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COMPARATIVE STUDY OF LEAF TRICHOME IN DIVERSE HABIT OF SOME CASSIA SPECIES

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ABSTRACT

Epidermal trichomes areoften seen in the surface view of the leaf lamina. They are diverse structure and functions. Trichome plays crucial role in the identification of plantsThey may be unicellular or multicellular and are further classified on the basis of absence or presence of glands.They aredefendant for plants against plant against natural hazards such as herbivores, plants from extreme high or low temperature, drought, ultraviolet (UV) radiations, pathogen attacks andreduce excessive transpirationWang *et, al.* (2021).In the present study 6 Species belonging to the genus*Cassia* were selectedit include two herb species*C.absus* L.,*C. uniflora* Mill., inshrub *C.occidentalis* L., *C. alata* L. and in tree *C. siamea* Lamk.,*C. surattensis* Burm. In these species diversity of trichomes,their structuralmorphological differences were studied.This review provides reference towards Taxonomic, Anatomical Study, Phylogeny and relationship among species of *Cassia* genus.

INTRODUCTION

Morphological characters are given important both for producing classification and for diagnostic purpose. Such character can be seen easily, morphology must go hand in hand with other fields in the establishment of phylogenetic relationship and for expressing classification and even these have been largely restricted to the reproductive phase when dealing within angiosperm.Plant surface shows spectacular differences in the shape, size, location function and origin. (Werker 2000). Trichomes aredistributed all over the surface on various organs in different plants, exhibiting diverse morphologies. Trichomes were among the first anatomical features of plants to be recognized by early microscopist and they have played a key role in plant Taxonomy Behnke (1984) In angiosperm, Trichomes may occurs on leaves, Petals, Stems, Petiole, Peduncles and seed coat depending on the species GSTs Glandular secreting trichomes are found on 30% of vascular plants. Dell and MC Comb(1978); Phan (2000) Trichomes are generally classified into single celled or multicellular, branched or unbranched and glandular or nonglandularon the basis of characeristics and functions. Trichomes also have distinct shapes, such as head, star, hook and scale. Theobald (1980) and Barthlott(2009) further divided trichomes into three categories based on the distribution on the leaves: Large, Small and Glandular trichomes.Trichome have been employed very frequently for systematic comparision because their diversity, universal presence in the angiosperm and their easy preparation.Dead trichomes may continue to function as water absorption, seed dispersal and aberasion protection. Werker (2000)Solereder(1908), Netowtzky(1932), and Metcafe and Chalk (1950) have supplied useful information on the diverse structure function and classification of trichomes with their significance in comparative anatomical studies. Comparative morphology of trichomes among the species of genus *cassia* are not extensively studied and thus, leave the scope for in depth study. In the present study a detail work carried out of the morphology of trichomes of some *Cassia* species.

Material and Methods: -

Material: - For present study 6 Taxa representing *Cassia*genus of subfamily Cesalpinaceae of Leguminaceae were selected.

Herbs: -*Cassia absus*L.,*Cassia uniflora*Mill.

Shrub: -*Cassia occidentalis*L.,*Cassia alata*L.

Tree: -*Cassia siamea*Lamk.,*Cassia suranttensis*Burm.

The plants were identified with reference to floras.

Methods: -

Plant material for the present investigation were collected from diversehabitat.

For the study, integrated picture of Trichome types and their organographic distribution,epidermal Peels were removed frommature leaflets by scrapping with scalpel whenever possible. In case of difficult material peels were separated and cleared by treating with aqueous sodium hydroxide followed by 2% Acetic acid. After washing with distilled water trichomes were stained with saffranine (1 % aqueous and mountain with glycerin. The observation was made directly under compound microscope. The Microphotograph of selected slides and measurement of each trichome were obtained by using Coslab(Scope image 9.0) Digital PC-Microscope camera focus through the eyepiece. Measurement of each trichome were taken place.

Observations:

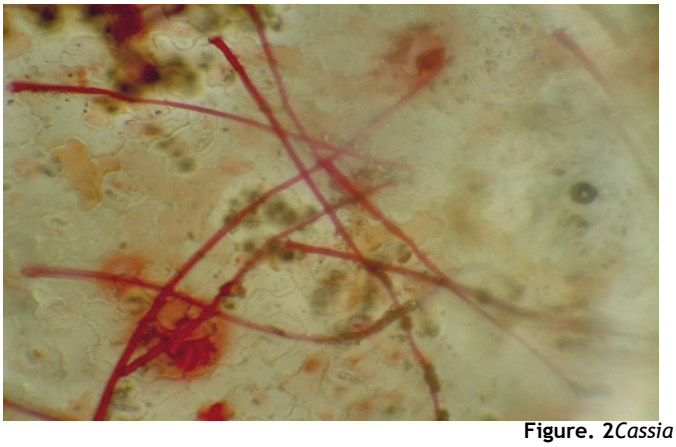
In *C. absus* trichomes of adaxial surface are nonglandular, unicellular trichome, moderately present, body straight, conical, elongated, pointed apex. Seated upon 56 straight wall basal cells. In abaxial surface nonglandular, unicellular moderately present body elongated apex pointed seated upon 5-6 basal cells.(**Fig 1**.)

Trichomes on Adaxial surface **Trichomes on Abaxial Surface**

Figure 1. *Cassia absus*L.

In *C. unifloraon* both surfaces trichomes non-glandular multicellular, uniseriate long cell with vary shape and size, 2-4 cells seated upon 5-6 basal cells with wavy walls, body straight, pointed apex(**Fig. 2**).

Trichomes on Adaxial surface **Trichomes on Abaxial Surface**



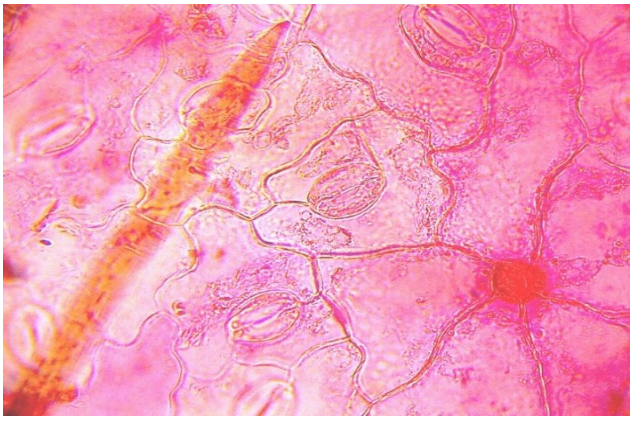
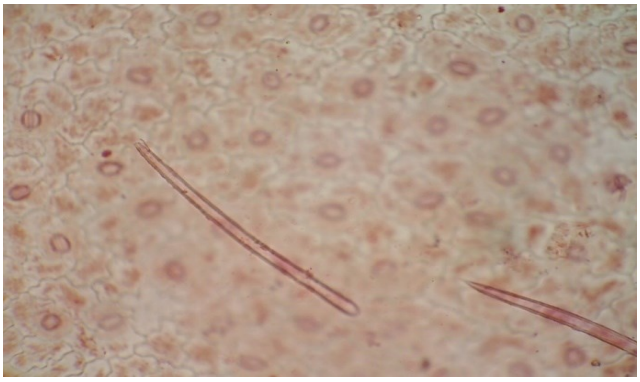
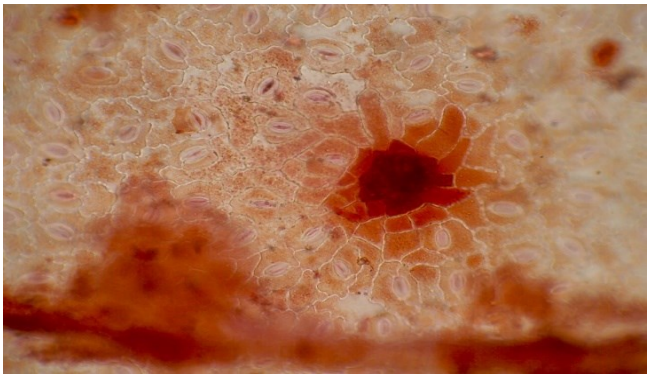


Figure. 2*Cassia uniflora*Mill.

In *C. occidentalis*adaxial trichomes absent but druses are present abaxially trichomes non-glandular types spareslydistributed, stalk multicellular type. Druses and crystal sand arepresent. Glandular trichomes present on leaf margin.(**Fig. 3**).

Trichomes on Adaxial Surface **Druses on Abaxial Surface**





Glandular Trichomes on Leaf Margin

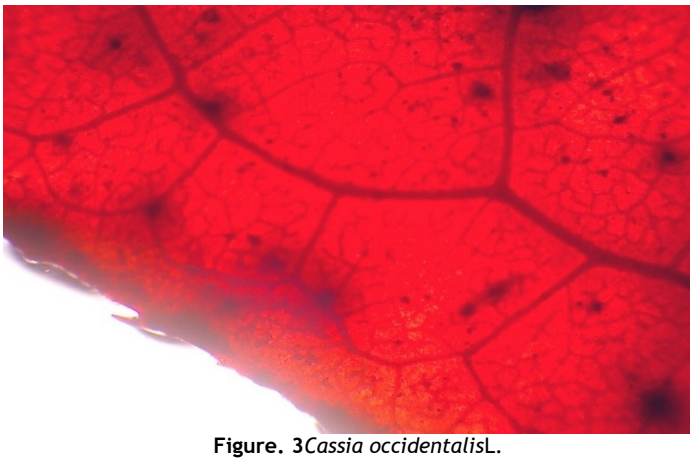


Figure. 3*Cassia occidentalis*L.

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n *C. alata* adaxial trichome non-glandular are presentmulticellular uniseriate more abundant than Adaxial surface. Abaxial non-glandular spareslydistributed, multicellular, uniseriate, druses of Calcium oxalate are present (**Fig. 4**).

Trichomes on Adaxial surface **Trichomes on Abaxial Surface**

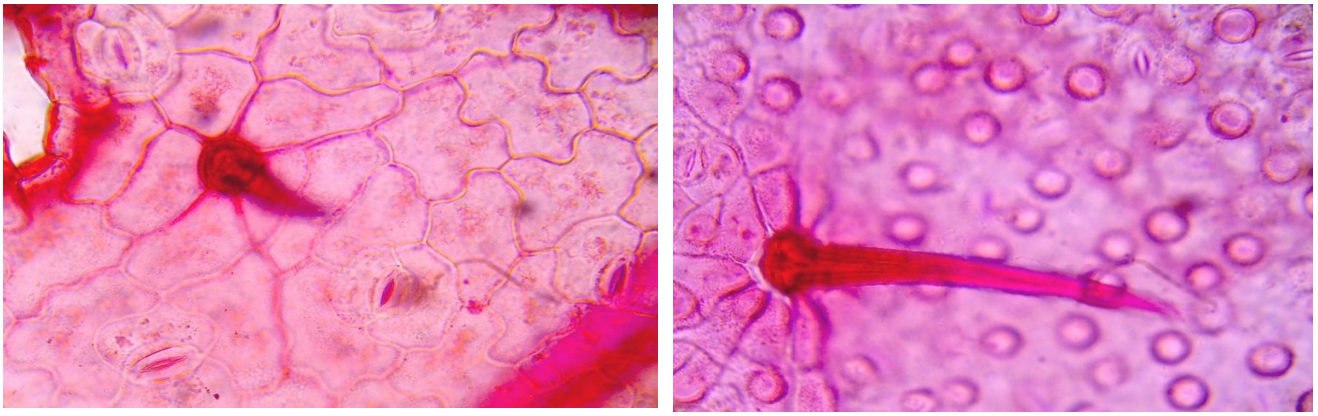
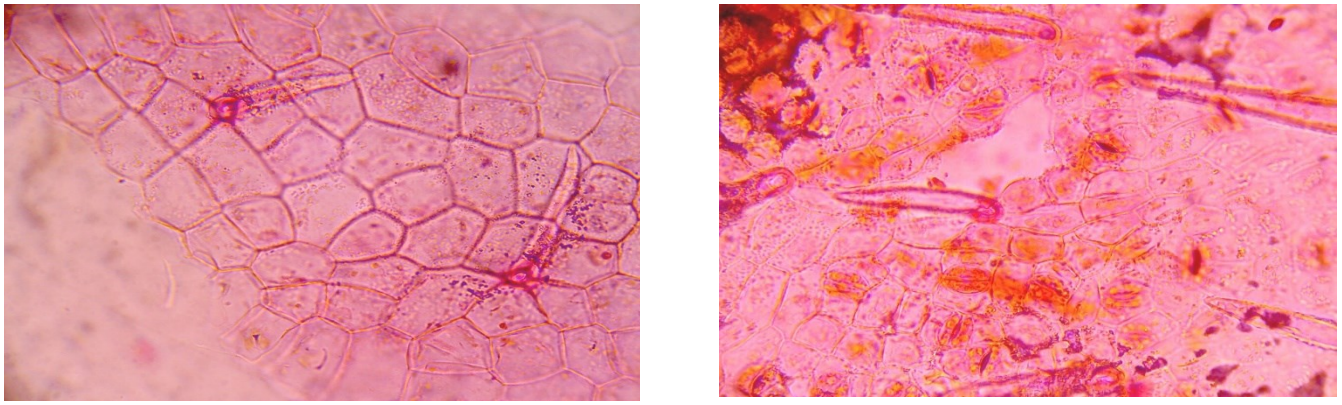


Figure. 4*Cassia alata*L**.**

In *C. siamea* on both surfaces trichomes, nonglandular, unicellular, sparesly distributed may be conical or papilose, wall, varrucose type. Body straight conical, elongated pointed apex, Seated
upon 7-8 straight wall basal cell (**Fig. 5**).



Trichomes on Adaxial Surface **Trichomes on Abaxial Surface**

Figure.5*Cassia siamea*Lamk.

In *C.suranttensis* on both surface trichome non-glandular, unicellular, moderately present varrucose type of trichomes, body straight conical, elongated pointed apex. Seated upon 7-8 Straight wall basal cells (**Fig. 6).**

Trichomes on AdaxialSurface **Trichomes on Abaxial surface**

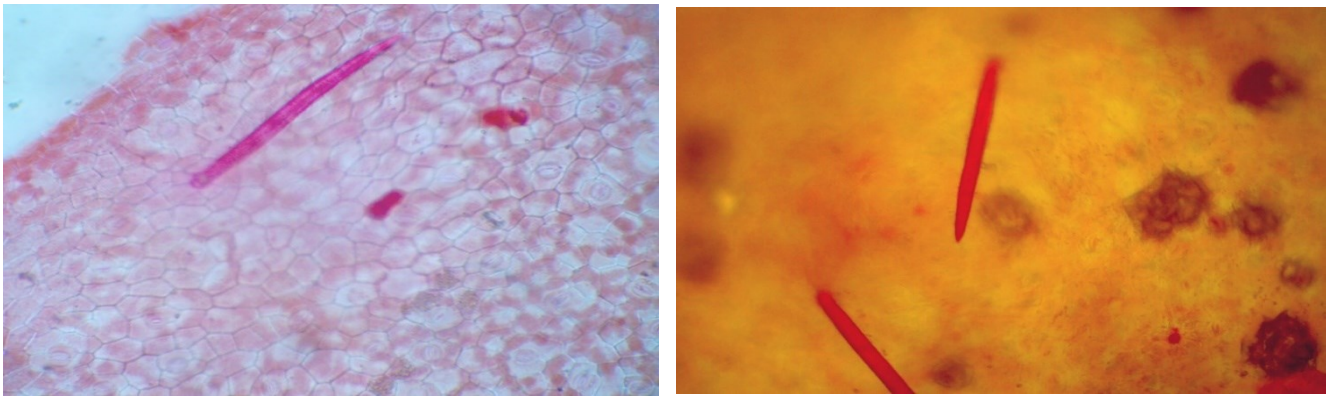


Figure. 6*Cassia suranttensis*Burm.

Table 1:Measurement of Trichomes on Leaflet

Sr. No.	Name of Taxa	Adaxial Surface	Abaxial Surface
1	*Cassia absus*L.	179.498×5.126 µm	83.801×2.778 µm
2	*Cassia unifloraMill.*	220.741-228.548×2.458µm	320.963-420.541×3.589µm
3	*Cassia occidentalis*L.	Absent	135.173×8.782µm **Glandular Trichome on leaflet margin** 151.048×17.855 µm
4	*Cassia alata*L.	18.137×5.261µm	41.633×3.821µm
5	*Cassia siamea*Lamk.	24.130-36.580×5.981µm	30.124×5.320µm
6	*Cassia suranttensis*Burm.	98.625×5.758µm	97.431×6.456µm

Result and Discussion: -

All theabove morphological variations of trichomes were noted among the herb, shrub, and tree species of *Cassia* genus.From the presentstudy observed that non-glandular trichomes were present in all species except *Cassia occidentalis* in addition to non-glandular, glandular trichomes, large and clubshaped, visible to the naked eye found on the margin of leaf this has been recorded previously by Metcalfe and Chalk (1950). In *C. occidentalis* on abaxial surface druses and crystal sands were also noted. In *C. alata* on abaxial surface druses of calcium oxalate were observed.

CONCLUSION

To conclude the present work found as significant contribution towards the taxonomic study of this genus *Cassia* that is variations were noticed regarding the trichome morphological features. Detailed morphological information can help the systematics and also taxonomist for interpreting phylogeny and relationship of the taxa. Since the genus is medicinally important data can tremendously help Pharmacogonasticstudies also.

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