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Trichome Studies of Argemone mexicana

Dr. Ela Tiwari
Professor of Botany
Govt. Auto. Girls P.G. College of Excellence, Sagar M.P.

Abstract

In Poisonous plant's anatomy may play a great role in the understanding of vital processes in general and of the phenomena of heredity and mutability in particular along with the taxonomical purposes.Present study is done on diffrent plant parts of *Argemone mexicana.which contains many toxic* **constitutents. Trichomes structure were drawn from epiderrrmal peel.** In this plant 7 types of glandular trichomes on all the organs and three types of stomata are observed. The importance of epidermal characters of leaves in angiosperm systematics has been reviewed by Stace (1965). Epidermal features, such as shape of epidermal cells, type of sculpturing on their walls, cell inclusions, etc. also provide useful information's of taxonomic value.

Introduction

Papaveraceae is known for having many medicinal, toxic and poisonous plants. One of these plants is *Argemone mexicana*. Mexican poppy is very commonly found as weed of grasslands and road sides. All the parts of this plant are poisonous, through having thorns on leaves it is usually avoided by cattles and others. It has toxic constituents i.e. sangunarine, isoquenoline, beberine snd protopines.

Taxonomic Description

Common name - Pili Kateli, Swarn Kshiri, Mexican Poppy, Argemone.

Description - *Argemone mexicana* is a species of poppy found naturalized throughout the tropics and subtropics, as an agricultural & Road side weed. It is coarse erect herbs with scattered prickles and firm taproot, milksap, long, branched prickly stems. Leaves glaucous, oblong lanceolate, pinnately lobed margins somewhat sinuate dentate the teeth tipped with a prickle sessible upper ones usually somewhat clasping the stem. Flowers are terminal, solitary, shortly pedicelled, bract leafy. Sepals are 3 oblong, apex horned, back prickly. Petals bright yellow, long, obovate. Stamens are indefinite, polyandrous, filaments long and yellow, anthers dithecous, extrorse, basifixed. Gynoecium is Tri-to hexacarpellary, syncarpous, ovary superior, unilocular, covered with spines, parietal placentation, ovules many, style reduced, stigma lobed. Fruit is a prickly oblong to broadly ellipsoid capsule. Seeds are very numerous nearly spherical, brownish, black.

Trichome Studies

Unicelled glandular hair (T6)– Foot: compound, body: conical or club shaped, entire, rounded tip, content: translucent, walls thin, smooth and straight. **Plate 1. Fig. 1, 5,** On stem, pedicel, androecium, leaf, calyx.

Uniseriate glandular hair (T25)– Foot: compound, body: multicelled, entire, rounded tip, content: translucent, walls thin, smooth and straight.

Plate 1. Fig. 2, 4, 12, 13. On gynoecium, stem, pedicel, leaf, calyx, fruitwall.

Unicelled flagellate glandular hair (T12)- Foot: compound, body: flagellate, entire, rounded tip, content: translucent, walls thin, smooth and straight. **Plate 1. Fig.** 3 & 11. On stem, pedicel, leaf, calyx.

Uniseriate conical glandular hair (T26)– Foot: compound, body: multicelled, entire, rounded tip, content: translucent, walls thin, smooth and straight. **Plate 1. Fig. 6 & 7 -** On stem & androecium.

Unicelled conical glandular hair (T9)– Foot: compound, body: spathulate, entire, rounded tip, content: translucent, walls thin, smooth and straight. **Plate 1. Fig. 8-** On gynoecium, fruitwall.

Unicelled multiarmed flagellate glandular hair (T14)- Foot: compound, body: flagellate, entire, rounded tip, content: translucent, walls thin, smooth and straight. **Plate 1. Fig. 9 -** On leaf, gynoecium.

Unicelled spathulate glandular hair (T11)– Foot: compound, body: spathulate, entire, rounded tip, content: translucent, walls thin, smooth and straight. **Plate 1. Fig. 10 -** On androecium. **It** is known for having many toxic and poisonous plants. One of these plants is *Argemone mexicana*. Mexican poppy is very commonly found as weed of grasslands and road sides. All the parts of this plant are poisonous, through having thorns on leaves it is usually avoided by cattles and others. It has toxic constituents i.e. sangunarine, isoquenoline, beberine snd protopines. Medicinally this plant used as pain reliever mainly. **Brahmachari, (2013)** regarded it as one of the most significant plant species in traditional system of medicine. The plant is used in different parts of the world for the treatment of several ailments including tumors, warts, skin diseases, inflammations, rheumatism, jaundice, leprosy, microbial infections, and malaria. According to Verma (2010), its yellow juice is given in curing dropsy and jaundice. In Ayurveda the plants is diuretic, purgative and destroys worms.

This plant shows 7 types of glandular trichomes on all the organs, with unicelled, multicelled and flagellate trichomes in different shapes occurred in this species. (i.e. T6, T9, T11, T12, T14, T25, T26 Plate no. 1 Fig. no. 1 to 13) A typical shape i.e. spathulate in unicelled and multicelled trichome was obseerved in this species,, while flagellate trichomes i.e. two armed and multiarmed types also can be considered as distinguishing features. (Table.1) These trichome are present on vegetative & floral parts i.e. leaf, stem, androecium, gynoecium. Trichome index studies revealed that highest trichome index was 9.68 found in wall of fruit while trichomes are absent in corolla.(Table. 1) Trichome frequency is observed 2.56 on both layers of leaf & stem and 1.90 on all the other parts. Density of trichome is 0.16 & 0.12 in all studied parts of the plant except on corolla.

Trichome was reported absent on its fruitwall by Rao and Dave, (2001). Zafar *et al.,*(2010) had seen some micro hairs on its leaves and Kapoor *et al.,* (1963) also observed trichomes on vegetative and floral parts of this plant. The significance of trichome types has been widely emphasized as one of the important taxonomic tool by various workers Seithe (1962, 1979); Metcalfe, (1968); Ramayya, (1969); (Martin and Juniper, (1970); Hey wood, (1971); Roe (1971); Edmonds, (1972); Seithe and Anderson, (1982); and have suggested a standared terminology for various trichome types.

Ibrahim and Ibrahim (2007) studied that observed the presence of anomocytic stomata in *Argemone mexicana*

PLATE 1

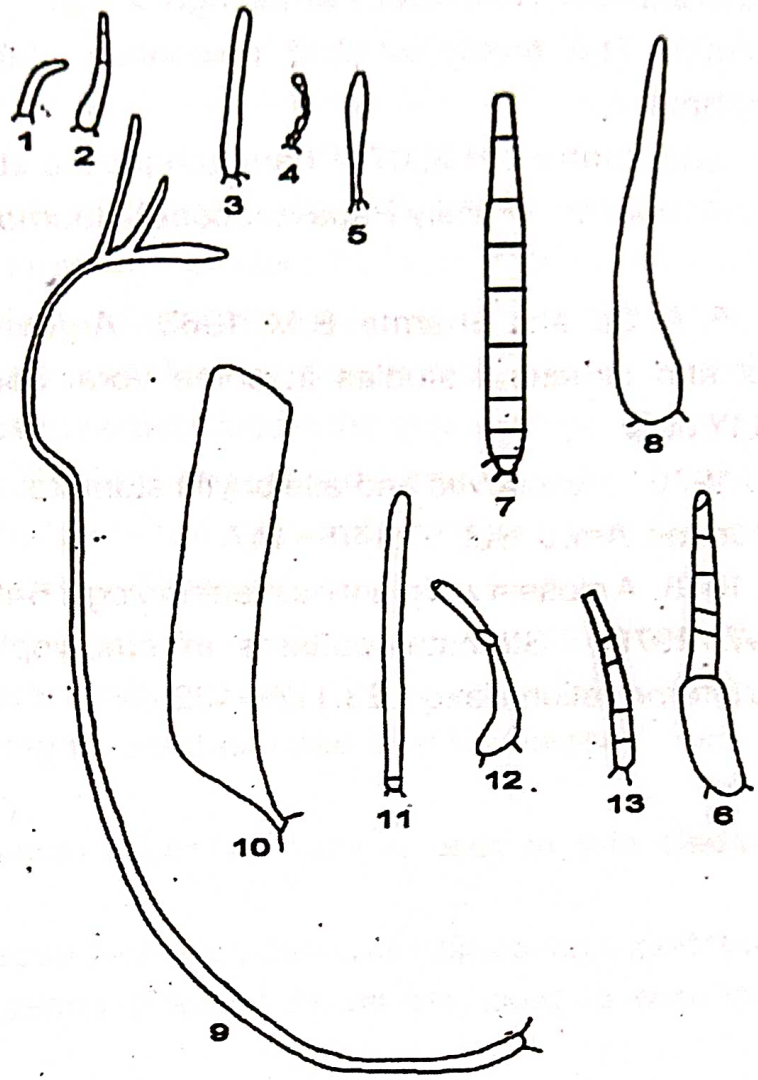

Plate no. - 1 - Trichome types of Argemone mexicana L.

Fig. 1 & 5- Unicelled glandular hair (T6) Fig. 1- Size - 40X 12.50, in stem, pedicel, leaf, calyxFig. 5- Size - 40X 13.75, in androecium Fig. 2, 4, 12, 13- Uniseriate glandular hair (T25) Fig. 2- Size - 10 X 50 in gynoecium, fruitwall Fig. 4- Size - 40X 8.75, in stem, pedicel, leaf, calyx Fig. 12- Size - 40X 27.50, in stem, pedicel Fig. 13- Size - 10X 110, in stem, pedicel Fig. 3 & 11- Unicelled flagellate glandular hair (T12) Fig. 3- Size - 10X 55, in stem, pedicel Fig. 11- Size - 10X 185, in leaf, calyx Fig. 6 & 7- Uniseriate conical glandular hair (T26) Fig. 6- Size - 40X 43.75, in stem Fig. 7- Size - 40X 58.75, in androecium. 8- Unicelled conical glandular hair (T9) Fig. 8- Size - 40X 58.75, in gynoecium, fruitwallFig. 9- Unicelled multiarmed flagellate glandular hair (T14) Fig. 9- Size – 10 X 1025, in leaf, gynoecium Fig.10- Unicelled spathulate glandular hair (T11) Fig.10- Size - 40X 69.75, on androecium .

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