Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science

Subject: Botany

Paper Code: BOC 103

Paper Title: Plant Anatomy and Embryology

Unit: 4

Module Name: Adaptation in xerophytes

(Introduction to xerophytes)

Module No: 30

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Notes:

Plant communities have been classified by Warming (1909) on the basis of dependence and relation of plants to water as hydrophytes, Xerophytes, Mesophytes, Epiphytes, Saprophytes and Halophytes.

Plants growing under different conditions become adapted anatomically and ecologically to habitats in order to maintain a balance for their better growth.

Xerophytes are plants growing in dry habitats or in areas of physical dryness. They adapt themselves to dry, sandy or rocky soils having poor water content and extreme atmospheric conditions. They are able to live in these environments because they contain special features that prevent water loss.

According to Solbrig and Orians (1977), Xerophytes may be classified depending on their strategies of adaptation into four groups Drought-escaping, Drought-evaders, Drought Endurers (Non Succulent), Drought Endurers (Succulent).

Drought-escaping Plants: These are generally annuals. These plants are generally small, shallow rooted. Their life cycle is normally completed in 4-6 weeks when there is availability of water where the seed germinates, seedling grows, flowers, fruits and the seeds are dispersed. These dispersed seeds persist in the soil throughout the dry periods.

Drought Evaders: These plants are extremely small in size and normally deciduous, where they drop their leaves and the stem becomes photosynthetic, having restricted growth. Hence, require very low amount of water for growth and development.

Drought Endurers (Non-succulent): These plants are called as “True Xerophytes” as they maintain a canopy and a positive carbon gain throughout the year. These plants have an extensive root system normally which either spreads through the surface soils or penetrate several meters below the

surface. These plants may be either shrubs which are small and thorny plants or trees with woody thick barks which can withstand extreme shortage of water.

Drought Endurers (Succulent): Succulence is the most obvious characteristic of drought-resisting plants. These plants are generally shallow-rooted allowing them to respond quickly to light rainfalls. Stems are often heavily waxed to reduce cuticular water loss. Leaves often are reduced to spines. These spines help to reduce heat load and dissipate heat. These plants resist drought by storing large amount of water.