

Ques

Root apex organisation?

Ans

During the later stages of development of embryo, the cells at the root pole become arranged in a pattern characteristic of the species. This group of cells comprises the apical meristem of the primary root. The cells of this region are all relatively undifferentiated & meristematic, densely protoplasmic & with large nuclei & they all undergo active division. The tissues of the mature root are essentially derived from a no. of these cells of the apical meristems, which are termed initials. Regarding the root apex organisation the following theories have been ~~put forward~~ given -

(1) Apical Cell theory  $\Rightarrow$  This theory was put forth by Nageli.

In the roots of vascular cryptogams (Pteridophytes) & Bryophytes, a single septated apical cell is present, it is generally thought that by its division this gives rise to all the tissues of the root. However the apical cell theory was

Superseded by the histogen theory.

In number, the initials range from one to many. Where the initials are more than one, they are arranged in one to four fairly distinct, uniseriate groups. In each group there are one to many initials. Where there is more than one group, the groups lie adjacent to one another on the longitudinal axis of the root. Each of these groups quickly develops one or more ~~of~~ growth zones. In many plants these zones appear to represent "the histogens".

The terms dermatogen, periblem & plezome are no longer in general use in description of stem ontogeny but they have been continued to indicate general zones in studies of root development. A fourth histogen the Calyptragen is also known, which is concerned with the formation of root cap.

In many gymnosperms there are two groups of initials - the inner forms the plezome, the outer forms the periblem & the cap