Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (First Year)

Subject: Botany

Paper Code: BOC 101

Paper Title: Biodiversity I (Microbes, Algae, Fungi and Bryophytes)

Unit: 4- Bryophytes

Module Name: Reproduction in *Funaria* - Sexual

Module No: 61

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Notes

Funaria is autoicously monoecious. The male (**antheridium**) and female (**archegonium**) reproductive structures develop on separate shoots of the same plant. Antheridia are borne on main shoot of the plant. The female branch develops as a side shoot, grows robustly and becomes longer than the male branch.

Antheridium

Antheridia are borne in clusters at the apex of the main axis. They are associated with numerous, green, sterile, long hair-like multicellular filaments with large capitate heads, called **paraphyses**. Leaves surrounding the antheridial cluster are known as **Perigonial leaves**. They spread out in the form of rosette which gives protection to antheridial cluster with surrounding perigonial leaves is called **perigonium**.

Structure of mature antheridium

Differentiated into **short**, **multi-cellular stalk** and an **elongate, club-shaped body**. The body has a sterile jacket layer of polyhedral with mass of **androcytes**. Operculum or lid is present at the apex. The mature antheridia

dehisce only in the presence of water. Liberated sperm is elongated, spirally coiled and biflagellate structure.

Archegonium

The archegonial branch springs from the base of the male shoot. The archegonia are aggregated into terminal cluster, stand erect at the apex of the female receptacle intermingled with paraphyses. It is surrounded by **perichaetial leaves** constitutes the **perichaetium** and protects the archegonia.

Structure of mature archegonium

Consists of a **stalk**, **basal swollen venter** and an **elongated neck**. Long, tubular and slightly twisted neck consists of six rows of neck cells which encloses axial row of 10 or more intensely protoplasmic **neck canal cell**. The archegonial jacket is single-layered thick in neck region, double-layered in the region of venter. Venter contains a ventral canal cell and an egg.

Fertilization

At maturity, both neck canal cell and ventral canal cell degenerate and become mucilaginous. Mucilage filled in the neck canal absorb water and swell, results in separation of terminal cell, forming a way to egg cell. Only one sperm fuses with the egg to form zygote. It divides in the archegonial venter and forms multicellular embryo which develops into a sporophyte. It is the diploid stage in the life cycle of *Funaria*.

Sporophyte

Mature sporophyte is differentiated into a **foot**, a **long seta** and a **pear capsule** at the tip. At maturity the operculum begins to dry which leads to dehiscence of capsule and dispersal of spores. Under favourable environmental condition the spores germinate. The exine ruptures and the intine protrudes out as a germ, elongates, septates and produces a filamentous primary protonema. It is the haploid stage in the life cycle of *Funaria*.