

THE SOUTH AFRICAN SPECIES OF ERYTHRINA.

By

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The genus *Erythrina*, as represented in South Africa, comprises plants ranging from shrubs to tall trees. The species generally have large and trifoliate leaves and showy flowers, while several have a large rootstock. Their distribution is predominantly eastern and their occurrence south-west of the Albany district is rare though *E. caffra* is said to thrive well in cultivation in the Cape Peninsula. There are, too, records of the genus from West Africa. A plant which flowered in the Natal Herbarium garden (D. 17675) is said to have been grown from seed sent from West Africa by Colonel G. Molyneux, while Galpin collected a specimen near Windhoek (Galpin 14213 in National Herbarium), adding a note that only one plant was seen.

In the following account one species dealt with is known only in cultivation, viz.: *E. Crista-galli* Linn. The flowering shoots of this species die off annually and it requires a considerable length of time for a plant to attain to the height of a tree. Noteworthy, too, is the absence of a definite peduncle, the small groups of pedicelled flowers frequently springing from the axils of the upper leaves. Other cultivated species include *E. constantiana* Micheli, *E. micropteryx* Poepp., *E. corallodendron* Linn., *E. breviflora* DC., all from the Durban Botanic Gardens, but as they are represented in most cases by only a single specimen they are not included in the present descriptions. Two other specimens which flowered in the Natal Herbarium grounds and as yet unnamed, are said to have been grown from seed brought by Colonel Molyneux from East and West Africa.

Of the remaining species the occurrence of *E. acanthocarpa* E. Mey., the Tambokkie Thorn, is limited to the Queenstown-Tarkastad-Cathcart area of the eastern Cape Province where these shrubs are said to form dense thickets. This species is distinguished by its green-tipped, scarlet flowers, spinous legume, and comparatively small leaflets, and has a long succulent "root." According to Marloth the tissue of this underground rhizome is filled with water as a reserve against prolonged drought.

The species with the tallest trees, sometimes up to 60 feet high, is *E. caffra* Thunb., the Kaffirboom. Although the brilliant scarlet flowers appear before the foliage, the patches of red form an attractive picture against the background of grassy plains on which the trees are often to be found. In the warm, subtropical climate of Natal the flowers appear earlier than they do further south in the Albany district, sometimes before the end of June when the foliage of the previous season has not yet entirely disappeared. Pegler states that natives regard the flowering of this tree as a sign to begin ploughing. Bayer in "An Account of the Plant Ecology of the Coastbelt and Midlands of Zululand" (Annals of the Natal Museum, Vol. VIII) observes that *E. caffra* becomes established under the shade of the palm, *Phoenix reclinata*. He further cites this species in a list of plants typical of the forest margin which do not occur within the forest itself, being killed out as a result of over-shadowing by taller forest trees.

Hutchinson (Kew Bulletin, 1933) has recognised a species *E. lysistemon*, found in the Transvaal and formerly included in *E. caffra*, from which, however, it is distinguished by the possession of a vexillary stamen quite free from the split staminal-tube. Though this species may be confined to the Transvaal, *E. caffra* also occurs within this territory.

E. latissima E. Mey. is a stout branching tree cited by Bayer (An Account of the Plant Ecology of the Coastbelt and Midlands of Zululand) as a constituent of open tree veld.

On the grassy hill slopes of Natal these scattered trees, 15-20 feet high, are conspicuous for their robust appearance. Smaller than this are the shrubby species *E. Humeana*, Spreng. and *E. Zeyheri* Harv., easily distinguishable by the coarser appearance of the latter with its larger and more prickly leaves and larger stipules. *E. Zeyheri* has a large, corky underground stem and extends inland further west than *E. Humeana*.

Economically the genus is not important. Because *E. caffra* is easily propagated vegetatively, it is employed in the construction of live fences round kraals, and with other species is cultivated for ornamental purposes. Burt-Davy in "A Manual of the Flowering Plants and Ferns of the Transvaal with Swaziland" affirms that the very light underground stem of *E. Zeyheri* has been used as a substitute for cork, and dried and smoked as a remedy for asthma. Watt and Breyer-Brandwijk (The Medicinal and Poisonous Plants of Southern Africa) state that a leaf paste of *E. caffra* is one of the ingredients of a poultice applied by the Zulus over the bladder in suspected disease of that organ, the skin being greased before application. A similar poultice is used in the local treatment of venereal sores. The same authors declare that a decoction of the root of *E. Humeana* is used as a fomentation, and by the mouth in tuberculosis. It is sometimes used for other chest conditions, e.g. bronchitis, while the Zulus and Swazis use the bark of *E. Zeyheri* as an ingredient in a decoction taken by the mouth for rheumatism, boils, and "blood disorders".

According to Watt and Brandwijk, seed of *E. Zeyheri* yields 28 per cent. of a fixed oil which is purgative and 4 per cent. of a volatile oil containing an alkaloid now generally known as *zeyherine*, previously as *erythrine*. This alkaloid has been recommended for tuberculosis. The volatile oil also contains *erythrol* which has a pungent odour like horse-radish and is a powerful irritant. It can be used in a liniment for counter-irritation. The Union Division of Forestry has received enquiries from America concerning the availability of seeds of *Erythrina* spp. for which a demand is anticipated if the extraction of their alkaloids proves successful. The coral-red seeds are utilised by Kaffir women in the manufacture of necklaces.

Acknowledgment is made to the following herbaria for the loan of specimens: Transvaal Museum, Pretoria (T. M.), Natal Herbarium, Durban (D.), Albany Museum, Grahamstown (G.).

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Erythrina Linn. Sp. Pl. ed. I. 706 (1753).

Coralodendron Mill. Gard. Dict. Abridg. ed. 4 (1754).

Mouricou Adans. Fam. II. 325 (1763).

Xyphanthus Rafin. Fl. Ludov. 103 (1817).

Chirocalyx Meisn. in Hook. Lond. Journ. Bot. II. 97 (1843).

Micropteryx Walp. in Linnaea, XXIII. 739 (1850).

Duchassaingia Walp. l. c. 741.

Macrocymbium Walp. in Flora, XXXVI. 194 (1853).

Stenotropis Hasskarl Retzia, I. 183 (1855).

Hypaphorus Hasskarl Hort. Bogor. I. 197 (1858).

Shrubs or trees ranging from 0.3 m. to 17 m. in height. *Stem* generally woody and branched, but subterranean and corky in *E. Zeyheri*; branches woody, leafy, armed with prickles, glabrous or tomentose, but then becoming glabrous with age. *Leaves* pinnately 3-foliolate, alternate, petioled, often arising in clusters at the apex of the stem in *E. Zeyheri*, in the other species generally scattered along the branches or sometimes clustered towards the ends of the branchlets; leaflets with or without prickles on the veins on one or both surfaces, eventually glabrous but sometimes tomentose when young; petiole terete and without furrows or furrowed, armed or unarmed, tomentose, puberulous or glabrous; terminal leaflet ovate, obovate, elliptic or ovate long-acuminate, sometimes broader than

long, obtuse to acute, rarely apiculate, with a pair of basal glands; petiolule of terminal leaflet frequently armed with prickles, white-tomentose, puberulous, or glabrous; lateral leaflets ovate, obovate, elliptic or ovate long-acuminate, occasionally broader than long, obtuse to acute, very rarely apiculate, sometimes unequal-sided, with a pair of glands at the base. *Stipules* ovate, oblong or linear, white tomentose, pubescent or glabrous. *Peduncle* woody, naked, often furrowed, armed or unarmed, tomentose to puberulous, but becoming glabrous with age. *Racemes* terminal and densely, or rarely lateral and laxly, many-flowered except in *E. acanthocarpa* where the short racemes are few-flowered. *Flowers* brilliant scarlet to dull crimson, tipped with green in *E. acanthocarpa*, showy, frequently pendulous, appearing before or with the leaves. *Bracts* ovate, ovate-rotund, oblong or linear-obovate, densely tomentose to puberulous, deciduous; bracteoles linear, woolly-villous to puberulous, frequently deciduous. *Calyx* tubular to campanulate, 2-lipped or sub-truncate, frequently obscurely 5-lobed, very rarely as broad as long, in *E. latissima* ovate or obovate and with the tube cleft below nearly to the base and the upper side produced into 5 apical linear or linear-lanceolate lobes, densely woolly-villous to puberulous, but glabrous in *E. Crista-galli*. *Vexillum* ovate, obovate, elliptic, oblong-obovate or elliptic-oblong, obtuse, frequently emarginate, with a short basal claw, glabrous, sometimes minutely velvety; keel roughly ovate, obovate or oblong, acuminate in *E. acanthocarpa*, sometimes truncate and with a lateral mucro above, in *E. Humeana* frequently with a lateral lobe, keel petals sometimes free, shortly narrowed at the base, very rarely not narrowed; wings ovate or roughly oblong to obovate, frequently curved and narrowing slightly above, shortly clawed at the base, longer or shorter than the keel, with a ventro-lateral lobe on each side in *E. acanthocarpa*. *Stamens* diadelphous, with the filaments free above and united into a split tube below except the vexillary filament which is free to its base in *E. lysistemon* but is united to the staminal-tube for varying lengths in the other species; anthers linear, 2-theous, dehiscing by longitudinal slits, dorsi-fixed. *Ovary* linear, many-ovuled, densely tomentose, on a gynophore; style linear, hispid below, glabrous above, rarely glabrous along its whole length; stigma small, simple, terminal. *Pods* (in those species seen) dark, subligneous, stalked, falcate, armed with prickles only in *E. acanthocarpa* constricted between the seeds and with these constrictions frequently elongated. *Seed* red, elliptic, with a scar of attachment.

KEY TO THE SPECIES.

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| 1. Peduncle and calyx whitish woolly-villous; calyx with 5 apical linear lobes, cleft nearly to the base on the lower side..... | 1 | <i>E. latissima</i> . |
| Peduncle and calyx not woolly-villous; calyx sub-truncate or 2-lipped, but not cleft to the base..... | 2 | |
| 2. Keel almost as long as the vexillum..... | 7 | <i>E. crista-galli</i> . |
| Keel about $\frac{1}{4}$ to $\frac{1}{2}$ as long as the vexillum..... | 3 | |
| 3. Calyx distinctly 2-lipped..... | 4 | |
| Calyx truncate or almost so..... | 5 | |
| 4. Vexillary stamen free to the base, possibly adhering to, but not adnate to, the split staminal-tube..... | 2 | <i>E. lysistemon</i> . |
| Vexillary stamen adnate to the split staminal-tube for about 1 cm. below.. | 3 | <i>E. caffra</i> . |
| 5. Terminal leaflet obovate, less than 5 cm. long; keel longer than the wings; legumes spinous..... | 4 | <i>E. acanthocarpa</i> . |
| Terminal leaflet ovate or elliptic, rarely obovate, usually 5 cm. or more long; keel shorter than the wings; legumes unarmed..... | 6 | |
| 6. Filaments free above for at least half the length of the longest stamens; leaflets sometimes with a few prickles on the veins beneath..... | 5 | <i>E. humeana</i> . |
| Filaments free for less than half, about $\frac{1}{3}$ the length of the longest stamens; leaflets well armed with prickles on the veins beneath..... | 6 | <i>E. zeyheri</i> . |

1. *E. latissima* *E. Mey.* Comm. Pl. Afr. Austr. 151 (1835).

Chirocalyx mollissimus Meisn. in Hook Lond. Journ. Bot. II. 98 (1843).

Erythrina sandersoni Harv. Thes. Cap. I. 39 (1859).

E. tomentosa R. Br. sec. Wood Natal Plantc. IV. iv. tab. 384-385 (1906), non R. Br.

E. abyssinica Lam. sec. Marloth Fl. South Afr. II. 1. 81 (1925), non Lam.

A tree, 3-7 m. high. *Branches* woody, armed with prickles, densely tomentose, becoming glabrous with age. *Leaves* with the veins of the leaflets occasionally armed with prickles, generally unarmed, variously pubescent, sometimes puberulous or at first densely tomentose above and below but becoming glabrous with age, the upper surface losing its tomentum first; petiole woody, 13-30 cm. long, up to 0.9 cm in diam., shallowly furrowed, unarmed, densely whitish tomentose to puberulous, becoming glabrous with age; terminal leaflet 5.5-30 cm. long, 7.5-31.5 cm. broad, broadly ovate, broader than long, obtuse; petiolule of terminal leaflet 5-16.5 cm. long, densely whitish-tomentose to puberulous, becoming glabrous; lateral leaflets 7-21 cm. long, 7-21.5 cm. broad, broadly ovate, frequently broader than long, obtuse, unequal-sided. *Stipules* ovate, densely white-tomentose. *Peduncle* 12-24 cm. long, not furrowed, unarmed, at first densely white-tomentose, becoming glabrous. *Raceme* terminal, densely many-flowered, 4-8 cm. long. *Flowers* dull crimson, showy, erect when in bud, but becoming pendulous as they mature. *Bracts* membranous, 1.2-2 cm. long, linear-obovate, densely white-tomentose; bracteoles up to 2 cm. long, linear, woolly-villous. *Pedice*l 0.4 cm. long, densely villous. *Calyx* 3-4.1 cm. long, 0.8-1.1 cm. diameter across the middle of the tube, ovate or obovate, with the tube cleft nearly to the base on the lower side and the upper side produced into 5 apical linear or linear-lanceolate lobes about 1/3 length of the calyx, densely woolly-villous. *Vexillum* 3.1-6.3 cm. long, 1.5-2.7 cm. broad across the middle, elliptic or oblong-obovate, obtuse, emarginate, with a short basal claw, glabrous; keel 1.3-1.9 cm. long, 1-1.4 cm. broad across the middle, keel petals free, obovate, shortly narrowed at the base; wings 1.7-2.8 cm. long, 0.8-1 cm. broad at the middle, obovate-oblong, curved, narrowed at the base, longer than the keel. *Filaments* 2.8-5.2 cm. long, vexillary filament free to the centre of the staminal-tube, the rest free above for approximately 1/3 the length of the longest stamens; anthers 2.5-4 mm. long. *Ovary* 1.5-2 cm. long; style 1.2-2 cm. long, linear, hispid below, glabrous above; stigma capitate.

Cape Province: Kentani district, *Pegler* 235, Sept., 1903, Oct., 1907 (N.H., G.); Umzimkulu district, *Clydesdale*, *Tyson* 1053 (N.H.)

Natal: Umzinto district, *Ifafa*, *Lansdell* (N.H. 16114); Durban district, Port Natal, *Krauss* 263 (N.H. 9326); unknown collector, *N.H.* 14466; Zululand, *Harris* (D. 28844).

Swaziland: Mbabane district, *Nicholson* (N.H. 22996).

Transvaal: Barberton district, *Logogotu*, *Holt* 334 (N.H.).

The following specimens consisting of leaves only may belong to this species:—

Transvaal: Barberton district, Barberton, *Smith* 7051 (N.H.), *Oranje in Herb. Burt-Davy* (N.H. 23296), Nelspruit, *Mogg* 13979 (N.H.); Pietersburg district, *Houtboschberg*, *Nelson* 382 (T.M. 11626).

The identity of the following specimens is doubtful. Possibly they should be included under *E. latissima*:—

Cape Province: Transkei, *Miller* (N.H. 23297).

Transvaal: Pietersburg district, Woodbush, *Hoffmann* 143 (T.M. 30424).

The following are cultivated specimens:—

Natal: Durban, in Botanic Gardens, *Wood* (D. 3579).

Cape Province : Kingwilliamstown, grown from seeds from Umtata, *Sim* 1362 (N.H.). This specimen probably belongs here.

Transvaal : Pretoria, cultivated in Division of Botany and Plant Pathology gardens, origin unknown, *Collett* (N.H. 24192).

The species, as here represented, is very variable as regards vegetative features, the amount of tomentum on the leaves in particular presenting a problem, the solution to which can probably be found only by an examination of material in the field. It is possible that two distinct species exist. However, because the floral structure appears uniform and because the dried herbarium material available does not warrant the creation of an additional species, the specimens formerly known as *E. latissima* E. Mey. have been left under that name.

2. *E. lysistemon* *Hutch.* in *Kew Bull.* 1933, 422.

A tree up to 7 m. high. *Stem* woody, branched; branches woody, leafy, covered with prickles. *Leaves* scattered or clustered towards the ends of the branchlets, unarmed, glabrous; petiole about 8.5 cm. long, shallowly furrowed, sometimes armed with one or two prickles, puberulous when young but becoming glabrous; terminal leaflet 9.5 cm. long, 8.5 cm. broad, broadly ovate, long acuminate, narrowing at the base, subobtuse; petiolule of terminal leaflet about 4 cm. long, sometimes bearing one or two prickles when young; lateral leaflets 8–9 cm. long, 6.5–8 cm. broad, broadly ovate, long acuminate, narrowing at the base, sub-obtuse, unequal-sided, with a pair of basal glands. *Stipules* 0.3 cm. long, ovate, pubescent when young, becoming glabrous, deciduous. *Peduncle* 6–24 cm. long, faintly furrowed, unarmed, pubescent at first, becoming glabrous. *Racemes* terminal, densely many-flowered, 2–6 cm. long. *Flowers* red, showy, pendulous, appearing before the leaves. *Bracts* ovate, pubescent, deciduous; bracteoles minute, linear, pubescent. *Pedice*l 0.2 cm. long. *Calyx* 1–1.4 cm. long, 0.7–0.9 cm. diameter above, campanulate, 2-lipped, upper lip sometimes shallowly 2-fid, tomentose. *Vexillum* 2.4–5.9 cm. long, 1.1–2.1 cm. broad across middle, obovate or elliptic, obtuse, sometimes emarginate, with a very short basal claw, glabrous; keel 0.7–1 cm. long, 0.3–0.5 cm. broad across the middle, oblong to obovate, narrowed at the base; wings 1–1.1 cm. long, 0.3–0.4 cm. broad across the middle, roughly oblong, narrowing above, curved, narrowed at the base, slightly longer than the keel. *Filaments* 2–3.6 cm. long, with the vexillary filament free to the base, possibly adhering to, but not adnate to, the split staminal-tube, and with the remaining filaments free for 0.7–1.1 cm. above; anthers 0.25 cm. long. *Ovary* 1–1.7 cm. long; style 0.9–1.7 cm. long, linear, hispid; stigma small, capitate. *Pods* stalked, constricted between the seeds, almost glabrous.

Transvaal : Belfast district, Crocodile River, *Smuts* 66 (N.H. 24193, **Type**); Pretoria district, Silverton, *Leemann* (N.H. 22845); Zoutpansberg district, Wylies Poort, *Taylor* 732 (N.H.).

Possibly the following two specimens belong to this species, the vexillary filament appearing to be not typically adnate and yet not distinctly free as in the above three cases :—

Swaziland : *Stewart* (T.M. 8924).

Transvaal : Barberton district, near Barberton, *Legat* in *Herb. Burt-Davy* (N.H. 26303).

3. *E. caffra* *Thunb.* Prodr. Pl. Cap. 121 (1800).

E. viarum *Todaro* Nouvi Generi e Nuove Specie di Piante 62 (1861).

E. insignis *Todaro* l. c. 66.

A tree 7–17 m. high. *Stem* woody, branched; branches woody, leafy, armed with prickles. *Leaves* scattered or clustered at the ends of the twigs, unarmed, glabrous.

petiole 6–16 cm. long, furrowed, sometimes with one or two small prickles when young but unarmed when mature, puberulous when young, becoming glabrous; terminal leaflet 8–16 cm. long, 8–18 cm. broad, broadly ovate, occasionally elliptic, frequently broader than long, subacute; petiolule of terminal leaflet 3–8 cm. long, unarmed; lateral leaflet 7.5–13 cm. long, 5–12 cm. broad, ovate, subacute, unequal-sided. *Stipules* minute, ovate, puberulous, deciduous. *Peduncle* 9–18 cm. long, terete, unarmed, tomentose when young, becoming glabrous. *Racemes* terminal, densely many-flowered, 2–4.5 cm. long, rarely half the length of the peduncle. *Flowers* brilliant scarlet, showy, pendulous, appearing before the leaves. *Bracts* membranous, ovate, pubescent, early deciduous; bracteoles minute, linear, pubescent. *Pedicel* 0.2–0.6 cm. long, pubescent. *Calyx* 1–1.9 cm. long, 0.8–1.2 cm. diameter above, campanulate, 2-lipped, becoming broader and splitting more deeply with age, tomentose. *Vexillum* 3.5–5.4 cm. long, 1.4–2.8 cm. broad across the middle, obovate or elliptic, obtuse, sometimes emarginate, with a short basal claw, glabrous; keel 0.8–2.1 cm. long, 0.4–1.4 cm. broad across the middle, roughly oblong, ovate or obovate, shortly narrowed at the base; wings 0.9–2.4 cm. long, 0.3–1.1 cm. broad across the middle, roughly oblong or obovate, narrowing slightly above, frequently curved, narrowed at the base, slightly longer than the keel. *Filaments* 2.9–5.1 cm. long, with the vexillary filament adnate for 1–1.8 cm. below and the rest free for 0.9–1.5 cm. above; anthers 3–4.5 mm. long. *Ovary* 1.4–2.7 cm. long; style 1.7–3.2 cm. long, hispid below, sometimes glabrous above; stigma simple, capitate. *Pods* black, subligneous, about 12 cm. long, stalked, unarmed, deeply constricted between the seeds and with these constrictions frequently elongated, densely tomentose when young, becoming glabrous when old. *Seeds* bright red, elliptic, with a linear scar of attachment.

Cape Province : Bathurst district, Kleinemund River, *MacOwan* 1434 (G.); Albany district, Grahamstown, Howieson's Poort, also Port Alfred, *Galpin* 67 (N.H., G.); Kingwilliamstown district, Pirie, *Sim* 2135 (N.H.); Komgha district, near Komgha, *Flanagan* 319 (N.H.); Kentani district, *Pegler* 89 (N.H., G., collected various dates), *Pegler* 1134 (N.H.).

Natal : Durban district, Durban, *Thode* A1514 (N.H. 18213), Berea, *Wood* 10016 (N.H. D. 10806), *Forbes* 350 (D. 18392), *Lansdell* (N.H. 1455); Camperdown district, Cato Ridge, *McClellan and Ogilvie* (D. 27899); Zululand, Eshowe, *Rogers* 24455 (T.M. 24020), Mtunzini, *Thode* A1528 (N.H. 18227), St. Lucia Bay, *Pole Evans* 3648 (N.H.), Zululand, Farm Egoa, *Curson* (N.H. 23016).

Transvaal : Barberton district, Saddleback Range, *Galpin* 494 (N.H., G.); Lydenburg district, Lydenburg, *Barnard* 534 (N.H.); Pretoria district, Pretoria, *Leendertz* 217 (G., T.M. 8334), Water Tower Hill, *Mogg* 15157 (N.H.); Pietersburg district, Woodbush, *Jenkins* (T.M. 7339); Zoutpansberg district, Louis Trichardt, *Breyer* (T.M. 24377).

The following specimen was grown in the garden of the Division of Botany and Plant Pathology, Pretoria :—

Transvaal : *Phillips* (N.H. 1648).

In the National Herbarium are records of two forms of this species with pink and yellow flowers. One was collected at Mbabane in Swaziland (*Nicholson* in N.H. 22847) and the other is a specimen from a plant cultivated in the Native Garden, Willowvale district (Forest Dept. Herb. 8865).

Pink-flowered specimens are also found growing in the Durban Botanic Gardens and in the garden of the Natal Herbarium. As it is not certain whether these "sports" occur wild as well as in cultivation, the creation of a variety is not yet justified. Marloth states that the occasional occurrence of these pale-coloured flowers is due to the absence of the red pigment in the epidermal cells. This explanation, of course, does not exclude the possibility of the "sport" being an inheritable mutation.

It is impossible to tell whether the following incomplete specimens should be included in *E. caffra* Thunb. or in *E. lysistemon* Hutch:—

Transvaal: Barberton district, Nelspruit, *Pole Evans* 3927 (N.H.); Pilgrims Rest district, Bushbuck Ridge, *Smuts and Gillett* 2344X (N.H.); Pretoria district, Schanskop, *Mogg* 15742 (N.H.); de Wildt, *Murray* (N.H. 23298), Wonderboompoort, *Leendertz* 953 (T.M. 8335); Rustenburg district, Rustenburg, *Leendertz* 3304 (T.M. 9801), *Turner* 1b (N.H.); Pietersburg district, Woodbush, *Hoffmann* 24 (T.M. 29179); Zoutpansberg district, *Bailey in Herb. Burt-Davy* (N.H. 26302), *Smuts* (N.H. 23299), Baiandbai, *Lang* (T.M. 32266).

E. Humeana Spreng. sec. Eckl. & Zeyh. Enum. Pl. Afr. Austr. Extratrop. 259 (1835), non Spreng.

A rigid shrub, 1–2 m. high. *Root* long and succulent, very light when dry. (Fl. Cap. II, 237). *Stem* woody, branched; branches woody, leafy, covered with recurved prickles. *Leaves* scattered along the branches and with or without a prickle at the base of the petiole, with the mid-rib armed with one or two small prickles beneath, pubescent when young becoming quite glabrous; petiole slender, 2–4 cm. long, armed with 2 or 3 recurved prickles, puberulous; terminal leaflet 3–3.5 cm. long, 2.5–3.5 cm. broad, broadly obovate or transversely elliptic, very nearly as broad as long, or broader than long, triangular apiculate or rounded above; petiolule of terminal leaflet 1.5–2.5 cm. long, with one or two prickles, puberulous; lateral leaflets 2.5–3.5 cm. long, 2–3 cm. broad, obovate to longitudinally elliptic, apiculate or sub-acute, frequently unequal-sided. *Stipules* minute, subulate, villous, deciduous. *Peduncle* 1–12 cm. long, sometimes furrowed, unarmed, tomentose when young, becoming glabrous. *Racemes* terminal or lateral, comparatively lax, few to many-flowered, extending the whole, or nearly the whole, length of the peduncle. *Flowers* scarlet, tipped with green, erect or horizontal, appearing with the leaves. *Bracts* ovate-rotund; bractoles linear, bracts and bractoles minute, densely pubescent, deciduous. *Pedicel* 0.6–0.8 cm. long, pubescent. *Calyx-tube* 1.2–1.7 cm. long, 1–1.7 cm. diameter above, broadly campanulate, sometimes as broad as long, subtruncate, obscurely 5-lobed, pubescent. *Vexillum* 4.2–5.5 cm. long, 2–3.2 cm. broad across the middle, elliptic-oblong, obtuse, emarginate, with a very short basal claw, minutely velvety; keel 1–1.5 cm long, 0.2–0.4 cm. broad across the middle, ovate or triangular ovate, acuminate, shortly narrowed at the base; wings 0.4–0.6 cm. long, 0.2 cm. broad below, ovate-acuminate, with a ventro-lateral lobe on each side, narrowed at the base, shorter than the keel. *Filaments* 3.4–5.2 cm. long, the vexillary filament free nearly to the base and the rest free above for more than half the length of the split staminal-tube; anthers 3–4 mm. long. *Ovary* 1.6–2.6 cm. long, broadly linear; style 1.8–3.2 cm. long, linear, hispid below-glabrous above; stigma small, capitate. *Pods* woody, 10–25 cm. long, curved, constricted, or not between the seeds, covered with numerous small straight prickles, stalked, at first tomentose but glabrous when old.

Cape Province: Albany district, Grahamstown, Botanical Gardens, *Marsh* (G.); Queenstown district, Queenstown, *Pole Evans* (N.H. 2997), *Rogers* (G.), grassy plains, Queenstown, *Galpin* 1653, Oct.–Nov. 1893 (N.H., G.); Cathcart district, north of Cathcart near Tylden, also near Imtani, and along Queenstown road, plentiful along the Tarkastad road from Queenstown near Carlsrust Siding and Bowkers Park, in thorn country only *Reynolds* 1606 (N.H.).

5. **E. Humeana** Spreng. Syst. Veg. III. 243 (1826).

E. Humei E. Mey. Comm. Pl. Afr. Austr. 150 (1835).

E. hastifolia Bertol. f. in Mem. Acc. Sc. Bolog. II. 568 (1850).

E. Raja Meisn. in Hook. Lond. Journ. Bot. II. 96 (1843).

E. caffra Thunb. sec. Ker-Gawl. Bot. Reg. IX. tab. 736 A, B (1823), non Thunb.

E. caffra Thunb. sec. Sims Bot. Mag. L. tab. 2431 (1823), non Thunb.

E. caffra Thunb. sec. DC. Prodr. II. 412 (1825), non Thunb.

E. caffra Thunb. sec. Reichb. Fl. Exot. V. tab. 312 (1836), non Thunb.

A shrub. *Branches* woody, leafy, armed with prickles. *Leaves* scattered along the branches, with the veins of the leaflets sometimes armed with a few small prickles on both surfaces or only on the lower, glabrous; petiole 5–14 cm. long, not prominently furrowed, bearing recurved prickles, puberulous when young; terminal leaflet 5–13 cm. long, 4.5–12 cm. broad, broadly ovate to elliptic, or ovate long-acuminate, sometimes broader than long, obtuse or sub-acute; petiolule of terminal leaflet 3.5–9 cm. long, bearing prickles; lateral leaflets 4.5–13 cm. long, 4–8 cm. broad, ovate, elliptic, or ovate long-acuminate, sub-acute. *Stipules* 0.5–1 cm. long, ovate or linear, deciduous. *Peduncle* 20–48 cm. long, terete, rarely furrowed, sometimes bearing prickles, pubescent when young, becoming glabrous with age. *Racemes* terminal, densely flowered above, more laxly below, 6–10 cm. long, rarely longer, but lengthening as the fruits ripen. *Flowers* red, showy, pendulous, appearing with the leaves. *Bracts* ovate or oblong; bracteoles linear; bracts and bracteoles minute, puberulous, deciduous. *Pedicel* 0.4 cm. long. *Calyx-tube* 0.9–1.3 cm. long, 0.6–0.8 cm. diameter above, tubular, subtruncate, shortly 5-lobed, puberulous. *Vexillum* 3.8–5 cm. long, 1.4–2.1 cm. broad across the middle, obovate or elliptic-obovate, obtuse, frequently emarginate, with a short basal claw, glabrous; keel 0.6–0.8 cm. long, 0.3–0.4 cm. broad, roughly oblong or ovate, narrowed at the base, frequently with a median or ventral lateral lobe and tapering above; wings 0.6–1.2 cm. long, 0.3 cm. broad across the middle, roughly oblong, narrowing above, curved, clawed at the base, longer than the keel. *Filaments* 3–3.4 cm. long, with the vexillary filament free almost to the base of the staminal-tube and the rest free for 1.7–2.3 cm. above, i.e. for at least half the length of the longest stamens; anthers 2 mm. long. *Ovary* 1.2–2 cm. long; style 1.5–1.9 cm. long, sparsely hispid; stigma small, terminal. *Pods* black, subligeous, 12–16 cm. long, stalked, unarmed, deeply constricted between the seeds, pubescent when young, becoming glabrous. *Seeds* red, elliptic, laterally compressed, with a scar of attachment.

Cape Province: Eastern Cape Province, *Drege* (N.H. 9325); Bathurst district, coast belt near Fish River Lighthouse, *Dyer* 2263 (G.), Coombs Vale, *Bennie* (G.); Albany district, Southwell, *Schönland* (N.H. 22921), Botha's Hill, *MacOwan* (G.); East London district, East London, *Galpin* 3388 (N.H.), "Overton", 11 miles west of East London, *Hilner* 161 (G.), Keiskama mouth, *Galpin* 7693 (N.H.), Stutterheim district, Fort Cunninghame, *Sim* 2136 (N.H.); Komgha district, near Komgha, Flanagan 125, January, 1890, 1891 (N.H., G.); Kentani district, *Pegler* 1179 (N.H., G.).

Natal: Durban district, Umgeni, *Wood* 13078 (D.), Botha's Hill, *McClellan* 134 (N.H.), Intshanga, *Wood* 9776 (D., G.), New Germany, *Wood* 12652 (N.H.); Richmond district, Byrne, *Galpin* 11906 (N.H.); Greytown district, *Wylie* (D. 22344, T. M. 34029); Vryheid district, Gobeni Hills, *Pole Evans* 2637 (N.H.); Mount Ashley, *Mogg* 6360 (N.H.); Zululand, Somkeli district, *Wood* 9224 (N.H.).

Swaziland: Mbabane district, Mafutane, *Bolus* 11831 (N.H.).

Transvaal: Ermelo district, Billy's Vlei, *Burt-Davy* 9326 (N.H.); Carolina district, Steynsdorp, *Dieperink* 87 (N.H.); Pietersburg district, Zoekmekaar, *Botha* (N.H. 23017); Zoutpansberg district, Louis Trichardt, *Breyer* (T.M. 19416).

Portuguese East Africa: Lourenco Marques district, Rikatla, *Junod* (T.M. 20185).

The following scanty specimens should probably be included in this species:—

Cape Province: East London district, Southernwood, *Smith* 3642 (N.H.).

Transvaal: Barberton district, Barberton, *Rogers* (T.M. 24277).

Possibly the specimen marked "Bottom of Woest Hill, 466" (G) should be included here.

Cultivated specimens of this species include the following:—

Cape Province: "The Hill", Claremont, near Cape Town, *Marloth* 9337 (N.H.); Eastern Cape Province, originally from Port Alfred, flowered in Dr. Becker's garden (G.).

Transvaal: Pietersburg district, Pietersburg, from the park, *Stapleton* (N.H. 22854, 22920).

6. **E. Zeyheri** *Harv.* in *Flor. Cap.* II. 236 (1861-62).

A shrub 0.3-0.5 m. high. *Stem* subterranean, corky. *Leaves* arising in clusters at the apex of the stem or from short terminal branches, with the leaflets prominently veined beneath and with the veins generally puberulous and armed with prickles on both surfaces or on the lower only; petiole 8-20 cm. long, often prominently furrowed, covered with recurved prickles, puberulous; terminal leaflet 10-26 cm. long, 8-21 cm. broad, but occasionally up to 30 cm. long and 25 cm. broad, broadly ovate or elliptic, rarely obovate, occasionally as broad as long, obtuse or subacute; petiolule of terminal leaflet 4-14 cm. long, bearing prickles; lateral leaflets 10-21 cm. long, 5-12 cm. broad, ovate to elliptic, obtuse to acute, frequently unequal-sided. *Stipules* coriaceous, 1-2 cm. long, ovate or oblong, glabrous, or occasionally puberulous. *Peduncle* 19-38 cm. long, often furrowed sometimes bearing a few small prickles, pubescent when young, becoming glabrous with age. *Racemes* terminal, densely many-flowered, 2.5-8 cm. long. *Flowers* red, showy, pendulous, appearing with the leaves. *Bracts* ovate or oblong, deciduous; bracteoles minute, linear, pubescent. *Pedicel* 0.4 cm. long. *Calyx-tube* 1.2-1.5 cm. long, 0.7 cm. diameter across the middle, tubular-campanulate, sub-truncate, shortly 5-lobed, puberulous. *Vexillum* 3.4-4.4 cm. long, 1.4-1.9 cm. broad across the middle, obovate, obtuse, sometimes emarginate, with a short basal claw, glabrous; keel 0.7-1 cm. long, 0.4-0.5 cm. broad across the middle, roughly oblong or ovate, frequently truncate and with a lateral mucro above, narrowed at the base; wings 0.9-1.5 cm. long, 0.3-0.5 cm. broad across the middle, oblong to obovate, frequently curved, clawed at the base, longer than the keel. *Filaments* 3-4 cm. long, with the vexillary filament free nearly to the base of the staminal-tube and the rest free for about 1 cm. above, i.e. for $\frac{1}{3}$ the length of the longest stamens; anthers 2 mm. long. *Ovary* 1.3-1.5 cm. long; style 1.6-2 cm. long, linear, sparsely hispid; stigma small, terminal. *Pods* dark, subligneous, 8-20 cm. long (Fl. Cap.), stalked, unarmed, constricted between the seeds and with these constrictions frequently elongated, pubescent when young, becoming puberulous. *Seeds* red, elliptic, with a linear scar.

Natal: Estcourt district, Mooi River, *Wood* 4076 (D. 4596); Weenen district, Mabelston, *Mogg* 3085 (N.H.); Dundee district, Amanga valley, native collector (N.H. 21765).

Basutoland: Mafeteng district, *Dieterlen* 547 (N.H.).

Orange Free State: Vrede district, Vrede, *Langham* (D. 12129); Senekal district, Doornkop, *Goossens* 810 (N.H.); between Senekal and Bethlehem, *Flanagan* 1827 (N.H.); Kroonstad district, Kroonstad, *Pont* 530 (N.H. 22840), near Valsch River, *Pont* 530 (N.H. 22841), East Hill, *Standard VII DI* (N.H. 22842).

Transvaal: Barberton district, Komatipoort, *Rogers* 12963 (T.M. 13737); Wakkerstroom district, Wakkerstroom, *van Dam* (T.M. 24352); Volksrust district, Volksrust, *Jenkins* (T.M. 9294); Ermelo district, Ermelo, *Hoffe* 16 (N.H.), Spitskop, *Pott* (T.M. 15084), on farm Nooitgedacht, *Henrici* 1210 (N.H.), Lake Chrissie, *Galpin* 710 (N.H.); Belfast district, Belfast, *Leendertz* 2681 (T.M. 8058); Bethal district, Bethal, *Leendertz* 3533 (T.M. 9331); Middelburg district, Middelburg, *Jenkins* (T.M. 9211), Witbank, Zondagsfontein, *Thode* A2799 (N.H. 19501, D. 26113), Klein Olifants River, *Young* A5 (T.M. 32510); Vereeniging district, Vereeniging, *Leendertz* 3899 (T.M. 10870), *Marloth* 8106 (N.H.); Pretoria district, on road to Tygerpoort, *Verdoorn* (N.H. 22839), Irene, *Pole Evans* (N.H. 22843) and *Leendertz* 693 (T.M. 8336), Fountains Valley, *Repton* 207 (N.H.), Scurfde Bergen, *Swierstra* (T.M. 6231); Boksburg district, Boksburg, *Breyer* (T.M. 15005); Johannesburg district, Klipriviersberg, *Marloth* 3848 (N.H.); Potchefstroom district, on the grassy, stony hills and on the banks of the Mooi River, *Zeyher* 531 (N.H. 9324, G., *Type*), Klerksdorp district, Klerksdorp, *Nelson* 223 (T.M. 11617).

The following specimens almost certainly belong to this species but are too scanty for precise examination:—

Natal : Newcastle district, near Newcastle, *Saunders* (D. 3440).

Basutoland : Leribe district, *Dieterlen* 547 (D. 13910).

Orange Free State : Heilbron district, *Brandmüller* 126 (N.H.); Sand River Vals River, valleys of Witte Bergen, *Barber* 646 (G.).

Transvaal : Wakkerstroom district, Wakkerstroom, *Pole Evans* (N.H. 26304); Carolina district, Carolina, *Rademacher* (T.M. 7495, 7503), *Galpin* 12989 (N.H.); Standerton district, Standerton, *Jenkins* (T.M. 9940), New Denmark, *Burt-Davy* 999, (D. 9685); Benoni district, Benoni, *Bradfield* 296 (N.H.); Johannesburg district, Frankenwald, *Burt-Davy* 2577 (N.H.), Modderfontein, *Haagner* (G.); Ventersdorp district, Goedgedacht, *Stutton* 596 (N.H.).

The following are cultivated specimens belonging to this species:—

Cape Province : Somerset East district, Somerset East, cult. e sem. Transgariëpinis, *MacOwan* (G.); Queenstown district, Queenstown, plant collected at Boksburg, flowered in Botanical Gardens, *Galpin* 7370 (N.H.).

Galpin 12989 cited above, exhibits the phenomenon of having two lateral leaflets attached on the same side of the petiole.

7. **E. Crista-galli** *Linn. Mant. I. 99* (1767).

E. fasciculata *Benth. in Linnaea XXII. 517* (1849).

E. laurifolia *Jacq. Obs. Bot. iii 1* (1768).

A shrub or tree, 1–6 m. high. *Stem* woody, sometimes robust, somewhat prickly; branches woody, leafy, armed with prickles, bright green, glabrous; the stronger branches continue perennially but the flowering shoots are annual. *Leaves* scattered along the branches, with the midribs of the leaflets sometimes armed with one or two recurved prickles beneath, armed and unarmed leaflets occurring on the same plant, glabrous; petiole slender, 8–12 cm. long, terete, with or without recurved prickles, glabrous; terminal leaflet 7–10 cm. long, 3–6 cm. broad, ovate or broadly or narrowly elliptic, obtuse to acute; petiolule of terminal leaflet 2.5–3.5 cm. long, sometimes with one or two prickles; lateral leaflets 6.5–9.5 cm. long, 2–5.5 cm. broad, ovate or broadly or narrowly elliptic, obtuse to acute. *Stipules* 0.8 cm. long, narrowly lanceolate, glabrous, deciduous. *Racemes* lateral, very laxly many-flowered, 11–30 cm. long, occurring on the upper portions of the foliage shoots. *Flowers* scarlet, showy, erect or horizontal, arising in clusters of two or three, appearing with the leaves, sometimes in the axil of a leaf. *Bracts* either wanting or early deciduous; bracteoles linear, glabrous, deciduous. *Pedicel* 2–2.5 cm. long, glabrous. *Calyx-tube* 1.2–1.5 cm. long, 1.2–1.5 cm. diameter above, broadly campanulate, distinctly 2-lipped or subtruncate, widening with age, frequently broader than long, glabrous. *Vexillum* 3–4.4 cm. long, 2.1–2.9 cm. broad across the middle, ovate, obovate, or elliptic, obtuse, sometimes emarginate, with a short basal claw, glabrous; keel 2.4–3.8 cm. long, 0.9 cm. broad across the middle, ovate, sometimes falcate, shortly or not at all narrowed at the base; wings 0.7–1.8 cm. long, 0.3–0.5 cm. broad, ovate or oblong-ovate, scarcely narrowed at the base, shorter than the keel. *Filaments* 2.9–4.7 cm. long, with the vexillary filament free to about the middle of the staminal-tube and the rest free for 0.3 cm. above; anthers 2.5 mm. long. *Ovary* 1.4–2 cm. long, on an extremely long gynophore; style 0.5–1 cm. long, linear, glabrous; stigma small, simple, terminal. *Pods* and seeds not seen.

Natal : Durban district, Durban Botanic Gardens, *Forbes* 876 (D. 36468).

Swaziland : Mbabane district, *Nicholson* (N.H. 23007, 23010).

Transvaal : Pretoria district, Pretoria, *Mogg in Government Herb.* 11612 (N.H. 26305) Pietersburg district, Pietersburg, *Stapleton* (N.H. 23008).