

Trilepisium in Seychelles (Moraceae)

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Abstract: The taxonomy of the Seychelles *Trilepisium* species is reviewed, concluding that it is distinct from the nominate Malagasy *T. madagascariense* and should be recognised as a Seychelles endemic, *T. gymndrum*. This is one of the most threatened plants in Seychelles, restricted to 4 known adult trees and a small number of saplings and seedlings. Conservation measures are described.

Key words: conservation, Moraceae, Silhouette, taxonomy

The Moraceae contains 2 native genera in the granitic Seychelles islands, *Ficus* and *Trilepisium*. *Ficus* is represented by 3 indigenous species (*F. bojeri* Baker, *F. lutea* Vahl and *F. rubra* Vahl) and one endemic subspecies (*F. reflexa* Thunb. *Seychellensis* (Baker) Berg). *Trilepisium* is represented by a single species, originally described as endemic ('*Bosqueia gymndra*' - Baker 1877) but more recently referred to *T. madagascariense* DC. (Berg 1977). This species was originally a major component of the lowland and mid-altitude forests, being described from Mahé and Praslin islands in 1768 (Gerlach 1995) and 'In all the islands' (Horne in Baker 1877). It is now restricted to 4 mature trees on Silhouette island. As the most recent taxonomic revision considered this population to be non-endemic and the species as a whole is not considered to be globally threatened it has received little conservation attention. The Nature Protection Trust of Seychelles considers the Seychelles population to be critically endangered (Gerlach 1997) and has an active programme of small-scale propagation. In the light of the threatened status of the Seychelles population it is important to ensure that the current taxonomic position of this population is correct. 14 species are currently synonymised within *T. madagascariense* and the monotypic nature of *Trilepisium* has been suggested to be doubtful (Friedmann 1994), accordingly the taxonomic position of the Seychelles population is reviewed here.

Variation in Afro-Malagasy *Trilepisium*

Trilepisium madagascariense is distributed throughout tropical Africa, Madagascar and Seychelles (Berg 1977).

As noted by Berg (1977) the African populations of *Trilepisium* show relatively little variation. Only three significant points of variation are detectable: leaf width, floral dimensions and fruit dimensions. Leaf width appears to be clinal, with narrower leaves in the east of the range. This does not correlate with any other character and has no taxonomic implications. Anther length is also clinal, with longer anthers in the east than in the west. Fruit dimensions appear to be randomly distributed and can be attributed to individual variation. On the basis of any lack of correlation between these variations and any clear breaks in the clinal patterns the African *Trilepisium* can be considered to be monotypic.

The Malagasy population is highly variable, particularly in leaf morphology. There are no clear correlations with other morphological or environmental features and the cause of

variation is difficult to determine. The anthers are relatively long (0.5-1.5mm, compared to 0.3-1.0mm for most of the African material) but show no clear pattern of variation.

Variations in leaf morphology on Madagascar were classified into 3 main groups by Berg (1977):

Group A - rigidly coriaceous leaves, apex obtuse, base acute, fruit <10mm. 10% of specimens were of this form.

Group B - coriaceous leaves, >10cm, apex long-acuminate, base obtuse, fruit >10mm. 10% of specimens were of this form.

Group C - leaves variable, small or medium (usually <10cm long), apex long or shortly acuminate. This group is intermediate between groups A and B and contains the majority of specimens (60%).

All Malagasy specimens are united by the presence of sparse, short uncinata hairs on the petioles, which distinguish them from the African population. Friedmann (1994) considered the Malagasy population to consist of 3-4 distinct species. A full revision of the Malagasy material is clearly necessary to separate genetic and environmental influences on morphology.

Morphology of the Seychelles populations (Fig. 1)

Berg (1977) noted that the Seychelles specimens resembled the Malagasy group A in leaf characters although Friedmann (1994) considered them closer to the African specimens, especially those of '*Bosqueia angolensis*', noting specifically that the leaves of Seychelles specimens were considerably longer than those of the Malagasy type.

Friedmann (1994) describes Seychelles material as having oblong-oval leaves, shortly acuminate at the tip, obtuse or sub-cuneiform at the base. Dimensions 8-12(-17) × 3.5-5(-5.5)cm, margins entire, glabrous. Petiole 0.8-1.5cm, stipules 2, one rolled round the other, amplexical, to 6.5mm long. This differs from Malagasy material in the glabrous petioles and most closely resembles east African material in leaf proportions. The basal leaf nerves are relatively well developed, unlike most Malagasy specimens, being closer to the African material.

The flower is typical of *Trilepisium*, being indistinguishable from Afro-Malagasy material in all but anther characters. The Seychelles anthers are 0.4-0.5 (-0.6)mm long compared to African anthers of 0.3-1mm and Malagasy anthers of 0.5-1.5mm, thus being at the lower end of the Malagasy range and most closely resembling the anthers of central African plants. The stigma is not coiled unlike most Afro-Malagasy specimens (although this is variable).

From this comparison it appears that Seychelles *Trilepisium* are closer to central or south-west African than to Malagasy specimens. As the Malagasy specimens differ from those of Seychelles and Africa by having uncinata hairs on the petioles, smaller, more coriaceous leaves and a tendency towards having longer anthers, *Trilepisium* can be divided into at least two main groups: Madagascar and Africa-Seychelles. The African and Seychelles populations are distinguished by the larger, more coriaceous leaves of the Seychelles plants.

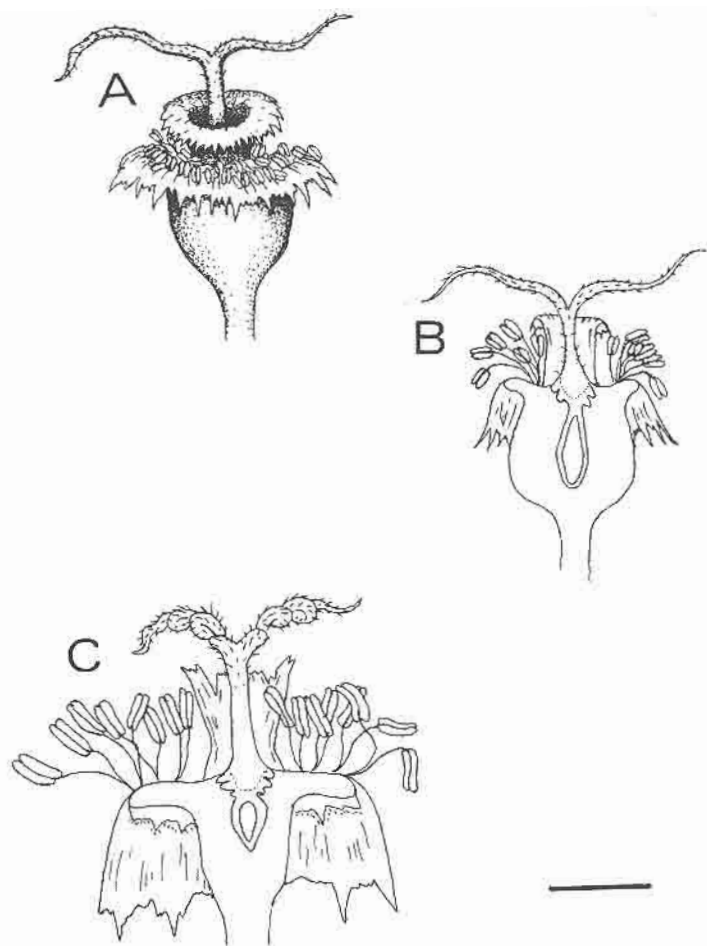


Fig. 1. *Trilepisium 'madagascariense'*. Scale bar 1 mm

A) whole flower (Seychelles); B) flower longitudinal section (Seychelles); C) flower longitudinal section (Madagascar)

As the Malagasy material includes the type of *T. madagascariense* the Seychelles specimens should be removed from its synonymy. In order to reflect this, Baker's (1877) name for the Seychelles population should be resurrected and altered to *Trilepsium gymnandrum* (Baker) **comb. nov.**

Distribution and ecological position of *Trilepsium gymnandrum*

The first records of *T. gymnandrum* in Seychelles date from 1768. Descriptions of a tree with a latex drying brown correspond closely to this species (Lionnet, 1984). This species was recorded throughout the lowland forests on Mahé and Praslin, it appears to have been an abundant species in the lower areas. The next reference by Horne (in Baker 1877) "In all the islands", this is in agreement with the 1768 records but too imprecise to be useful. Thomasset collected a specimen from "mountain forest" (label on Thomasset 96), a description used by the Percy Sladen Memorial Expedition of 1905 to refer to the forests between Cascade and Montagne Planeau on Mahé where Thomasset's estate was situated. The only subsequent record is Friedmann (1986, 1994) who could only locate the species on Silhouette.

The current distribution of *T. gymnandrum* is highly restricted. Mature trees have only been located at two sites; on the south-west slope of Mont Pot à Eau (Grand Congoman in Fridemann 1994) and between Mare aux Cochons and Mont Dauban, where only 4 trees are present. These sites are mid/high-altitude forest at 300m and 600m above sea level respectively. Seedlings are frequently located on the Jardin Marron path and less frequently on the Chemin Montagne Possee. A single sapling approximately 2m tall is present on the latter path at about 300m above sea level.

The early historical records of this species as being common in lowland forests is in marked contrast to the records since 1905 and the present-day distribution. This is probably a consequence of the deforestation of lowland areas, the high-forest distribution being a relict. Seedlings removed from Jardin Marron and planted at La Passe 30m above sea level have established easily, supporting the view that this species is adapted to lowland habitats. Seedlings left growing in the path have not been recorded surviving more than a few months (1 year in one case). These were growing in the compacted soil of the path and in loose, humus rich soil to the sides. Rainfall in these sites is high and the canopy closed, resulting in very low light levels. Those planted in lowland areas are also in comparatively dry humus rich sites. The canopy is more open and light penetration is high. Under these conditions survival is high and growth is rapid.

The dispersal mechanisms of this species are not known. The 10mm diameter single seeded fruit appears to be adapted to bird dispersal. The distribution of seedlings apparently distant from parent trees supports the suggestion that birds such as the endemic Seychelles bulbul (*Hypsipetes c. crassirostris*) and the alien Indian mynah (*Acridotheres tristis*) are the main dispersal agents. Mynahs are uncommon in the high forests but both species are abundant in lowland areas on Silhouette.

Conservation

The highly restricted range of the species and the scarcity of mature trees makes this one of the most threatened of all Seychelles trees. Using the IUCN Red List criteria (IUCN

1994) it can be classified as Critically Endangered on the basis of the extremely small number of mature individuals (criterion D). Several of the Seychelles plants have extremely small populations although none are quite as restricted as *T. gymnandrum* (e.g. *Medusagyne oppositifolia* and *Drypetes risleyi* 50 trees; *Psychotria silhouettae* 6 known plants).

The 4 mature trees and the sapling on the Chemin Montagne Possee are not at risk from any known threats. They are found in semi-natural forest areas on Silhouette which, although not given official protection, is managed for conservation purposes by The Nature Protection Trust of Seychelles in conjunction with the Islands Development Company. All seedlings located to date have been in sub-optimal locations and have been at risk from trampling by people walking on the paths or by cutting during path maintenance operations. Since July 1999 all such seedlings have been removed. These are grown by the NPTS at La Passe until they reach approximately 40cm in height. Two plants have reached this height to date and were planted out in a suitable area in January 2000. The area selected is an area of lowland palm forest being restored after clearance of aliens and coconuts (*Cocos nucifera*). In this area both plants have grown quickly and now reach 48.5-54cm. A further 3 plants will be planted out in the near future in adjacent areas.

Using this small scale propagation approach it will be possible to produce a steady growth in the *T. gymnandrum* population, keeping in pace with lowland habitat restoration. Proposed expansions of the habitat restoration work of the NPTS Silhouette Conservation Project may enable the rate of propagation to increase, although the limited parent population is an unavoidable constraint.

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