## **Quadrant II – Transcript and Related Materials**

Programme: Bachelor of Science (Second Year) Subject: Botany Paper Code: BOC-103 Paper Title: Plant Anatomy and Embryology Unit: Secondary Growth Module Name: Activity of vascular cambium in stem Module No: 14 Name of the Presenter: Jyosna Gawas

## Notes

Growth is an ongoing process in plants. Primary growth results in increasing the length of the stem. Secondary growth results in woody axis formation. The **increase in girth of the stem due to activity of cambium** is called as secondary growth. Secondary growth is **seen in** Gymnospems, dicots, monocots (*Yucca* & *Dracaena*)

Secondary growth takes place due to the action of **cambium (fascicular and interfascicular) and cork cambium**.

In stem secondary growth takes place in two regions – cortex and stele. Secondary growth that takes place in the **stele** is called **intrastelar secondary growth**. Secondary growth that takes place in the **cortical region** is called **extrastelar secondary growth**. In dicot stem, vascular bundles are conjoint, collateral and open type. 5Cambium present in between xylem and phloem is vascular cambium (fascicular cambium).

During secondary growth, medullary ray cells between vascular bundles become meristematic to form a strip of interfascicular cambium. Both fascicular and interfascicular cambium joins together to form cambial ring. The cells of the cambial ring undergo repeated division followed by differentiation to form more secondary xylem towards the inner side and less secondary phloem towards the outer side. As a result primary xylem gets pushed towards the centre and primary phloem towards the outer side. With increase in the secondary xylem pith gets replaced by primary xylem and finally primary xylem is replaced by secondary xylem. Due to formation of secondary phloem, primary phloem patches are pushed outwards and finally gets crushed along with primary cortex, endodermis and pericycle.

Due to the formation of secondary vascular tissues, diameter of the stem increases. As a result the epidermis ruptures and a new protective layer called periderm is formed.

Cortical cells undergo dedifferentiation to cork cambium (phellogen). Cork cambium cells divide producing parenchymatous cells towards the outer and inner side. Cells towards the outer side form the phellem. Cells of which gets suberised and is called as cork. Cells towards the inner side form the phelloderm (secondary cortex). Phellem, phellogen and phelloderm constitute the periderm.