

Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (Third Year)

Subject: Botany

Paper Code: BOC 105

Paper Title: Classical Taxonomy and Phylogeny

Unit: Morphology of Angiosperms

**Module Name : Associated outgrowths and
Modification of stipules**

Module Number : 13

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Notes

Structure of leaf:

The leaf consists of three main parts:

Blade: the expanded photosynthetic portion. Also called as lamina.

Petiole: the stalk of the leaf and

Stipules: a basal appendage of petiole generally occurring in pairs

ASSOCIATED OUTGROWTHS

- **Stipules**
- **Stipels**

- **Ligule**
- **Leaf sheath**
- **The stipules are adjunct or an appendage of a leaf or an outgrowth of the leaf base.**
- **Stipels are secondary stipules associated with leaflets of a compound leaf.**
- **The ligule is an outgrowth of the leaf sheath or of the sheathing base of the leaf.**
- **The leaf sheath is the dilated base of the leaf or the petiole or the sheathing leaf base.**
- **The stipules, stipels and ligules are homologous structures, for without exception all of them are outgrowths of the leaf base correlated with the branches of the laterals.**
- **Whereas leaf sheath as extension of the axial component developed later as it is found in herbaceous plants.**
- **The primary functions of the leaf base and its outgrowths are protective and to somewhat mechanical in function.**

Stipules:

- **These are the appendages at the junction of a leaf.**
- **They are present as one on each side of the insertion.**
- **Thus stipules may be an adjunct or an appendage of leaf or an outgrowth of the base.**

Eg. Hibiscus rosa-sinensis

Stipel:

- **It is the stipule of a leaflet.**
- **It is usually one in number at the base of each leaflet in a compound leaflet.**
- **These are secondary stipules associated with leaflets of a compound leaf.**

Eg. Phyllanthus emblica

Ligule:

- It is an outgrowth from the leaf sheath or the petiole of the grasses where it joins the blade.
- Ligule is an outgrowth of the leaf sheath or of the sheathing leaf base in the monocot leaves.

Eg. Grasses

Leaf sheath:

- It is a close fitting tubular or enrolled cone.
- It is formed by the stem clasping petioles i.e. the lower portion of the leaf.
- Thus the leaf sheath is the dilated base of the leaf or the petiole or the 'sheathing leaf base'.

Eg. Bamboo

MODIFICATION OF STIPULES

1. Free stipules

Eg. *Hibiscus rosa-sinensis*.

2. Adnate or adherent stipules

Eg. *Rosa indica*

3. Spiny stipules

Eg. *Zizyphus jujuba*

4. Tendrillar stipule

Eg. *Smilax*

5. Foliaceous stipules

Eg. *Lathyrus aphaca*

