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RESEARCH ARTICLE

A new variety of *Ipomoea cairica* (Convolvulaceae) from Karnataka, India

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Abstract

Ipomoea L. is a species-rich genus in the family Convolvulaceae, widely distributed across temperate and tropical regions of the world. Due to its wide distribution and morphological variability, identifying and classifying *Ipomoea* species has become challenging. The present study attempts to classify species within the genus *Ipomoea* based on morphological features, with a particular focus on floral characters, which serve as useful diagnostic traits for identification. This study specifically focuses on *I. cairica* (L.) Sweet, commonly known as 'blue morning glory,' a wide spread species within the family. It is characterized by a campanulate glabrous corolla, a key floral feature. However, in the present investigation, additionally a distinct characteristic wing like appendages on the outer part of petals was observed in the flowers of *I. cairica.* This trait suggests a divergence in habitat preference and points to the possible evolution of a new variety. Based on careful observation over four generations, it is concluded that a putative variety of *I. cairica* has emerged, consistently exhibiting these unique features. Consequently, it is elevated to the rank of a new variety, named *I. cairica* var. *appendiculata,* from Karnataka, India. A detailed description, illustration and an artificial key for the new variety are provided.

Keywords: Convolvulaceae; floral appendages; *I. cairica* var. *appendiculata*; Karnataka; new variety

Introduction

Ipomoea L. is one of the most economically important genera of the family Convolvulaceae, commonly called as 'morning glory'. The genus is widely distributed across both temperate and tropical regions of the world. It is represented by about 642 species worldwide (1). In India, about 58 taxa that includes 50 species, 2 sub-species, 4 varieties and 2 formae have been reported (2). In recent years, *I. fulvicaulis* (Hochst. ex Choisy) Boiss. ex Hallier f., *I. imperati* (Vahl.) Griseb., *I. triloba* var. *deccansis* D.K. Londhe & A.S. Bhukatar, *I. simoesiana* Shimpale, A.V. Kattee & S.B. Patil and *I. purga* (Wender.) Hayne has been added to the Indian flora (3-7).

There is a considerable confusion among researchers regarding species characterization and identification within the genus *Ipomoea*, due to similarities in habit, leaf form and flower traits across many taxa. Additionally, the plicate corolla plays a key role in differentiating the species of *Ipomoea,* characterized by mid-petaline bands that enhance the flower beauty with a star-like appearance and show variation with growth habit (2).

During the present study, the authors discovered a new variety of the genus *Ipomoea* from Karnataka State, India, which is morphologically comparable to *I. cairica* but shows differences in corolla structure and habitat. *I. cairica* is an ornamental plant often regarded as invasive species in many countries, and it is used in folk medicine to treat rheumatism and inflammation (8, 9). To date, only *I. cairica* var. *semine-glabra* Bhandari has been recorded as a variety in India, based on external seed morphology and documented from Rajasthan (10). The present study describes a new variety within the same taxon based on flower morphology specifically, the presence of additional wing-like appendages on the outer part of corolla, a feature consistently observed over the past four generations. This new taxon has been confirmed, described and illustrated following a critical review of the relevant literature and an examination of taxonomically significant characters.

Materials and Methods

Plant material

Extensive field trips were conducted to explore the genus *Ipomoea* L. in Karnataka State, India during the period 2019-2024. During field surveys, distinctive characters were observed in the flowers of *I. cairica,* which necessitated consistent field visits at least 20-25 across four generations to study the morphological variations of the suspected species. Standard methods were followed for plant collection, processing and preparation of herbarium specimens (11). The voucher specimens of the new taxon have been deposited in the Herbarium of the Department of Studies in Botany, University of Mysore, Manasagangotri, Mysuru, Karnataka.

Morphological characteristics

The morphological analyses and systematic treatment of the taxon reported in this study are based on the specimens available at the Herbarium of the Department of Studies in Botany, University of Mysore (UOMMGM), Herbarium, Botany Department, University of Calicut, Calicut (CALI) and Madras Herbarium, Coimbatore (MH), along with the available literature. The micromorphological characters were analyzed and photographed using a digital camera (NIKON D3300 DSLR 24.2). The new variety was compared morphologically with other varieties of *I. cairica,* which confirmed the distinctness of the new taxon. For comparison, among the varieties of *I. cairica,* corolla characters namely nature, shape and seed hairiness were considered and tabulated (Table 1).

For ease of identification of the new taxon, systematic treatment, phenology, an artificial key, illustration and field photographs have been provided (Fig. 1-3). A dichotomous artificial key was constructed manually.

Results

Taxonomic treatment

Ipomoea cairica (L.) Sweet var. *appendiculata* Anasuya, GR Shivamurthy, M Murali, MC Thriveni & KN Amruthesh var. nov. (Fig. 1-3).

Type

India, Karnataka, Raichur District, Sindhanur, 15.886413N, 76.84317E, Mannikeri Camp, 02.04.2025, *Anasuya 1185* (holotype; UOMMGM).

Diagnosis

Ipomoea cairica var. *appendiculata* is morphologically very similar to other varieties of *I. cairica* but can be easily distinguished by the presence of wing-like appendages on the petals. A detailed morphological comparison is provided in Table 1.

Description

Perennial climber, stem cylindrical 2-6 m long, 0.4-0.8 cm thick, glabrous, sometimes tubercled. leaves alternate, petiolate; petioles cylindrical with a groove on one side, glabrous sometimes finely tubercled 3-7 x 0.2-0.4 cm. Pedate leaves, palmately divided into 5-7 lobes; lobes unequal, lateral lobes smaller than middle ones; ovate to obovate 3-5 x 1-3 cm; base acute, tip obtuse, margin entire; adaxially green, abaxially light green. Pseudostipules present 1-2 cm. Inflorescence axillary; dichasial cyme or in lax, usually 2-5 flowered; peduncles 2-2.5 x 0.2-0.4 cm; base wider than tip; pedicels 1-3 x 0.1-0.2 cm, glabrous, sometimes tubercled. Bracts small, 01-0.3 cm, glabrous, caducous. Sepals 5, glabrous, subequal; inner 2 smaller than outer 3; the central part dark green, margin and apex whitish-green; ovate to oblong; truncate to obtuse base; acute tip; free, quincuncial; 0.3-0.8 x 0.2-0.4 cm; persistent and partially enclosing the fruit. Corolla 5, gamopetalous, plicate, purple; campanulate above, cylindrical below, the base 1-2.5 cm, upper extended part 3-4 cm; margin sub-entire, diameter 4-6 cm, length 4-5 cm. 3-5 wing like extra appendages present on the outer side of the petals; linear to lanceolate 2-3 x 0.5-0.8 cm. Stamens 5, 2-3 cm, unequal, pinkish; base cylindrical, hairy and adnate to the base of the corolla lobes; anther lobes 0.3-0.6 cm, whitish purple; pollen grains spherical, spinulose. Gynoecium bicarpellary; ovary superior, bilocular, 2 ovules in each, placentation axile; style filiform, whitish purple, 0.2-0.3 cm; stigma dicapitate, 0.1-0.2 cm, white.

Etymology

Variety name “appendiculata” is a Latin word meaning “appendage” or “addition” referring to wing-like appendages of corolla.

Table 1. Distinguishing features of allied varieties of *I. cairica*

Sl. No.	Taxonomic traits	*I. cairica* var. *cairica*	*I. cairica* var. *semine-glabra*	*I. cairica* var. *appendiculata*
1	**Distribution**	Cosmopolitan in nature	Rajasthan, India	Karnataka, India
2	**Habitat**	Very common on roadsides and in waste lands	Rare along roadsides	Found in moist places along ponds and canals
3	**Corolla**	Petals glabrous	Petals glabrous	Petals having wing-like appendages
4	**Seeds**	Pubescent, margins hairy	Glabrous	Pubescent

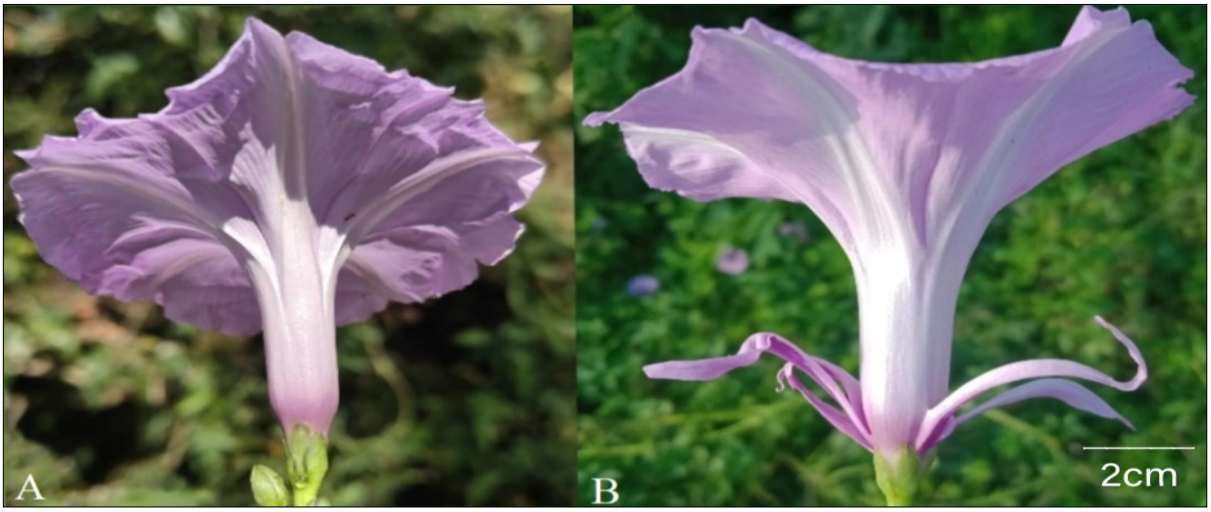

Fig. 1. Flower morphology of *Ipomoea cairica.* (A) glabrous corolla of *I. cairica* var. *cairica,* (B) corolla showing wing like appendages in *Ipomoea cairica* var. *appendiculata*.

Fig. 2. *Ipomoea cairica* (L.) Sweet var. *appendiculata*. (A) habit, (B) single leaf, (C, D) flower - front and side view, (E) flower split open to show androecium, (F) sepals, (G) single stamen and (H) gynoecium.

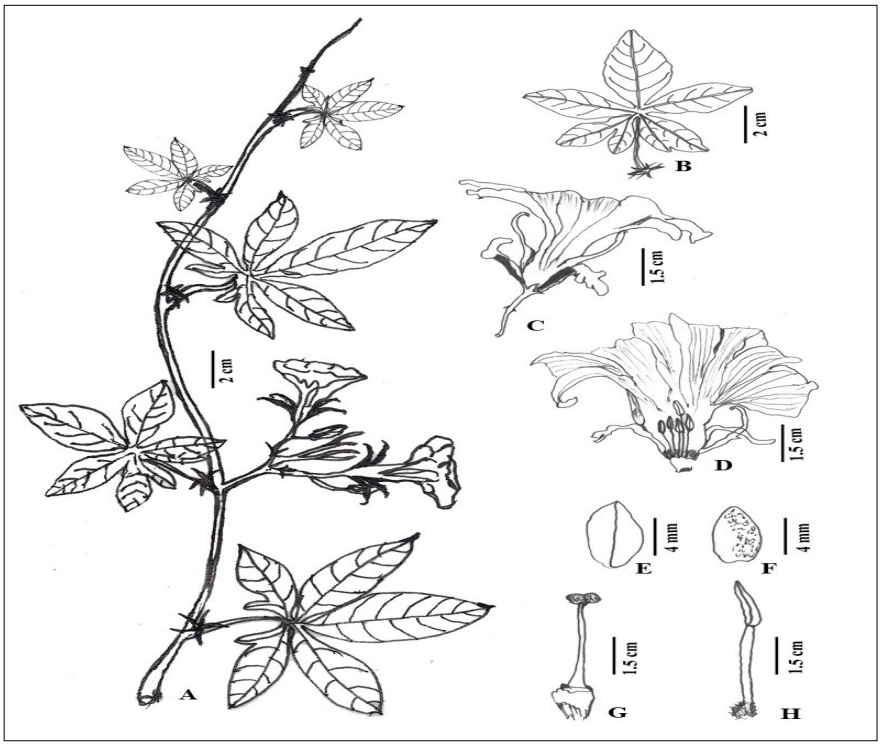

Fig. 3. Line drawings of *Ipomoea cairica* (L.) Sweet var. *appendiculata* (A) habit, (B) single leaf, (C) single flower - side view, (D) flower split open to show androecium, (E, F) sepals, (G) gynoecium and (H) single stamen.

Distribution

I. cairica var. *appendiculata* is currently known to occur along roadside from few locations of Raichur and Bagalkote districts of Karnataka, India and the elevation is 400.83 ± 12 m.

Key to the varieties of *I. cairica*

1. Seeds glabrous…….. *I. cairica* var. *semine-glabra*

-Seeds pubescent; margins hairy.....…….2

2. Corolla without appendages…….. *I. cairica* var. *cairica*

-Corolla with wing-like appendages……..*I. cairica* var. *appendiculata*

Conclusion

It can be concluded that *I. cairica* is a morphologically variable species exhibiting significant infraspecific diversity. The present study reaffirms the presence of a variation at infraspecific level, distinguished primarily by unique floral characteristics, specifically the wing like appendages on the corolla and supported by variations in habitat and seed traits which led to the reporting of a new variety.

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Authors' contributions

All the authors have contributed equally. All authors read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest: Authors do not have any conflict of interests to declare.

Ethical issues: None

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