

REGULAR ARTICLE

Taxonomic studies on genus *Ipomoea* (Convolvulaceae) in the flora of Jammu and Kashmir State

B. L. Bhellum

Department of Botany, Govt. Degree College Kathua 184 101, India

ABSTRACT

The present paper deals with genus *Ipomoea* of family Convolvulaceae of Jammu and Kashmir state. A total of 16 species of the genus have been enumerated from the J & K state based on the collections made between 2002 and 2008 from different parts of the present limits of the state. Line drawings of some selected species are given.

Keywords: Flora, Convolvulaceae, *Ipomoea*, J & K, India

INTRODUCTION

Ipomoea L. comprises of the largest genus in number of species of family Convolvulaceae in number of species. It is distributed all over the world having about 500 species (Mabberley 2008). However, this number of species distributed all over the Several Western and Indian botanists, naturalists, forayed different parts of the state. Notable among them are Royle (1833- 1839), Hooker f. (1872- 1897), Coventry (1923- 1930), Blatter (1927- 1929), Stewart (1972), Sharma and Kachroo (1981) and Bhellum and Magotra (2007). Based on these works, different Floras have been compiled, the number of species *Ipomoea* in the world varies from 600 to 700 species (Austin & Huaman 1996) table 1. Members of Family Convolvulaceae are distributed in tropical, subtropical and temperate regions of the state.

Table 1. Showing total number of species of *Ipomoea* L. in World, India and J & K State

Name of the genus	Number of Species in the world	Number of species in India	Number of species in J & K State
<i>Ipomoea</i> L.	600	60	16

Austin (1986) made the study of *Ipomoea nil* Complex (Convolvulaceae). The genus is almost unrepresented in the alpine zone of Kashmir Himalayas. All species propagate by seeds and some of them multiply vegetative parts. Most of the speices of *Ipomoea* are climbers and trailers. The present paper highlights the taxonomic status of genus *Ipomoea* in the flora of Jammu and Kashmir State.

MATERIAL AND METHODS

Plant explorations were carried out in different seasons of the year at some selected sites in Jammu and Kashmir. This paper is based on the collection of angiosperm flora in general and family Convolvulaceae in particular between 2002 and 2008. The forays of two different types were undertaken round the year, the collection trips to distant places were of the duration of 3- 7 days. In between, brief trips of 1- 2 days durations were executed along or in the company of one or more helpers. In this way, it was possible to raise the collections from the different parts of the state. In the first year the collections were massive and in the subsequent years they reduced to solitary specimen. While collecting the plant specimens field numbers

were allotted and relevant data about the plant was recorded in the field book. The specimens were carried to the Laboratory in the polythene bags, ruck-sacks or in plant press depending upon the length of trip and distance of the place of collection. The plants collected were pressed in the in wooden press wrapped in blotters. These specimens are changed frequently to reduce the discoloration of foliage and flowers and to avoid rotting. The dried specimens were mounted on the Herbarium sheets. Printed labels were pasted and relevant data was entered. These specimens were identified with the help of taxonomic literature of family Convolvulaceae.

KEY TO GENUS IPOMOEA L.

- 1.+ Leaves stipulate; pseudostipulate foliaceous ----- 2
- 1. – Leaves exstipulate ----- 4
- 2. + Corolla salverform; stamens and style exserted ----- 3
- 2. – Corolla infundibuliform; stamens and style inserted ----- 3. *I. cairica*
- 3. + Leaves pinnately divided; segments filiform; seeds glabrous -----13. *I. quamoclit*
- 3. – Leaves simple, entire or lobed; seeds densely furred ----- 5. *I. coccinea*
- 4. + Flowers in cymes, sessile or peduncled ----- 5
- 4. – Flowers cymes ----- 6
- 5. + Heads sessile; bracts less than 6; corolla upto 1.5 cm long; capsule patently hairy ----- 8. *I. iriocarpa*
- 5. –Heads peduncled; bracts 6- 8 (- 12); corolla more than 2.5 cm long; capsule glabrous12. -----I. *pes-tigridis*
- 6. + Inflorescence in umbellate or corymbose cymes ----- 7
- 6. – Inflorescence in 1 or a few flowered cymes ----- 9
- 7. + Corolla upto 1.8 cm long ----- 14. *I. triloba*
- 7. – Corolla more than 2.5 cm long ----- 8
- 8. + Leaves entire; sepals 1- 1.2 cm long, patently hairy at base, apex acute ----- 13. *I. purpurea*
- 8. – Leaves palmately 3-lobed; sepals 2- 3 cm long, densely hirsute at base, apex acuminate ----- 10
- 9. + Sepals gradually narrowed long acute or subacute straight slightly spreading -----11. *I. nil*
- 9. – Sepals abruptly narrowed subacute tip strongly spreading or curved ----- 9. *I. hederacea*
- 10. + Sepals cuspidate or mucronate ----- 11
- 10. – Sepals neither cuspidate nor mucronate ----- 13

11. + Pedicel thickened upwards ----- 12
 11. – Pedicel uniform throughout ----- 10. *I. hederifolia*
 12. + Stem mucronate; corolla purple or purplish pink; filaments hairy at base ----- 15. *I. turbinata*
 12. – Stem not mucronate; corolla white; filaments glabrous throughout ----- 1. *I. alba*
 13. + Leaves wooly underneath ----- 7. *I. dichroa*
 13. + Leaves glabrous or pubescent underneath ----- 14
 14. + Erect suffruticose shrubs; corolla puberulous at base ----- 4. *I. carnea* ssp. *fistulosa*
 14. – Creeping or twining herbs; corolla and capsule glabrous ----- 15
 15. + Aquatic herbs; stem rooting; seeds nearly glabrous or minutely hairy ----- 2. *I. aquatica*
 15. – Terrestrial herbs; stem not rooting; seeds patently hairy ----- 6. *I. cymosa*

A total of 16 species have been reported so far from the state of Jammu and Kashmir. These species are given below with a brief description.

A BRIEF TAXONOMIC DESCRIPTION

1. *Ipomoea alba* L., Sp. Pl. 161. 1753; Ooststr. in Steenis, Fl. Malesina ser. 1, 4: 480. 1953; Schet in Smithonian Contrib. Bot. 23: 27. 1975; *I. bona-nox* L. Sp. Pl. ed. 2, 228. 1762, nom illeg. ; Clarke in Hooker f., FBI. 4: 197. 1883; *Colonyction aculeatum* (L.) House in Bull. Torrey Bot. Club. 31: 590. 1904.

Glabrescent stout twiner; flowers white; capsules ovoid-globose.

Occurrence: Srinagar, Kashmir

Distribution: Native of Tropical America

2. *I. aquatica* Forst. Fl. Aegypt.-Arab. 44. 1775; Ooststr. in Steenis, Fl. Malesina ser. 1, 4: 473. 1953; Sharma & Kachroo, Fl. Jammu 1: 225. 1981.

Marshy or aquatic herbs; stem rooting hollow, spongy; flowers purplish-pink; capsule globose.

Occurrence: Abundant on marshy situations at Chakrohi, R. S. Pura.

Distribution: Throughout India, Pakistan, Ceylon, China, Malaya, Tropical Africa and Australia

3. *I. cairica* (L.) Sweet, Hort. Brit. 287. 1827; Gamble, Fl. Madras 918 (645). 1921.

Perennial glabrous twiner; stem much branched; flowers purple; capsule ovoid.

Occurrence: Cultivated in Gardens; sometimes found as an escape.

Distribution: Decan peninsula with Ceylon, Malaca, Tropical Asia, Africa, Australia and America.

4. *I. carnea* ssp. *fistulosa* (Mart. ex Choisy) Austin, Taxon 26: 237. 1977; *I. fistulosum* Mart. ex Choisy in DC. Prodr. 9: 349. 1845.

Erect or ascending suffruticose shrubs; flowers purplish-pink; capsule globose.

Occurrence: Common in Jammu and rare in the hilly areas.

Distribution: Native of America and introduced in Asia and other continents.

5. *I. coccinea* L. Sp. Pl. 160. 1753; Clarke in Hooker f., Fl. Brit. Ind. 4:199.1883; Stewart, Ann. Cata. Vasc. Pl. W. Pak. & Kashm. 575. 1972.

Scandant herbs; stem weak; flowers crimson or orange yellow; capsule ovoid.

Occurrence: Cultivated and quasiwild throughout India

Distribution: Introduced from America, throughout India.

6. *I. cymosa* Roem. et Schult. Syst. Veg. 4: 241.; Clarke in Hook. f., Fl. Brit. Ind. 4:211.1883.

Scandant, glabrous, twiner; flowers white or white tinged with yellow; capsule ovoid.

Occurrence: Reported from Kashmir.

Distribution: India, Ceylon, Malaya, Australia, Tropical Africa.

7. *I. dichroa* Choisy in DC. Prodr. 9: 364. 1845; Verdcourt in Kew Bull. 33: 165. 1978. (Fig. 1).

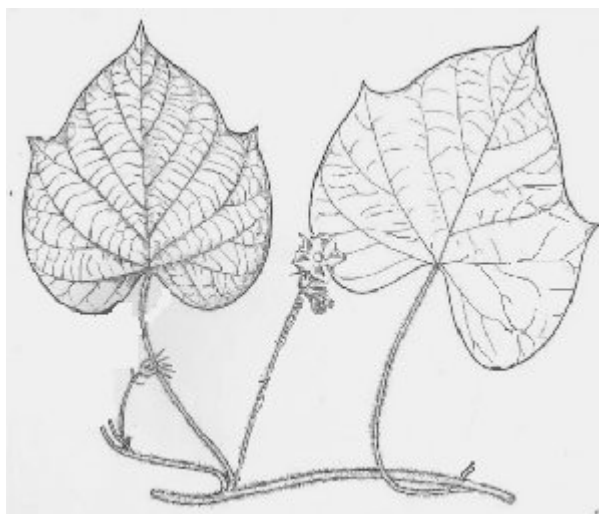


Fig. 1. *Ipomoea dichroa* L.

Twining, patently hirsute herbs; flowers pinkish-purple; capsule ovoid-globose.

Occurrence: Common at Vijaypur, Tarore, Sarore and Ramgarh.

Distribution: Native of Tropical America, introduced and run wild.

8. *I. hederacea* Jacq.

Twining herbs; flowers bluish-purple; capsule ovoid.

Occurrence: Common at Jammu

Distribution: India,

9. *I. hederifolia* L. Syst. Nat. ed. 10, 925. 1779; Vickery in Enum. Fl. Nep. 3: 106. 1982; *I. coccinea* auct. non L. ; Clarke in Hooker f., FBI. 4: 199. 1883. (Fig. 2).

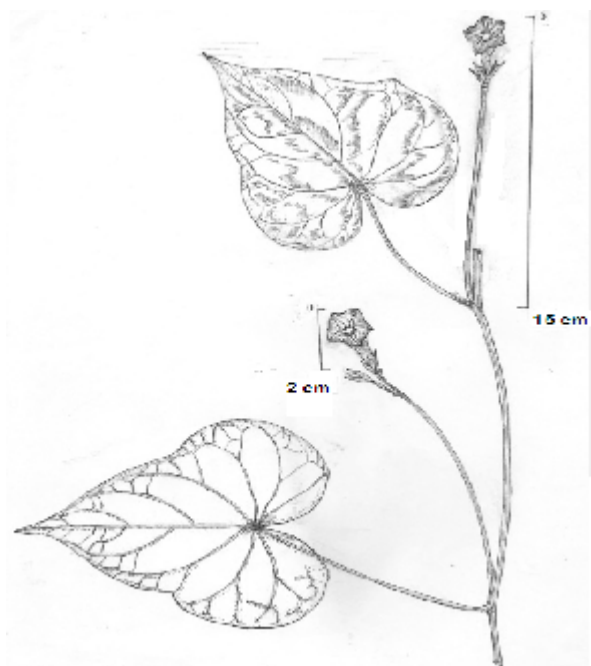


Fig. 2. *Ipomoea hederifolia* L.

10. *I. iriocarpa* R. Br., Prodr. 484. 1810; Ooststr. in Steenis, Fl. Malesina ser. 1, 4: 462. 1953; *Convolvulus hispidus* Vahl. Symb. Bot. 3: 29. 1774; *I. hispidus* (Vahl.) Roemer & Schultes, Syst. 4: 238. 1819; (non Zuccagani in Roem. 1809). Sharma and Kachroo, Fl. Jammu 1: 226. 1981; *I. sessiliflora* Roth, Nov. Pl. 116. 1821; Whight, Ic. t. 169. 1839.

Annual, slender, hispid herbs; flowers pink; capsule globose or ovoid.

Occurrence: Commonly grows as weed in maize at Batote, Bhaderwah and Chanderkote.

Distribution: India, Ceylon, Afghanistan, and Tropics of old world.

11. *Ipomoea nil* (Linn.) Roth, Catalogue Bot. 1:36. 1797. van Ooststroom in van Steenis, Fl. Males., ser. 1, 4:465.1953, Austin, l.c. 193.; Sinners, Taxon 14: 231. 1965; Sharma & Kachroo, Fl. Jammu 1: 226. 1981; *I. hederacea* auct. (non L.) Jacquin 1768.

Annual, hairy twinner; stem slender, villous; flowers sky-blue; capsule sunglobse.

Occurrence: Common at Dalwas in district Ramban and Ramnagar of district Udhampur.

Distribution: All tropical and subtropical regions. Common throughout India.

12. *I. pes-tigridis* L., Clarke in Hook. f., l.c. 204. 1883. (Fig 3).

Twinning patently hirsute herbs; flowers pink; capsule ovoid.

Occurrence: Common at Ramnagar, Jammu, Kathua, Samba and Udhampur

Distribution: Throughout India, Pakistan, Ceylon, Burma, Malaya, China, Polynesia, and Tropical Africa.



Fig. 3. *Ipomoea pes-tigridis* L.

13. *I. purpurea* (L.) Roth, Bot. Abh. 27. 1787; Austin, Taxon 35(2):357. 1986; *Convolvulus purpureus* L., Sp. Pl. ed. 2, 1: 219. 1762.

Annual twining herbs; stem slender; flowers rosy-pink; capsules ovoid.

Occurrence: Common weed in maize fields at Batote, Udhampur, and Reasi.

Distribution: India, Tropical America, and warm countries.



Fig. 4. *Ipomoea quamoclit* L.

14. *Ipomoea quamoclit* L., Sp. Pl. 159. 1753. Roxb., Fl. Ind. ed Carey & Wall. 1:503.1832, Clarke in Hook. f., l.c. 199, Trimen, l.c. 215, Bamber, l.c. 621, van Oostroom, l.c. 482, R.R. Stewart, l.c. 576; *Quamoclit vulgaris* Choisy in Mem. Soc. Phys. Geneve 6: 434. 1834; *Q. pinnata* Bozer. Hort. Manrit. 1837. (Fig 4).

Twining glabrous herbs; flowers deep-red; capsule ovoid.

Occurrence: Common on open situations at Naseem Bagh in Srinagar and in surroundings of Jammu.

Distribution: Native of Tropical America, Usually cultivated in India rarely found as escape.

15. **I. triloba* L. Sp. Pl. 161. 1753; Shah, Fl. Gujrat 1: 475. 1978; Singh & Pandey in Bull. Bot. Surv. Ind. 21: 92. 1979; Bhellum & Magotra in J. Phytol. Res. 20(2): 243- 245. 2007.

Slender Twiner; flowers purple; capsule globose.

Occurrence: Grows along the margins of canals at Jammu.

Distribution: Native of America India, Pantropical.

Note: The species marked with asterisk (*) represents new record for the flora of Jammu and Kashmir State reported by Bhellum and Magotra in 2007.

16. *Ipomoea turbinata* Lag., Gen. Sp. Pl. 10. 1816. Gunn, Brittonia 24: 163. 1972; Swami & Gupta, Fl. Udhampur 252. 1998; *Convolvulus muricata* (L.) Jacq. Hort. Schoeb. 3(2): 40. t. 323. (non cav.) sensu Clarke in Hooker, f., FBI. 4: 197. 1883.

Twiner weak, glabrous herbs; flowers pale-purple.

Occurrence: Common at Ramnagar.

Distribution: India, Pakistan, Ceylon, Burma and Japan

RESULTS

The state of Jammu and Kashmir has quite rich vegetation and distribution of *Ipomoea* in the state is quite diverse because of its varied climate and elevation. Some district floras have been compiled from this region which include species growing in this region. Members of this genus are dominant in the plains and a few species are found in the Kashmir Himalayan region of the state. In past, the some pockets of the state remained untouched. In view of the fragmentary accounts genus *Ipomoea* has been compiled. In the process *Ipomoea triloba* was recorded new to the state by Bhellum and Magotra (2007). A total of 16 species of *Ipomoea* has been collected from the Jammu and Kashmir state which is 3% of the world reported species. In India the 60 species reported account for 10 % of the world *Ipomoea*.

DISCUSSION

The present study was conducted on the genus *Ipomoea*, comprising of 16 species (Fig. 5). Most of the species are climbers except a few suffruticose shrubs. All these species have been distinguished on the basis of habit, habitat, morphology of stems, leaves, inflorescence, pedicel, corolla, capsule and seeds. Singh and Kachroo (1976) have reported *Ipomoea iriocarpa* from Srinagar. Sharma and Kachroo (1981) reported six

species and a subspecies of *Ipomoea* from district Jammu of this state

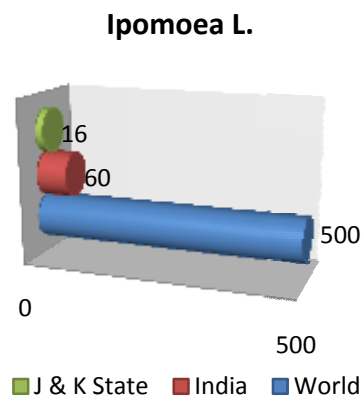


Fig. 5. Bar graph showing number of species of *Ipomoea* in the world, India and J & K State

namely *Ipomoea alba*, *I. carnea* ssp. *fistulosa*, *I. iriocarpa* (*I. hispidus*), *I. turbinata* (*I. muricata*), *I. nil* and *I. pestigridis*. Swami and Gupta (1998) have reported five species and a subspecies of *Ipomoea* viz. *Ipomoea cairica*, *I. carnea* ssp. *I. fistulosa*, *I. iriocarpa*, *I. purpurea*, *I. nil* and *I. turbinata*. A new record for the flora of Jammu and Kashmir of *Ipomoea triloba* from Jammu has been reported by Bhellum and Magotra (2007). *Ipomoea quamoclit* normally reported from all the tropical areas but it has hitherto been reported from temperate region of Kashmir Himalayas which can easily be recognised by its finely dissected leaves. Therefore, Jammu and Kashmir experiences salubrious climate and well adapted abundant of natural vegetation of *Ipomoea*. A bracted key is provided for identification of each species. Some selected illustrations of line drawing are given to facilitate these species in the field.

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REFERENCES

- [1] Austin, D. F. 1986. Nomenclature of *Ipomoea nil* complex (Convolvulaceae) *Taxon* **35**: 355- 358.
- [2] Austin, D. F. & Huaman, Z. 1996. A synopsis of *Ipomoea* (Convolvulaceae) in the Americas *Taxon* **45**: 3-38.
- [3] Bhellum, B. L. & Rani Magotra 2007. Additions to the flora of Jammu and Kashmir State- New Reports. *J. Phytol. Res.* **15** (2): 229- 231.
- [4] Blatter, E. 1927- 1929. *Beautiful flowers of Kashmir*. Series I- III. London
- [5] Coventry, B. O. 1923- 1930. *Wild flowers of Kashmir*. Series I- III. London
- [6] Hooker, J. D. 1872- 1897. *The flora of British India*. Reeve & Co. Ltd. London.
- [7] Mabberley, D. J. 2008. *Mabberley's Plant book, A portable dictionary of Plants, their classification and uses*. Third Edition. Cambridge University Press, Cambridge.
- [8] Royal, J. F. 1833- 1839. *Illustrations of the Botany and other branches of the natural history of the Himalayan Mountains and of the flora of cashmere*. Vol. I. & II London.
- [9] Sharma B. M. & P. Kachroo 1981. *Flora of Jammu and plants of neighborhood*. Bishen singh and Mahendra Pal Singh, Dehra Dun.
- [10] Stewart, R. R. 1972. *Annotated catalogue of Vascular plants of West Pakistan and Kashmir*. Fakhri Printing press, Karachi.