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Stomata

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Definition of Stomata

- Stomata are minute pores occur on epidermal surface of leaves and also some herbaceous stems
- Each stoma is guarded by two specialised epidermal cells, called guard cells
- These guard cells are also surrounded by other specialised epidermal cells called subsidiary cells or accessory cells.
- These cells also plays an important role during opening and closing of stomata



Classification of Stomata

Five types according to the distribution of stomata

- a) Apple and Mulberry Type:** Stomata are present on under surface only.
- b) Potato Type:** More stomata on the lower (or under) surface than on upper surface.
- c) Oat Type:** Stomata are equally distributed on both surfaces.
- d) Water Lily Type:** Stomata only on upper surface.
- e) Potamogeton Type:** Stomata are either absent or functionless. Ex: submerged aquatic plants



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On the basis of daily movement of stomata, Loft field classified it into three main groups:

- i) Alfalfa Type:** Stomata are open throughout the day and night
Ex: pea, bean, radish, mustard, vitis etc.
- ii) Potato Type:** Stomata are open throughout day and night except for a few hours in the evening, e.g. onion, plantain, cabbage, pumpkin etc.
- iii) Barley Type:** Such stomata are open only for a few hours during the day e.g. cereals.



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In dicotyledons following six types of stomata are found:

1. Anomocytic or Type A (Ranunculaceous or irregular-celled type)

- i. No subsidiary cells are present, stoma remains surrounded by several irregularly arranged epidermal cells.

Ex: Several dicotyledons, including *Tridax*, *Citrullus*, *Ranunulus*, etc.

2. Anisocytic or Type B(Cruciferous or unequal-celled type):

- i. Stoma remains surrounded by three subsidiary cells, one is distinctly- smaller than other two. Ex: *Brassica*, *Sedum* etc.

3. Paracytic or Type C (Rubiaceous or parallel-celled type):

- i. One or more subsidiary cells are present.
- ii. Subsidiary cells flank the stoma parallel with the long axis of the guard cells. Ex: Members of Rubiaceae, and genera such as *Vigna*, etc.



4. Diacytic or Type D (Caryophyllaceous or cross-walled type):

- i. Stoma remains surrounded by a pair of subsidiary cells.
- ii. Common walls of subsidiary cells remain at right angles to the long axis of the guard cells.

Seen in *Ocimum*, Caryophyllaceae (e.g., *Dianthus*), etc.

5. Actinocytic:

- i. Actinocytic stoma remains surrounded by a circle of radiating cells.

Ex. *Ancistrocladus* and *Euclea pseudebenus* (Ebenaceae).

6. Gramineous:

- i. Gramineous stoma possesses two guard cells that are shaped like dumb-bells.
- ii. Ex. Gramineae and Cyperaceae.



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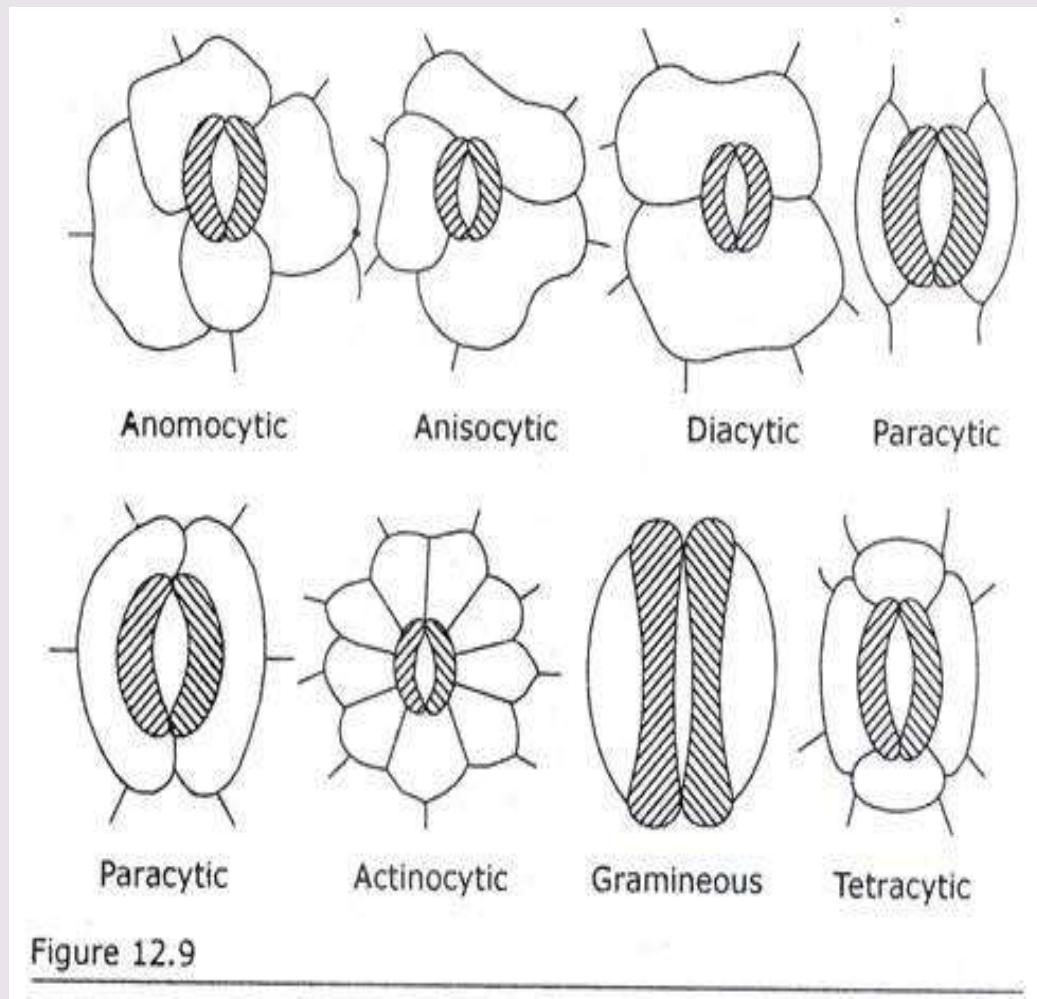


Figure 12.9

https://www.google.com/search?q=stomata+and+its+classification&rlz=1C1ASUC_enIN847IN847&tbo=isch&source=iu&ictx=1&fir=ZKpczmE2wnSajM%253A%252C9



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Thank You