

Sophora toromiro

The History and Taxonomy



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You can view: [Summary](#)

Full text:

- [Introduction](#)
- [Cultivation](#)
- [Description](#)
- [Distribution](#)
- [Colour plate](#)
- [Line drawings](#)
- [References](#)

Summary

The history and taxonomy of *Sophora toromiro* Skotts. (Leguminosae), a native of Easter Island now thought to be extinct in the wild, are discussed; there is a full botanical description, a colour plate and other illustrations, and cultivation requirements are provided.

The History and Taxonomy of *Sophora toromiro*

Introduction

Some 3700 km west of the coast of Chile lies a bleak volcanic outcrop known as Easter Island (Rapa Nui). This low undulating basaltic plateau barely 150sq. km in area supports a monotonous vegetation of about 100 species, the majority of which are widespread introductions by man. Indigenous trees and shrubs are almost wanting but Easter Island (Rapa Nui) has a botanical jewel in its crown, the leguminous tree *Sophora toromiro*.

The genus *Sophora* consists of about 80 species of trees, shrubs and perennial herbs from the tropical and temperate regions of both hemispheres. *Sophoreae*, the tribe to which *Sophora* belongs is one of the least specialised of all the papilionoid tribes containing an assemblage of somewhat dissimilar genera. As a tribe its taxonomic position within the legume family has been contentious. In general papilionoid flowers have 10 stamens of which at least 9 (if not all) are fused to some degree forming a tube. In the *Sophoreae*, however, this is not the case. Indeed the 10 stamens are entirely unattached to each other or rarely minutely fused at the base. Linnaeus alluded to this interesting feature in *Hortus Cliffortianus* (Linnaeus 1738) when he remarked that the name *Sophora* might signify "of the wise men" (sophorum). He suggested the name brought both "knowledge and warning" that plants which combine papilionoid flowers with free stamens, as is the case in *Sophora*, should not be regarded as forming a distinct class.

Though a relatively large and diverse genus, *Sophora* has long been considered divisible into sections. One such section was the subject of a paper by Sousa & Rudd (1993) in which the authors segregated 4 species of *Sophora*. The segregates were placed in the genus *Styphnolobium* which is distinguished from *Sophora* in having bracteate flowers, indehiscent fruits and a higher chromosome number ($2n=28$ instead of $2n=18$). Furthermore *Styphnolobium* is strictly arborescent whereas *Sophora* includes perennial herbs, shrubs and trees. *Styphnolobium japonicum* (formerly *Sophora japonica*) is more commonly known as the Japanese Pagoda tree and is much valued for its creamy flowers born in late summer and autumn.

A number of the most commonly cultivated species of *Sophora* including *S. toromiro* form part of section *Edwardsia* of the genus *Sophora* (Peña et al, 1993). Members of Section *Edwardsia* are distinguished by a number of features. The stamens and stigma are exerted from the corolla; the wings and keel petals are similar in size and shape; the standard petal points forward (not reflexed) and the fruit is often 4-winged. This group includes *Sophora prostrata*, *S. microphylla*, *S. tetraptera*, *S. macrocarpa* and *S. toromiro* itself. *S. prostrata* is a small, sometimes prostrate shrub with brownish-yellow to orange flowers. The popular evergreen *S. microphylla* bears bright yellow flowers appearing early to late spring and is often confused with *S. tetraptera* whose bright yellow somewhat tubular flowers appear in late spring. *S. microphylla* may be distinguished from *S. tetraptera* by the more numerous leaflets (20-40 as compared to 10-20 pairs) and leaflet shape, being relatively broader (obovate-oblong to almost orbicular in *S. microphylla*) as compared to elliptic-oblong in *S. tetraptera*. Furthermore *S. macrocarpa* is similar in appearance to *S. tetraptera* and is sometimes confused with it. *S. macrocarpa* however, may be distinguished from *S. tetraptera* by the unwinged pods and fewer leaflets (6-12 pairs). It is to *S. tetraptera* that *S. toromiro* is most closely related differing from it in the whitish pubescence, yellowish-green leaflets and smaller, more globose yellow seeds.

After Captain Cook's return in 1771 from his first voyage around the world, another was soon planned. In Forster's journal of the second voyage he wrote that "two stout vessels, the *Resolution* and the *Adventure*, were fitted as King's sloops for that purpose and the command of them given to Capt. James Cook and Capt. Tobias Furneaux". Early on Monday 13th July 1772, the ships sailed out of Plymouth to explore the unknown delights of the Southern Hemisphere. At first they sailed south to the Cape of Good Hope,

continuing on to New Zealand and then west to Easter Island (Rapa Nui) where *S. toromiro* was first seen. Forster described their first sight of this splendid leguminous tree "By resting several times we were at last enabled to reach the summit of the hill, from whence we saw the sea to the west and the ship at anchor. The hill (Hanga Roa) was covered with a shrubbery of the mimosa (*S. toromiro*), which grew here to the height of eight or nine feet, and some of whose stems were about the thickness of a man's thigh".

At that time *S. toromiro* formed scattered thickets on the island but its valuable timber had many uses (for building materials, household articles, canoes and carvings) and the natural groves steadily declined (Lobin & Barthlott, 1988; Alden, 1991). Later introduced sheep and cattle further depleted numbers by stripping off the bark, until earlier this century only one rather inaccessible tree remained. Eventually this too was threatened. In 1955-56 the Norwegian archaeologist and explorer Thor Heyerdahl collected seeds from this single specimen. He is believed to be the last visitor to Easter Island (Rapa Nui) to see *S. toromiro* in its natural habitat. It is from Heyerdahl collection that the present European stocks of cultivated *S. toromiro* descend (see following article by Mike Maunder).

Cultivation

S. toromiro requires a temperate glass-house for cultivation in Britain with a minimum temperature of 12.5o C and a maximum of 22.5o C. As a native of the higher altitudes of Easter Island (Rapa Nui), this species tolerates higher temperatures. Experiences at Kew of planting out specimens in the Temperate House show they are intolerant of continually low soil and air temperatures of less than 10oC. Air humidity should be maintained at between 50-80% rh. In strong sunshine over 55 kilo lux, 45% shade is provided. In these conditions a more or less evergreen much-branched shrub is formed. Our plants have reached 78 cm whereas specimens at the botanic garden in Bonn have reached 1m high. As yet the Kew plants have not shown an inclination to flower.

Plants should be cultivated in a well drained loam compost with a low base fertiliser and liquid feeding given as required. Plants should be watered well and then the compost allowed to dry before thoroughly re-wetting. The greatest problem to successful cultivation is pest control. Glass-house red spider mite (*Tetranychus* spp.) indicated by silver speckling of the foliage together with small green mites, is by far the worst problem and when severe, will cause complete defoliation. Glass-house red spider mite can be controlled effectively by biological predators *Phytoseiulus persimilis* and *Therodiplosis persicae*, together with cultural control of maintaining high humidity and spraying the foliage with water to break up any colonies. Chemical control with Fenbutin oxide may be used but *Sophora toromiro* is generally quite sensitive to chemicals that cause leaf burn or defoliation. Mealy Bug (*Pseudococcus* ssp.) may become a problem and is controlled by biological predators *Cryptolaemus montrouzieri* and *Leptomastix dactylopii*. In addition, treatments of the pesticide Buprofezin during the winter months will control immature stages.

Propagation may be achieved from seed which should be removed from the legume. A hot water soak of 40-70oC for 24 hours is needed to soften the hard seed coat, or it may be

chipped. Seed should be sown in a gritty compost and placed in a humid environment with 24o C bottom heat. Plants can be pricked out into single pots when they have a couple of true leaves. Vegetative propagation can be achieved by taking semi-ripe shoot cuttings, from mid-summer. These should be struck under mist with bottom heat at 21o C, using a 2500 ppm rooting hormone dip containing IBA/NAA at 0.5 w/w. After weaning, well rooted cuttings can be potted or grown on.

Sophora toromiro Skottsbo., The Natural History of Juan Fernandez and Easter Island 2: 73 (1922). Type: Easter Island, Hanga Roa, *Fuentes* 688 (?GB).

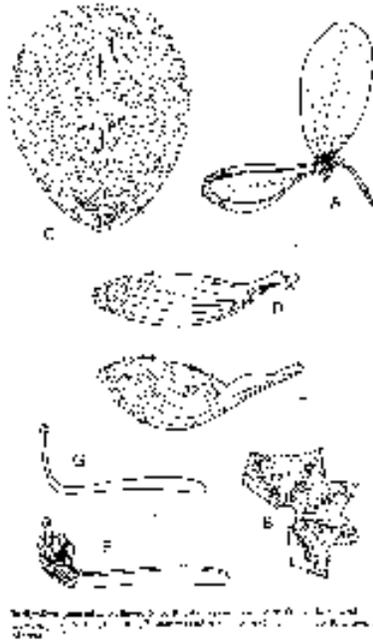
Edwardsia toromiro R.A.Philippi, Bot. Zeit. 31: 737 (1873) nom. nud .

Sophora tetraptera auct. non J. Mill., Ic. Pl., t.1 (1780), nec Ait., Hort. Kew. 2: 43 (1789).

Description

Shrub or *small tree* up to 5 m high. Main stem 10 - 20 (50) cm in diameter; bark reddish-brown, longitudinally fissured. *Leaves* 4.2 - 7.4 cm long, imparipinnate, petiole 0.5 - 0.9 cm long; rachis 3.7 - 6.5 cm long; secondary stems, petioles and leaf rachises densely white sericeous; leaflets 1.0 - 1.5 × 0.3 - 0.5 cm, narrowly elliptic, opposite to subopposite, subsessile, moderately white sericeous above, more densely so below, papery, yellowish to bright green when fresh. *Flowers* 1.5 - 3 cm long, solitary; calyx tube ± 7 mm long with 5 short triangular lobes up to 2 mm long, oblique, broadly campanulate, densely white sericeous. *Corolla* yellow; standard 2.7 × 1.8 cm, obovate; wings 2.7 × 0.9 cm, narrowly elliptic, shorter than the keel; keel 3.0 × 0.9 cm, narrowly elliptic. *Stamens* 10, free. Ovary shortly stipitate; stipe ± 2 mm long, ovary 1.6 cm long, linear oblong, densely white sericeous. *Pods* not seen (description taken from Skottsberg (1922)). *Pod* up to 10 cm long, long-stipitate, brown, typically with 4 narrow striate wings 1.5 mm wide, with fairly thin walls and up to 7 chambers separated by papery septa. Seeds ovoid to globose, 4 - 5 × 3.5 - 4 mm, yellow.

Line Drawing



Distribution

- Endemic to Easter Island (Rapa Nui).

Colour Plate



References

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