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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



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## 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*, *Ranunculus*, 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.



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#### **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., *Diantbus*), etc.

#### **5. Actinocytic:**

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

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

#### **6. Gramineous:**

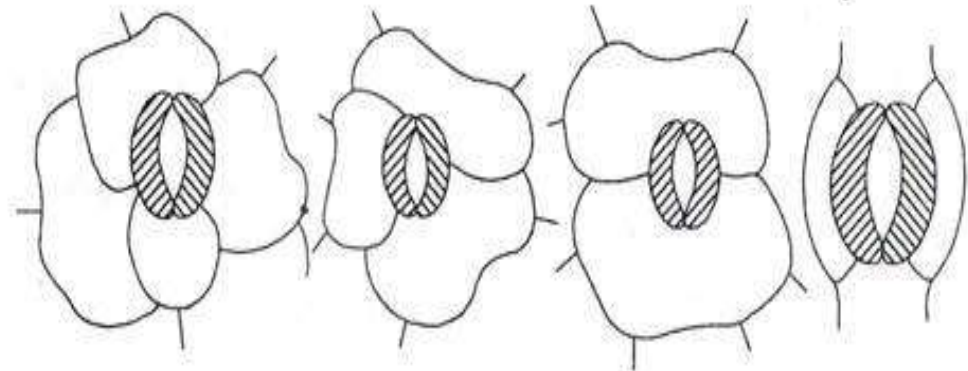
- i. Gramineous stoma possesses two guard cells that are shaped like dumb-bells.
- ii. Ex. Gramineae and Cyperaceae.





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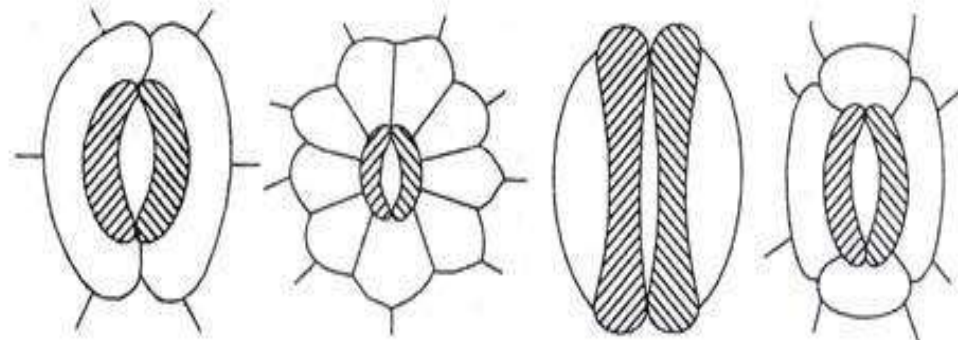


Anomocytic

Anisocytic

Diacytic

Paracytic



Paracytic

Actinocytic

Gramineous

Tetracytic

Figure 12.9

[https://www.google.com/search?q=stomata+and+its+classification&rlz=1C1ASUC\\_enIN847IN847&tbm=isch&source=iu&ictx=1&fir=ZKpczmE2wnSaJM%253A%252C9](https://www.google.com/search?q=stomata+and+its+classification&rlz=1C1ASUC_enIN847IN847&tbm=isch&source=iu&ictx=1&fir=ZKpczmE2wnSaJM%253A%252C9)



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***Thank You***