



Topic:

❖ **FLOWER IS A MODIFIED SHOOT:**

That the flower is a modified shoot or a branch in the very beginning can be revealed by the following facts :

1. AXIS NATURE OF THALAMUS:

Flower consists of an axis known as thalamus or torus.

- a) This axis bears modified floral leaves viz, sepals, petals, stamens and carpels. Generally the axis in a flower consists of short or suppressed internodes and nodes. But it is not always the case; the axis is long in some flowers e.g. in *Gynandropsis gynandra* (Capparidaceae), *Passiflora suberosa* (Passifloraceae) etc. the internodes of the thalamus between corolla and androecium (called androphore) and between androecium and gynoecium (called gynophore) become enlarged with same whorled arrangement of stamens and carpels respectively; so no doubt that the thalamus is axial in nature. In *Capparis sepiaria* (Capparidaceae) the formation of gynophore only is also noted.

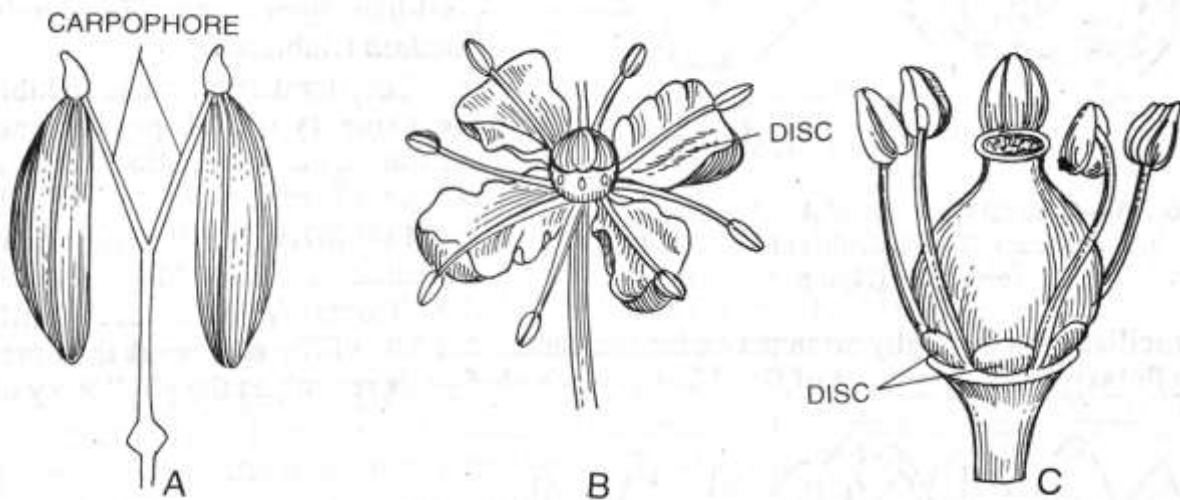


Fig: A- Carpophore prolongation of the thalamus in *Foeniculum vulgare*.

B- Disc in *Ruta* of Rutaceae. C- Scaly disc in Grape (*Vitis* of Vitaceae).



Fig: Monstrous development in rose (*Rosa* sp.).

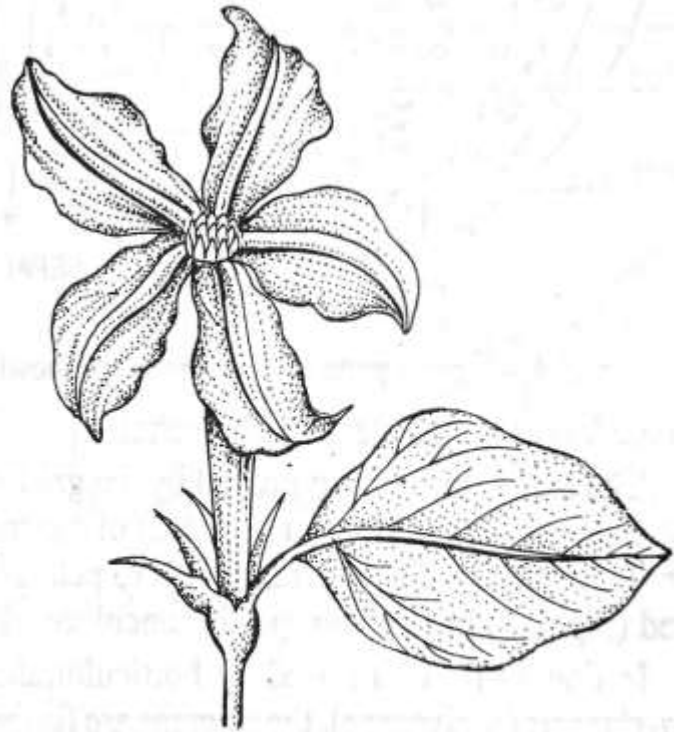


Fig: Flower of *Mussaenda* sp. showing one of the sepals leafy.

- b) Normally, the growth of the thalamus is checked by the carpels but in some cases like species of *Pyrus* (pear), *Rosa* (rose), etc., the thalamus had been found to undergo further upward growth having green stem with prickles and small foliage leaves beyond the gynoecium- this phenomenon is known as monstrous development or proliferation.

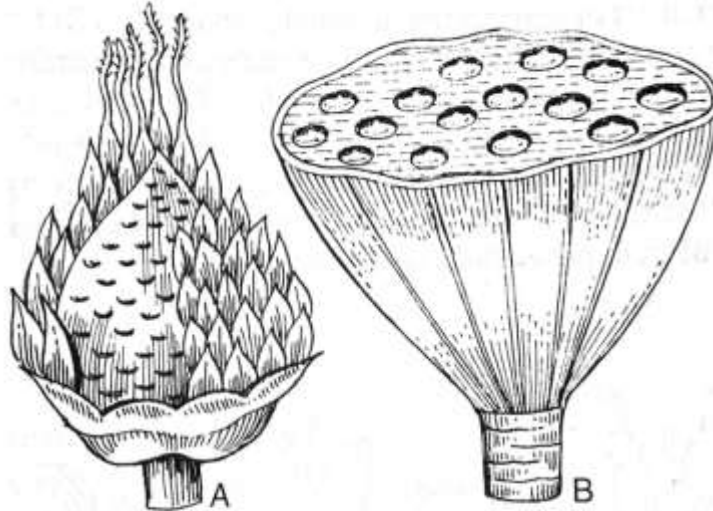


Fig: Conical thalamus of *Artabotrys odoratissima* (Anonaceae). B—Thalamus of lotus (*Nelumbium speciosum* (Nymphaeaceae).

- c) In *Polyalthia longifolia* (Anonaceae), *Michelia champaca* (Magnoliaceae) etc., the carpel bearing region of the thalamus elongates like the stem giving rise to an aggregate fruit.

2. LEAF NATURE OF FLORAL MEMBERS:

That the floral leaves are modified leaves is proved in most cases by their leafy nature; in many cases the sepals may assume typical leaf-like structure with veins and petal-like pigments e.g. *Mussaenda frondosa* (Rubiaceae).

The floral leaves also exhibit the same types of ptyxis and aestivation i.e. prefoliation as those of foliage leaves.

In *Michelia champaca*, *Magnolia sp.* etc. of Magnoliaceae the floral leaves are both verticillately and spirally arranged on long thalamus, but in majority of flowers the floral phyllotaxy i.e. arrangement of floral leaves is whorled - this resembles the phyllotaxy of foliage leaves on the stem and branches.

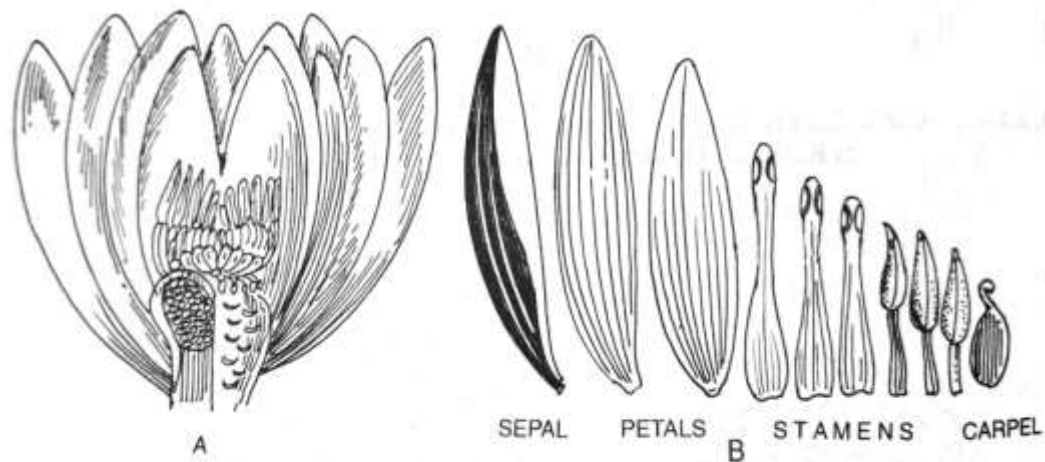


Fig: Flower parts of *Nymphaea sp.* showing gradual transition of floral members.

The leaf nature is also proved by the gradual transition of sepals to petals and petals to stamens as seen in flowers of *Nymphaea sp.* (Nymphaeaceae). The transition from leaves to sepals and from sepals to petals showing all similar leafy structure is also noted in *Paeonia sp.* (Ranunculaceae).

In double flowers raised by horticultural skill e.g. *Rosa sp.* (Rosaceae), *Hibiscus rosa-sinensis* (Malvaceae), the stamens are further remodified into petals- so stamens are highly modified leaves.

In *Canna sp.* (Cannaceae), stamens are modified into petaloid staminodes. In *Zinnia sp.* carpels are modified into sepaloid or petaloid structures.

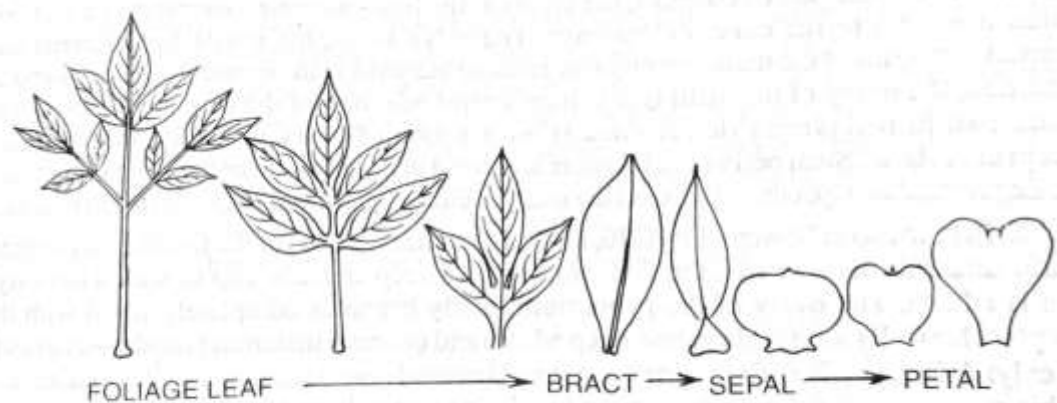


Fig: Gradual transition of foliage leaf to petal in *Paeonia officinalis*.



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That the carpel is also leafy in nature can be proved on examination of single carpel of *Pisum sativum* (Papilionaceae) in which it is folded along its midrib to form a chamber (the ovary) containing seeds. The elongated part of the carpellary leaf forms the style; its extreme apex, the receptive spot for the pollen forms the stigma.

3. HOMOLOGY OF FLORAL BUDS:

Floral buds like vegetative buds may be metamorphosed bulbils e.g. viviparous bulbils of *Agave sp.* (Agavaceae). Development and position of vegetative buds are also like those of floral buds i.e. axillary and terminal.

References:

1. Studies In Botany (Volume-I). Jatindra Nath Mitra, Debabrata Mitra, Salil Kumar Choudhuri, Moulik Library, 2000, ISBN: 978-93-81676-01-1.
2. A Textbook Of Botany (Volume-II). Ashim Kumar Ghosh, Kashinath Bhattachariya, Gopinath Hait, New Central Book Agency(P) Ltd., 2015, ISBN: 978 81 7381 555 3.

(All the above mentioned information including the figures are collected from the above references and will be solely used for teaching and learning purposes).