

On the discovery of a new endemic *Cynanchum* (Apocynaceae) on Gunner's Quoin, Mauritius

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Abstract - *Cynanchum scopulosum* Bosser (Apocynaceae), a new Mauritius endemic species was discovered in 2003 on Gunner's Quoin Nature Reserve, a highly degraded offshore islet north of Mauritius. The plant's basic ecology is described and threats to its persistence are discussed. The species is Critically Endangered. Recommendations to secure its future are given. The discovery adds further conservation value to Gunner's Quoin.

Key words - *Cynanchum scopulosum*, islet restoration, invasive species, IUCN conservation status.

INTRODUCTION

The flora of Mauritius started to be documented during the late 18th century, and within two centuries most of its species had been described (BOSSER *et al.* 1976-onwards). However, despite having only about 5% of its original native vegetation left, new records of native plant species continue to be made. Recent examples include a new endemic Myrtaceae, *Syzygium guehoi* Bosser & Florens (BOSSER & FLORENS 2000), discovered in 1989, or the orchid *Taeniophyllum coxii* (Summerh.) Summerh., an aphyllous epiphyte of wide distribution first recorded in Mauritius in 2000 (ROBERTS *et al.* 2004). Here we report on the latest such discovery, made in 2003, of a *Cynanchum* species (Apocynaceae) endemic to Gunner's Quoin islet, north of Mauritius.

The Apocynaceae is a large mainly tropical family of some 415 genera and 4,555 species (STEVENS 2001-onwards) of which some 200 belong to the genus *Cynanchum*¹ (MABBERLEY 1997). In Mauritius, the Asclepiadoideae is represented by six native genera and 11 native species (BOSSER & MARAIS 2005).

The first mention of *Cynanchum* in Mauritius, of which the species cannot be ascertained, was made by BOJER (1837) under *Sarcostemma mauritianum*. It was recorded on high mountains on Mauritius, a habitat type today occupied by *C. glomeratum*. Later, BAKER (1877) mentioned a second species, *Decanema bojerianum* Decne (= *C. luteifluens* (Jum. & H. Perrier) Desc.), which appears to be the same as Bojer's taxon (BOSSER & MARAIS 2005). Later references to *Cynanchum* in Mauritius are under *Sarcostemma viminalis* (ex. VAUGHAN 1937, GUÉHO 1988). It is now established however that Rodrigues has one and Mauritius three endemic species of *Cynanchum* (BOSSER & MARAIS 2005). No native *Cynanchum* is known from Reunion island.

¹ In the Flore de Mascareignes *Cynanchum* is treated under Asclepiadaceae

METHODS

Study site

Gunner's Quoin, a 76ha offshore volcanic islet 4 km north of Mauritius, consists of rock laid down 0.7-0.025M years ago (MONTAGGIONI & NATTIVEL 1988) and culminates at 162m a.m.s.l. Most of the islet consists of friable volcanic tuft while the eastern side has an overlying basalt layer. Inferring from CAMOIN *et al.* (2004), the islet would have been cut off from mainland Mauritius by rising sea level some 10,000 years ago. VAUGHAN and WIEHE (1937) believed that the islet supported a palm savannah in its pristine condition before being much altered by human activity since the 18th century. The most recent published botanical surveys previous to our visit revealed an ecosystem largely overrun by alien plants which made up 48 of the 72 higher plant species (DULLOO 1994). Despite its advanced degradation state, where large parts of the islet are dominated by invasive plants, Gunner's Quoin still harbours some valuable native relicts like the largest population of the Mauritius endemic *Lomatophyllum tormentorii*. The native vertebrate fauna includes mainly tropic birds (*Phaeton rubricauda* and *P. lepturus*) and Wedge-tailed shearwater (*Puffinus pacificus*) as well as four species of reptiles. The eradication of Norway rats (*Rattus norvegicus*), black-naped hare (*Lepus nigricollis*) and domestic rabbit (*Oryctolagus* sp.) in the 1990's (BELL 2002), greatly enhanced the conservation value of the islet particularly as a site for eventual reintroduction of reptiles from Round Island.

Surveys

The authors found the new *Cynanchum* species during a four-days biodiversity survey of the islet in December 2003 under a Government of Mauritius project commissioned for the creation of the Islets National Park. The survey was carried out in all different areas safe the inaccessible western cliffs which were examined where possible with binoculars. Ecological notes, like level of threats posed to the habitat by alien species, were taken to allow for an assessment of the threat category of the species using IUCN Criteria (IUCN 2001). Samples were deposited at the Mauritius Herbarium and duplicates sent to the Herbarium of the Museum National d'Histoire Naturelle, Paris.

RESULTS

We found 77 higher plant species including the new *Cynanchum* of which a colony of an estimated two dozens intermingled individuals was found. A sample was deposited at the Mauritius Herbarium (Holotype MAU 23772). Other vouchers collected on a second visit in 2004 are: MAU 24070, 24071, 24072, 24073 and 24074.

C. scopulosum was growing from the upper scarp downwards on a near vertical sea facing cliff and its ledges in the south west of the islet between 20-50 m amsl (Fig. 1). The species is a rather procumbent liana with branches reaching one cm in diameter. It has markedly constricted nodes and a silvery green tinge that distinguishes it vegetatively from all other Mauritian *Cynanchum*. Its branching stems reach several metres long and creeps over exposed rocks and low cliff vegetation. Towards their extremities, the stems are usually erect sometimes reaching one meter high. The colony spans a maximum

of about 40 m laterally and 30 m vertically and varies from dense monospecific areas towards its core to more diffused growth towards the edges where it grows together with several other native species including *Tylophora coriacea* (Apocynaceae), *Lomatophyllum tormentorii* (Asphodelaceae), *Scaevola taccada* (Goodeniaceae), and more rarely with *Latania loddigesii* (Arecaceae) and *Dicliptera falcata* (Acanthaceae). There is, however, a number of invasive alien plants that appear to be encroaching on the *Cynanchum*'s habitat, including the fire prone grass *Heteropogon contortus* and other aggressive weeds like *Flacourtia indica* (Salicaceae) and *Opuntia vulgaris* (Cactaceae) that have already developed into dense stands or thickets elsewhere on the islet.

DISCUSSION

The flora of Gunner's Quoin was thoroughly surveyed at least three times (BULLOCK *et al.* 1983, DULLOO 1994, MWF 2003) since its description in the 1930's (VAUGHAN & WIEHE 1937). It thus appears surprising that the new *Cynanchum* species covering a patch of several dozen metres across was discovered only in December 2003. However, while some surveys genuinely missed the plant (VAUGHAN & WIEHE 1937, MWF 2003), others appeared to have located but misidentified it. Thus Bullock *et al.* (1983) recorded an alien tree weed, *Euphorbia tirucalli* (Euphorbiaceae) where we discovered *C. scopulosum*. Another survey by BELL *et al.* (1994) mentioned a clump of *E. tirucalli* where we later found the *Cynanchum* colony. In fact, *C. scopulosum* superficially resembles *E. tirucalli* from a distance. Infertile herbarium samples of the two species can also be very similar. We found no *E. tirucalli* on the islet.

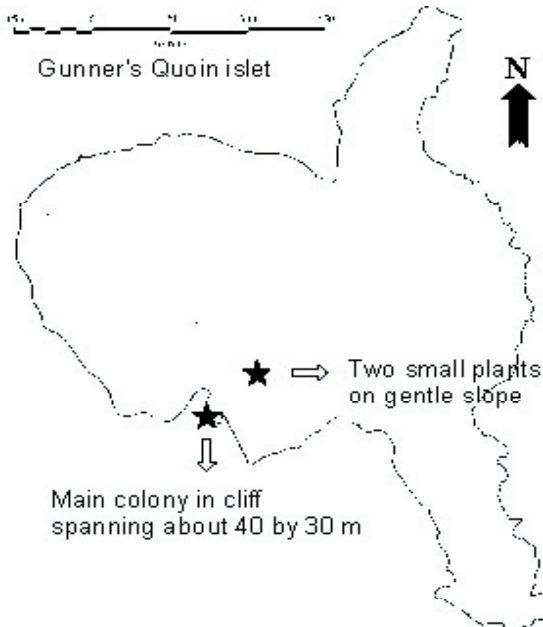


Fig 1. Distribution of *Cynanchum scopulosum* on Gunner's Quoin Islet Nature Reserve, north of Mauritius.

It is fortunate that there was no attempt to eradicate the misidentified *Cynanchum* during restoration of the islet like was successfully done with rats, hares and rabbits (BELL 2002). But it is worrying that a plant found on nearby Serpent Island in 2003 and identified as a weed by the expedition members, which comprised no experienced botanist, has been destroyed and that no sample was kept (TATAYAH & COLE 2004). There exists also the unfortunate habit on Mauritius to weed *Cynanchum* spp. from areas managed for conservation because it is a toxic plant. Weeding of *Cynanchum* has been reported from Ile aux Aigrettes Nature Reserve (A. KHEDUN pers. comm. 2004), Perrier Nature Reserve and Mondrain Private Reserve (G. D' ARGENT, pers. comm. 2004). *Cynanchum* seems now eradicated from the latter two sites.

Conservation status

C. scopulosum is known only from Gunner's Quoin. A second expedition there in August 2004, revealed a tiny second clump of two plants on a ridge 100m from the first colony bringing the total area occupied by the species to less than 0.1ha in two separate places (Fig. 1). The species thus has one of the most restricted range for an endemic plant on Mauritius.

This fact alone exposes it to a high threat of extinction in the wild. The colony may thus easily be destroyed by fire, the more so that much of the islet is today invaded by fire prone *Heteropogon contortus*, and also receive illegal visitors regularly lighting camp fires. Indeed, devastation by fire has been recorded in the past (DULLOO 1994) and probably explains partly at least both why the islet is so poor in native plants and why the *Cynanchum* itself has such a restricted and marginal distribution.



Fig. 2. *Cynanchum scopulosum* on Gunner's Quoin - young plant and flowers.

Destruction of the colony by a landslide appears likely as this is a common feature on the island as indicated by numerous rock fall scars on the sea facing cliffs. The site where *Cynanchum* grows is also gradually being invaded by alien plants. Thus, the species should be regarded as Critically Endangered (CR B1ab(iii) + 2ab(iii); D).

Given these risks, we recommend that the plant be propagated to several locations of suitable ecology on the islet itself, including well inland. Also the proximity and similar climate and geology of Round and Flat Islands, and their ongoing restoration programmes make them ideal sites to receive translocated *C. scopulosum*. Establishing these populations would greatly reduce the plant's extinction risks in the wild. It is quite conceivable that *C. scopulosum* might have once grown on these two islets given the plant's efficiently wind-dispersed seeds and the fact that many native species are known not to have survived the human-induced ecological devastation of both islets.

Extinction risks will also be minimised by maintaining the plant in *ex-situ* facilities. *C. scopulosum* is easy to propagate. All 12 cuttings taken rooted without rooting hormones within 5-6 weeks. These are being grown in the arboreta of the National Parks and Conservation Service and of the Mauritius Herbarium (MSIRI). Propagation by seeds, although advisable, seems less easy for the moment due to the currently rather rare expeditions to the islet and since the plants appear to set very few fruits at a time.

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