SHORT COMMUNICATION

STATUS ASSESSMENT OF THE SADDLEPEAK DEWFLOWER
(MURDANNIA SADDLEPEAKENSIS RAMANA & NANDIKAR: COMMELINACEAE): AN ENDEMIC SPIDERWORT PLANT OF ANDAMAN ISLANDS, INDIA

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Abstract: The current distribution and threat assessment of Murdannia saddlepeakensis Ramana & Nandikar (Commelinaceae), an endemic plant of Saddle Peak National Park, northern Andaman is presented here. The data available from field surveys indicate that this species is Critically Endangered according to the 2011 IUCN Red List Categories and Criteria.

Keywords: Critically Endangered, IUCN Red List Criteria, Murdannia saddlepeakensis, Saddle Peak National Park, status assessment.

A large number of the world’s plant species are threatened by several factors such as habitat loss, exploitation, biological invasions, industrialization, pollution and accelerated climate change (Morroone 1994). With so many species at risk of extinction in the near future, efforts to conserve plant biodiversity are unfortunately hindered by the lack of a comprehensive inventory due to lack of sufficient data for assessment of the threat status of each species (Brummitt et al. 2008).

Endemic species with limited geographical ranges are more susceptible to extinction than widely ranging species. Hence, an effective conservation strategy for endemic species requires detailed knowledge of their population status and distribution. Most of the floristic databases lack crucial data pertaining to distributional range and population size of endemic species, and the data for many species are just carried forward from past works without comprehensive field work. Very few studies have been published on population numbers and status assessment for some endemic plants in India (Rao et al. 2010, 2011, 2012; Panda 2013; Baig et al. 2014; Salamma & Rao 2014; Pethe et al. 2015).

Endemism is the principal criterion to determine hotspot status as the endemic species are entirely...
dependent and are restricted to a particular geographic area for their survival, and are often the most vulnerable (Myers et al. 2000). The geographical area can be defined by political boundaries, such as country endemics, or by ecological boundaries. The degree of endemism for an area is often cited as a measure of the uniqueness of the flora, and consequently is an important criterion for prioritizing a site for conservation (Myers et al. 2000). It should be noted that the confinement of endemic species to a single habitat renders them extremely vulnerable to environmental change.

**Study Area**

The Andaman & Nicobar Islands popularly known as ‘Emerald Isles’ are a Union Territory and the largest archipelago system in the Bay of Bengal, consisting of 306 islands and 206 rocks and rock outcrops (islets). It is situated between 6°45′–13°41′N & 92°12′–93°57′E, covering 8,249km² geographical area with a coastline of 1,962km. These islands stretch north–south in direction and simulating an arc stretching over a length of about 912km and with maximum width of 57km. The Andaman group of islands have a total area of 6,408km², comprising a total length of 467km and width of 52km.

The Saddle Peak forests (13°15′–13°41′N & 92°37′–93°7′E; Fig. 1) was declared a National Park in 1979. The total area of the Saddle Peak National Park is 32.4km² and is located in Diglipur forest division of northern Andaman. As it comes under Category II of IUCN protected area categories (Stolton et al. 2013), trekking is possible with permission from the forest department. The climate is typically oceanic. Temperature usually varies between 20–30°C. The months, June to October are characterized by heavy precipitation. The Saddle Peak National Park is surrounded by moist deciduous vegetation as well as tropical evergreen forest and possesses several endemic species. Champion & Seth (1968) classified the vegetation type as southern hilltop evergreen forest (1A/C3).

**Murdannia saddlepeakensis** Ramana & Nandikar (Image 1)

This species is an erect herb of about 40–60 cm high, glabrous perennial with a basal rosette of leaves; roots fibrous. Leaves: basal rosette leaf sheaths 0.5–1 cm
long, lamina narrowly linear, 20–60 cm long, 4–8 mm wide, acuminate at apex, rounded at base merged into the sheath, margins entire; cauline leaves with sheaths 0.2–2 cm long, glabrous, narrowly lanceolate to linear, 10–25×2–5 mm, rounded at base, acute to acuminate at apex, entire at margin, glabrous, often scabrid; central flowering shoot erect, 20–40 cm long, unbranched or rarely branched from apically reduced cauline leaves (a bract). Inflorescence terminal and axillary (from uppermost foliaceous bract) of peduncled cincinni; peduncles 2–7 cm long, glabrous, cincinni to 2 cm long, few-flowered, bracteoles ca. 5 mm long, caducous. Flowers bisexual, ca. 1.5 cm wide; pedicels (2–)3–5 mm long; sepals elliptic to oblong-elliptic, 5–6 mm long, pale white to green; petals ovate to obovate, lilac to pale lavender; stamens 2, filaments densely bearded, (3–)4 mm long, anthers elliptic, ca. 1 mm long; staminodes 3, antepetalous with glabrous to sparsely bearded filaments, anterodises tri-lobed, yellow; one rudimentary stamen, antisepalous with densely bearded filament ending with sterile knob; ovary glabrous; style recurved towards staminodes, (3–)4 mm long; stigma simple. Capsule subglobose, 4–5×3 mm, locules 1-seeded. Seeds elliptic or rarely ovoid, testa surface scrobiculate, the depressions often partially uniting on the dorsal surface, forming a little larger, irregular depressions,
dark brown, hilum linear or oblong-linear, embryotega dorsal-semidorsal, farinose sparsely in all depressions and around the embryotega. Flowers and fruits from October to February.

The Assessment

Under the project ‘Quantitative Assessment and Mapping of Plant Resources of Andaman & Nicobar Islands’, extensive surveys were conducted throughout the islands of the Andaman & Nicobar group from Landfall Island to Indira Point, including the remote volcanic islands of Narcondum and Barren islands. The entire topography of the islands was surveyed by undertaking field trips to the different parts of the study area spanning all administrative boundaries of the Andaman & Nicobar Islands. As far as the study area is concerned, standard IUCN sampling methodology (2011) was used for determining the area of occupancy. Accordingly, the whole terrain of the study area, Saddle Peak National Park was stratified into 70 grids with 2km cell width each (4km² grids) for this purpose and were given numbers for identifying the location easily (Image 2). Within each grid, occurrence of the endemic plants listed was surveyed based on the sampling procedure mentioned.

For the threat assessment Murdannia saddlepeakensis under Criterion B, GeoCAT (http://geocat.kew.org/), an open source browser-based tool was used to perform the rapid geospatial analysis for Red Listing the taxa of interest. This tool was developed to utilize spatially referenced primary occurrence data for the analysis of two aspects of the geographic range of a taxon: EOO and AOO. In Google Maps and Google Earth, GeoCAT can quickly and easily combine data from multiple sources. Analysis can be done and visualized instantly, providing an indication of the Red List threat rating, subject to meeting the full requirements of the criteria (Bachman et al. 2011).

Since the discovery of M. saddlepeakensis from Saddle Peak National Park, northern Andaman Islands in 2011, it is claimed to be endemic to this protected area. A thorough survey for the occurrence of this species was intended to estimate the population and distribution of this species at Saddle Peak National Park and its adjoining forest region to ascertain the threat status. Accordingly, the whole terrain of Saddle Peak National Park was surveyed for locating and estimating the populations of M. saddlepeakensis. The population of this species was located in four points at close proximity and each site was observed to be populated with ca. 25–30 individuals. The sites of occurrence were recorded by GPS (Table 1) for the estimation of extent of occurrence (EOO) and area of occupancy (AOO) (Fig. 2). This species was not found in the interior forests and appears to prefer open scrub forest of rocky landscape at an elevation range of 450–600 m.

Results and Discussion

Murdannia saddlepeakensis was categorized as Data Deficient earlier (Ramana et al. 2013). Based on the recent field observations made periodically, the conservation status of the species has been re-evaluated following the latest IUCN Red List Criteria (Version 3.1; IUCN 2001). Of the five criteria (A–E) pertaining to threat categories, the species qualifies for criterion B1 (EOO) as M. saddlepeakensis is restricted to a single location - Saddle Peak National Park.

Criterion B1: The EOO of Murdannia saddlepeakensis is estimated to be 1.8km². A continuing decline of population is observed and inferred (sub-criterion b) in terms of quality of habitats (iii) as there is a constant tourism and trekking activity at the national park which

<table>
<thead>
<tr>
<th>Locality</th>
<th>GPS Coordinates</th>
<th>Elevation</th>
<th>Grids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saddle Peak</td>
<td>13°11'8.12&quot;N &amp; 93°20.95&quot;E</td>
<td>610m</td>
<td>e4</td>
</tr>
<tr>
<td>Way to Saddle Peak</td>
<td>13°10'37.46&quot;N &amp; 93°00'40.44&quot;E</td>
<td>393m</td>
<td>f4</td>
</tr>
<tr>
<td>450m from 2nd viewpoint</td>
<td>13°8'58.28&quot;N &amp; 93°56.70&quot;E</td>
<td>478m</td>
<td>g5</td>
</tr>
<tr>
<td>Saddle Peak Hill Top</td>
<td>13°9'28.88&quot;N &amp; 93°23.40&quot;E</td>
<td>645m</td>
<td>g4</td>
</tr>
</tbody>
</table>

Table 1. Distribution of Murdannia saddlepeakensis at Saddle Peak National Park
comes under Category II of protected areas push this species to extreme. Thus, the species is categorized Critically Endangered with geographical range being less than 100km² and satisfies sub-criterion b(iii).

Hence, it is certain that the assessment for *Murdannia saddlepeakensis* is Critically Endangered [B1ab(iii)].

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