Coral trees (Erythrina, Papilionaceae) of Auckland

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Erythrina L.

Gr. erythros red, reference to the colour of the flower in Linnaeus' original species (and in most others).

Cosmopolitan, mostly in warmer regions; c. 110 species. Mostly trees, but some shrubs and a few tuberous-rooted perennial herbs, deciduous, thorny on leaf rachis and midrib and usually on the stem, the leaves pinnately 3-foliolate, with glandular stipels unique in the family.

Key to the species grown in Auckland (after Krukoff and Barneby 1974, and see also Krukoff 1982, and the colour photographs of Lucas & Theobald 1982)

Calyx tube about as long as wide, bowl-shaped, the margins entire or minutely wrinkled at anthesis; keel-petals united, 1/2-2/3 as long as standard, 2-many times as long as the wing-petals; seeds black or brown, never red (but occ. streaked with muddy red in E. falcata); leaflets ± oblong

Inflorescences terminal on leafy and us. ascending branchlets, and often with flowers among the leaves; flowers spreading to ± pendent, tending to become inverted so that the standard lies towards the base of the inflorescence; standard gaping widely and the stamens far-exserted; stamens separate for 3-7 mm, leaflets minutely waxy beneath; bark somewhat corky, fissured, ± thornless. . . . . **E. crista-galli** L.

Inflorescences lateral, leafless, pendent; flowers pendent, the standard gaping somewhat (but the stamens not exserted); stamens separate for 9-18 mm; leaflets not waxy beneath; bark (at least in our trees) not corky or deeply fissured, thorny . . . . . **E. falcata** Benth.

Calyx tube longer than wide, at anthesis either expanding to accomodate the narrow and scarcely gaping corolla, or split by it in one or two places; keel-petals united (E. caffra, E. lysistemon) or free; seeds red with a black hilum (but unknown in E. x sykesii or E. x orba); leaflets deltoid

* Standard comparatively short and broad, strongly recurved, gaping widely to expose the stamens; keel-petals broad-oblong, almost 0.3 times as long as standard, 20-25 mm long, the wing-petals slightly longer; flowers standing away from inflorescence axis; bark smooth, (except for sinuous-vertical lines of lenticels and thorn remnants) . . . **E. caffra** Thunb.

* Standard narrowly oblong, moderately recurved, hardly gaping, the stamens remaining enclosed; keel-petals broad-oblong, c. 0.15 times as long as standard, 9-18 mm long, the wing-petals slightly longer; flowers declined towards the inflorescence axis; bark as in E. caffra, but perhaps us. more thorny . . . . . **E. lysistemon** Hutch.

* Standard broadly oblanceolate, moderately recurved, gaping somewhat, the stamens exposed; keel-petals ± obliquely oblong, almost 0.5 times the length of standard, c. 22 mm long, the wing-petals linear-oblong, c. 0.3 times as long as standard; trunks and branches thorny, the bark as in E. caffra . . . . . **E. x sykesii** Barneby & Krukoff

* Standard linear-elliptic, hardly recurved or gaping, the stamens nearly entirely enclosed; keel-petals oblong, c. 0.4 times as long as standard, to c. 30 mm long, the wing-petals lanceolate, c. 0.15 times as long as standard; trunk and branches very thorny, the bark golden-brown, shed in irregular curled flakes . . . . . **E. x orba** Barneby & Krukoff

Erythrina caffra, kaffir boom, is native to South Africa. Its best-known Auckland representative is the very large old tree in Old Government House Gardens, which is supposed to have been planted in the early 1850s by Sir George Grey (who would be seeing the species in South

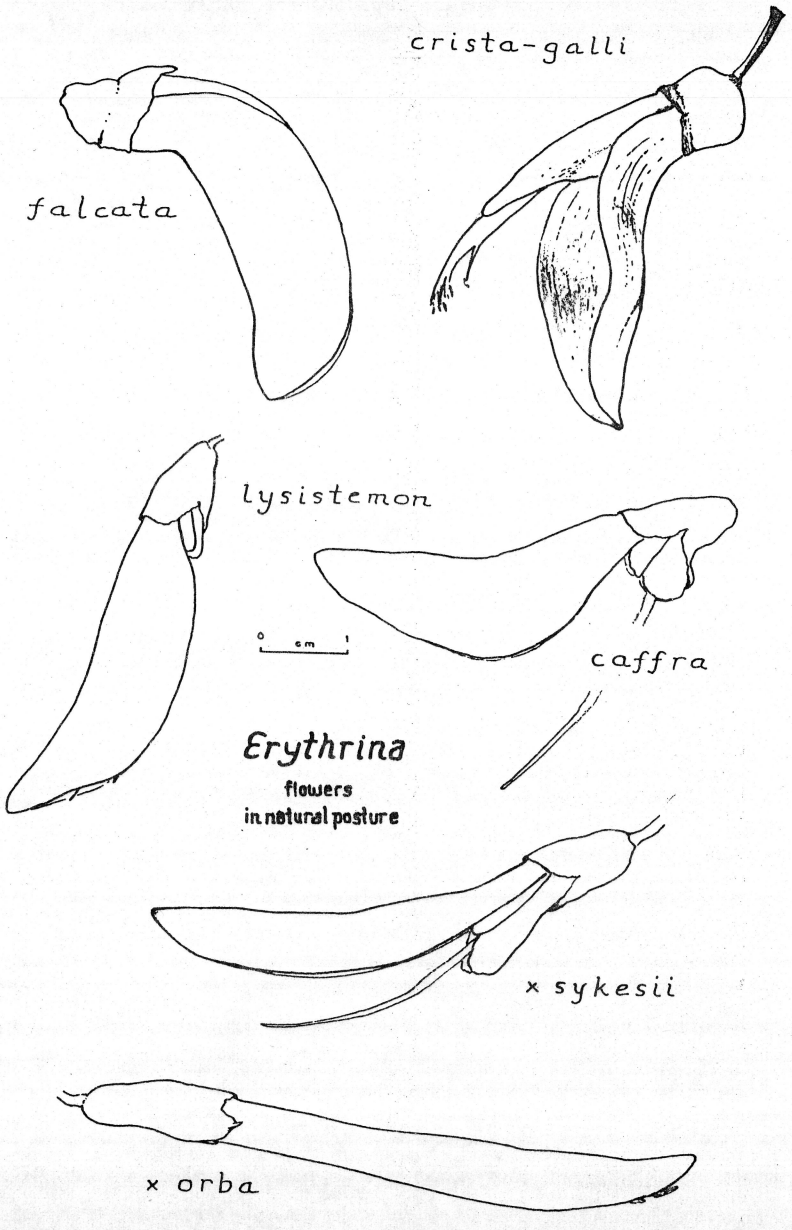

Illustration: Flowers of Erythrina species, more or less in the position they adopt at anthesis. The stamens have been omitted in E. caffra and E. x sykesii -- they follow the line of the style. In E. x orba and E. lysistemon the stamens and the style just show at the corolla mouth.

Africa later that decade).

A few pods can sometimes be picked up below the Government House tree, while in New Plymouth an old tree preserved in a suburban street "island" produces seedlings in the gutter drift.

Erythrina crista-galli, Brazilian coral tree, is found here and there in Auckland, e.g. at Gribblehurst Park, and at Oakley Hospital (where seedlings can be found on the dry north-facing clay cutting below the parent tree). The self-pollarding branches and thick fissured bark of this plant are very distinctive.

Erythrina falcata, native to Brazil, is known to me only from a pair of well-grown trees in a gully below Evelyn Rd, Howick.

There is a tree in the city in front of International House in Whittaker Place which might belong to E. falcata, but its thick bark and somewhat fleshy flowers make it resemble its nearest relative E. crista-galli. Perhaps it is a hybrid of these two, but such plants are not mentioned in Krukoff & Barneby (1974).

Erythrina lysistemon, native to South Africa, is known to me only from the healthy old tree at the west end of the duckpond in the Auckland Domain.

Erythrina x orba was described in 1974 from the old tree growing at the Parnell Rose Gardens on the lower edge of the lawn, past the Nancy Steen Memorial Garden. The parent that gives it its narrow corolla and fastigiate habit is likely to be E. speciosa, a Brazilian species, which I have seen making impenetrably thorny thickets along the creek at the Melanesian Mission on Norfolk Island. The other parent is unknown (as is the source of the hybrid); possibly it is E. lysistemon.

The notes and illustrations of the flower of E. x orba in Krukoff & Barnaby (1974) are based on material that is not quite typical; in particular, the keel petals are often longer and almost oblong rather than irregularly lanceolate.

There is a small tree, which has regrown since breaking off about 10 years ago, in Albert Park near Kitchener Street.

Erythrina x sykesii, also described in Krukoff & Barneby (1974), is quite common in parks and larger gardens in Auckland and northern New Zealand, and is grown too on the east coast of Australia. Our oldest tree may be the one in the roundabout at Boston Road, Mt Eden, probably a relic of the old Colonial Ammunition Co. estate (John Adam, pers. comm.)

This hybrid has the rather narrow corolla typical of hummingbird-pollinated species of the New World, and an analysis of its nectar sugars has indicated that such a species may be involved as one parent (Baker in Webb et al. 1988). The other parent is probably an Old World species such as E. caffra, whose wider flowers are pollinated by perching birds. E. coralloides of southern U.S.A. and Mexico has been suggested as the first parent, but this has very short keel petals. Perhaps E. speciosa, which is long-keeled, is again involved, with E. x sykesii the backcross of E. x orba to E. caffra or E. lysistemon. This would go some way towards explaining why there don't seem to be any very old E. x sykesii individuals around. It is tantalizing that the earliest Erythrina hybrid, E. x bidwillii, was produced in the Sydney Botanic Gardens in the 1840s, where J.C. Bidwill was carrying out such horticultural experiments.

Fruit is never formed by E. x sykesii, even at Old Government House,

where E. caffra stands close by.

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A Plate of Beans

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"Beans ... are hard of digestion, and make troblesum dreames"
-- William Turner "A New Herball: the seconde parte" 1562

But 400 years later:

"The hardness and impermeability of the dried testa is caused mainly by the contraction of the walls of the palisade-cells as the seed ripens. When dried, the palisade may be almost impossible to section, but a trace of water on a fractured surface enables the razor to glide through". (Corner 1951)

The conception of a single family (Fabaceae) for this group of about 16000 species is supported by a remarkably uniform seed coat anatomy. This coat is derived entirely from the outermost of the ovule's two integuments. With few exceptions, it has: a palisade of Malpighian cells -- prismatic in shape, thick-walled, usually unlignified cells; a layer of thick-walled hourglass-shaped cells; an inner layer of parenchyma or aerenchyma. A curious feature hardly known outside the legumes is the occurrence of a "light line" in the palisade. This appears to be caused usually by a sudden narrowing of the lumen, but sometimes differences in the chemistry of the wall, or anomalous structures, are present too.

ILLUSTRATIONS

A. Cross section of typical leguminous seed coat x 200; detail of palisade cells (in different species) x 240. cu cuticle l.l light-line. After Corner.

The family is divided into 3 subfamilies, and the seeds of each have a characteristic appearance and anatomy:

Faboideae

B. Erythrina crista-galli Pod x 0.8; seeds x 4; cross-section of seed coat x c. 30.