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STUDY OF FLORAL NECTARIES OF THE ANGIOSPERM PLANTS

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ABSTRACT:

The nectary is a common secretory tissue in Angiosperms. It produces nectar, a sugar solution that is regarded as one of the main rewards for pollinators in many species (Fahn, 1979).

The word 'nectary' is derived from 'nectar' which in Greek means 'The drink of Gods'. We have collected total 11 angiospermic plants for nectary study.

KEYWORDS: Angiospermic plants, Flowers, Gland, Nectaries, Sugar.

INTRODUCTION:

Nectaries are more common in the Angiosperms. Presence of nectaries is a biological character as it is related to a vital function of pollination. Pollination is successful in many plant species as a consequence of pollinators seeking nectar (Southwick *et al*, 1981). Linne (1735) coined the term "nectarium". Caspary (1848) divided floral and extrafloral nectaries based on structure and Delpino (1868-75) proposed the terms nuptial and extranuptial nectaries based on function. Schmid (1988) has proposed broad topographical classification of nectaries and several terms. Nectaries are classified into two main types, (1) Floral nectaries and (2) Extrafloral nectaries on the basis of their functions. Floral nectaries are found inside the flowers and directly involved in pollination whereas extrafloral nectaries are those occurring on the outer floral and vegetative parts are not involved in pollination. The nectary has ecological significance because nectaries are the places where liquid substances are produced and offered to variety of animals involved in interactions. The most ancient plant with nectaries still living today

belongs to Pteridophyta. *Pteridium aquilinum*, a quasi-cosmopolitan fern in which nectaries provide rewards for ants that defend the plants from predators (Heads and Lawton, 1985). In Gymnosperms, nectaries are only found in certain *Chlamydospermae* such as *Ephedra* sp. and *Welwitschia*, being involved in pollination (Bino *et al*, 1984 and Wetsching and Depisch, 1999).

Floral nectaries occur on various floral parts and have been used in plant taxonomy and phylogeny (Fahn, 1979). Nectar is exuded from the nectary by epidermal cells, by trichomes or by nectariferous parenchyma cells (Fahn, 1988). Various aspects of nectar production, amounts of nectar available, its chemical composition, including qualitative and quantitative is required to correlate with field observations of visits by nectarivores along with several events involved in pollination.

MATERIALS AND METHODS:

A preliminary survey of over 11 plants collected at random in and around Patan city was made between 2023 and 2024. Plants were observed for their colour in their habitat itself, brought to the laboratory in polythene bags and examined for their nectaries in different parts. Identification of plants were made using Shah (1978). Patan city lies between Latitude 23° 42' 0" N and Longitude 71° 48' 0 E.

Topography of nectaries

The positions of nectaries or nectariferous gland were studied in selected eleven plant species belonging to different families. The location and morphology of nectary was studied from fresh plant material.

Structure of nectaries

Anatomical study in relation to the nature of secretory tissue of nectariferous glands has been carried out. Internal structure was studied by taking free hand sections. Dehydration was carried out through an alcohol/xylol series stained with saffranine fast green and the slides were prepared.

RESULT AND DISCUSSION:

The observations on different aspects of nectar and nectaries of selected plants were undertaken at various sites. eleven plant species were selected for investigations on flowering phenology, flower dynamics, nectary topography and structure.

1. *Antigonon leptopus* Hk. & Arn.

Antigonon leptopus is a large, rapidly spreading climber. Leaves simple, alternate, cordate - ovate. Flowers pink or white produced in axillary racemes of panicle, rachis of racemes frequently terminated by a branched tendril.

Flowering phenology: In *Antigonon leptopus* flowering begins from first week of September and full bloom was during the first week of October to second week of November. The flowering was terminated towards the second week of February.

Flower dynamics: In *Antigonon leptopus* flowers produced in axillary racemes of panicles. The number of flowers per inflorescence ranges from 30-40 flowers per plant during the peak period of flowering.

Topography of nectary: Nectary is located in between the ovary and bases of the stamens.

2. *Bougainvillea spectabilis* Willd.

Large, thorny, straggling shrubs; thorns 0.5-4cm long, curved. Stem branchlets pubescent. Leaves alternate.

Flowering phenology: Throughout the year.

Flower dynamics: Inflorescence: 1-7 flowers red cymes united into leafy terminal panicles; peduncles 1.2-6.5cm long.

Topography of nectary: Nectary is located in between the ovary and bases of the stamens.

3. *Caryota urens* L.

5-10 m, unarmed trees; Leaves : bipinnately compound.

Flower dynamics: In compound spadix with drooping branches. Flower : monoecious, sessile, incomplete, actinomorphic, unisexual, trimerous, cyclic.

Flowering phenology: All round the year.

Topography of nectary: Nectary is located in between the ovary and bases of the stamens.

4. *Catharanthus roseus* L.

Perennial under shrubs; Stem : herbaceous, branched, solid, with milky latex. Leaves : opposite.

Flower dynamics: Axillary, solitary or geminate or dichasial cyme.

Flowering phenology: Through out the year.

Topography of nectary: Hypogynous nectaries present one on anterior side & other on posterior side of the ovary.

5. *Citrus limon* (L.) Burm. F.

Citrus limon is a small glabrous tree, Leaves oblong to elliptic-ovate.

Flowering phenology: The plants bloom twice a year, once during June-July with a peak period of first week of July and once again during November - January with a peak period of second week of December to last week of December.

Flower dynamics: Flowers are produced in 2-3 flowered clusters.

Topography of nectary: In *Citrus limona* prominent nectary disc is found to be located around the base of ovary. Nectary is of ovarian type.

6. *Euphorbia pulcherrima* Willd. Ex. Klot.

Deciduous shrub with slender woody branches below naked bark brown. Stem :terete, glabrous or nearly so.

Leaves : alternate, ovate – elliptic to lanceolate.

Flowering phenology: Nov – Jan.

Flower dynamics : Cyathia numerous in dichotomous terminal cymose.

Topography of nectary: lobes gland orange – yellow

7. *Ixora coccinea* L.

Glabrous shrub. Leaves opposite.

Flowering phenology: Throughout the year.

Flower dynamics: terminal, paniculate corymb cymes. Flowered, scarlet or yellow, numerous.

Topography of nectary: A nectar is secreted from surrounding the basal portion of style and nectar is collected in the corolla tube. Nectar secretion begins during anthesis.

8. *Kalanchoe pinnata* (Lam.) Pers.

Glabrous plant up to 1.5 m tall with pinnate leaves; lower leaves often simple.

Flowering phenology: Flowering winter–spring

Flower dynamics: Inflorescence large with reddish flowers; calyx inflated, papery with much shorter lobes; corolla nearly one and half times as long as calyx, with short acute lobes.

Topography of nectary: The nectary is located between the stamens and carpels. On distal leaves there are nectaries that at flowering time secrete droplets high in glucose.

9. *Mimusops elengi* L.

Glabrous, evergreen tree with a compact leaf head; bark grey or nearly light black, smooth, scaly. Leaves :alternate.

Flowering phenology: June – Oct.

Flower dynamics: Inflorescence :axillary solitary Flower : white, actinomorphic, hypogynous, fragrant.

Topography of nectary: The nectary is located between the stamens and carpels.

10. *Moringa oleifera* L.

Deciduous, unarmed tree; Leaves :alternate.

Flowering phenology: Throughout the year

Flower dynamics: Inflorescence :terminal, Flower : White or creamy-white, complete, zygomorphic.

Topography of nectary: The nectary is located on the ovary.

11. *Ocimum basilicum* L.

Aromatic erect, much – branched, herbs. Leaves :opposite.

Flowering phenology: Throughout the year.

Flower dynamics: In compact or distant whorls in terminal, simple or branched thyrsoid racemes
Flower :white.

Topography of nectary: Each nectary forms an asymmetrical four-lobed disc at the base of the outer surface of the ovary

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