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ANATOMICAL AND PHYTOCHEMICAL STUDIES IN SOME MEMBERS OF FAMILY MALVACEAE: A REVIEW

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Abstract

Malvaceae family is one of the largest families consisting of more than 245 genera and 4225 species. Anatomy of the family will provide detail account on internal organization like vascular bundle, xylem, phloem, sclerenchyma and parenchyma cells. Analysis of different phytochemical will provide its therapeutic uses.

Keywords: Malvaceae, Anatomy, Phytochemical analysis.

Introduction:-

The family Malvaceae is well known as Mallow family. Distributed worldwide as herb, shrub and trees having over 243 genera and 4225 species mostly distributed in tropical and temperate climates.

The members of the family are herbs,shrubs and trees with stellate pubescence often mucilaginous leaves palmately veined, stipules prominent, flowers usually with epicalyx, anthers monothecous, carpel five or more, ovary superior, axile placentation.

Plant anatomy is the study of internal structure of plants. It is one of the fundamental disciplines of botany.

Anatomical study of plants will help to understand the functional relationship of plant, growth pattern, evoloution,ecology and systematic position of that taxa.

Plant anatomy also interacts with other fields like phisiology, ecology, evolution, pharmacology etc.At cellular level plant are composed of variety of specialized cells which are responsible for various function such as photosynthesis,food storage ,nutrient uptake,water transport etc.These cells are organised into tisssues such as epidermis,cortex,vascular tissue.Understanding the structure of epidermal layer,cortex,vascular bundle,xylem and phloem cells,parenchyma cells becomes crucial in understanding plant anatomy. It will also focus on foliar epidermal structures like trichomes, stomata etc.

The largest or most important genera in the family include *Hibiscus* (550 species), *Dombeya* (225 species), *Sida* (200 species), *Pavonia* (150 species), *Sterculia* (150 species), *Malva* (56 species), and *Gossypium* (40 species).

Malvaceae now includes several formerly segregate families, mostly woody, with members such as *Theobroma* , *Ceiba* , and *Ochroma*.Members of the family are usually readily recognizable even when sterile by their combination of fibrous bark, alternate stipulate leaves with toothed margins (the stipules are not sheathing), more or less palmate venation, and multicellular hairs that are stellate to scaly. An epicalyx, the outer series of what appears to be a double calyx, is common and is formed from the bracts or

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floral leaves of a reduced inflorescence. The sepals meet each other at the edges and are often fused at the base, and closely packed hairs at the base inside secrete nectar. When the nectary is on the inside of the calyx, it probably ensures that the corolla is fused at most only basally. Pollinators—birds and long-tongued insects are common—reach the nectar held in the calyx cup by probing between the bases of the corolla. The edges of the petals overlap regularly. The stamens are often numerous and variously fused or in bundles. The inside wall of the fruit and the surface of the seed are often hairy.

Anatomical perspective: -

The family Malvaceae is commonly called as Mallow family. Malvaceae includes 243 genera and 4225 species worldwide (Mabberely, 2008) the family Malvaceae is cosmopolitan in distribution consist of herb, shrub and trees having stellate hairs on young parts, mucilaginous juice present, leaves alternate, stipulate, multicostate, reticulate, inflorescence solitary or cyme, flower actinomorphic, hypogynous, pentamerous with epicalyx, corolla free, stamen indefinite, monoadelphous, monothecous, stamen united to form a tube.

Walter s Judd and Steven R. Manchester (1997) Circumscript the Malvaceae by cladistics analysis of the morphological, anatomical, palynological and some chemical characteristic.O.Adedeji and H.C.Illoh (2004) studied comparative foliar anatomy of ten species in genus Hibiscus in Nigeria and observed variation in the number of vascular bundle, presence or absence of medullary bundles in the pith at the distal end of petiole, median and distal regions generally round in all species, cortex composed of angular collenchyma cells to the inner part.

Ayse Mine Gencler Ozkan and M.Erkan Uzunhisarcikli (2009) observed stem and leaf anatomy of four Althea species growing in Turkey and found similar type of epidermal layer in all four composed of single layer of rectangular or isodiametric tightly packed cells.cortex with 2-4 layers of chlorenchyma cells, cortical parenchyma contains mucilage cells,xylem composed of thick and concentric cylinder interrupted by medullary rays, central parenchymatous pith is composed of thin walled, large, rounded cells, some are transferred into mucilage cells.

Nighat Shaheen et al., (2009) studied diversity and distribution of trichomes in genus Sida L.and found the glandular an deglandular trichomes on the leaves also presented systematic relevance of epidermal features and trichome diversity within genus Sida L.Joecildo Francisco Rocha and Rodrigues Machado investigated on antomy, ultrastructure and secretion of extrafloral nectary of Hibiscus pernambucensis. Pollen morphology of genera Alccea and Althaea was studied by Night Shaheen et al, (2010) and revealed the the presence of apolar, pantoporate and echinate pollen.

Leaf anatomical features of three Theobroma species native to the Brazilian Amazon of Malvaceae was studied by Tacymara Barata Garcia et al., (2014) they found glandular and non-glandular trichomes distributed on both surfaces of leaves the mesophyll in all species was dorsiventral with collateral vascular bundle surrounded by sheath of sclerenchymatous

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and parenchymatous cells with phenolic content. Saikat Naskar (2016) carried out anatomical studies on some common members of Malvaceae from West Bengal and observed the cuticle thickness is highest in Gossypium and lowest in Malvastrum also the cystolith like structure in mesophyll tissues of all the species is found.

Taxa of sub family Malvoideae from Egypt in relation with morphology and anatomy studies was studied by Wafaa et al., (2018). They provided dendogram which indicated close taxonomic relationship between Hibiscus esculentus and H.sabdriffa more than Marva parviflora.Zeinab et al.,(2018) has provided cladistics analysis of 39 selected species belonging to 24 genera of Malvaceae "Core Malvales" from Egypt. Eman A.Karakish (2020). Investigated comparative anatomical studies of some species of Malvaceae from Saudi Arabia given its systematic significance.

Phytochemical Perspective:

Phytochemical profiling and GC-MS analysis of aqueous methanol fraction of Hibiscus asper leaves was done by Njoku U. et al., (2021) and reported presence many secondary metabolites and bioactive compounds.

Shushma Chaudhary et al., (2019) studied qualitative and quantitative GC-MS analysis of Hibiscus cannabis mucilage and found many biological compounds with high pharmaceutical significance.GC-MS Fatty acid analysis of leaves of Malvaviscus arboreus was investigated by Omnia H. (2020). And identified number of mono-, di-, and tri-unsaturated fatty acids. Divya selvaraj et al., (2020). Studied GC-MS analysis of Abelmoschus leaves and reported bioactive compounds with their biological properties and functions.

Ekpo A., Etim P. C. (2009) studied the antimicrobial activity of *sida acuta*, Gulnaz A.R et al. (2018) analaysed phytochemicals from extracts of sida. Preliminary phytochemical screen of sida *rhombifolia*, L. was done by Raj and Rajeswari (2018). Richa S. S. and Sharma M. L. (2014) studied Phytochemical Investigations and Anatomical Study of Three species of Sida.Selvadurai S. (2017) investigated Phytochemical Screening of Sida spinosa.

Conclusion:-

This review represents the scientific study that shows anatomical study regarding stem,leaf,petiole and foliar structures also it gives information of preliminary phytochemical of family Malvaceae.

Still anatomical and chemical knowledge of many species are woefully incomplete, and much basic and unfortunately perhaps unfashionable work can be done to clarify the distribution of anatomical and chemical characters.

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