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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/19185
DOI URL: http://dx.doi.org/10.21474/IJAR01/19185

RESEARCH ARTICLE

MEDICINAL PLANTS EXHIBIT VARIATION IN LEAF MORPHOLOGY FROM FLORA OF TELANGANA, INDIA

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Manuscript Info

Manuscript History
Received: 31 May 2024
Final Accepted: 30 June 2024
Published: July 2024

Abstract

Intraspecific variation in medicinal plants known from since ancient times from India region. Many of the medicinal plants belong to flowering plants expressing the variations at different levels in a isolated populations or in a single individual. Particularly the medicinal plants exhibit variation is leads to the much confusion in the local and indigenous systems of medicines. Investigation and identification of intraspecific medicinal plants from flora of Telangana region and its causes and consequences in the local and traditional medicines are discussed in detail in the present paper.

Introduction:-

Intraspecific diversity/variation is one of the main sources of information for recognizing evolutionary patterns among the flowering plants. To identifying the cause of intraspecific variation in wild populations is essential to understanding the evolutionary process that maintains diversity and promote speciation (Futuyma, 1998). The plant populations of the single/same species growing under various environmental and geographic conditions respond to different selection pressures, expressing varations mat morphological and genetical leveler among populations (Ramsey, Cairns and Vaughton, 1994; Fenster and Stenoien, 2001; Albarran-Lara et al., 2019). The variation in leaf morphology is correlated with environmental variable. Several environmental factors have been shown to play key roles in the evolution of plant species by selecting for phenotypic variation (Pfennig et al., 2010), especially variation related to leaf traits. Thus, the study of leaf morphology in plant populations can help us to identify the environmental factors that have potentially influenced the process of species diversification and phenotypic variability (Aschcroft, French & Chisholm, 2011). The relationships of leaf variation with environmental variables have been focused on the global scales (Ordoñez et al., 2009; Yang et al., 2015; Wright et al., 2017), regional (e.g., North America) (Royer et al., 2008) and local (e.g., South Australia, Amazonia and Bolivia) (Sokal, Crovello&Unnasch, 1986; Gregory-Wodzicki, 2000; Malhado et al., 2009a; Malhado et al., 2009b; Guerin, Wen & Lowe, 2012). To identify the intraspecific taxa from the flora of Telangana region the study has taken up as a part of doctoral degree.

Flowering plants are the main source for traditional medicines across the globe. Many of the medicinal plants belongs to flowering plants expressing the intraspecific variations at different levels in leaf structure, leaf size, leaf shape, flower color, in number of floral parts and seed color etc. In medicinal plants intraspecific variations and their significance mentioned traditional systems of medicine Ayurveda and Siddha systems. Six variants of “Gurivinda or Guriginja” “Abrusprecatorius” (Leguminosae) report in the sidda system of medicine (Balachandran 2015). The use of intraspecific medicinal plants given priority over the common one. The traditional healers have a strong belief

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they work effectively rather than common one. The recent studies comparative phytochemical studies on some of the Intraspecific taxa (Sandhya et al. 2024) also supporting for the same. In the present paper the medicinal plants exhibit morphological variations discussed in detail.

Out of them the taxa exhibit morphological variation in leaf traits ca. 10 presented in the paper. To avoid taxonomic confusion among the populations or individuals of the same species providing the live images (plate 1, 2) for all the intraspecific taxa reported in the paper. in the table with their scientific names, family, local name and with morphological trait varation given in detail in

Results and Discussions:-

The studies on the identification of intraspecific diversity taxa from the flora of Telangana region has resulted around 50 flowering plant taxa. Out of them 9 taxa exhibit variations in leaf morphology focussed in this paper. In the table 1 the scientific name of the species, its family and the morphological leaf variations in their typical form and variant given in detail.

Table 1:- Medicinal plants exhibits leaf morphological variations from the flora of Telangana region.

S.No.	Scientific name	Family	Morphological variations
1.	**Aegle marmelos**(L.) Correa	Rutaceae	**Typical form:** Foliage typically trifoliate (3- distinct leaflets). **Variant:** Simple, margins partially to deeply 3-lobed.
2.	**Andrographisbeddomei**C.B. Clarke	Acanthaceae	**Typical form:** Foliage ovate, spathulate, light green, glabrous. **Variant:** Ovate, ovate to oblong, oblong, dark green, hairy.
3.	**Ceropegiabulbosa**Roxb.	Apocynaceae	**Typical form:** Foliage broadly ovate, rounded, pointed at apex. **Variant:**Linear lanceolate, much narrowed at apex.
4.	**Cissusquadrangularis**L.	Vitaceae	**Typical form:** Stems and branches distinctly four angled foliage with partially to deeply lobed margins. **Variant:** Stems and branches two angled, leaf margins not lobed.
5.	**Cocculushirsutus**(L.) W. Theob.	Menispermaceae	**Typical form:** Foliage ovate to broadly ovate, margins not lobed. **Variant:**Foliage with lobed margins from apex base.
6.	**Euphorbia fusiformis** Buch.-Ham. ex D.Don	Euphorbiaceae	**Typical form:** Foliage broadly oblong, lamina and margins without coloration. **Variant:** broadly oblong to spathulate with coloration on the lamina and margins. **Variant:**
7.	**Ecliptaprostrata**(L.) L.	Asteraceae	**Typical form: Foliage** oblong lanceolate, apex much narrowed.

			Variant: Linear lanceolate, apex pointed.
8.	**Hemidesmus indicus** (L.) R.Br.	Apocynaceae	**Typical form:** Foliage oblong to linear lanceolate with white variegations on mid and lateral veins. **Variant:** Ovate, broadly ovate, orbicular with or without variegations.
9.	**Vitex negundo**L.	Lamiaceae	**Typical form:**Foliage with 3-5 leaflets without purple colour. **Variant:** Foliage with 3-5 leaflets with deeply purple colour.

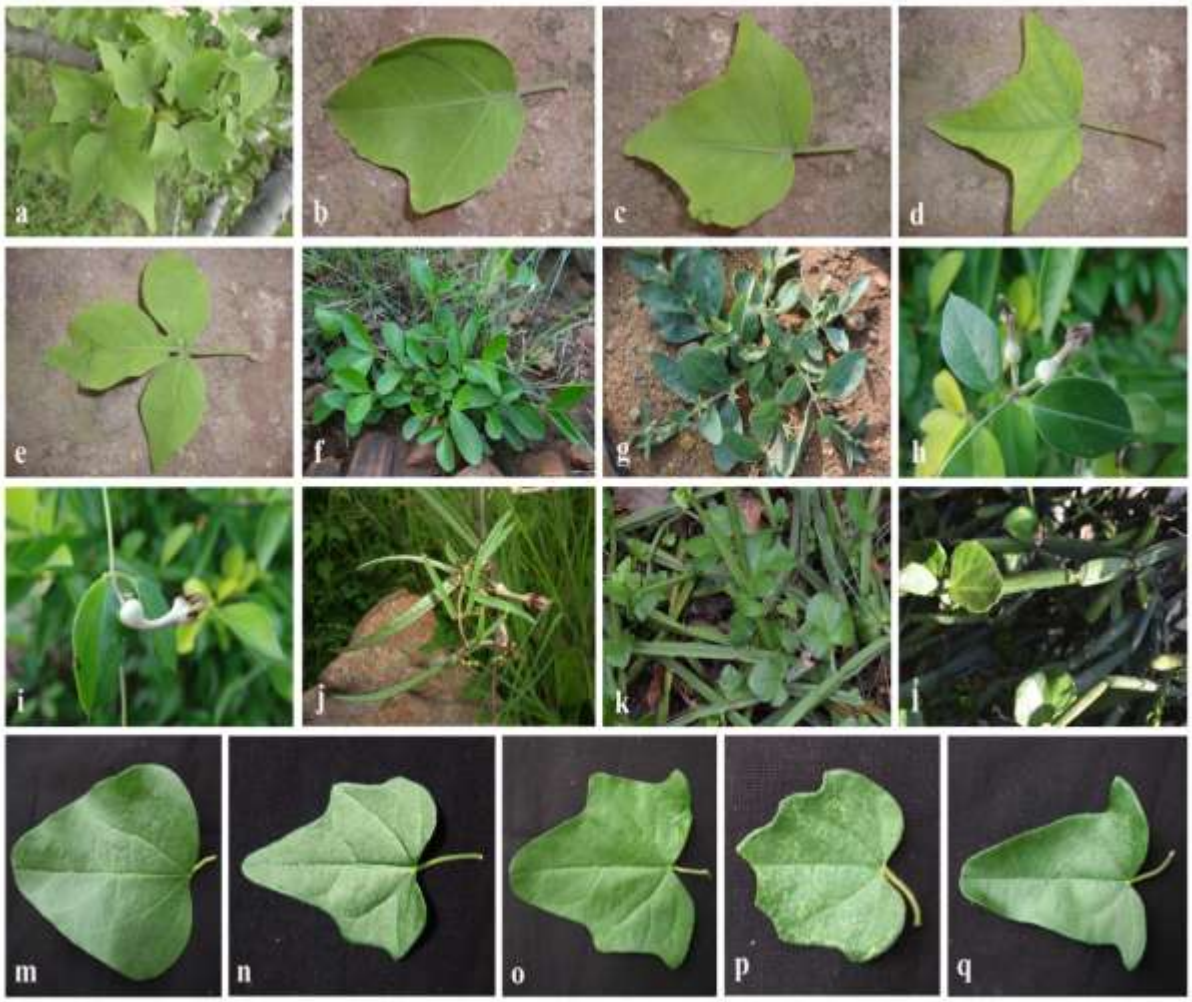

Plate 1:-a – e. **Aegle marmelos**(L.) Correa; f, g. **Andrographisbeddomei**C.B. Clarke; h – j.**Ceropegiabulbosa**Roxb.; k, l.**Cissusquadrangularis**L.; m – q. **Cocculushirsutus**(L.) W. Theob.

Plate 2:-a, b.**Ecliptaprostrata**(L.) L.; c – g. **Euphorbia fusiformis** Buch.-Ham. ex D.Don; h – k. **Hemidesmus indicus** (L.) R.Br.; l – n. **Vitex negundo**L.

Conclusions:-

Intraspecific diversity or variation among medicinal plants leads to the many confusions. Mainly for local and traditional healers confused in the identity and usage of intraspecipic variants and its typical species in traditional medicines. The other confusion with intraspecific variants taxonomic confusions. Many of the intraspecific variants are described as novel species and synonymised under typical form also a major confusion for the common man. To avoid all this, to understand the species complexity there is a urgent need of intensive explorations of the intraspecific taxa at regional and global level particularly in medicinal plants. Further to know the potential of intraspecific variant medicinal plants in traditional medicines comparative phytochemical studies are needed for typical form and its intraspecific variants.

Acknowledgement:-

The authors are thankful to the Principal, University College of Science, Saifabad, Osmania University, Hyderabad for the facilities and support.

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