummitt, stat. nov.

Basionym: *Tephrosia nyasae* Bak. f. in Trans. Linn. Soc., Bot., ser. 2, 4: 9 (1894). Type: Nyasaland, without precise locality, *Buchanan* 51 (K).

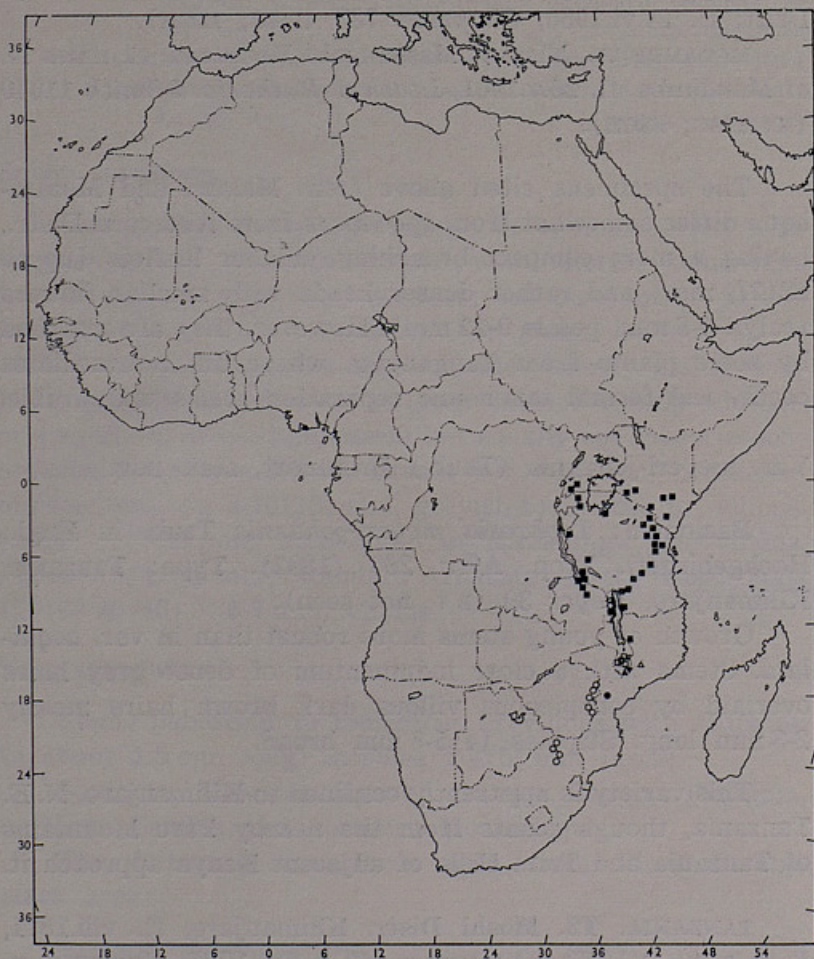


Fig. 8. — Distribution of *Tephrosia aequilata*.

- subsp. *aequilata*
- subsp. *nyasae*
- ▲ subsp. *mlanjeana*
- △ subsp. *namuliana*
- subsp. *gorongosana*
- subsp. *australis*

Tephrosia zombensis Bak. in Kew Bull. 1897: 257 (1897).
Type: Mt. Zomba, Whyte 394 (K).

Young stem rather shortly appressed- to ascending-tomentose, greyish, without longer spreading hairs. Leaves with (6)7-9 pairs of leaflets; indumentum of petiole and rhachis similar to that of young stem; leaflets up to 45(52) × 18(20) mm, the upper surface appressed-pubescent, the lower surface densely greenish-grey appressed-pubescent and sub-sericeous; stipules 3-4.5 mm broad. Bracts 5-7(10) × 2-3 mm, ovate-acuminate; pedicels 5-8 mm, appressed- to ascending-grey-tomentose or rarely somewhat villous. Calyx 7-10 mm, appressed- to ascending grey-tomentose to -villous. Petals (14)16-20 mm; standard cuneate at the base. Pods 32-40 × 5-6 mm.

Apparently restricted to the Zomba Plateau and Shire Highlands of southern Malawi, possibly also on the Vipya Plateau of northern Malawi.

MALAWI. Southern Prov.: Zomba, 1830-2135 m, fl. & fr. ix.1859, Kirk (K). Shire Highlands, fl. vii.1885, Buchanan (K). Without locality, fl. 1891, Buchanan 1480 (K). Without locality, fl. & fr. 1891, Buchanan 51 (K, type). Zomba, fl. 1901, Sharpe 169 (K). Shire Highlands, fl. c. 1906, Adamson 251 (K). Zomba Mt., fl. & fr. x.1929, Clements 18 (FHO). Zomba Plateau Descent, fl. & fr. 31.viii.1946, Gouveia & Pedro 1978 (LMJ; PRE). Zomba Plateau, 1500 m, fl. & fr. 2.vi.1946, Brass 16154 (K; PRE; SRGH). Zomba, near top of road to plateau, fl. & fr. 3.viii.1960, Leach 10389 (K; LISC; SRGH). Zomba Mt., path to Cingwe's Hole, fl. 22.vi.1961, Chapman 1396 (FHO; K; SRGH).

A collection from Malawi, N. Prov., Vipya Mountains, Luwawa, fl. 21.ii.1962, Chapman 1604 (SRGH) is probably also best referred to subsp. *nyasae* but more material from this area is required. The type of *Tephrosia zombensis* Bak. is referred to this subspecies but has longer, more spreading pubescence on stem and rhachis than is usual.

Subsp. **mlanjeana** Brummitt, subsp. nov.

Caules juveniles pilis longis patentibus in tomento breve interspersis, pilis omnis plerumque brunneis. Folia 6-8(9)-foliolata; indumentum petioli et rhachidis ut in caule; foliola ad 38×20 mm; pagina superior appresso-pubescent, pagina inferior dense viridi-griseo- appresso-pubescent, plerumque subsericea; stipulae 3-4 mm latae. Bracteae $4-9 \times 2-4$ mm, ovatae ad obovato-acuminatae; pedicelli 5-12 mm, griseo-villosi. Calyx 7-12 mm, caesio-villosus. Petala 17-20 mm; vexillum basi cuneatum. Legumina non satis nota.

Typus: Malawi, Mt. Mlanje, Tuchila Plateau, 1830 m, fl. & fr. 25.vii.1956, *Newman & Whitmore* 198 (BM, holotypus; SRGH, PRE isotypi).

Known only from Mlanje Mountain in southern Malawi. Other specimens seen:

MALAWI. **Southern Prov.** Mlange, Tuchila Plateau, 1525 m, viii.1901, *Purves* 78 (K). Mlanje Mt., Chipalombe Shelf, 2135 m, fl. 15.v.1958, *Chapman* 569 (FHO; K; PRE).

A further collection from Mlanje — L. Ruo Plateau, 1950 m, fl. 4.viii.1956, *Newman & Whitmore* 323 (BM; SRGH) differs conspicuously in its abundant long golden-brown hairs on stem, petiole and rhachis, leaflet under-surface, bracts and calyces, and also in its glabrous or quickly glabrescent leaflet upper surface, longer calyx (14 mm) and broader stipules (4-5 mm). Further collections are required.

Subsp. **namuliana** Brummitt, subsp. nov.

Caules juveniles pilis brunneis longis patentibus in tomento griseo breve interspersis. Folia (7)10-13-foliolata; indumentum petioli et rhachidis ut caulis pilis omnis brunneis; foliola ad $52 \times 17(20)$ mm, pagina superior appresso-pubescent vel glabrescent, pagina inferior plus minusve tenuiter pubescent, viridis, non sericea; stipulae 4-5 mm latae. Bracteae $5-7 \times 1-2.5$ mm, ovato-acuminatae ad anguste triangulares; pedicelli 8-20 mm, longe caesio-villosi. Calyx 7-10 mm, griseo-villosus (vel brunneo-). Petala 17-24 mm; vexillum basi late cuneatum ad truncatum. Legumina matura ignota.

Typus: Mozambique, Zambézia, Namuli Peaks, W. face, 1525 m, fl. 26.vii.1962, *Leach & Schelpe* 11471 (κ, holotypus; SRGH, isotypus).

Apparently found only on Namuli Peaks, Gúruè Distr., Mozambique. Other specimens seen:

MOZAMBIQUE. **Zambézia**. Pico Namuli, fl. without date, *Mendonça* 2290 (LISC). Picos Namuli, fl. 11.viii.1949, *Andrada* 1840 (COI; LISC).

Subsp. **gorongosana** Brummitt, subsp. nov.

Caules juveniles breviter appresso- vel ascenderent tomentosi pilis griseis, sine pilis longis patentis. Folia 5-7-foliolata; indumentum petioli et rhachidis ut in caule; foliola ad 40×17 mm, pagina superior juventute appresso-pubescentis, pagina inferior tenuiter appresso-pubescentis, viridis, non sericea; stipulae 2-3 mm latae. Bractee 4-5 \times 2-3 mm, ovato-acuminatae; pedicelli c. 5 mm, plus minusve breviter ascenderent griseo-vel brunneo-pubescentes. Calyx c. 6-7 mm pilis griseis et brunneis ascendentibus. Petala c. 18 mm. Legumina ad $40-45 \times$ c. 6 mm, appresso-pubescentes.

Typus: Mozambique, Manica e Sofala, Gorongosa, serra de Gorongosa, 1000 m, fl. & young fr. 6.v.1964, *Torre & Pava* 12305 (LISC, holotypus).

Known only from Gorongosa. One other specimen seen:

MOZAMBIQUE. **Manica e Sofala**. Gorongosa Mts. near Morombosi Falls, fr. 13.ix.1946, *Pedro & Pedrógão* 182 (LMJ; PRE).

Two further collections from the Gorongosa Mountains Gorongosa, fl. & fr. 1884-1885, *Carvalho* (COI — as *T. aequilata* Bak. var. *grandiflora*) and serra de Nhandete, fr. 15.x.1946, *Simão* 1091 (LISC), differ markedly from subsp. *gorongosana* and may represent a further new taxon. They have more or less both long and short brown hairs on stem and leaf-rhachis, brown-villous strongly persistent lanceolate bracts, grey-villous pedicels and calyx, and brown-

villous pods up to 45 mm long. Further collections from Gorongosa are required.

Subsp **australis** Brummitt, subsp. nov.

Caules juveniles ascendenter vel patenter tomentosi vel villosi pilis brunneis plerumque distincte longis cum aliis brevibus. Folia (6)7-10(11)-foliolata; petioli et rhachides breviter brunneo-tomentosi pilis longis patentibus interspersis; foliola ad $40 \times 12(15)$ mm; pagina superior appresso-pubescent, pagina inferior tenuiter ad plus minusve dense appresso-pubescent, viridis, non sericea; stipulae 1.5-4 mm latae. Bracteae (4)5-10 \times 1.5-2(2.5) mm, lanceolato-triungulares ad ovato-acuminatae; pediceli 4-6 mm, brunneo-villosi vel -tomentosi. Calyx 7-12 mm, ascendenter vel patenter brunneo-villosus. Petala 13-18 mm; vexillum basi truncatum. Legumina (20)24-30 \times 5-7 mm, patenter brunneo-villosa.

Typus: Rhodesia, Melsetter Distr., 1675 m, fl. & fr. ix.1953, *Williams* 146 (K, holotypus; PRE, SRGH, isotypi).

Mountains of eastern Rhodesia, from Inyanga to Melsetter, and the Transvaal, and apparently also on the Nyika Plateau in northern Malawi.

MALAWI. **Northern Prov.**: Nyika Plateau, 2350 m, fl. 17.viii.1946, *Brass* 17288 (K; PRE; SRGH). Nyika Plateau, Nchena-chena Spur, 1900 m, fl. & fr. 20.viii.1946, *Brass* 17361 (K; SRGH). Nyika escarpment, between 'rain' forest tongues, Nchenachena, 1980 m, fl. vii.1953, *Chapman* 104 (FHO; K).

RHODESIA. **Eastern Div.** Umtali, 1525 m, ix.1922, *Eyles* 3614 (SRGH). Stapleford, Inyanga, fl. & fr. without date, *Eyles* 7157 (K; SRGH). Inyanga Downs, 2135 m, bud iv.1935, *Gilliland* 1944 (BM; K). Melsetter Distr., Melsetter Commonage, Townlands-Sawarombi road, 1525 m, fl. & fr. 12.viii.1950, *Crook* 68 (K; SRGH). Melsetter Sub-Station, fl. 22.v.1953, *West* 3317 (SRGH). Melsetter Distr., 1675 m, fl. & fr. ix.1953, *Williams* 146 (K; PRE; SRGH — types). Melsetter Distr., Chimanimani Mountains, Long Gully, 1260 m, fl. 18.v.1958, *West* 3618 (SRGH).

SOUTH AFRICA. **Transvaal.** New Agatha, Tzaneen, fl. & fr. vi.1916, *Rogers* 18886 (κ). Zoutpansberg, Pepiti Falls, fr. viii.1930, *Hutchinson & Gillett* 4342 (κ). De Hoek, fl. & fr. 18.vii.1935, *L. E. Taylor* 646 (κ). Zoutpansberg Distr., Entabeni Forest Res., Muchindudi Falls, fl. & fr. 5.vi.1948, *Codd* 4189 (κ). Letaba Distr., 1000 m, fl. 28.v.1958, *Scheepers* 341 (κ). Letaba Distr., Duiwelskloof, end of road first turning left after McDonald's turn off on Prov. road to Duiwelskloof, 1000 m, fr. 4.vi.1958, *Scheepers* 357 (κ).

The Nyika plants tend to have broader stipules and bracts and stem hairs more clearly differentiated into long and short, but it does not seem possible to distinguish them taxonomically from the Rhodesian and Transvaal plants.

39. **Tephrosia robinsoniana** Brummitt, sp. nov.

T. aequilatae Bak. affinis sed foliis brevioribus 4-6-jugatis, foliis inferioribus paginis ambabus dense griseo-pubescentibus, foliis superioribus pagina superiore glabris, foliolis minoribus, dentibus duobus superioribus calycis valde connatis differt.

Frutex c. 1.5 m alta. Caules juveniles appresso- vel ascendenti- griseo-pubescentes. Folia 4-6-jugata; petiolus et rhachis appresso- vel ascendenti- griseo-pubescentes, coniunctim usque ad 4 cm longi; foliola ad 20×9 mm, elliptica ad obovata, basi plus minusve anguste rotundata, apice late rotundata ad subtruncata, haec folii infimi ramulorum omnium plerumque dense paginis ambis appresso- griseo-pubescentes, haec foliorum superiorum subtus appresso-pubescentes sed supra glabra, marginibus deorsum aliquantum incurvatis; stipulae $7-8 \times 3-4$ mm, triangulares. Flores in racemis compactis quam folia superiora brevioribus; bracteae ad 5×2 mm, pedicellos florum juvenilium non occulentes; pedicelli 4-8 mm, appresso-vel ascendenti- griseo-pubescentes. Calyx c. 7 mm longus, griseo-pubescentis; dentes tubum plus minusve aequantes vel infimo parum excedente, duo superiores per maximam partem longitudinis connati, triangulum latum efformantes sed apicibus dentium ipsis liberis 0.75 mm longis arte adjacentibus. Petala 16-18 mm

longa, laete rosea. Tubus staminalis supra connatus. Ovarium appresso-pubescentis; stylus pubescens; legumen ignotum.

Typus: Zambia, Central Prov., Mkushi Distr., Fiwila, rocky hillside, 1340 m, fl. 3.i.1958, *Robinson* 2576 (K, holotypus; SRGH, isotypus). Described as a shrub, 1.5 m, flowers bright pink on inner petal-surfaces.

Known only from the type collection. The species is named after the collector, Mr. E. A. ROBINSON, who has contributed greatly to our knowledge of the Zambian Flora in recent years.

40. *Tephrosia whyteana* Bak. f. in Trans. Linn. Soc. Bot., ser. 2, 4: 9 (1894). Type: Malawi, Mt. Mlanje, *Whyte* (K).

This species is very similar to *T. aequilata* Bak. which appears to be more or less sympatric with it. *T. whyteana* is distinguished by its caducous stipules and bracts, the latter falling before the subtended flower opens, by its generally laxer inflorescence and slightly longer pods (4-6 cm). It appears to comprise two subspecies, one on Mlanje Mountain in Malawi and the other some 130 km to the north-east on the mountains of Gúruè Distr., in Mozambique.

Subsp. *whyteana*

Shrub up to 3.5 m. Inflorescence axis (from lowest flower) 3-8 cm; pedicels (7)9-15 mm, with long light brown spreading hairs. Calyx 6-9(11) mm, teeth (1)3-4(6) mm, without or with few long conspicuously spreading hairs. Petals 16-23 mm. Pods clothed with fairly dense ascending or spreading brown hairs similar to those on the stem.

MALAWI. Southern Prov.: Mt. Milanji, fl. & fr. 1891, *Whyte* s. n. (K, holotype). Mlanje Mt., 1615 m, fl. 23.ix.1929, *Burt Davy* 21983 (FHO). Mlanje Mt., fl. 24.ix.1929, *Burt Davy* 22052 (FHO). Mlanje Mountain, Luchenya Plateau, 1860 m, fl. 26.vi.1946, *Brass* 16445 (BM; K). Mlanje Mt., L. Ruo Gorge, 1830 m, fl. 28.viii.1956, *Newman & Whitmore* 616 (BM; SRGH). Mlanje, near Lichenya forestry cottage, 1920 m, fl. & fr. 12.vii.1958, *Chapman* H 712 (PRE; SRGH).

Mlanje Mt., path to Luchenya Hut, 1950 m, fl. 9.vi.1962, *Richards* 16611 (K; LISC).

The specimens cited show quite a range of variation. *Brass* 16445 has a longer calyx than others (11 mm, teeth 6 mm) with copious long spreading hairs, and approaches somewhat subsp. *gemina*.

Two further collections from Mlanje — Hills above Great Ruo Gorge, 1200 m, fl. 18.vi.1962, *Richards* 16769 (K); Ruo, fl. 1919, *Mrs. Shinn* (BM) — differ conspicuously from the specimens cited in having stem, leaf-rhachis, pedicel and calyx shortly appressed-pubescent with only few longer hairs which are also appressed and not spreading, and the calyx c. 6 mm with the teeth short (1-3 mm). *Richards* 16769 appears to have been collected at a lower altitude than the specimens referred above to subsp. *whyteana* (no altitude is given for the *Shinn* collection) and further collections may show that these represent a distinct taxon.

Subsp. *gemina* Brummitt, subsp. nov.

Frutex ad 6 m alta. Inflorescentia brevis, 1 cm in statu florifero vel ad 3 cm in statu fructifero; pedicelli 20 mm in statu florifero, ad 28 mm in statu fructifero, pilis fulvis longis praediti. Calyx 12-13 mm, dentibus 6-7 mm, pilis fulvis longis patentibus praeditus. Petala 20-24 mm. Legumina pilis appressis vel ascendentibus griseis densissime vestita.

Typus: Mozambique, Zambézia, Montes do Gúruè, fl. & fr. 20.ix.1944, *Mendonça* 2163 (LISC, holotypus).

Known only from the type collection.

41. *Tephrosia montana* Brummitt, sp. nov.

T. grandibracteatae Merxm. et *T. festinae* infra descriptae affinis, sed bracteis parvis acutis indumento brunneo breve patente differt.

Frutex ad 3 m alta. Ramuli breviter brunneo-tomentosi pilis patentibus. Folia 10-14-jugata; petiolus et rhachis breviter brunneo-tomentosi; foliola ad 38(50) × 11 mm, elliptica

ad oblonga, basi obtusa vel rotundata, apice subacuta vel obtusa, plerumque valde mucronata, marginibus sursum involutis, pagina superior glabra, pagina inferior tenuiter appresso-pubescent; stipulae 6-12 × 1-2 mm, anguste triangulares vel lineares. Inflorescentia in statu florifero compacta, quam folia superiora plus minusve brevior, in statu fructifero ad 15 cm elongata; bracteae inconspicuae, caducae, 5-6 × 1-3 mm, ovatae ad lanceolatae, apice acutae, brunneo-tomentosae; pedicelli 7-15 mm, breviter tomentosi. Calyx 7-10 mm, breviter brunneo-vel griseo-pubescent, dentes partem campanulatam aequantes, duae superiores per maximam partem longitudinis connatae, triangulum latum apicibus solum 1 mm liberis efformantes. Petala 20-24 mm longa, purpurea; vexillum basi truncatum. Ovarium appresso-pubescent; stylus pubescent; legumina 7-8 × c. 0.7 cm, juventute dense brunneo-tomentosa, in statu maturo tenuiter tomentosa.

Typus: Mozambique, Manica e Sofala, summit of Monte Vengo, Macequece, 1300 m, fl. & fr. 23.xi.1943, *Torre* 6229 (LISC, holotypus).

Known from the type and six other collections from the mountains near the border of Rhodesia and Mozambique and Gorongosa Mountains some 150 km further east.

RHODESIA. **Eastern Div.** Inyanga, forest margin, fl. & fr. viii.1920, *Eyles* 2612 (PRE; SRGH). Umtali, fl., *Eyles* 7170 (K; SRGH); Stapleford, Nyam Kombi River, fl. 8.v.1949, *Armitage* A 13/49 (SRGH). Inyanga Distr., near Nyamingura River, 970 m, fl. 24.iv.1958, *Phipps* 1236 (K; PRE; SRGH). Inyanga Distr., Inyanga Estates, 1645 m, fl. 14.vi.1958, *Seagrief* 3034 (SRGH).

MOZAMBIQUE. **Manica e Sofala.** Gorongosa, Serra de Nhan-dete, fr. 15.x.1946, *Simão* 1107 (LISC).

T. montana differs from *T. grandibracteata* and *T. festina* in its smaller, ovate to lanceolate, acute bracts, and its short spreading brown tomentum. It appears to occur sympatrically with both of these species in the Inyanga

District and more information is required as to its distribution, ecology and range of morphological variation.

42. *Tephrosia praecana* Brummitt, sp. nov.

T. festinae infra descriptae affinis sed forma bractearum, magnitudine calycis et petalorum, et magnitudine et indumento leguminum differt; *T. montanae* supra descriptae etiam affinis sed numero foliolorum et forma bractearum differt.

Frutex vel arbuscula. Ramuli pilis griseis vel griseo-brunneis breviter tomentosi. Folia (4)6-8-jugata; petiolus et rhachis coniunctim 6-9 cm, ut ramuli tomentosi; foliola ad 38×10 mm, elliptica vel oblonga, basi plus minusve rotundata, apice obtusa ad subacuta, marginibus sursum aliquantum involutis; pagina superior glabra, pagina inferior appresso-pubescentis; stipulae $8-10 \times 1-3.5$ mm, falcato-triangulares. Inflorescentia in statu florifero compacta, subglobosa, quam folia superiora brevior, in statu fructifero elongata; bractee magnae, conspicuae sed caducae, ad 6×10 mm, late obtriangulares, vix apiculatae, dense et breviter griseo- vel brunneo-tomentosae. Calyx 6-9 mm, ut bractee tomentosus; dentes partem campanulatam aequantes vel minores, duo superiores omnino vel per magnam partem longitudinis connati, triangulum latum obtusum integrum vel apicibus tantum per 0.75 mm liberis formantes. Petala 21-22 mm longa, caeruleo-purpurata; vexillum basi cuneatum. Tubus staminalis c. 16 mm longus, supra connatus. Ovarium appresso-pubescentis; stylus pubescens; legumina $72-78 \times 7-8$ mm, breviter brunneo-tomentosa.

Holotypus: Rhodesia, E. Div., Mount Pene or 'Singwekwe', 2135 m, fl. & fr. 12-14.x.1908, *Swynnerton* 6176 (BM).

Known from only the type and one other collection:

MOZAMBIQUE. **Manica e Sofala.** Monte Chiroso, Mavita, fl. 26.x.1944, *Mendonça* 2634 (LISC).

The holotype is described as a small shrub, while *Mendonça* 2634 is said to be a small tree ('pequena árvore'). SWYNNERTON's specimen was not assigned to a species by

E. G. BAKER and not mentioned in the account of SWYNERTON's collections in *Journ. Linn. Soc.* **40** (1911), although it is a fairly good specimen with flowers and fruit. It was later labelled in pencil as *T. whyteana* Bak. f. but left among indetermined *Tephrosia* material at the British Museum.

43. *Tephrosia festina* Brummitt, sp. nov.

T. grandibracteatae Merxm. affinis sed bracteis acuminato-orbicularibus dense griseo- vel brunnes-tomentosis, ramulis et rhachidibus etiam dense griseo- vel brunneo-tomentosis, et floribus minoribus differt (vide etiam *T. montanam* et *T. praecanam*).

Frutex ad 5 m altus. Ramuli breviter griseo- vel brunneo-tomentosi. Folia 7-11-jugata; petiolus et rhachis ut ramuli tomentosi; foliola et stipulae iis *T. praecanae* (vide supra) similes. Inflorescentia in statu florifero compacta, subglobosa, quam foliola brevior, in statu fructifero ad 10 cm elongata; bractee magnae, conspicuae sed caducae, ad 14 × 12 mm, plus minusve acuminato-orbiculares, dense et breviter griseo- vel brunneo-tomentosae. Calyx 9-12 mm; dentes partem campanulatam aequantes vel excedentes, duo superiores per magnam partem longitudinis connati, triangulum acutum apicibus tantum per 1 mm liberis formantes. Petala 13-17 mm, purpurata; vexillum basi truncatum ad late cuneatum. Tubus staminalis 9-10 mm longus, supra connatus. Ovarium apresso-pubescentis; stylus pubescens; legumina 52-60 × 7-8 mm, lanato-tomentosa pilis plus minusve griseis.

Typus: Rhodesia, E. Div., Inyanga Road kopje, fl. & fr. iii.1935, *Gilliland* 1684 (K, holotypus; BM, FHO, PRE, isotypi).

Known only from the type and seven other collections from Inyanga and Umtali Districts of eastern Rhodesia.

RHODESIA. **Eastern Div.** Inyanga Distr., old Fort Rhodes Estate, fl. 30.iii.1959, *Cleghorn* 491 (K; SRGH). Inyanga Distr., Punch Rock, fl. viii.1959, *Williams* 142 (SRGH). Umtali Distr., Vumba Clouds Downs, 1770 m, fl. & fr. 29.ii.1960, *Head* 161 (BM). Vumba Clouds Downs, 1525 m, fl. 8.iii.1960,

Head 306 (BM). Inyanga Distr., on the slopes of Crusader, fl. 12.iii.1964, *Corby* 1092 (K; SRGH). Inyanga Distr., Inyanga Fort, 1830 m, fr. 5.i.1965, *Wild* 6702 (K; LISC; PRE; SRGH). Inyanga Distr., Juliasdale, $\frac{1}{4}$ mile east of Punch Rock, fr. 8.i.1965, *Wild* 6738 (BR; EA; K; LISC; PRE; SRGH).

The specific epithet is chosen with reference to the very rapid shedding of the bracts, which provide the main diagnostic character in this group of species.

T. festina has been recorded as growing on granite substrata, whereas the closely related *T. grandibracteata* from the same district is recorded from dolerite soils, but further information about their ecology and distribution is required.

44. *Tephrosia chimanimaniana* Brummitt, sp. nov.

T. grandibracteatae Merxm. affinis sed caulibus dense patenti-pubescentibus vel-tomentosis, stipulis brevioribus, bracteis suborbicularibus longe acuminatis dense brunneo-tomentosis vel -villosis, petalis minoribus differt.

Frutex 0.3-2 mm altus. Ramuli juveniles dense brunneo-vel griseo-patenti-pubescentes vel -tomentosi. Folia (5)7-12-jugata; petiolus et rhachis appresso-ad patentitomentosis pilis nunquam valde inaequalibus; foliola ad 25(30) \times 8(10) mm, elliptico-oblonga, basi rotundata, apice rotundata ad truncata, valde mucronata, marginibus sursum parum involutis, pagina superior glabra, pagina inferior dense appresso-pubescentis saepe subsericea; stipulae 4-5 \times 1-15 mm, anguste triangulares. Inflorescentia compacta globosa terminalis quam folia superiora brevior; bracteae grandae flores juveniles ocludentes, ad 14 \times 9 mm, suborbiculares apice longe acuminatae, dense brunneo-tomentosae ad villosae, pilis albidis longis saepe interspersis; pedicelli 5-7 mm longi, griseo-villosi. Calyx 7-10 mm longus, dense brunneo-ad albido-villosus, dentes parte campanulata longiores, duo superiores liberi vel parum connati. Petala 13-15 mm longa, purpurea vel nonnunquam subcaerulea; vexillum basi truncata ad parum cordatum. Tubus staminalis c. 9 mm longus.

Ovarium appresso-pubescent; stylus pubescens; legumina ignota.

Typus: Rhodesia, Melsetter Distr., Chimanimani Mountains, among quartzite crags, fl. 20.viii.1954, *Wild* 4589 (K, holotypus; PRE, SRGH, isotypi).

Apparently restricted to the Chimanimani Mountains, where it occurs from the foot of the first range to the quartzite crags, reaching an altitude of least 2,135 m. Other specimens seen:

RHODESIA. **Eastern Div.:** Chimanimani Mts., in the crags, 2135 m, fl. 26.ix.1906, *Swynnerton* 1464 (K; SRGH). Chimanimani Mts., at foot of «1st range», rock crevice in open grassland, fl. ix.1955, *Watmough* 10 (SRGH). Chimanimani Mts., Long Gully, 1310 m, fl. 29.v.1959, *Noel* 2023 (SRGH). Chimanimani Mts., top of Long Gully, in wet grass, fl. 29.v.1959, *Noel* 2156 (SRGH). Chimanimani, lower west slope of the first range, fl. 7.ix.1961, *Loveridge* A 73 (K; SRGH).

T. chimanimaniana should be added to the list of 41 species endemic to the Chimanimani Mountains given by WILD in *Kirkia* 4: 125-157 (1964).

45. **Tephrosia grandibracteata** Merxm. in Mitt. Bot. Staats-samml. Münch. 6: 200 (1953). Type: Rhodesia, Rusape, *Dehn* s. n. (M; photo K).

Shrub up to 3(5) m high. Young branches shortly and closely appressed- golden-brown-pubescent. Leaves with (7)9-14(16) pairs of leaflets; pubescence of petiole and rhachis similar to that of young branches; leaflets up to 40(48) × 12(15) mm, elliptic-oblong, more or less rounded at base and apex, ± strongly mucronate, the margins somewhat incurved towards the upper surface; upper surface glabrous, lower surface shortly and closely appressed- brownish-pubescent with the hairs not or scarcely overlapping each other; stipules 5-15 × 1-1.5 mm, more or less linear. Inflorescence at first a roughly ovoid head more or less exceeded by the upper leaves, elongating to up to 10 cm in fruit; bracts large and very conspicuous but caducous, up to 20 ×

13 mm, ovate to obovate and tapered gradually to a long-acute apex, shortly and closely appressed- brown-pubescent; pedicels 7-12 mm long (to 18 in fruit), appressed-pubescent. Calyx 9-13 mm, the teeth longer than the campanulate part, the two upper teeth connate for most of their length to form a broad triangle with only the terminal 1-2 mm free; the whole shortly and rather thinly appressed-pubescent. Petals 20-27 mm long, purple; standard about as broad as long, broadly rounded to emarginate at the apex, more or less truncate at the base; lower margin of keel curved through about 90°. Stamen tube 15-18 mm long. Ovary shortly appressed-pubescent; style pubescent; pods $7-8.5 \times 0.6-0.8$ cm, the sutures somewhat broadened, surfaces closely appressed-, dark brown-pubescent.

Mountains of Rhodesia. The following specimens have been seen:

RHODESIA. **Central Div.:** Rusape, fl. viii.1952, *Dehn* (M — type). **Eastern Div.:** Inyanga, 1830 m, fl. viii.1920, *Henkel* in *Eyles* 2566 (PRE; SRGH). Inyanga Downs, fl. ix.1934, *Eyles* 7920 (SRGH). Rhodes Inyanga Estate, fr. i.1936, *Pardy* 31/36 (K). Inyanga Distr., Pungwe View, 1830 m, fl. 26.vii.1941, *Hopkins* SRGH 8095 (K); 8095 (K). Inyanga Distr., top of road to Pungwe Falls, exposed site, 1830 m, fl. 23.x.1946, *Ratray* 958 (K; SRGH). Inyanga, Pungwe Hills, in open grassland, fl. & fr. 23.x.1946, *Wild* 1484 (K; SRGH). South Inyanga, on open plateau, grass country, at edge of Iron Cliffs overlooking Hondi Gorge, 1830 m, fl. 20.viii.1947, *Chase* 579 (K; LISC; SRGH). Viewpoint, Pungua Gorge, fl. 1947, *Chase* s. n. (PRE). Inyanga Distr., Farm Pamushana, grassland, 1830 m, xi.1955, *O. B. Miller* 3128 (PRE). Farm Pamushana, destroyed forest, 1830 m, fl. v.1956, *O. B. Miller* 3526 (SRGH). Inyanga Distr., near Hondi View, 1760 m, fl. 10.vi.1957, *Goodier & Phipps* 82 (SRGH). Inyanga Distr., Hondi View, fl. 5.iv.1958, *Corby* 869 (SRGH). Inyanga National Park, upper edge of mt. forest, fl. & fr. 15.xi.1958, *West* 3787 (K; PRE; SRGH). Pamushana, evergreen forest edge, 1980 m, fl. & fr. 6.viii.1961, *Methuen* 16 (K; LISC). Inyanga Distr., Pungwe view above Pungwe Falls, in

Anthospermum, *Hypericum lanceolatum* scrub, not on granite, 1830 m, fr. 7.i.1965, *Wild* 6722 (BR; EA; LISC; SRGH).

Group 8. BARBISTYLED SPECIES WITH
GLABROUS PODS AND TRANSVERSELY
ELONGATE SEEDS

46. ***Tephrosia rupicola*** J. B. Gillett in *Kew Bull.* 13: 131 (1958). Type: Rhodesia, Marandellas Distr., *Corby* 410 K, holotype; SRGH, isotype).

Subsp. ***rupicola***

Hairs on young stem and inflorescence axis spreading or upwardly somewhat appressed, brown, or grey-brown. Leaflets pubescent on upper surface. Calyx 9-11 mm. Petals 15-22 mm.

RHODESIA. **Central Div.:** probably near Rusape, fl. c. 1921, *Hislop* 333 (K). Marandellas Distr., fl. 11.ii.1942, *Dehn* 588 or 384 (SRGH). Marandellas Distr., Dombi Dombi granite outcrop, 1615 m, fl. & fr. 13.iii.1949, *Corby* 410 (K; SRGH). Marandellas Distr., granite rocks, fr. 5.iv.1952 *Wild* 3249 (K).

Subsp. ***dreweana*** Brummitt, subsp. nov.

Ramuli et axis inflorescentiae pilis deflexis griseis vestiti. Pagina superior foliolorum glabra. Calyx 7-8 mm. Petala c. 12 mm.

Holotypus: Rhodesia, Southern Div., Fort Victoria Distr., Zimbabwe, on drier rocks, fl. & young fr. 5.ii.1961, *Drewe* 25 (SRGH).

Known only from the type collection. This plant is illustrated in the magnificent paintings of Rhodesian flowers by the collector, LADY DREWE.

47. ***Tephrosia gobensis*** Brummitt, sp. nov.

T. grandiflorae et speciebus cognatis affinis sed stipulis linearibus nec ovatis nec cordatis et leguminibus brevioribus circa 5-seminalibus valde differt; etiam *T. radicans*

similis sed habitu lignoso non reptanti, ovario glabro et proprietatibus ceteribus differt.

Fruticulus c. 30 cm altus. Ramuli dense pilis appressis vel ascendentibus griseis vestiti. Folia pinnata, (2)3-5 paribus foliolorum praedita; petiolus 0.3-1.0 cm longus, petiolus et rhachis coniunctim (0.6)1.2-2.4 cm, appresse pubescentes; foliola (0.6)0.8-1.6 × (0.3)0.4-0.6 cm, obovata ad oblanceolata, basi cuneata, apice late rotundata ad emarginata; pagina superior glabra vel sparse pubescens, pagina inferior appresse-pubescentis, grisea; stipulae 3-5 × 0.4-0.8 mm, lineares. Flores in racemis brevibus terminalibus 0.5-3 cm longis et in axillis 1-4 foliorum superiorum dispositi; bractae 1.5-3 × 0.7-1 mm, ovatae ad anguste triangulares; pedicelli 2-4 mm. Calyx 5-6 mm longus, appresse pubescens; dentes superiores per $\frac{3}{4}$ longitudinis connati, dentes laterales tubum aequantes. Petala c. 15 mm longa, pallide rosea. Tubus staminalis supra connatus. Ovarium marginibus pilis plus minusve rigide patentibus praeditum, aliter glabrum; stylus pubescens, in statu fructifero c. 1 cm longus; legumina c. 25 × 7.5 mm, plus minusve plano-naviculiformia, stylo usque fere ad fructus maturitatem persistente praedita, praeter ad margines glabra, brunnea; semina c. 5, transverse elongata.

Holotypus: Mozambique, Lourenço Marques Div., 'Goba, junto da ponte sobre o rio Umbeluzi', fl. & fr. 31.iii.1945, A. E. Sousa 132 (LISC). Isotypus: 'Near the fountain «Fontedos-Libombos, 9.5 kilometres from Goba', bud & fr. 31.iii.1945, A. Estêves de Sousa 132 (PRE).

Known only from the type collection, which was made on shallow soil overlying basaltic rocks.

The pods of this species suggest that it is closely related to *T. incarnata*, *T. grandiflora* Ait. and allied species, but it lacks the broad auriculate stipules of that group. It is not matched by any other Mozambique or South African material seen and does not fit the descriptions of any of the species given for South Africa by Miss FORBES. More collections are required from this area of Mozambique which

seems to be particularly interesting in the study of this genus (see also following species).

48. **Tephrosia cordata** Hutch. & Burt Davy in Burt Davy, Fl. Pl. Ferns Transvaal 1(2): xxxi (1932). — Forbes in Bothalia 4(4): 995 (1948). Type: Swaziland, Mbabane, fr. i.1905, *Burt Davy* 2886 (K).

This species, well known from Swaziland and the Transvaal, was recorded by Miss FORBES from Mozambique with the citation of a single collection by SCHLECHTER in the Berlin herbarium. This specimen is now destroyed and no other specimens from Mozambique have been seen. *T. cordata* is allied to *T. gobensis* (above) and *T. incarnata* (below), but has very characteristic strongly cordate stipules 7-14 mm broad and is unlikely to have been confused by Miss FORBES. Further confirmation of its occurrence in the Flora Zambesiaca area is desirable.

49. **Tephrosia incarnata** Brummitt, sp. nov.

T. shihwanensi Schinz affinis, sed caulibus levigatis glabratis, pedunculis longioribus folia excedentibus, stipulis latioribus glabris saltem unilateraliter auriculatis differt.

Annua vel breviter perennans caulibus erectis plus minusve ramosis ad 1.3 m altis. Caules superne sparsissime pubescentes infime glabri, levigati. Folia (3)4-6(7)-jugata; petiolus (1.5)2.5-5.5 cm, petiolus et rhachis conjunctim (3.5)5-12 cm longi, sparse appresso-vel ascendenti-pubescentes; foliola (1)1.5-3.5 × 0.5-1.4 cm, elliptica vel oblonga ad obovata, basi cuneata, apice obtusa ad emarginata, pagina superior glabra, inferior appresso-pubescentis; stipulae 7-13 mm ab insertione ad apicem, 3-6(8) mm latae, apice longe acutae, margine adaxiale valde auriculatae, margine abaxiale rotundatae vel parum auriculatae, castaneae, glabrae vel marginibus ciliatis. Inflorescentiae breves, densae, terminales vel interdum nonnullae in axillis foliorum superiorum; pedunculi plerumque 9-18 cm longi, flores supra folia superiora portantes; axis inflorescentiae dense brunneo-vel albo-pubescentis; bractee grandae, conspicuae, 6-12 ×

4-9 mm, late ovatae ad suborbiculares, concavae, apice acuminatae ad rotundatae, flores juveniles occultentes sed caducae, nonnunquam apice fissae ut videtur 2- vel 3-dentatae, castaneae ad purpureo-brunneae, breviter pubescentes vel raro glabrae; pedicelli 4-10 mm, dense pilis brunneis patentibus vel appressis vestiti. Calyx 3.5-5(5.5) mm longus, pars campanulata 1.5-2.5 mm, appresso- ad patenti-pubescentis, dentibus duobus superioribus ad dimidiam longitudinis connatis apicibus 1.5 mm libris. Petala 12-13 mm longa, incarnata ad purpurea; vexillum basi cuneatum ad subtruncatum. Tubus staminalis supra connatus, stamen superius valde vel laxe adfixum, vel fortasse tubus apertus et stamen superius liberum. Ovarium glabrum vel marginibus pilis paucis vestitum, nigrum; stylus pubescens; legumen 50-62 × 7.5-9.5 mm, fuscum, glabrum; semina 12-15, transverse elongata.

Typus: Rhodesia, Umtali Distr., Himalayas, Engwa, 1940 m, in *Widdringtonia whytei* scrub, fl. & fr. 2.iii.1954, *Wild* 4450 (SRGH, holotypus; K, LISC, PRE, isotypi).

Mountains of eastern Rhodesia (Inyanga to Chirinda), southern Mozambique and northern Transvaal.

RHODESIA. **Eastern Div.** Tandai River, fl. ii.1931, *Myres* 688 in *Eyles* 7379 (K; SRGH). Melsetter, 1830 m, fl. iii.1934, *Brain* 10532 (SRGH). Nyumquarara Valley, fl. & fr. ii.1935, *Gilliland* K 1337 (BM; K). Inyanga Distr., fl. & young fr. 28.ii.1942, *Hopkins* SRGH 8838 (K; SRGH). Chirinda Distr., fl. & young fr. 28.iii.1950, *Hack* 167/50 (SRGH). Melsetter Distr., fl. & fr. ix.1953, *Williams* 116 (SRGH). Umtali Distr., Himalayas, Engwa, 1940 m, in *Widdringtonia whytei* scrub, fl. & fr. 2.iii.1954, *Wild* 4450 (K; LISC; PRE; SRGH — types). Melsetter Distr., near 'Skyline', Melsetter-Chipinga road, edge of forest in ravine, fl. & fr. 28.ii.1956, *Drummond* 5118 (COI; K; SRGH). Melsetter Distr., Chimanimani, west tributary of upper Bundi, grassy scrub in wooded gully, 1464 m, fl. ii.1957, *Phipps* 434 (K; PRE). Melsetter Distr., Chimanimani, Long Gully, 1464 m, fl. 2.ii.1957, *Phipps* 454 (SRGH). Inyanga Distr., near Nyamingura River, dense scrub, 975 m, fl. & fr. 21.iv.1958, *Phipps* 1167 (SRGH). Umtali Distr.,

'Nimbus' farm, S. W. Vumba, 1615 m, mountain slope in shrubs, fl. & fr. 17.ix.1958, *Chase* 7022 (BM; K; PRE; SRGH). Chipinga Distr., Mt. Selinda, open grassland near edge of forest, fl. 22.ii.1960, *Goodier* 950 (SRGH). Vumba, Leopard's Rock, 1645 m, fl. & young fr. 1.iii.1960, *Head* 185 (BM). Melsetter Distr., Skyline, fl. 23.i.1964, *Corby* 1066 (K; SRGH).

MOZAMBIQUE. **Lourenço Marques.** Sabié, Mte. Libombos, Meponduine, near the border, fl. 25.iv.1947, *Pedro & Pedró-gão* 735 (LMJ). Namaacha, near the Canada Dry factory, fl. & fr. 27.iii.1957, *Barbosa & Lemos* 7534 (COI; LISC; LMJ).

SOUTH AFRICA. **Transvaal.** Houtbosh, bud & young fr. 1875-1880, *Rehmann* 6229 (K). Letaba Distr., Rosendal, Westfolia, 1220 m, fl. & fr. 18.ii.1956, *Keet* 1741 (K). Letaba Distr., between provincial road and Mtataspruit, 945 m, bud 2.ii.1958, *Scheepers* 74 (K). Letaba Distr., under tall *Eucalyptus* near roadside, 915 m, fr. 3.ii.1958, *Scheepers* 161 (K).

These plants have previously usually been referred to *T. shiluwanensis* Schinz, described from the Transvaal. Examination of the type of that species, however, shows that that differs rather conspicuously in having densely appressed-pubescent stems, shorter peduncles (about 5 cm) which probably do not exceed the upper leaves, and narrow, pubescent stipules (1-1.5 mm broad) which are not auriculate. The taxonomy of this group in South Africa is difficult and not yet fully understood, but it seems that the plants cited here must be regarded as specifically distinct from *T. shiluwanensis*.

The two southernmost specimens, those cited from Mozambique, differ from others in having larger flowers, the petals being 19-23 mm long as against 12-18 mm, and the bracts glabrous and a conspicuous chestnut brown. More material from this area may suggest that they belong to a distinct subspecies.

Group 9. **TEPHROSIA DASYPHYLLA AND ALLIED SPECIES**

This group includes barbistyled species which have the vexillary stamen free, unifoliolate or trifoliolate (rarely 5-foliolate) leaves, and fairly large flowers aggregated into a dense terminal head surrounded by the upper leaves, or sometimes a short fairly dense terminal raceme. *T. cephalantha* is readily distinguished by its annual habit with woody stocks producing unbranched herbaceous stems up to 50 cm high.

T. dasyphylla was originally described from Angola, and plants closely matching the type are now known from Angola, south-eastern Congo (Katanga), Tanzania, Zambia, Rhodesia and northern Mozambique. These plants have characteristically trifoliolate leaves with oblong leaflets up to 2 cm broad, and include the types of *T. luembensis* De Wild. and *T. subfalcato-stipulata* De Wild. In Fl. Congo Belge 5 (1954) CRONQUIST adopted a broad view of *T. dasyphylla*, giving in synonymy *T. argyrolampra* Harms and *T. butayi* De Wild. & T. Dur. and including plants with unifoliolate elliptic leaves up to 4 or 5 cm broad. These broad-leaved plants seem to be confined to western Zambia and adjacent Katanga, with a single known record from central Tanzania, so apparently overlapping the distribution area of typical *T. dasyphylla*. *T. butayi* was described from the north-western Congo, and the type has unifoliolate leaves up to 28 mm broad (one single leaf has 2 leaflets), thus approaching the broad-leaved plants from Katanga and Zambia, and indeed, although the indumentum of leaves and stem is rather different, it scarcely seems possible to regard them as different species. However, other plants from eastern Congo closely resemble the type of *T. butayi* but have 3- or 5-foliolate leaves and scarcely seem specifically distinct from typical *T. dasyphylla*. Furthermore, some of the broad-leaved plants in Katanga and western Zambia frequently have one or two small lateral leaflets, so tending towards typical *T. dasyphylla*, and a clear-cut separation of them from *T. dasyphylla* does not seem possible.

The recently described *T. youngii* Torre from north-eastern Angola also seems to fall into this complex, differing from the type of *T. butayei* only in its rather broader leaves and perhaps denser and more silvery-sericeous indumentum, and from the Katangan-Zambian plants only again in this indumentum.

The position is further complicated by two other taxa, *T. muenzeri* Harms from Ufipa District of south-eastern Tanzania and an undescribed plant with quite a different indumentum from Lundazi district of eastern Zambia, both taxa thus occurring more or less within the area of typical *T. dasyphylla*. Both of these have unifoliolate broad leaves but differ from the similar Katangan-Zambia plants in that the leaves are sessile instead of shortly petiolate, and also in their respective leaf indumenta. *T. argyrolampra* Harms, from north-western Tanzania and adjacent Burundi is undoubtedly closely related to this group but has more or less sessile trifoliolate leaves with all three leaflets large, elliptic, 25-35 mm broad and a subsericeous indumentum.

A satisfactory taxonomic treatment of this complex seems difficult to achieve. To 'lump' the whole lot into one species with seven subspecies seems undesirable as the overall variation is considerable and the taxa do not appear to be replacing each other geographically, several being sympatric with typical *T. dasyphylla*. The most natural grouping might perhaps be to include the four taxa with broad predominantly unifoliolate leaves in one species which would then comprise four disjunct subspecies all differing slightly in indumentum, two having sessile leaves and two shortly petiolate leaves. This grouping would overlap in area the usually trifoliolate typical *T. dasyphylla* and *T. butayei*. *T. argyrolampra* seems to be distinct geographically and morphologically and is probably best regarded as a separate species.

On the other hand, however desirable such a grouping might appear to be at first sight, the difficulty of assigning many plants to either one or other species in the Congo and Zambia seems to argue against it, unless it can be

clearly shown in the future that the intermediates are hybrids between two sympatric species. From the evidence at present available from herbarium specimens it seems most practical to group all the four taxa with petiolate leaves as one species, despite the fact that they are not geographically disjunct, since these four seem to intergrade morphologically. This leaves *T. muenzneri* and the Lundazi plant as a second species, and *T. argyrolampra* as a third perhaps most distinct species. This arrangement is here adopted, but reconsideration of the position will be desirable when more collections and field observations are available.

50. *Tephrosia dasyphylla* Welw. ex Bak. in Oliv., Fl. Trop. Afr. 2: 118 (1871). Type: Angola, Huíla, morro de Lopolo, *Wehwitsch* 2084 (LISU, holotype; BM, K, isotypes).

Key to subspecies

1. Stems closely appressed- greyish-pubescent or -tomentose; leaves more or less silvery-sericeous beneath; stipules 5-9×0.5-1.2 mm
2. Leaves (always?) unifoliolate, 1.5-2 times as long as broad. subsp. *youngii*
2. Leaves unifoliolate or sometimes 3-5-foliolate, leaflets 2.2-4 times as long as broad subsp. *butayi*
1. Stems spreading- or sometimes ascending- brown- or rarely grey-tomentose; leaves greyish-green to whitish spreading- or appressed-pubescent beneath, but usually not sericeous; stipules (6)8-15 × 1-2 mm
3. Leaves predominantly unifoliolate, at maturity 25-50 mm broad, leaflets elliptic subsp. *amplissima*
3. Leaves predominantly trifoliolate, up to 17 mm broad (25 mm in Rhodesia E.), leaflets oblong subsp. *dasyphylla*

Subsp. *dasyphylla*

Tephrosia dasyphylla sensu Cronquist, Fl. Congo Belge 5: 104 (1954) et Torre, Consp. Fl. Angol. 3: 163 (1962) pro parte.

Stems spreading- or sometimes ascending- brown- or rarely greyish- tomentose. Leaves predominantly 3-foliolate but occasional lower leaves unifoliolate or upper leaves 5-foliolate; petiole and rhachis together 0.6-2.5(3) cm long,

the petiole usually distinctly longer than the rhachis which may sometimes be almost absent, tomentose like the stem; terminal leaflets (4)5-10 \times (0.6)0.8-1.7(2.5) cm, lateral leaflets 3.5-6.5(8) \times 0.5-1.3(2) cm, all linear-oblong or very narrowly elliptic to narrowly lanceolate, obtuse to emarginate at the apex, the lower surface greyish-green to white appressed-pubescent but usually not sericeous; stipules (6)8-15 \times 1-5.5 mm. Calyx (7)9-12(14) mm long, \pm appressed grey- or brown-villous. Petals (17)19-26(29) mm.

Congo (Katanga), Tanzania, northern Mozambique, Zambia, Rhodesia and Angola.

CONGO. **Katanga.** Valée de la Petite Luembe, fl. & fr. ii.1910, *Hock* (BR; holotype of *T. luembensis* De Wild.). Plateau de Bianco, fl. xii.1912, *Homblé* 893 (BR; holotype of *T. subfalcato-stipulata* De Wild.). Snelleghem, fl. xi.1928, *Quarré* 1411 (BR). Elisabethville [fide F. C. B.], fr. vi.1935, *Quarré* 4584 (BR). 12 km to N. W. of Elisabethville, fl. & fr. 6.ii.1958, *Gathy* 34 (K).

TANZANIA. **T4. Ufipa Distr.** Old Sumbawanga Road, Malonje Plateau, 1800 m, fl. 3.i.1962, *Richards* 15890 (K). **T5. Mpwapwa Distr.:** Kiboriani Mtn., 1525-1830 m, fr. 15.xi.1937, *Mr. & Mrs. Hornby* 937 (K). **T7. Mbeya Distr.** N. slopes Poroto Mts., below Mporoto Sawmill, 1645-2010 m, fl. 8.iii.1932, *St. Clair Thompson* 728 (K). **Iringa Distr.** Mufindi W., 1705-1890 m, 23.ii.1932, *St. Clair Thompson* 445 (K).

MOZAMBIQUE. **Niassa.** Massangulo, fr. 15.v.1948, *Pedro & Pedrógão* 3507 (LMJ). Vila Cabral, S. slope of serra de Massangulo, 1180 m, fr. 25.ii.1964, *Torre & Paiva* 10761 (LISC).

ZAMBIA. **Northern Prov.** Lake Chila, Abercorn, 1645 m, fl. 4.i.1952, *Richards* 264 (K). Near Lake Chila, fl. 21.i.1952, *Nash* 115 (BM). Lake Chila, 1525 m, fl. 21.i.1955, *Richards* 4202 (K). Kawimbe, Abercorn Distr., 1630 m, fl. & fr. 24.i.1957, *Richards* 7964 (K). Itembwe Gorge, Abercorn, 1500 m, fl. 3.i.1960, *Richards* 12054 (K). Kasama Distr., Forestry plantation, Kasama-Abercorn road, 1275 m, fl. 1.iii.1960, *Richards* 12686 (K). Abercorn Distr., Mambole escarp-

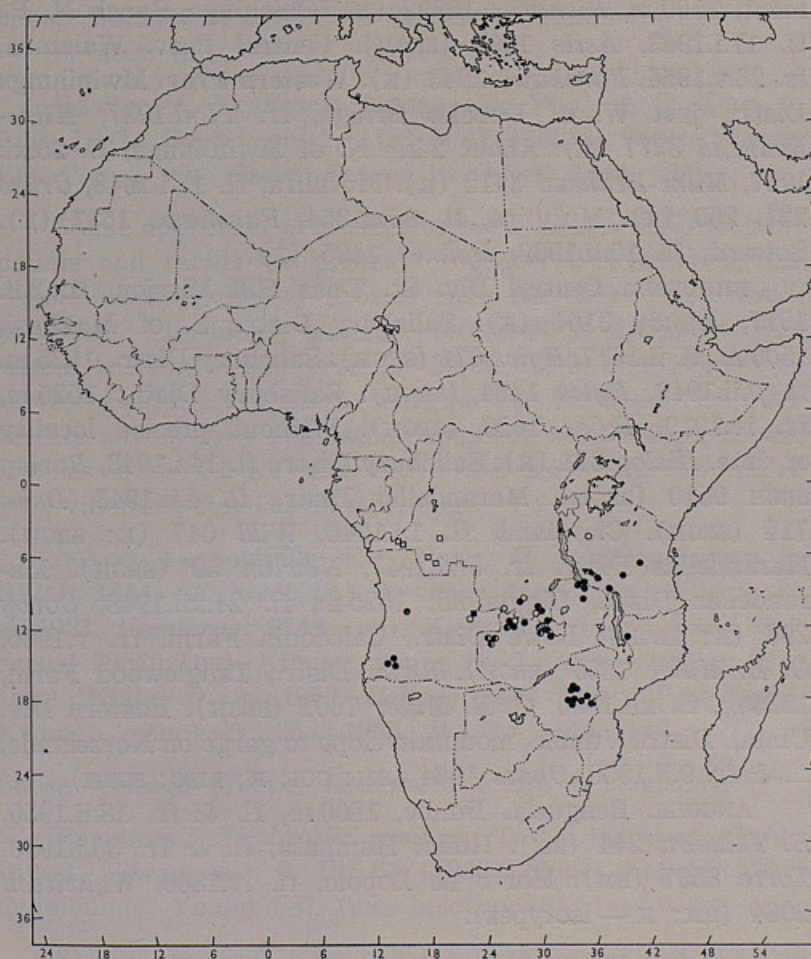


Fig. 9. — Distribution of *T. dasyphylla*, *T. muenzneri* and *T. argyrolampra*.

- *T. dasyphylla* subsp. *dasyphylla*
- *T. dasyphylla* subsp. *amplissima*
- *T. dasyphylla* subsp. *youngii*
- *T. dasyphylla* subsp. *butayei*
- *T. dasyphylla* intermediate between subsp. *dasyphylla* and subsp. *amplissima*
- ▲ *T. muenzneri* subsp. *muenzneri*
- △ *T. muenzneri* subsp. *pedalis*
- A *T. argyrolampra*

ment, 1500 m, *Richards* 18892 (K). Chishinga Ranch N. P., fl. 17.i.1963, *Astle* 1965 (SRGH). **Central Prov.** Walamba, fr. 23.v.1954, *Fanshawe* 1243 (K). **Western Prov.** Mwinilunga Distr., just W. of Dobeka Bridge, fr. 17.xi.1937, *Milne-Redhead* 3277 (K). About 2 km N. of Mwinilunga, fl. 26.xi.1937, *Milne-Redhead* 3412 (K). Mufulira, fl. 17.i.1948, *Cruse* 231, 250 (K). Mufulira, fl. 8.ix.1954, *Fanshawe* 1537 (K). Solwezi, fl. 10.ii.1962, *Holmes* 1495 (K).

RHODESIA. Central Div. St. Trias Hill Mission, fl. 2.ii.1917, *Mundy* 3154 (K). Salisbury Distr., S. of Makbusi, 1500 m, fl. ii.1917, *Eyles* 671 (SRGH). Salisbury Distr., 1525 m, fl. 9.ii.1949, *Eyles* 1484 (SRGH). Salisbury Distr., 1525 m, fr. iv.1919, *Eyles* 1626 (SRGH). Without precise locality or date, *Hislop* 321 (K). Salisbury Distr., fl. 14.i.1943, *Baring* SRGH 9510 (SRGH). Marandellas Distr., fl. 4.ii.1943, *Dehn* 714 (SRGH). Cleveland, fl. 1.i.1946, *Wild* 647 (K; SRGH). Marandellas Distr. fr. 5.vi.1947, *Newton* 59 (SRGH). Marandellas Distr., Digglefold, 1525 m, fl. 24.xii.1948, *Corby* 296 (K; SRGH). Rewa Distr., Caledonia Farm, fr. v.1960, *O. B. Miller* 7360 (SRGH). Ruwa Distr., Tanglewood Farm, 1525 m, fl. xii.1960, *O. B. Miller* 7601 (SRGH). **Eastern Div.** Umtali Distr., Vumba, mountain slope to gorge on Norselands, fl. & fr. 9.ii.1950, *Chase* 1964 (BM; COI; K; LISC; SRGH).

ANGOLA. Benguela. Bimbe, 1800 m, fl. & fr. 18.ii.1950, *B. Teixeira* 244 (BM). **Huíla.** Humpata, fl. & fr. 30.i.1956, *Torre* 8567 (BM). Morro de Lopolo, fl. iv.1860, *Welwitsch* 2084 (BM; K — isotypes).

The single collection cited from the mountains of eastern Rhodesia, *Chase* 1964, differs rather conspicuously from other specimens referred to this subspecies. It has broader, more elliptic leaflets, the terminal ones up to 2.5 cm broad and the lateral ones up to 2 cm broad, densely white-pubescent beneath, with stems ascending greyish-pubescent. Further collections might show that this represents a distinct montane subspecies.

Subsp. **butayei** (De Wild. & T. Dur.) Brummitt, comb.
et stat. nov.

Basionym: *Tephrosia butayei* De Wild. & T. Dur. in Bull. Herb. Boiss. sér. 2, 1(8): 747 (1901). Type: Congo, Bas Congo, riv. Nsele, *Butaye* in Gillett 1444 (BR).

Stems appressed greyish-pubescent. Leaves 1-5 foliolate; petiole and rachis (if present) together 6-20(26) mm, the petiole either longer or shorter than the rachis, appressed-pubescent; terminal leaflets (40)50-90 × (10)15-28 mm, lateral leaflets (when present) 30-60 × 7-20 mm, elliptic to narrowly elliptic, obtuse to emarginate at the apex, the lower surface silvery-grey appressed-pubescent, often subsericeous; stipules 5-9 × 0.5-1.2 mm. Calyx 6-9 mm long, appressed grey-villous. Petals 15-19 mm long.

CONGO. Leopoldville. Riv. Nsele, fl. x.1910, *Butaye* in Gillett 1444, BR, holotype). Between Ipamu and Kikart, fl. vii.1921, *Vanderyst* 9746 (BR). Kisantu, without date, *Vanderyst* 20520 (BR). Kibubu, young fr. 7.ii.1950, *Callens* 2344 (BM). Kiala, fl. 2.ii.1952, *Callens* 3037 (BM). Tono-Feshi-Kwango, young fr. 25.vi.1955, *Devred* 2109 (BR).

Subsp. **youngii** (Torre) Brummitt, comb. et stat. nov.

Basionym: *Tephrosia youngii* Torre in Mem. Junta Invest. Ultram. sér. 2, 19: 63 (1960). Type: Angola, Mona Quimbundo, *Young* 587 (BM, holotypus).

Stems appressed grey-pubescent to tomentose. Leaves unifoliate; petiole 5-15 mm, appressed grey-pubescent; lamina 4-7 × 2-4 cm, elliptic to obovate, broadly rounded to emarginate at the apex, subcuneate to rounded at the base, the lower surface silvery sericeous; stipules 6-8 × 0.7-1 mm. Calyx c. 8 mm long, appressed grey-villous. Petals 16-20 mm long.

Angola.

ANGOLA. Lunda. Mona Quimbundo, fl. 2.ix.1932, *Young* 587 (BM, holotypus). Dala, valley of Chiumbe River, fl. 2.xi.1932, *Young* 1284 (BM).

Subsp. **amplissima** Brummitt, subsp. nov.

Caules patenter brunneo-tomentosi. Folia unifoliolata vel nonnunquam 1-2 foliolis lateralibus minoribus praedita; petiolus et rhachis (si adest) conjunctim 8-20 mm ut in caule tomentosi, rhachis (si adest) 3-13 mm; foliola solitaria vel terminalia 60-120 × (25)30-48 mm, plus minusve elliptica, apice obtusa ad retusa vel raro subacuta, basi subcuneata ad rotundata; pagina inferiora pilis griseis curvatis ad crispatis non valde appressis dense vestita, non sericea; stipulae 10-15 × 1-2 mm. Calyx 8-11 mm longus, appresse griseo- vel brunneo-villosus.

Holotypus: Zambia, Western Prov., Mufulira, fringing forest, fl. 11.i.1948, *Cruse* 249 (K).

Congo (Katanga), Tanzania (one record), western Zambia, eastern Angola.

CONGO. **Katanga**. Bianco-Lualaba. fl. c. 1920, *Homblé* (BR). Ruashi, 7 km NE d'Elisabethville, fr. iv.1950, *Schmitz* 2812 (BR).

TANZANIA. **T4. Tabora Distr.**: Unyamwesi, between Kombe and Usinge, km 1003.6, fl. 26.i.1926, *Peter* 35574 (K).

ZAMBIA. **Western Prov.** 1 km S. of Matonchi Farm, fl. 2.i.1938, *Milne-Redhead* 3924 (K). Mufulira, 7.xii.1947, *Cruse* 102 (K). 1220 m, fl. 11.i.1948, *Cruse* 249 (K, holotype). Kalene Hill, 1370-1525 m, fl. xi, *Marks* 4 (K). Chingola, fr. 16.i.1964, *Fanshawe* 8226 (K).

ANGOLA. **Lunda**. Dala, Biúla, rio Chiji, fr. 27.iv.1937, *Exell & Mendonça* 1178 (BM).

Intermediates between subsp. *dasyphylla* and subsp. *amplissima*

The following specimens have predominantly trifoliolate leaves with elliptic leaflets, the terminal ones 1.6-2.2 cm broad.

ZAMBIA. **Barotseland**. Balovale, fl. xii.1953, *Gilges* 301 (K; PRE; SRGH). **Western Prov.** Mwinilunga Distr., 64 km S. of Mwinilunga, 19 km W. of Lunga, fr. 18.viii.1930, *Milne-Redhead* 932A (K). Mufulira, fl. 16.xi.1947, *Cruse* 71 (K).

It may be noted that *Milne-Redhead* 932A was growing with *T. cephalantha*.

51. **T. muenzneri** Harms in Engler, Bot. Jahrb. 45: 310 (1910).
Type: Tanzania, T4, Ufipa Distr, Msamwia, iii.1909, *Münzner* 197 (holotype, not seen, presumed destroyed at Berlin). The following specimen is here designated as a neotype: Tanganyika, T4, Ufipa Distr., Abercorn-Muse road, at gap of Chapota turning, 1500 m, fl. & fr. 22.x.1960, *Richards* 13368A (K).

Subsp. **muenzneri**

Stems grey- to brown-tomentose. Leaves unifoliolate; petiole (as distinct from basal pulvinus) absent, the basal pulvinus 1-3 mm; lamina up to 105 × 52 mm, elliptic, rounded to ± cuneate at the base, broadly rounded to emarginate at the apex; lower surface densely covered with silvery-grey curved or crisped hairs somewhat appressed but not strongly so; stipules 7-9 × 1-2 mm. Calyx 6-7 mm, ± grey-villous. Petals 17-23 mm. Pods 45-50 × 9 mm, densely brown villous.

S. W. Tanzania.

TANZANIA. T4. Ufipa Distr.: New Sumbawanga-Abercorn road turning to Chapota, 1800 m, fl. 19.x.1959, *Richards* 11509 (K); Abercorn-Muse road at gap of Chapota turning, 1500 m, fl. & fr. 22.x.1960, *Richards* 13368A (K).

Subsp. **pedalis** Brummitt, subsp. nov.

A subspecie typica indumento caulium, foliorum et leguminum, forma foliorum et magnitudine stipularum differt.

Caules pilis longis (ad 1.5 mm) brunneis flexuosis sparse vestiti. Folia ad 95 × 35 mm, obovata ad oblanceolata, basi valde cuneata; pagina inferiora pilis rigidis rectis vel geniculatis sparse vestita; stipulae 11-13 × 0.6-1 mm, lineares. Calyx 7-8 mm longa. Petala ignota. Legumina c. 45 × 9 mm, plus minusve sparse patenti-pubescentia.

Holotypus: Zambia, Eastern Prov., Lundazi Distr., Lundazi to Mzimba mile 4, fr. 28.iv.1952, *White* 2495 (FHO).

Known only from the type collection which was from *Julbernardia paniculata*, *Brachystegia manga*, *Br. spiciformis* woodland on pink, sand loam.

52. **Tephrosia argyrolampra** Harms in Engler, Bot. Jahrb. 51: 226 (1914). Type: Burundi, Nord-Uha, x.1911, Meyer 1092 (holotype, presumed destroyed at Berlin). The specimen cited below, *Peter* 38511, is here designated as a neotype.

Stems densely appressed light-brown pubescent, \pm sericeous. Leaves trifoliolate; petiole (as distinct from basal pulvinus) absent, pulvinus and rachis together up to 20 mm; terminal leaflets up to 98×38 mm, elliptic to slightly oblanceolate, lateral leaflets slightly smaller than the terminal ones, up to 80×30 mm, base \pm cuneate, apex rounded; lower surface densely and closely appressed silvery-pubescent, sericeous; stipules $6-7 \times 1.5-2$ mm. Calyx 5-6 mm long, lower part grey appressed-pubescent, upper light-brown appressed-pubescent. Petals 18-20 mm.

Burundi, Tanzania.

TANZANIA. T4. Buha Distr.: Uha, Nisusi to Birisa, 10.iii. 1926, *Peter* 38511 (K).

53. **Tephrosia zambiana** Brummitt sp. nov.

T. manikensi De Wild. affinis, sed foliis 3-5-foliolatis, racemis magis elongatis et dentibus calycis longioribus differt.

Suffrutex ramis herbaceis simplicibus ad 35 cm altis. Rami dense albo-appresso-pubescentes. Folia plerumque 3-foliolata, raro 1- vel 5-foliolata; foliola ad 5.5×1.1 cm, anguste oblonga, supra glabra, subtus dense albo-appresso-pubescentes, juventute subsericea. Racemi terminales nodis distinctis saltem 5-8, folia superiora valde excedentes, etiam nonnunquam floribus inferioribus in axillis foliorum superiorum. Calyx 9-11 mm, albo-appresso-pubescent, dentibus subaequalibus 5-7 mm longis, duobus superioribus non valde connatis. Petala 18-20 mm longa, verisimiliter purpurea vel

carina alba. Tubus staminalis supra non connatus, filamentum vexillarum librum. Ovarium tomentosum; stylus pubescens; legumen ignotum.

Typus: Zambia, Kasama Distr., Mungwe, fl. 2.x.1960, *Robinson* 3899 (K, holotypus; SRGH, isotypus).

Known only from the type collection. *T. zambiana* is similar to *T. manikensis* De Wild. from Katanga, but differs from it in having leaves mostly 3-foliolate with a petiole and rachis instead of unifoliolate and sessile, the racemes longer with at least 5-8 clearly visible nodes, and longer calyx teeth ($1\frac{1}{2}$ -2 times as long as the tube) with the two upper ones free more or less to the base. It may also be confused with *T. dasyphylla*, from which it differs in the elongate raceme clearly exceeding the upper leaves, the rachis much longer than the petiole in the upper leaves, and the denser subsericeous white indumentum of the stem and leaflet undersurface.

54. *Tephrosia cephalantha* Welw. ex Bak. in Oliv., Fl. Trop. Afr. 2: 119 (1871). Type: Angola, Huíla, morro de Lopolu, *Welwitsch* 2087 (BM), see notes below.

CRONQUIST, Fl. Congo Belge 5: 103 (1954), has drawn attention to the facts that two 'forms' occur in this species, distinguished by the size and shape of the leaflets, and that both forms were represented in the original material from which the species was described. It appears that most specimens from the Congo have narrow leaflets, 3-7(10) mm broad, 5-8 times as long as broad, and usually have predominantly 5-foliolate leaves. This form is not known from the Flora Zambesiaca area, where the leaves are predominantly 3-foliolate (only occasional leaves 5-foliolate), and the leaflets are 10-20(26) mm broad and only 2-5 times as long as broad. However, some specimens from the Congo appear to be somewhat intermediate, while both variants seem to occur in Angola with no geographical separation. It seems most appropriate to regard the two variants as varieties.

The original species description [BAKER in OLIVER, Fl. Trop. Afr. 2: 119 (1871)] was based on two collections of

WELWITSCH from Angola, numbers 2087 and 2089. Examination of the specimens of these numbers at Kew and the British Museum shows that no. 2089, from Pungo Andongo, is clearly referable to the variety with broader leaflets, but the other, 2087 from Huíla, Morro de Lopolo, approaches more closely to the other variety. A choice between the two for purposes of typification has been made by SCHREIBER, in *Mitt. Bot. Staatssamml. München* 16: 298 (1957) who gives 2087, the plant with narrow leaflets, as the type of the species. A third collection of WELWITSCH, no. 2090 from Huíla, Ferrão da Sola, was described by BAKER (loc. cit.) as var. *decumbens*, the stem being decumbent at the base, but this character does not seem to justify taxonomic recognition. However, since this plant is clearly referable to the variety recognised with broad leaflets, the epithet var. *decumbens* must be adopted for this variety, being the earliest (and only) varietal epithet applied to it. An emendation of the circumscription of *T. cephalantha* var. *decumbens* is therefore here proposed. It is unfortunate that the epithet is so inappropriate, for the variety is generally an erect herb.

Var. **cephalantha**: leaves often predominantly 5-foliolate, the terminal leaflets 3-7(10) mm broad, 5-8 times as long as broad. Angola and the Congo.

Var. **decumbens** Welw. ex Bak. emend. Brummitt: leaves predominantly 3-foliolate, the terminal leaflets 10-20 mm broad, 2-5 times as long as broad. Angola, S. W. Africa (incl. Caprivi Strip), Bechuanaland, Zambia, Rhodesia.

A specimen from Zambia, Northern Prov., Samfya, Lake Bangweulu, fl. & fr. 30.i.1959, *Watmough* 200 (K; LISC; PRE; SRGH) resembles *T. cephalantha* var. *decumbens* in size and shape of leaflets, but differs markedly in several characters: the leaves are mostly 5-foliolate, with the petiole and rachis together up to 2.5(3) cm; the flowers have much larger petals, up to 22 mm, though the calyx is short, 9-10 mm, and so only about half as long as the petals; and the pods are larger, 5-5.5 × 0.7-0.8 mm, and rather closely

appressed-pubescent. The relationship of this plant to *T. tanganicensis* De Wild. from Tanzania requires investigation when more collections are available.

55. **Tephrosia manikensis** De Wild. in Fedde, Repert. 13: 104 (1914).— Cronquist in Fl. Congo Belge 5: 103 (1954). Type: Haut Katanga, La Manika, 1911, *Hock* s. n. (BR) — see notes below.

Although apparently restricted to a fairly small geographical area — the Manika Plateau and adjacent ranges of Katanga — this species is very variable in indumentum, inflorescence, calyx size and shape, and petal size, shape and colour. Particularly striking is the indumentum of the lower surface of the leaves, which may be either thinly appressed-pubescent or densely white-tomentose and sericeous. This seems to be correlated to some extent with other characters, but there does not appear to be a marked geographical separation of the two kinds, which are therefore here regarded as varieties rather than subspecies.

Var. **manikensis**

Stems \pm appressed brown-pubescent. Lower surface of leaves rather thinly appressed-pubescent, greyish-green. Inflorescence elongate, with 3-7 clearly visible nodes. Calyx appressed- or ascending- grey- or brown-tomentose. Petals recorded as pink or mauve.

CONGO. **Katanga**. Manika, fl. x.1911, *Hock* (BR — see note below). Plateau de Bianco, env. de Katentania, young fr xi.1912, *Homblé* 836 (BR); *ibid.* 846 (BR). Parc Nat. Upemba, Lusinga, fl. 25.vi.1945, *de Witte* 2352 (BR). Riv. Dipidi, 1700 m, fl. 5.viii.1947, *de Witte* 2746 (BR). Riv. Sweba, fl. 28.viii.1947, *de Witte* 2803 (BR). Plateau de Kundelungu, partie sud, fl. 16.viii.1948, *Schmitz* 1982 (BR). P. N. Upemba, between Kabwe-kaumo and Mukana, fl. 30.ix.1948, *de Witte* 4365 (BR); *ibid.* 1.x.1948, 4418 (BR); *ibid.* 18.x.1948, 4541 (BR). P. N. Upemba, near Kadidiki, fl. 29.viii.1949, in *de Witte* 7594 (BR).

Intermediate between var. *manikensis* and var. *albosericata*: Kundelungu, 1700 m, 27° 53' E, 10° 26' S, fl. 5.x. 1959, *Schmitz* 3093 (BR).

Var. *albosericata* Brummitt, var. nov.

Caules ± appresse brunneo-pubescent. Foliorum pagina inferior dense appresse albo-velutina, sericea. Inflorescentia capitulata, subglobosa, vel nodis 1-2 inferioribus ± remotis. Calyx ± patenter albo-villosus. Petala rosea vel azurea.

Typus: Congo, Katanga, environs de Lubudi, fl. 1937, *Cabu* 4 (BR, holotypus; K, isotypus).

CONGO. **Katanga.** Kausenia, fl. 13.viii.1933, *Lynes* (BR). Elvalubudi, Lukata, fl. viii.1933, *Quarré* 3361 (BR). Environs de Lubudi, fl. 1937, *Cabu* 4 (BR, holotype); *ibid.*, 17 (BR); *ibid.* 46 (BR); *ibid.* 51 (BR; K). Près du Jardin Botanique CSK, fl. xii.1937, *Quarré* (?) 5014 (BR). Without locality, fl. ix.1945, *Quarré* 6988 (BR).

The type sheet of *T. manikensis* bears three different stems, each differing in leaf and stem indumentum. The left-hand one is only thinly pubescent and not at all sericeous, the right hand one is more densely pubescent, and the central one is more or less sericeous and yellowish-green. This last is the one which corresponds most closely with the original description «foliis... infra plus minus dense velutinis, argenteo-sericeis» but it has not the same white indumentum as plants referred above to var. *albosericata* and the elongate inflorescence and appressed tomentum of the calyx also differ from that variety. It seems best therefore to regard the first of the two above varieties as the typical variety, as has been done, although the type itself is more or less intermediate.

One further specimen — P. N. Upemba, Kilube-Kundjawatango, P. C. R. in *de Witte* 3647 (BR) — is bigger in most parts than any other specimen seen (leaves up to 13 × 2.8 cm, stipules 11 mm, calyx 12 mm), and has an elongate raceme and brown appressed-tomentose calyx but white-sericeous leaves.

Group 10. A NEW BARBISTYLED SPECIES
OF UNCERTAIN AFFINITY

56. *Tephrosia miranda* Brummitt, sp. nov.

Species stylo barbato, foliis numerosis, inflorescentiis foliatis, leguminibus pauciseminis, affinitate dubia.

Frutex 2-3 m altus. Caules ascendentes griseo-tomentosi. Folia plerumque 5-7-jugata sed superiores deinceps ad foliolum solitarium reducta; petiolus 3-7 mm, petiolus et rhachis conjunctim ad 8 cm, griseo-tomentosi; foliola ad 33×13 mm, obovata ad oblanceolata, basi cuneata ad rotundata, apice rotundata; pagina superior pilis gracilibus tenuiter pubescens, pagina inferior pilis griseis laxè appresso-pubescens; stipulae $7-9 \times 1.5-2$ mm, lineari-triangulares, tomentosae, caducae. Flores in racemis terminalibus et axillaribus ad 10 cm longis dispositi; nodi foliis (plerumque unifoliolatis) ad apicem deinceps ad bracteas lineari-ellipticas circa 5 mm longas reductis praediti; pedicelli 8-11 mm. Calyx 4.5-5.5 longus, breviter appresse griseo-pubescens; dentes superiores per maximam partem longitudinis connati triangulum acutum apice per 0.75 mm divisum formantes. Petala rubra; vexillum 14-16 mm longum, basi cuneatum; alae et petala carinae aliquantum breviora. Tubus staminalis supra connatus. Ovarium appresso-tomentosum; stylus pubescens; legumina c. 35×7.5 mm, leviter curvata et parum inter semina lateraliter constricta, dense et breviter pubescentia, ut videtur indehiscencia sed irregulariter rumpentia; semina 3-5, circa $5 \times 3 \times 1.5$ mm, brunnea, carunculo parvo inconspicuo praedita.

Typus: Mozambique, Nampula Distr., serra da Mesa, 6 km from Nampula, 500 m alt., granite rock desert, fl. & fr. 3.iv.1964, *Torre & Paiva* 11599 (LISC, holotypus).

Known from only the type and one other collection:

MOZAMBIQUE. Niassa: Nampula Distr., monte Nassapo, 23 km from Nampula towards Meconta, 400 m alt., granite rock desert, fl. 13.i.1964, *Torre & Paiva* 9929 (LISC).

This species is remarkable within *Tephrosia* both in its inflorescence and its pods. Although the flowers are arranged in what may reasonably be called racemes, each fascicle is subtended, not by a bracts as in other racemose species, but by a stipulate foliage leaf which shows a clear resemblance to the lower leaves even though the uppermost ones in each inflorescence are only unifoliolate and very much reduced in size. The pods on the one fruiting specimen known are slightly curved, somewhat constricted laterally between the seeds, and apparently indehiscent but breaking up irregularly, the epicarp flaking off from the endocarp. More flowering and fruiting material is required.

Addendum. NOTES FOR FUTURE COLLECTORS

The genus *Tephrosia* is taxonomically a very difficult one, and it will be clear from the notes above that many problems still await attention in the Flora Zambesiaca area. While more collections are certainly required from all parts of the area there are some districts which seem to be particularly important in the study of the genus and which will well repay further investigation. It is hoped that these few final notes will focus attention on those areas from which more collections and field observations are particularly required.

Northern Zambia. While many excellent collections have been received at Kew in recent years from Abercorn District, the rest of the Northern Province and Eastern Province remain poorly known. *T. zambiana*, *T. robinsoniana*, *T. kasikiensis* subsp. *chinsaliana* and *T. muenzneri* subsp. *pedalis* are all known from only single collections, the first three without fruit and the last without flowers. The variation of *T. lepida*, *T. richardsiae*, *T. kasikiensis* and *T. punctata* also requires particular attention in this area. In the Abercorn District field observations on the relationships of *T. malvina* and *T. micrantha* to *T. purpurea*, of *T. paradoxa* to *T. stormsii*, and of var. *abercornensis* to var. *heckmaniana* within *T. elata* would be particularly valuable.

Rhodesia. More collections are still required from the mountains of the eastern division. Of particular interest is the *T. aequilata*-*T. grandibracteata* group in which local endemic taxa occur and four new species are described above. The variation, distribution and ecology of these should be investigated further. *T. elongata*, *T. purpurea* subsp. *altissima*, *T. longipes* subsp. *swynnertonii* and *T. dasyphylla* subsp. *dasyphylla* are all inadequately known in this area, and the status of *T. lurida* var. *drummondii* from Glencoe Forest Reserve especially requires investigation. In other parts of Rhodesia the status of the varieties of *T. rhodesica* is in doubt, the relationship of *T. longipes* to *T. lurida* is uncertain, *T. coronilloides* has recently been collected for the first time, and *T. rupicola* and its subsp. *dreweana* are inadequately known. In the river valleys of the south the variation of *T. villosa*, *T. purpurea* and *T. forbesii* should be examined in the light of the above notes.

Mountains and lake shores of Malawi. From the mountains more material of *T. aequilata*, *T. whyteana*, *T. nyikensis*, *T. interrupta* subsp. *mildbraedii* and subsp. *elongatiflora*, *T. purpurea* subsp. *altissima* and *T. elongata* are required. On the shores of Lake Malawi *T. purpurea* subsp. *dunensis* and *T. reptans* var. *arenicola* are of particular interest.

Northern Mozambique. Despite excellent recent collections this area is still poorly known. *T. faulknerae* and *T. miranda*, newly described above, are known from only two collections each, while *T. pentaphylla* has been collected only once in the Flora Zambesiaca area. The subspecies of *T. aequilata* and *T. whyteana* are of particular interest on the Namuli Peaks.

Mountains of southern Mozambique. The mountains inland from Lourenço Marques seem to be particularly interesting for certain groups of *Tephrosia* centred in South Africa, and the area is still poorly known. The group including *T. incarnata*, *T. gobensis* and *T. cordata* is particularly interesting, while the variation of *T. polystachya* and *T. multipuga* requires elucidation. More material of *T. elongata*

from this area may show that it is taxonomically separable from var. *tzaneenensis*.

The author's thanks are due to Mrs. WINNIFRED HEBB and Mr. S. A. RENVOIZE for assistance in preparation of the text and maps for these notes.

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SUR L'IDENTIFICATION ET LA
TYPIFICATION DE *CAUCALIS DAUCOIDES* L.
ET DE *CAUCALIS GRANDIFLORA* L.

par

ROSETTE BATARDA FERNANDES

Institut Botanique de l'Université de Coimbra

Le *Caucalis daucoides* a été défini par LINNÉ (Sp. Pl.: 241, 1753) par: a) une diagnose — *Caucalis daucoides involucri universali longitudine umbellae lanceolato*; b) un synonyme — *Caucalis dauci sylvestris folio, echinato magno fructu*, Magn. monsp.: 292; c) une description, qui a été basée sur un spécimen envoyé à LINNÉ par SAUVAGES; d) l'habitat — Montpellier.

Quelques auteurs (THELLUNG in HEGI, Fl. Mitteleur. 5, 2: 1068, 1926; DE LITARDIÈRE, Prodr. Fl. Corse, 3, 1: 62, 1938; B. K. CHICHKIN in Fl. U. R. S. S. 16: 183, 1950; etc.) admettent que *C. daucoides* L. (1753) est un synonyme de *C. platycarpus* (1753), ce dernier taxon compris dans le sens d'*Orlaya Kochii* Heywood (= *O. platycarpus* Koch)¹. D'autres auteurs, comme HEYWOOD (in Agron. Lusit. 22: 12, 1960), croient que la description de *C. daucoides* comprend l'*Orlaya grandiflora* Hoffm. et l'*O. Kochii*. D'après la description présentée, ARCANGELI (Comp. Fl. It.: 300, 301, 1882) le considère identique au *C. daucoides* L. (1767). D'autres encore, comme BRIQUET (Fl. Alpes Marit. 4: 91, 1906, in adnot.) et BERTOLONI (Fl. Ital. 3: 177, 1837), affirment que la description se rapporte exclusivement à l'*O. grandiflora*. Ce dernier point de vue est, à présent, aussi le nôtre, c'est à dire, nous croyons que le *C. daucoides*, de 1753, est identique au *C. grandiflora* L.

¹ Celui-ci a été aussi notre avis en 1956 (cf. Bol. Soc. Brot. sér. 2, 30: 133, 1956).

La description de *C. daucoides* est très détaillée en ce qui concerne l'ombelle florifère, mais elle ne dit rien sur les fruits, ce qui fait croire que l'exemplaire étudié par LINNÉ en était dépourvu. Il s'agirait d'un spécimen à l'ombelle possédant 5 bractées lancéolées et acuminées, ce qui est le cas le plus fréquent chez l'*Orlaya grandiflora* (l'*O. Kochii* présente un involucre normalement à 2-3 bractées, dont, parfois, une plus longue que les autres et à sommet divisé); à fleurs nombreuses (*flosculi copiosi*), comme il arrive chez l'*O. grandiflora* (chez l'*O. Kochii* les fleurs ne sont pas en si grand nombre), dont trois *hermaphrodites* dans chaque ombellule comme chez l'*O. grandiflora*¹ (chez l'*O. Kochii* il y a seulement deux fleurs *hermaphrodites* dans chaque ombellule); et à pétales extérieurs rayonnants très longs et bipartis (*petalis maximis*). Après la description, LINNÉ fait la comparaison entre le *Caucalis daucoides* et le *C. grandiflora*, en affirmant que, chez celui-ci, les bractées de l'involucre sont plus courtes et les pétales extérieurs plus ronds. Comme, à notre avis, le *C. daucoides* est l'*Orlaya grandiflora*, cette comparaison semble n'avoir pas de sens, puisqu'elle aurait été établie avec la même espèce, étant donné que le *C. grandiflora* L. est aussi, d'accord avec tous les auteurs, l'*O. grandiflora* Hoffm. Cependant, l'échantillon de SAUVAGES pourrait présenter des différences par rapport à ceux considérés par LINNÉ dans *C. grandiflora*², ce qui justifierait la

¹ Il peut y avoir jusqu'à 4 fleurs hermaphrodites dans chaque ombellule chez l'*O. grandiflora*.

² Une autre explication pourrait être aussi suggérée: LINNÉ aurait mal interprété les auteurs anciens, en prenant l'espèce décrite par ceux-ci et qu'il a considérée comme un synonyme de son *C. grandiflora*, non dans le sens de l'*Orlaya grandiflora*, mais dans celui de l'*O. Kochii*. De cette façon, la comparaison serait valable, puisque cette dernière espèce possède les pétales rayonnants plus courts et plus ronds que ceux de l'*O. grandiflora*. Cette hypothèse s'accorde aussi avec l'échantillon de l'Hortus Siccus Cliffortianus qui porte sur l'étiquette la «phrase name» de BAUHIN — *Caucalis arvensis echinata, magno flore* — synonyme de l'espèce 2 (= *C. grandiflora*) de l'Hortus Cliffortianus — échantillon qu'appartient à l'*O. Kochii* et non à l'*O. grandiflora*. Néanmoins, l'*O. grandiflora* est une espèce tellement bien caractérisée et si bien décrite et représentée iconographiquement

comparaison. D'ailleurs, ce cas ne serait pas le seul dans lequel le savant botaniste suédois décrit deux fois une même espèce sous des noms différents.

En consultant les microfiches de l'herbier de LINNÉ (S), notre attention a été attirée par celle portant le n.º 118-1, laquelle, selon l'Index des microfiches et d'après C. A. M. LINDMAN (in Ark. Bot. 9, 2: 39, 1910), représenterait le *C. daucoides*, mais qui nous semblait correspondre à un échantillon de l'*O. grandiflora*. Grâce à l'amabilité du Directeur du Naturhistoriska Riksmuseum, de Stockholm¹, l'exemplaire correspondant à cette microfiche (Tab. 1) nous a été envoyé. D'après son étude, nous avons constaté que, comme nous l'avions supposé, il appartient à l'*O. grandiflora*, s'accordant parfaitement avec la description de *C. daucoides* L. (1753). Il porte les indications suivantes: a) sur un petit rectangle de papier, comme étiquette, la phrase *Caucalis dauci sylvestris folio echinato magno fructu*, c'est à dire, le synonyme donné par LINNÉ pour son espèce n.º 2 (*C. daucoides*) de Species Plantarum, de 1753; b) le numéro 2, au crayon, et la détermination 2 — *Daucoides*, écrite à l'encre sur la face du papier de montage, sous l'étiquette; c) sur l'envers du papier de montage, *a Linne P*. L'écriture de l'étiquette nous semble celle de LINNÉ² et non celle de SAUVAGES (cf. S. SAVAGE, Cat. Linn. Herb.: t. 1-5 et 8, 9, 1945). Le numéro 2 sous l'étiquette a été écrit par LINNÉ (cf. C. A. M. LINDMAN, op. cit. 9, 2: 2, 39, 1910) et les autres indications par DAHL, son disciple, auquel il a offert beaucoup d'exemplaires. L'indication *a Linne P* n'offre aucun doute sur la provenance du spécimen.

par quelques-uns des botanistes cités par LINNÉ qu'il nous semble absurde que cet auteur ait pu la confondre avec une autre. Nous reviendrons à ce sujet plus loin.

¹ Nous remercions M. le Directeur de cette Institution par le prêt de ce précieux document.

² Selon C. A. M. LINDMAN (op. cit. 7: 7, 1908), LINNÉ a écrit les noms sur des étiquettes seulement dans sa jeunesse. Il a reçu l'herbier de SAUVAGES en 1749 (cf. W. T. STEARN, An Introduction to the Species Plantarum: 106, 1957), alors qu'il était âgé de 42 ans, donc quand il n'était plus un jeune homme. Mais quelques exceptions pourraient avoir eu lieu en ce qui concerne certains échantillons, sur lesquels il aurait mis des étiquettes.

Étant donné que cet échantillon s'accorde absolument (il possède une seule ombelle florifère, à bractées dont la longueur l'égalent) avec la description du *C. daucoides* L. (1753); qu'il porte le synonyme¹ indiqué par LINNÉ pour cette espèce; que le n.º 2 est celui qui correspond à cette espèce; et qu'il a été en possession de LINNÉ², nous le considérons comme le lectotypus de ce taxon.

Caucalis daucoides L., Sp. Pl.: 241 (1753)

Lectotypus: spécimen de l'Herbier Linnéen (microfiche 118-1) de S.

Comme cet échantillon s'identifie avec l'*Orlaya grandiflora* (L.) Hoffm., *C. daucoides* L. est un synonyme de cette espèce et, par conséquent, de *C. grandiflora* L.

Le *Caucalis grandiflora* L. (Sp. Pl.: 240, 1753) a été caractérisé par: a) une diagnose — *Caucalis involucris singulis pentaphyllis: foliolo unico duplo majore*, identique à celle de de l'espèce n.º 2 de l'Hortus Cliffortianus (p. 91, 1738); b) une série de synonymes, dont quelques-uns avaient été déjà donnés dans ce même ouvrage; c) l'habitat — *Habitat in Europa*

¹ Le synonyme attribué par LINNÉ à son *C. daucoides*, de 1753, est inclus par GOUAN (Fl. Monsp.: 285, 1765) dans *C. daucoides* que cet auteur a pris dans un autre sens (= *C. daucoides* L., de 1767, = *C. Lap-pula* Grande). D'après la description que donne MAGNOL (Bot. Monspel.: 292, 1676) de son *Caucalis dauci sylvestris...*, on ne peut pas savoir si ce taxon correspond entièrement au *C. daucoides* L., de 1767, puisqu'au moins en partie le texte se rapporte à l'*Orlaya Kochii*. Mais, de toute façon, LINNÉ a interprété incorrectement l'espèce de MAGNOL.

² Probablement l'échantillon 338-2, de LINN, marqué aussi avec le numéro 2, de l'écriture de LINNÉ, mais sans indication de sa provenance, serait un double de celui de S. Plus tard, LINNÉ, reconnaissant son erreur, c'est à dire que son *C. daucoides*, de 1753, était identique au *C. grandiflora*, l'aurait lié par un épingle avec le n.º 338-1 (LINN) qui appartient à la dernière espèce et est marqué avec 1 (*C. grandiflora* est le premier dans *Species Plantarum*) et HU, ce qui montre qu'il provenait de l'Hortus Botanicus Upsaliensis. L'original qui possédait l'étiquette aurait été donné à DAHL, qui, en se basant sur le numéro 2 et le synonyme, aurait écrit la détermination *daucoides*, sans faire attention aux caractères de la plante.

australiori inter segetes. La première partie de la diagnose s'applique très bien à l'*Orlaya grandiflora*, dont les involucre sont plus fréquemment à 5 bractées, ce nombre étant aussi celui des bractées des involucrelles; mais le caractère *foliolo unico duplo majore* ne s'ajuste pas à cette espèce, car toutes les bractées de son involucre sont à peu près de la même longueur, tout au moins quand complètement développées¹.

Parmi les synonymes, un des plus importants est l'*Echinophora pycnocarpus*, de COLONNA (Ecpfr.: 91, t. 94, 1606), puisque cet auteur donne une description assez exacte et une fidèle figure de son espèce, ne laissant rien à douter qu'il s'agit de l'*Orlaya grandiflora*².

Étant donné que LINNÉ répète, en 1753, la diagnose de l'Hortus Cliffortianus, on devrait s'attendre à trouver, dans l'herbier de CLIFFORD, un échantillon pouvant typifier le *Caucalis grandiflora*. En effet, il y a dans cet herbier (voir Tableau I)³ un exemplaire ayant, sur l'étiquette, la «phrase

¹ Nous croyons que LINNÉ a obtenu cette donnée de COLONNA (Ecpfr.: 92, 1606), puisque cet auteur, à propos des bractées de l'involucre de son *Echinophora pycnocarpus* (synonyme de *C. grandiflora* L.), affirme: «Umbellae verò cauliculus antequam in umbellam dividatur, basim illi construit in quinque foliolis stellatis, quorum ora limbo albo circumdantur, eorumq.; unicum in longius duplò degenerat, & antequam flores in umbellam expandantur, illos veluti folliculo inclusos servabant». Cependant, dans la figure de gauche de la Table 94 du même ouvrage, qui représente cette espèce, les bractées des ombelles semblent être à peu près de la même longueur.

² Un nouveau synonyme, donné par LINNÉ pour le *C. grandiflora* en 1753, est le *Caucalis involucro universali pinnatifido, partialibus indivisis umbella multifida*, Fl. Suec.: 225 (1745), qui offre des difficultés d'identification. Nous n'avons pas vu la première édition de la Flora Suecica, mais dans la seconde (p. 463, 1755) LINNÉ range ce *Caucalis* dans les «Dubia», en disant: «Planta non dum flores explicaverat, ut poteram speciem determinare, in quam alii inquirant ulterius». D'après les caractères de l'involucre et du nombre de rayons, il semble s'agir d'un *Daucus*, mais les bractées des involucrelles seraient «indivisis», ce qui ne s'accorde pas avec les espèces de ce genre. Voir ce que affirme RICHTER (Codex Linn.: 257, 1835), à propos de cette plante.

³ On trouve six spécimens de *Caucalis* (voir Tableau I) dans l'herbier de CLIFFORD, dont un dans la couverture du genre *Artemisia* et les

name» de BAUHIN, incluse par LINNÉ comme synonyme dans son espèce 2, de 1738, et dans le *C. grandiflora*, de 1753. L'étiquette porte aussi la détermination *grandiflora*, en écriture différente de l'antérieure. Malgré cela, l'échantillon n'appartient pas à l'*Orlaya grandiflora* (lequel jusqu'à ce jour a eu comme basonyme le *C. grandiflora* L.), mais à l'*O. Kochii* Heywood. De cette façon, on conclut que, ou bien l'échantillon correspondant à l'*O. grandiflora* a disparu en se conservant son étiquette, ou LINNÉ a commis une erreur d'interprétation. Cette dernière supposition semble possible, puisque le dit exemplaire est, de tous les *Caucalis* de l'Hortus Siccus, celui qui, par ses pétales extérieurs rayonnants, se rapproche le plus de l'*O. grandiflora* et, en outre, ce qui est anormal pour l'*O. Kochii*, au moins une des ombelles possède un involucre à 5 et non à 3 bractées.

Si on prenait cet échantillon comme l'«obligate lectotypus» de *C. grandiflora*, puisqu'aucun autre de cet herbier ne le pourrait être, le concept qu'on a eu de cette espèce jusqu'à présent devrait changer, ce qui obligerait à une altération nomenclaturale.

Cependant, si LINNÉ a commis une erreur d'interprétation en 1738, le même peut n'avoir pas eu lieu en 1753, en étudiant les spécimens de *C. grandiflora* qu'il possédait alors. On sait que, jusqu'à 1748, cette espèce ne fut pas cultivée au Jardin Botanique d'Upsala car elle ne figure pas dans l'Hortus Upsaliensis (1748), qui inclut seulement le *Caucalis* 3 (= *C. platycarpus*, de 1753) et le *Caucalis* 4 [= (*Tordylium*) *Torilis nodosa*] de l'Hortus Cliffortianus. Dans l'herbier de LINNÉ (LINN), les deux spécimens 338-1 et 338-3, qu'appartiennent à l'*Orlaya grandiflora*, portent l'indication HU, ce qui

autres dans celle de *Caucalis*. Tous portent des étiquettes avec des «phrases names» qui n'ont pas été écrites par LINNÉ. D'autres déterminations, d'une écriture différente et en nomenclature binomiale, ont été faites par un autre inconnu, après 1762, puisque LINNÉ a transféré l'*Artemisia muricata* dans le genre *Daucus* en cette date (Sp. Pl. ed. 2, 1762). La place des étiquettes au moment où ce dernier inconnu a étudié les plantes n'était pas la même qu'à présent; en effect, faisant foi par ses déterminations, l'étiquette de D était placée en B et l'étiquette de l'échantillon F a été échangée avec celle de A.

indique son origine; la plante correspondante pourrait avoir été cultivée à l'Hortus Botanicus Upsaliensis entre 1748 et 1753. Mais, si cela ne fut pas le cas, LINNÉ a certainement examiné l'exemplaire de l'Hortus Siccus de J. BURSER qui se trouvait alors à Upsala, où il est encore (UPS). Étant donné que ce dernier botaniste fut un correspondant de BAUHIN et que son herbier est ordonné et nommé selon le Pinax (cf. W. T. STEARN, op. cit.: 116, 1957), l'Hortus Siccus de BURSER possède une grande importance, ayant permis à LINNÉ d'identifier beaucoup des espèces de BAUHIN. Dans le dit herbier, l'échantillon VII (2) 54 porte, sur l'étiquette, la «phrase name» de BAUHIN (Pinax: 152) que LINNÉ a mise dans la synonymie de son espèce n.° 2 de l'Hortus Cliffortianus et dans celle du *C. grandiflora*, de 1753 — *Caucalis arvensis echinata, magno flore* — et l'indication que la plante avait été récoltée «In Saxonia». Comme la Saxe appartient à l'Allemagne (la «Germania» est une des régions citées comme l'habitat de l'espèce n.° 2 de *Caucalis*, en 1738), en considérant cette donnée et l'antérieure, nous désignons l'exemplaire de BURSER comme le lectotypus de *C. grandiflora* L. Ce spécimen s'identifiant avec l'*Orlaya grandiflora* Hoffm., on conclut que LINNÉ avait, en 1753, la même idée de cette espèce qu'il a eu depuis, dans le Systema (pag. 205, 1767), et qui est aussi celle que ont eue avant et après lui tous les botanistes.

***Orlaya grandiflora* (L.) Hoffm.**

Caucalis grandiflora L., Sp. Pl.: 240 (1753).

Lectotypus: Specimen VII (2) 54 [in Horto Sicco Burseri (UPS)]¹.

Dans cet article nous avons employé le nom *Orlaya Kochii*, proposé par HEYWOOD (op. cit.: 13) en substitution d'*O. platycarpus* Koch. Selon presque tous les auteurs, cette espèce serait le *Caucalis platycarpus* L., de 1753, identique au

¹ Quelqu'un, sur une étiquette récente, a élu l'exemplaire C (voir Tableau I) de l'Hortus Cliffortianus (BM) comme le lectotypus de l'*Orlaya grandiflora*. Étant donné ce que nous venons de conclure, cette étiquette doit être retirée de cet échantillon.

C. platycarpus L. de 1767, mais d'après HEYWOOD, qui a suivi l'opinion de quelques autres botanistes (SCOPOLI, Fl. Carn. ed. 2, 1: 190, 1772; DANDY, List of Brit. Vasc. Pl.: 69, 1958; etc.), le *C. platycarpus*, de 1753, est identique au *C. daucoides* L., de 1767 (= *C. Lappula* Grande). Pour arriver à cette conclusion, HEYWOOD s'est basé sur l'échantillon D (voir Tableau I) de l'Hortus Siccus Cliffortianus, qu'il a désigné comme le lectotypus de *C. platycarpus* L. En effet, cet exemplaire appartient au *C. daucoides* L., de 1767, et il porte une étiquette avec une «phrase name» que quelques auteurs (cf. GOUAN, loc. cit.) considèrent comme synonyme de cette espèce. Cependant, la description de *C. platycarpus*, de 1753, est ambiguë, englobant en partie (*involucris triphyllis*) l'*Orlaya platycarpus* et en partie (*umbellulis trispermis*) le *Caucalis daucoides*, de 1767, la partie restante (*umbella trifida*) pouvant s'appliquer à chacun de ces deux taxa. Etant donné qu'il y a parfois des ombellules fructifères anormales (à trois et même à quatre fruits) chez l'*Orlaya platycarpus*, la description s'ajusterait parfaitement à cette espèce si les échantillons vus par LINNÉ n'étaient pas normales. D'autre part, en ce qui concerne le nombre des bractées de l'involucre, la description ne peut pas s'appliquer au *C. daucoides* L., de 1767, puisque cette espèce ou ne possède aucune ou seulement une bractée à l'involucre. De plus, les synonymes et les figures indiqués par LINNÉ pour le *C. platycarpus*, de 1753, s'accordent avec l'*Orlaya platycarpus* et non avec le *C. daucoides*, de 1767. Si cette dernière espèce était la même que le *C. platycarpus*, de 1753, alors LINNÉ n'aurait pas besoin de corriger la description de celle-ci, en 1767, dans le Systema, où la phrase «*Caucalis umbella trifida, umbellulis trispermis, involucris triphyllis*», de 1753, est substituée par «*C. umbellis trifidis aphyllis, umbellulis trispermis triphyllis*», dont la signification est bien différente de l'antérieure. De plus, la figure indiquée pour le *C. daucoides*, de 1767, est la tab. 97, de COLONNA, tandis que la figure qui LINNÉ indique pour le *C. platycarpus*, de 1753, est la tab. 94 du même auteur. Il est vrai que, soit pour cette dernière espèce, soit pour le *C. daucoides*, de 1767, LINNÉ cite comme synonyme l'Hortus Cliffortianus, page 91, ce qui amènerait à croire, qu'en effet, il s'agit de la même espèce dont le type se

TABLEAU I

Spécimens de *Caucalis* de l'Hortus Siccus Cliffortianus (BM).

	Déterminations primitives («phrase-names») sur les étiquettes originales	Déterminations postérieures (binoms ou épithètes linnéens) sur les étiquettes originales	Déterminations plus récentes, au crayon, sur le papier de montage	Déterminations dactylographiées sur des étiquettes récentes	Identifications
A	<i>Daucus major</i> , <i>daucoides tingitana</i>	<i>Daucus muricatus</i>	<i>Turgenia latifolia</i> Hoffm.		<i>Turgenia latifolia</i> (L.) Hoffm.
B	<i>Caucalis monspeliaca</i> , <i>echinata</i> , <i>magno fructu</i>	<i>Daucoides</i>	<i>Turgenia latifolia</i> Hoffm.		<i>Turgenia latifolia</i> (L.) Hoffm.
C	<i>Caucalis arvensis echinata</i> , <i>magno flore</i>	<i>grandiflora</i>		[Type Specimen (imprimé)] of <i>Caucalis grandiflora</i> L., Sp. Pl. 1: 240 (1753)	<i>Orlaya Kochii</i> Heyw. (= <i>O. platycarpus</i> Koch)
D	<i>Caucalis dauci sylvestris folio echinato</i> , <i>magno fructu</i>	<i>latifolia</i>		[Type specimen (imprimé)] of <i>Caucalis platycarpus</i> L., Sp. Pl. 1: 241 (1753)	<i>Caucalis daucoides</i> L., 1767 (non 1753) = <i>C. Lappula</i> (Weber) Grande = <i>C. platycarpus</i> L., 1753, sec. Heywood, non Auct. pl.
E	<i>Caucalis nodoso</i> , <i>echinata semine</i>	<i>Tordylium nodosum</i>	<i>Torilis nodosa</i>		<i>Torilis nodosa</i> (L.) Gaertn.
F	<i>Caucalis arvensis</i> , <i>echinata</i> , <i>latifolia</i>	<i>latifolia</i>		<i>Daucus muricatus</i>	<i>Daucus muricatus</i> (L.) L.

trouverait dans l'Hortus Siccus de CLIFFORD. Mais se rappellerait LINNÉ exactement de tous les spécimens de cet herbier, après toutes les années écoulées depuis son départ de la Hollande? En prenant en considération toutes les peines qu'il s'est données pour déterminer les échantillons de *Caucalis* de son herbier (il faut voir les successives déterminations, parfois deux, avant d'arriver à la définitive), on ne s'étonnera pas que quelque confusion soit survenue dans son esprit concernant les plantes de l'herbier de CLIFFORD. D'ailleurs, l'échantillon D (voir Tableau I), c'est à dire le lectotypus proposé pour le *C. platycarpus* L., de 1753, même en ne considérant pas le caractère du nombre de bractées de l'involucre, ne s'accorde pas complètement avec les autres caractères référés dans la diagnose de cette espèce. En effet, l'ombelle supérieure possède 5 rayons et non 3 et il y a 2-3 fruits par ombellule et non toujours 3. De plus, il y a dans cet herbier un spécimen (C du Tableau I) appartenant à l'*Orlaya platycarpus*, mais avec l'étiquette *Caucalis arvensis echinato magno flore*. Alors, en supposant que le spécimen du vrai *C. grandiflora*, auquel ce synonyme se rapporte, ait disparu en se conservant son étiquette, quel des deux échantillons, le C ou le D, a été considéré par LINNÉ comme son espèce n.º 3 (= *C. platycarpus*, de 1753) de l'Hortus Cliffortianus? ¹ Il faut considérer encore que toutes les «phrases names» des étiquettes de ces spécimens, à l'exception de *Caucalis dauci sylvestris folio, echinato magno fructu*, sont citées par lui comme des synonymes de ses espèces, en 1748. Pourquoi alors cette exception?

¹ Dans la note de la page 400 nous avons vu que quelques échanges d'étiquettes ont eu lieu à l'herbier de CLIFFORD. On peut admettre aussi que l'étiquette originale de l'échantillon C était celle qu'on trouve à présent sur l'exemplaire B et qui porte un synonyme indiqué par LINNÉ pour son *C. platycarpus*, de 1753. Cependant, la même étiquette pourrait être sur l'échantillon D, ce qui donnerait raison à HEYWOOD. Dans ce cas, à quel spécimen appartiendrait originellement l'étiquette de D? On peut, évidemment, mettre de côté les étiquettes et leurs «phrases names», mais, pour qu'un spécimen pût être pris comme lectotypus d'une espèce, il faut que, par ses caractères, il s'accorde avec la description de celle-ci (ce qui n'est pas tout-à-fait le cas présent) et qu'il y ait une probabilité qu'il ait été

En considérant que la diagnose de *C. platycarpus*, de 1753, est ambiguë, qu'elle ne s'applique totalement à l'échantillon D de l'herbier de CLIFFORD, qu'elle peut s'appliquer aussi, au moins en partie, au spécimen C, ne serait-il préférable de prendre ce taxon comme un «nomen confusum», ayant encore en considération qu'il a été compris en deux sens différents (comme *Orlaya platycarpus* et comme *Caucalis Lappula*) ?

HEYWOOD a employé, comme nous l'avons dit, *Orlaya Kochii* au lieu d'*O. platycarpus* Koch. D'après la figure de l'*O. Topaliana* Beauverd (in Candollea, 7: 262, t. 7, 1937), cette espèce nous semble très proche (comme il est admis par son auteur lui-même) sinon identique à celle-là. Si, par l'étude d'un nombre plus élevé de plantes (BEAUVERD a basé sa description sur une seule récolte dont les fleurs étaient apétales) on vient à établir l'identité, le nom de BEAUVERD sera celui qui devra être employé et non celui de HEYWOOD. Il y a même un nom antérieur à l'*O. Topaliana*, l'*O. intermedia* Boiss. (in Ann. Sc. Nat. 2: 49, 1844), que l'auteur a postérieurement (Fl. Or. 2: 1071, 1872) considéré comme une variété de l'*O. platycarpus*. Dans le cas de l'*O. intermedia* Boiss. n'être pas espèce indépendante, sera ce nom qu'on est obligé à prendre au lieu d'*Orlaya platycarpus*. Nous n'avons pu étudier aucun échantillon de ces taxa, mais nous attirons sur eux l'attention des botanistes intéressés à ces problèmes.

Dans l'herbier de LINNÉ (LINN) les échantillons sont groupés selon l'ordre des espèces suivie dans le Systema (ed. XII: 205, 1767), de la façon suivante:

vu par son auteur. Étant donné que LINNÉ dans l'Hortus Cliffortianus réfère cinq espèces de *Caucalis* (dont une sous *Arteria*) et que, à présent, on trouve six exemplaires étiquetés comme *Caucalis* dans l'Hortus Siccus, un parmi eux semble n'avoir y existé au temps du séjour de LINNÉ en Hollande. Lequel ?

	Echantillons	
Espèce n.º 1 (Syst. et Sp. Pl.)	{ 338- 1 } 338- 2 338- 3	} groupe 1
<i>Caucalis grandiflora</i> L.		
[<i>Orlaya grandiflora</i> (L.) Hoffm.]		
Espèce n.º 2 (Syst.)	{ 338- 4 } 338- 5 338- 6	} groupe 2
<i>Caucalis daucoides</i> L.		
(<i>C. Lappula</i> Grande= <i>C. platycarpus</i> L., 1753?)		
Espèce n.º 7 (Syst. ¹)	{ 338- 7 } 	} groupe 3
<i>Caucalis latifolia</i> L.		
[<i>Turgenia latifolia</i> (L.) Hoffm.]		
Espèce n.º 4 (Syst.)	{ 338- 8 } 338- 9 338-10	} groupe 4
<i>Caucalis platycarpus</i> L.		
(<i>Orlaya Kochii</i> Heywood= <i>O. platycarpus</i> Koch = <i>O. Topaliana</i> Beauverd? = <i>O. intermedia</i> Boiss.?)		
Espèce n.º 5 (Syst. et Sp. Pl.)	{ 338-12 } 	} groupe 5
<i>Caucalis orientalis</i> L.		
Espèce n.º 6 (Syst. et Sp. Pl.)	{ 338-13 } 	} groupe 6
<i>Caucalis leptophylla</i> L.		
[<i>Torilis leptophylla</i> (L.) Reichenb. f.]		

De cette façon, il y a correspondance entre les numéros des espèces et ceux des groupes d'exemplaires. L'échantillon 338-11 a été exclu de cette liste, puisqu'il s'agit du *Caucalis pumila* Gouan, espèce non citée dans le Systema. L'identification de l'échantillon n.º 338-13, qu'appartient au *Torilis leptophylla*, n'a pas été faite par LINNÉ, mais par SMITH qui a écrit *C. humilis* Jacq. Hort. t. 195 (synonyme du *T. leptophylla*).

¹ Avec le n.º 7, mais référé en 3ème place dans le Systema, entre les espèces n.º 2 (*C. daucoides*) et n.º 4 (*C. platycarpus*). Dans Species Plantarum, celle avec le n.º 3 est le *C. mauritanica* qui n'est pas représenté dans LINN.

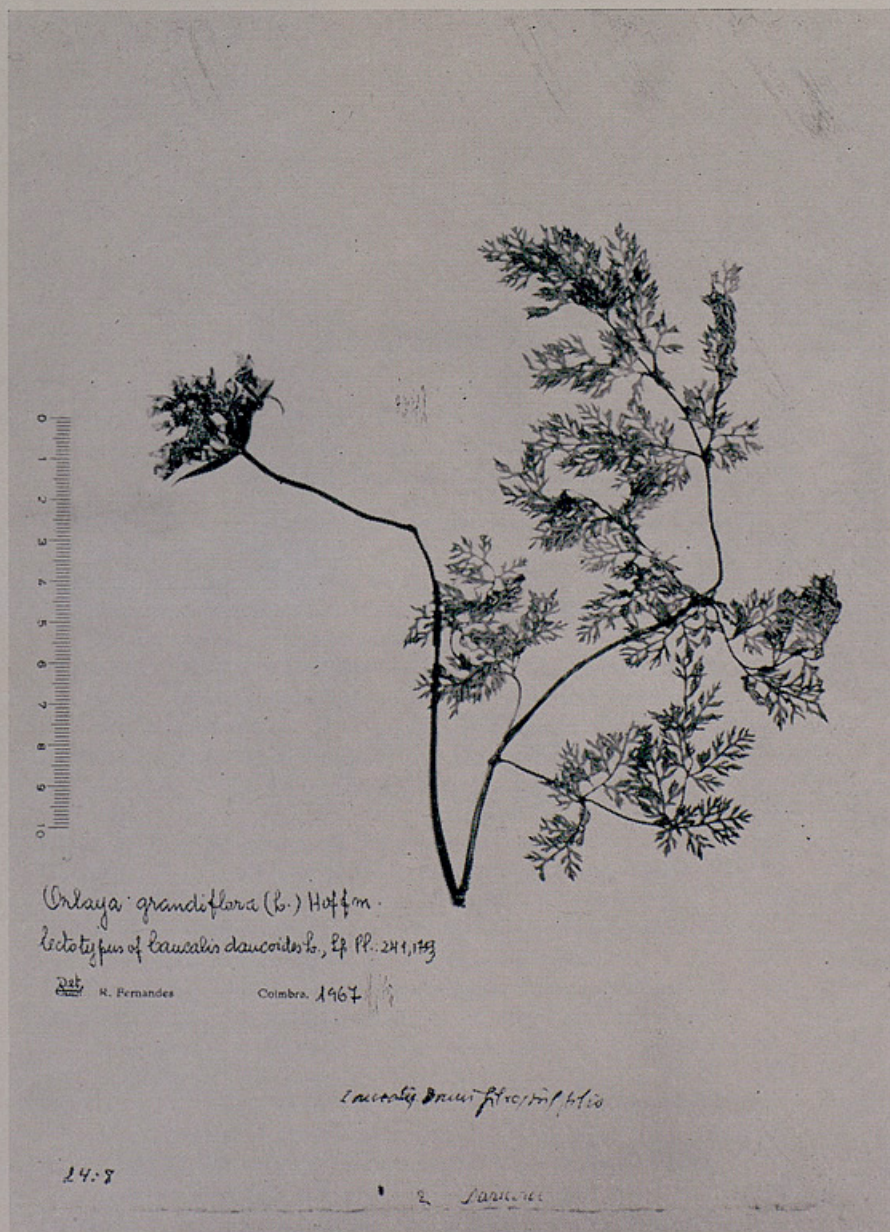
ADDENDA

Après l'envoi de cet article pour publication, nous avons pris connaissance de l'étude «Flora der Insel Kythera gleichzeitig Beginn einer nomenklatorischen Überprüfung der griechischen Gefässpflanzenarten», par W. GREUTER & K. H. RECHINGER (in Boissiera, 13: 1967), où se trouve (pag. 92, 93) une note concernant le *C. daucoides* L.

GREUTER, l'auteur de cette note, fait l'identification de ce taxon d'après le synonyme de MAGNOL que nous avons référé ci-dessus (pag. 395). Sa conclusion est que le *C. daucoides* L., de 1753, est identique à l'*Orlaya platycarpus* Koch (= *O. Kochii* Heywood), en faisant la nouvelle combinaison *O. daucoides* (L.) Greuter, puisque, selon lui, dans le genre *Orlaya*, rien ne s'opposait à son établissement. Comme nous l'avons dit (cf. note 1, pag. 398), le texte de MAGNOL correspondant à son «*Caucalis dauci sylvestris folio, echinato magno fructu*», se rapporte, au moins en partie, au *C. daucoides* L., de 1767; d'autre part, la description de LINNÉ se réfère, à notre avis, à l'*Orlaya grandiflora* et s'applique complètement à l'exemplaire de l'herbier de LINNÉ (S) qui nous avons désigné comme le lectotypus de *C. daucoides* et qui est un échantillon de l'*O. grandiflora*.

De plus, GREUTER considère le nom *O. platycarpus* Koch comme un nouveau nom légitime. Si cela peut être admis, ce nom doit se maintenir. Mais, si le nom de KOCH ne pourra pas être employé, on doit choisir pour l'espèce l'épithète *O. Topaliana* Beauverd, puisque GREUTER, d'après l'examen du type, a constaté que ce taxon, comme nous l'avions supposé, est identique à l'*O. platycarpus*. Cependant, si l'*O. intermedia* Boiss., espèce à laquelle GREUTER ne fait aucune référence, est aussi identique à l'*O. platycarpus*, le nom de BOISSIER sera celui qu'on doit choisir (cf. pag. 405).





Lectotypus de *Caucalis daucoides* L. (1753)
 Spécimen 118-1 de l'herbier de Linné (S)



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