

5.1.1 Regions of the Root

The root is covered at the apex by a thimble-like structure called the **root cap** (Figure 5.3). It protects the tender apex of the root as it makes its way through the soil. A few millimetres above the root cap is the **region of meristematic activity**. The cells of this region are very small, thin-walled and with dense protoplasm. They divide repeatedly. The cells proximal to this region undergo rapid elongation and enlargement and are responsible for the growth of the root in length. This region is called the **region of elongation**. The cells of the elongation zone gradually differentiate and mature. Hence, this zone, proximal to region of elongation, is called the **region of maturation**. From this region some of the epidermal cells form very fine and delicate, thread-like structures called **root hairs**. These root hairs absorb water and minerals from the soil.

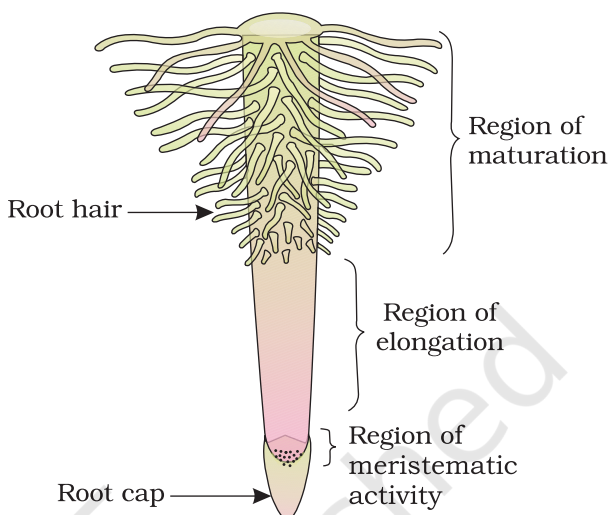


Figure 5.3 The regions of the root-tip

5.2 THE STEM

What are the features that distinguish a stem from a root? The stem is the ascending part of the axis bearing branches, leaves, flowers and fruits. It develops from the plumule of the embryo of a germinating seed. The stem bears **nodes** and **internodes**. The region of the stem where leaves are born are called nodes while internodes are the portions between two nodes. The stem bears buds, which may be terminal or axillary. Stem is generally green when young and later often become woody and dark brown.

The main function of the stem is spreading out branches bearing leaves, flowers and fruits. It conducts water, minerals and photosynthates. Some stems perform the function of storage of food, support, protection and of vegetative propagation.

5.3 THE LEAF

The leaf is a lateral, generally flattened structure borne on the stem. It develops at the node and bears a bud in its axil. The **axillary bud** later develops into a branch. Leaves originate from shoot apical meristems and are arranged in an acropetal order. They are the most important vegetative organs for photosynthesis.