



objection:-

- ① Starch-sugar hypothesis explains stomatal movement with slower speed.
- ② Stoma of many plants like members of the family Liliaceae lack starch.
- ③ Proton transport hypo:-

This was proposed by Lewitt - 1974 and supported by Fujino - 1975, Ramasao - 1976, Bhatia and Malik - 1977, Noggete & Fritz - 1979-80.

A/c to these workers - the subsidiary and epidermal cells contains K^+ or Na^+ ions. They acts as osmotically active compounds. In presence of light these ions migrate into guard cells. They increase the O.P. The guard cells start taking water from the subsidiary cells and epidermal cells. They become turgid and stoma opens. The reverse reaction happens in absence of light.

Light \rightarrow influx of K^+ or Na^+ ions into guard cells \rightarrow water enters into guard cell \rightarrow increase of turgor pressure \rightarrow stoma opens.

Demerit:-

- (i) It fails to explain the effect of moisture on stomatal movement.
- (ii) It fails to explain about the control of electro-neutrality of the guard cells.
- (iii) ATP also participate in stomatal movement not explained by this hypothesis.

(3) Malate Switch hypothesis:- This was proposed by Bowling - 1976. A/c to this hypothesis. The change in pH of guard cells takes place during opening or closing of stomata. The K^+ ion present in epidermal or subsidiary cells move into the guard cells in presence of light to changes their osmotic pressure. In such a condition the O.P of guard cells increase and they start taking water from the subsidiary cells they become turgid and stoma opens. The electro-neutrality of guard cell is controlled by the H^+ ions, of originates on dissociation of malic acid which is either secreted by the chloroplast or develop on CO_2 incorporation into PEP. when K^+ ion migrates into the guard cells the H^+ ions move out of the guard cells. The reverse reaction happens in the absence of light.