

Studies on morpho - taxonomy and anatomy of *Ipomoea quamoclit* L. growing in Ranchi, Jharkhand, India.

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ABSTRACT

Ipomoea quamoclit belongs to the family morning glory, More than one third of the species are included in to major genera *Ipomoea* (650) and *Convolvulus* (250) under Convolvulaceae. In India 63 species of *Ipomoea* were reported where as 19 species were reported from Jharkhand. In the current communication an endeavor is made to study morpho taxonomy, anatomy of *Ipomoea quamoclit*. It was observed that flower of *Ipomoea quamoclit* is the small, 1-2 in axillary cymes sepals persistent, equal enlarged in fruit. In anatomical study the primary vascular bundle of the stem consists of bicollateral. The cambium undergoes differential activity on opposing sides of the stem, while a concentric pattern results from the activity of a discontinuous supernumerary cambium.

Key- words- *Ipomoea*, morpho taxonomy, anatomy, Ranchi.

INTRODUCTION

Ipomoea quamoclit (cypress vine, cypress vine morning glory, cardinal creeper, cardinal vine, star glory or hummingbird vine) belongs to the family morning glory¹ with its red flowers and fern like leaves growing on a fence. *Ipomoea* comprises of the largest genus in number of species under family Convolvulaceae.² More than one third of the species are included in to major genera *Ipomoea* (650) and *Convolvulus* (250) under Convolvulaceae.³ In India 63 species of *Ipomoea* are reported⁴ where as 19 species are reported from Jharkhand⁵. All species propagate by seeds and some of them multiply vegetative parts.⁵ Most of the species of *Ipomoea* are climbers and trailers.⁶ *Ipomoea* species vary widely in habit⁷, and vegetative and reproductive character making the genus a prime candidate for studies of character of species⁸, In the present communication an endeavor is made to study the morphotaxonomy, anatomy of *Ipomoea quamoclit* L. growing in Ranchi. Ranchi is the capital of the state of Jharkhand situated at 23022' E with average elevation of 651 m above sea level. Ranchi has a hilly topography and its dense tropical forest.⁹ The state of Ranchi is covered with 139 Sq.Km dense forest. The climate of the district is warm and

humid. Three distinct seasons are felt during the year. Rainy season (mid of June till October), winter (mid of October to February) and summer (March to mid of June).¹⁰ The annual rainfall is varying from 1420 mm to 1450 mm. The average temperature ranges from 37 °C to 19 °C. Hills, serene environment of dense forest, picturesque river valleys and mountain peaks with ancient shrines are further characteristic features of the district.¹¹

Materials and Methods

The materials for the Morphotaxonomy and Anatomical studies were locally collected from natural habitat and dissected and characters were studied properly. For anatomical studies the sections of the root, stem and leaves were cut and studied under light electric microscope (OLYMPUS CH20i).

Result and Discussion

Habit: Annual herb.

Habitat: Gardens.

Flowering and fruiting time: July to October.

Taxonomic description: A slender annual, twiner. The leaves of this annual twining vine are deeply pinnatifid Leaves 7.5-12.5 cm long, pinnately cut, up

to the midrib into many pairs of linear to fill form patent segments. Flowers 1-few in axillary cymes. Corolla salver-shaped, red, tube 2.5-3.5 cm long. Capsule ovoid about 1 cm long

Flowers small, 1-2 in axillary cymes sepals persistent, equal enlarged in fruit. Corolla red coloured, , funnel form, campanulate midpetaline bands well defined. Stamens exerted, filaments filiform, unequal, dilated and pubescent basally, anthers ovate, longitudinally dehiscent, not twisted, Ovary 3 loculed, Style one, filiform, included or exerted, stigma capitate or 2 - 3 globose. Capsule ovoid, about 1 cm long, 3 non valved black Seeds.

The anatomy of leaves, stem root of *Ipomoea quamoclit* L. are described. Bicolateral bundles comprise the midrib and major veins, while the minor veins consist of collateral bundles. A petiole base possesses two adaxial collateral bundles and one or two abaxial bicollateral bundles. The lamina has well-defined palisade and spongy mesophyll layers. Development of stem vasculature of this twining vine may be separated into five ontogenetic stages, namely: the bicollateral bundle stage, the cambium-like meristem stage, the normal cambial stage, the anomalous cambial stage and the supernumerary cambial stage.

The primary vasculature of the stem consists of bicollateral bundles. Within these bundles the external protophloem becomes separated from the protoxylem and internal phloem by a cambium-like meristem that produces cylinders of external metaphloem and metaxylem. A cambium then arises between the external phloem and the primary xylem and produces secondary phloem centrifugally and secondary xylem centripetally. Lobed, concentric and foraminate patterns of anomalous secondary growth subsequently develop in a stem. The lobed pattern develops as the cambium undergoes differential activity on opposing sides of the stem, while a concentric pattern results from the activity of a discontinuous supernumerary cambium. A foraminate pattern develops as included phloem forms within parenchymatous islands of the secondary xylem. *Ipomoea quamoclit* possesses a

taproot whose outer boundary is a periderm of subepidermal origin. A foraminate pattern of anomalous secondary growth develops within this root.

Stomata

Paracytic stomata and multicellular, glandular and unicellular, eglandular trichomes occur on both the leaves and stem.

Discussion

There is considerable disagreement regarding the systematic position of the family. *Ipomoea* species vary widely in habit, and vegetative and reproductive character making the genus a prime candidate for studies of character of species. The epidermal characters in Convolvulaceae are considered to be playing a minor role in taxonomic and phylogenetic studies along with other disciplines. Metcalfe and Chalk, reported anisocytic, anamocytic and paracytic stomata in this family In our studies were also recorded and previous workers also found similar results.

Conclusion

An identification key to species is constructed based on leaf anatomy and seed coat characters. This data can be used in other subjects such as pharmaceutical botany, organic chemistry, taxonomy and horticulture, in terms of species identification.

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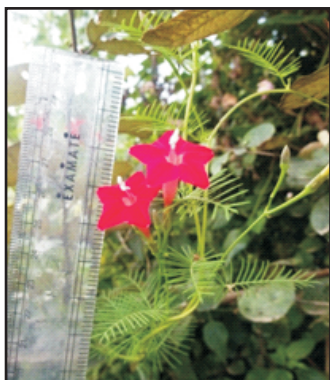


Fig. 1. *Ipomoea quamoclit* L.



Fig. 2. Morphometric of *Ipomoea quamoclit* L



Fig. 3. T.S. of shoot of *Ipomoea quamoclit* L.

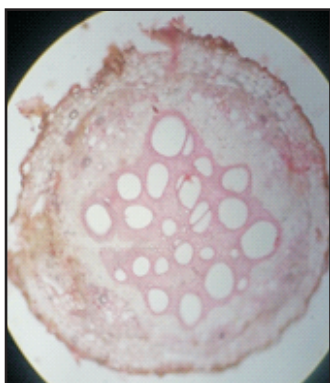


Fig. 4. T.S of root *Ipomoea quamoclit* L.

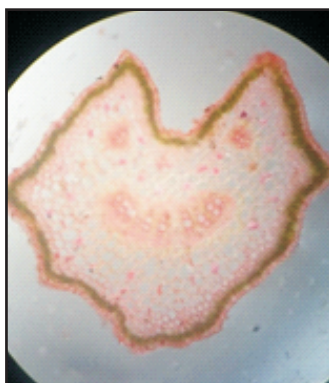


Fig. 5. T.S. of petiole *Ipomoea quamoclit* L.

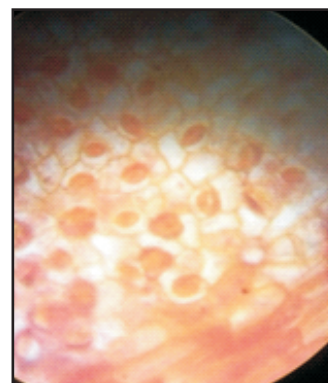


Fig. 6. Stomata of *Ipomoea quamoclit* L.