Original Research Article

Leaf Morphometric Studies in some *Ipomoea*species of Convolvulaceae family

ABSTRACT

Eight species of *Ipomoea* (Convolvulaceae) were morphometrically studied upon their leaf characters, with the help of taxonomical analysis to solve the relationship between these species. On the basis of taxonomical component analysis, among the studied species, it has been disclosed that the numerical characters such as leaf length, petiole length, leaf breadth and lamina length are positively correlated to resolved taxonomical relation of different species of the same genus. Contribute important role in bringing together the species within a genus while the ratio of leaf length to leaf breadth, leaf base nerve number, and the ratio of leaf lamina length to petiole length significantly separates the species from each other.**(not clear)** Morphometric characters provided justification for the existing classification of the *Ipomoea* genus. It also indicates the component matrix after extraction of the characters that contributed strongly in similarity between the selected *Ipomoea* species. Three characters which include Leaf length, leaf breadth, and the ratio of leaf length to leaf breadth contributed significantly to the delimitation of the species of *Ipomoea* studied. Leaf morphometrically study analyzed some *Ipomoea* species of the Convolvulaceae family there are Ipomoea *quamoclit* L.; *Ipomoea batatas* (L.) Lam.; *Ipomoea cairica* (L.) Sweet; *Ipomoea hederacea* Jacq.; *Ipomoea obscura* (L.) Ker Gawl.; *Ipomoea cordatotriloba* Dennst.; *Ipomoea lacunosa* L. and *Ipomoea hederifolia* L. **(abstract summary is not clear)**.

Keywords: *Ipomoea, taxonomy, leaf, morphometric studies*

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INTRODUCTION:

The convolvulaceae is one of the major family of flowering plants known as morning glory family with approximately 3,625 species and of 57 genera from all over the world(The Plant List, 2010). Major numbers ofspecies areincorporated in the genera Ipomoea (Cronquist, 1988). Approximately 600-700 species of *Ipomoea* have been mentioned from the entire world (Meira et al., 2012). India is representedby the reportedly59 species of*Ipomoea*from the entire country.(Shimpale & Amrapali, 2019).

In Ayurveda total thirteen Ayurvedic preparations**(this line is not clear)** used for various diseases and abnormalitiesand treatments such as hypertension, kidney ailments, diabetes, dysentery, constipation, fatigue, arthritis, rheumatism, hydrocephaly**(should write "hydrocephalus")**, meningitis, and inflammations.*Ipomoea* species exhibit great medicinal importance used as ornamental plants, food, medicines and have religious faith in different religions(Khare, 2007; Meira et al., 2012).Pharmaceutical properties have some *Ipomoea* species. Ethno-medicinal uses of some *Ipomoea* species parts such as leaves, root, bark, seed and some time whole plant(Londhe et al., 2017).**(Make the sentence clear, and advised to revise the literature).**

As being the Ethno-medicinal important plants, proper identification, nomenclature and identification of *Ipomoea* is essential. Morphometric studies reveal the numerical analysis and comparison between closely related taxa. Distinct separation and grouping of the closely related plant species can be executed with the help of morphometric analysis and principal component analysis in studied *Ipomoea* species with similarity matrix. Such type of studies has been performed in *Terminalia*, *Cassia*, *Clerodendrum* and*Caesalpinia*(Soladoye et al., 2010; Deshmukh et al., 2012; Deshmukh, Labhane, et al., 2013;Deshmukh, Waghmare, et al., 2013).

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MATERIALS AND METHODS:

Study area

Some selected regions of Nashik district such as Nashik and Dindori taluka (Table no. 1). Eight*Ipomoea* species (Convolvulaceae) where collected from the Nashik district during the year 2021 to 2022. The collected species where identified as per different Floras(Lakshminarasimhan, 1986;Singhet al., 2001).

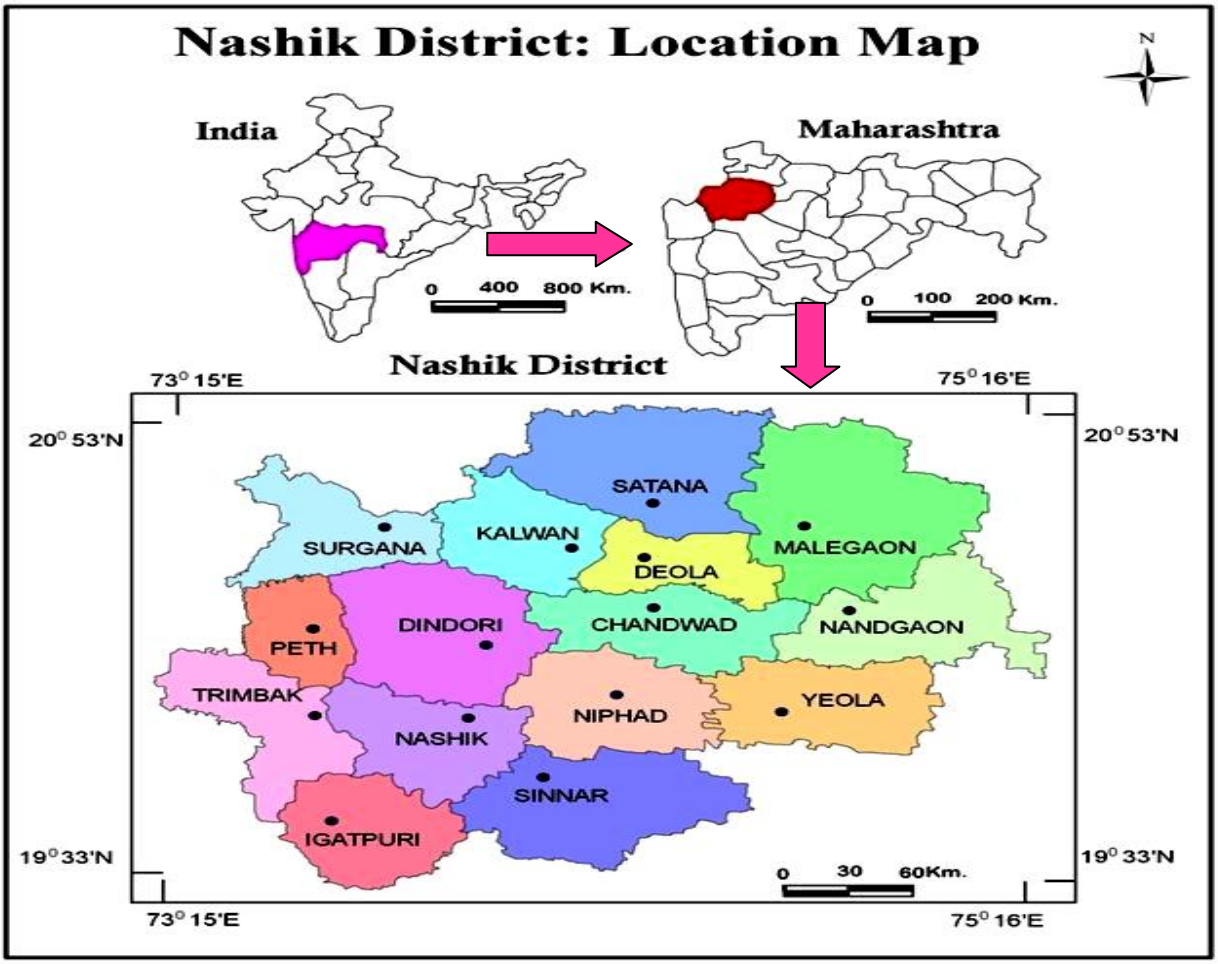

Fig.- 1 Study area

Quantitative characters of Leaf viz. leaf length, leaf breadth, leaf base nerve number, petiole length, leaf lamina length was measure with the help of line ruler. The twenty sample from each sample where proceed with the use of measures of central tendency and values of median.

Table 1:*Ipomoea* Species studied from Nashik, Maharashtra

Sr. No.	Species Name	Location	Geographic coordinates
1.	*Ipomoea quamoclit* L.	Chandshi, Nashik, Maharashtra	20°01'54.4"N 73°45'38.3"E
2.	*Ipomoea batatas* (L.) Lam	Chandshi, Nashik, Maharashtra	20°01'51.6"N 73°45'37.1"E
3.	*Ipomoea cairica* (L.) Sweet	Nanashi , Maharashtra	20°20'34.9"N 73°37'23.9"E
4.	*Ipomoea hederacea* Jacq.	Makhmalabad, Nashik, Maharashtra	20°03'16.4"N 73°46'13.3"E
5.	*Ipomoea obscura* (L.) Ker Gawl.	Jambutke, Maharashtra	20°18'36.4"N 74°00'39.2"E
6.	*Ipomoea cordatotriloba* Dennst.	Makhmalabad, Nashik, Maharashtra	20°03'42.0"N 73°46'44.9"E
7.	*Ipomoea lacunosa* L.	Jambutke, Maharashtra	20°18'46.4"N 74°00'49.4"E
8.	*Ipomoea hederifolia* L.	Jambutke, Maharashtra	20°18'42.1"N 74°00'49.5"E

RESULTS AND DISCUSSION:

Current study related with Eight species of *Ipomoea* (Convolvulaceae)and five leaf quantitative characters (Table no. 2) based on PCA. The PCA studiesrevealed significant correlation between leaflength, petiole length, leaf breadth, laminalength while the leaf base nerve number servefor distinct segregation of the species withinthe same genus. It has also been analyzed that,the ratios of leaf length to leaf breadth and leaflamina length to petiole length also segregatesthe taxa within a genus (Tables no. 3).*Ipomoea* species showed five distinct Leaf Morphometric characters as *Ipomoea quamoclit* L.; *Ipomoea batatas* (L.) Lam.; *Ipomoea cairica* (L.) Sweet; *Ipomoea hederacea* Jacq.; *Ipomoea obscura* (L.) Ker Gawl.; *Ipomoea cordatotriloba* Dennst.; *Ipomoea lacunosa* L. and

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Ipomoea hederifolia L.**(results statement is not appropriate and discussion part is not properly addressed)**.

CONCLUSION:

Leaf morphometric analysis of eight species of *Ipomoea quamoclit* L.; *Ipomoea batatas* (L.) Lam.; *Ipomoea cairica* (L.) Sweet; *Ipomoea hederacea* Jacq.; *Ipomoea obscura* (L.) Ker Gawl.; *Ipomoeacordatotriloba* Dennst.; *Ipomoea lacunosa* L. and *Ipomoea hederifolia* L. Five distinct Leaf Morphometric characters provided justification for the existing classification of the *Ipomoea*genus. In Table 3 also indicates the component matrix after extraction of the characters that contributed strongly in similarity between the selected *Ipomoea* species.

Three characterswhich include Leaf length, Leafbreadth and ratio of leaf length to leaf breadth contributed significantly to the delimitationof the species of *Ipomoea*studied. We recommend anapplicationof this method in an elaborate taxonomic review ofthe genus *Ipomoea* in the future.

Table 2: Leaf Qualitative Characters of *Ipomoea* Species (Median values in cm).

	I1	**I2**	**I3**	**I4**	**I5**	**I6**	**I7**	**I8**
LL	2.8	4.2	4.1	12	4.7	6.2	3.2	6.2
LB	1.6	4.9	4.5	10.6	5.8	6.5	1.7	6.4
LL/LB	1.75	0.85	9.11	1.13	0.81	0.95	1.88	0.96
LBNN	1	8	5	5	8	7	5	6
LLL	0.4	0.7	1.4	1.7	1.2	1	0.5	1
PL	1.2	2.5	4.7	12.3	3.3	5	1.8	2.8
LLL/PL	0.33	0.28	0.29	0.13	0.36	0.2	0.27	0.35

LL: Leaf length; LB: leaf breadth; LL/LB: ratio of leaf length to leaf breadth; LBNN: leaf base nerve number; PL: petiole length; LLL: leaf lamina length; LLL/PL: ratio of leaf lamina length to petiole length.

I1: I. quamoclit; I2: I. batatas; I3: I. cairica; I4: I. hederacea; I5: I. obscura; I6: I. cordatotriloba; I7: I. lacunosa and I8: I. hederifolia

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Table 3: Principal Component Analysis in studied *Ipomoea*Species with Similarity Matrix.

	LL	**LB**	**LL/LB**	**LBNN**	**LLL**	**PL**	**LLL/PL**
LL	1						
LB	0.322444	1					
LL/LB	0.561452	0.224167	1				
LBNN	0.629489	0.483692	0.155365	1			
LLL	0.343801	0.991041	0.196019	0.576248	1		
PL	0.525037	0.905605	0.229338	0.808479	0.94559	1	
LLL/PL	0.456568	0.888217	0.452034	0.356243	0.841389	0.76188	1

LL: Leaf length; LB: leaf breadth; LL/LB: ratio of leaf length to leaf breadth; LBNN: leaf base nerve number; LLL: leaf lamina length; PL: petiole length; LLL/PL: ratio of leaf lamina length to petiole length.

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