

FIRST REPORT OF *CEROPEGIA BULBOSA* ROXB. FROM COASTAL HABITAT OF KULABA FORT, ALIBAG, MAHARASHTRA

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ABSTRACT

The present paper gives an account of taxonomic description of *Ceropegia bulbosa* which is first time reported from the coastal habitat of Kulaba fort, Alibag, Maharashtra. The species from the said habitat showed remarkable morphological differences which do not match with the usual characters of the species from other habitats. These morphological differences can be counted as an adaptation for its survival to such harsh saline climate of Kulaba fort. The study thus gives an account of a new habitat for the *Ceropegia* species to the available list of other habitats.

Keywords: Coastal, Habitat, Morphological, Adaptations, Characters

INTRODUCTION

Ceropegia L. of family Apocynaceae, is an old world tropical genus and is one of the largest genus in the tribe Ceropegieae which consist of about 200 species and is widespread along the margin of the Indian Ocean.

The genus *Ceropegia* has always been a fascination to the botanists because of various reasons like their distinct diversity in reference to habit, habitat, flower structure and ecological adaptations. Attractive flytrap flowers (Percival, 1969), flower design, corolla size and shape and coloring pattern etc are some special characters of this genus.

Among different species *Ceropegia bulbosa* is one of the widely distributed species but still threatened (Yadav and Kamble, 2008). The species is represented by two varieties i.e. *C. bulbosa* Roxb. var *bulbosa* and *C. bulbosa* Roxb. var *lushii* (Grah.) Hook (Cook, 1958). The former one is characterized by broad leaves while the later is a narrow leaved variety.

Ansari (1984) reported 44 species of Indian *Ceropegia* of which 28 are said to be endemic. Presently the genus is represented by 50 species of which about 38 species were recorded in Western Ghats. Out of these 38 species of *Ceropegia* in Western Ghats about 15 are narrow endemic and all of them are highly threatened. Several species of *Ceropegia* are facing different threats and are narrow endemics while 16 species are recorded under different categories in Red Data Book (Nayar and Sastry, 1987-89).

The present paper not only gives the taxonomic description but also describe the unusual morphological differences showed by the species *Ceropegia bulbosa* located from Kulaba fort, Alibag. Alibag is a coastal town situated on the Western coast of India and on shore of Arabian Sea. Alibag lies in the Kokan region of Maharashtra state and is always a place of attraction to the tourist because of Kulaba fort. Kulaba fort is an ancient fort which is located in the sea around 2 km from the shores of Alibag beach. The fort is totally surrounded by the sea and exposed to harsh marine climate. The geographical coordinates of Kulaba fort is 18.6344°N and 72.8642°E.

Many regional surveys are their which reports the occurrence of species from different habitat but the present paper provides the first report of *Ceropegia bulbosa* from coastal habitat of Kulaba fort.

During field collection about 7-10 individuals were spotted growing in the exposed saline climate with some morphological differences which were noted as adaptations to such climate. The taxonomic description of the *Ceropegia bulbosa* is as follows.

Taxonomic Description

Ceropegia bulbosa Roxb.

Local Name: Khaparkundi

Flowers and Fruits: August- October

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Habit: Climber on a mangrove associate *Clerodendron inerme*.

Roots: Tuberous, flattened, small turnip like, fibers arising from the base and circumference of the tuber.

Stem: Highly twinning, when young smooth and fleshy but becomes woody when gets matured.

Leaves: Simple, opposite decussate, thick petiole, very thick leaf blade, leaf shape highly variable from linear lanceolate to obovate to elliptical, glabrous on both abaxial and adaxial surface, mucronulate apex, exstipulate and shining.

Inflorescence: Axillary, Cyme.

Flowers: 4 -10 flowers per cyme about 1.5 -2 cm, pedicillate (0.5-1cm), bisexual, straight or curved, bracts solitary. Calyx 5, polysepalous, lanceolate, acute with purple spots on the surface. Corolla whitish green, swollen at the base, contracted at the middle and forming a purple colour cage like structure at the apex lined all over by hairs. Corona double, outer joined to form 5 lobes and purple inside, inner 5, pollen masses yellow resting on brown pointed angles of stigma.

Follicles: Two, straight tapering at the apex, each about 7-9 cm long.

Medicinal Uses: Local people eat raw tubers and leaves for having fun of mix sweet and sour taste. The tubers were also given to treat digestive problems.

Morphological differences that were noticed beside the usual character of the species are as follows:

- Many individual showed the remarkable differences in leaf shape from linear lanceolate (6-8 cm, characteristic of *C. bulbosa* var *lushii*) to obovate to elliptical (4-8 cm) with mucronulate leaf apex not usual acuminate. The linear lanceolate leaves were present at the base of the plant near to soil then changing its shape to obovate and elliptical at the apex.
- The petioles and leaves were very thick and leaf blades were shining.
- Many mature and almost all young leaves showed wavy leaf margin.
- Most of the leaves showed reddish purple shaded leaf blades and leaf margins.
- Various areas of stem also showed reddish purple shades.
- The stem were found to be highly twinning around its supporting plant i.e. *Clerodendron inerme*, a Mangrove associate.

RESULTS AND DISCUSSION

In India, *Ceropegia bulbosa* is one of the widespread species with two varieties i.e. broad leaved variety *bulbosa* and narrow leaved variety *lushii* but still under the tag of threatened word. The species is widely found in Western Ghats mainly associated with drier hilly regions among spiny and thorny bushes.



Figure 1: Kulaba Fort, Alibag

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From the study it was found that the species have successfully adapted to such harsh climate by showing remarkable adaptations like linear lanceolate leaves which is to reduce leaf surface area in turn to reduce transpiration. It is well known that plants exposed to saline conditions often synthesize foliar anthocyanin in response (Scott, 2002). *Ceropegia bulbosa* showed same adaptation, where formation of anthocyanin pigments in leaves is to protect the cells from UV light and direct sunlight. Anthocyanin pigment formation not only decrease leaf osmotic potential but also helps in water uptake and reduce transpiration. The species also showed high twining of stem on its supporting plant which is to tolerate the strong salty winds. The leaves of collected species were thick and shining which make them waterproof and protect them against drying out in salty winds. The leaves also showed curly margins which is generally done by the plants to run off the salty water.



Figure 2: Habitat of *Ceropegia bulbosa* at Kulaba fort, Alibag



Figure 3: Purple shaded leaves and stem of *Ceropegia bulbosa*

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Figure 4: Tubers of *Ceropogia bulbosa*



Figure 5: Fruits of *Ceropogia bulbosa*

Recently *Ceropogia* species have attracted attention of several workers due to its rare nature of occurrence and their need of conservation. Species of *Ceropogia* are very difficult to propagate, cultivate and maintain in gardens and hence their conservation is a major challenge to biologists. Thus keeping the above challenges in mind, author's successfully done ex-situ conservation of *Ceropogia bulbosa* by collecting their tubers from their natural habitat and planting them in gardens.

Thus from these peculiar morphological studies it can be concluded that the species have successfully enabled themselves to survive under such harsh coastal climate and thus the present study add a new habitat for the *Ceropogia* species.

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