

(+ or -) is ... It remains haploid for some time. (9)

2) Monokaryotic Phase on Barberry (Sec. host)

In this phase, the haploid phase of life cycle is observed. In this phase the fungus produces two types of spores -

- a) Pycniospores and
- b) Aeciospores.

(a) * Development of Pycnia / spermatogonia and Formation of Pycniospores / spermata.

- The germination of basidiospores produce monokaryotic mycelium which accumulates beneath upper epidermis of the barberry leaves and develops into a cup shaped Pycnium / spermatogonium. Pycnia are formed after about ~~four~~⁷⁻¹⁰ days of infection.
- Pycnia are sub-epidermal, reddish orange in colour and flask shaped to globose structure with an ostiole / opening. Numerous vertical hyphae known as spermatophores develop at the base of Pycnium. At the tip of each spermatophore, uninucleate Pycniospores / spermata are produced.
- Some of the sterile hyphae called "Paraphyses" are found in the neck region of Pycnium. In addition some vertical fertile hyphae also come out through the ostiole which are called 'flexuous hyphae'.

- by wind to reach the primary host i.e. Wheat plant
- With the germination of aeciospores a dikaryotic mycelium develops on the wheat plant.
 - In this phase mycelium produces Uredospores & Teleutospores.

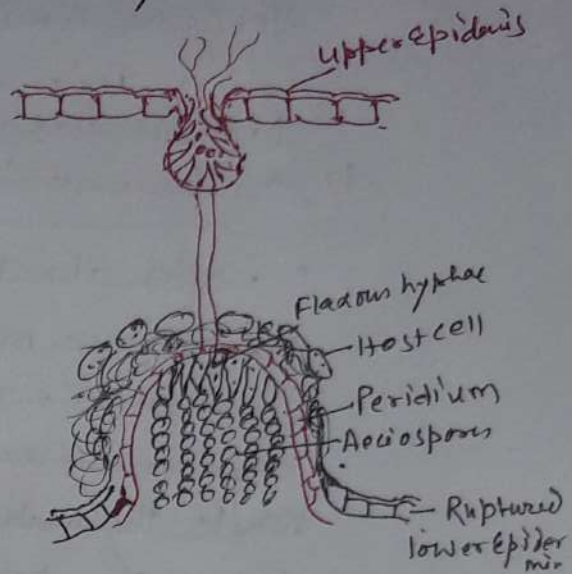


Fig. Section through Aecium showing Aeciospores.

* Economic Importance of Puccinia

Puccinia is a parasitic fungus which causes rust disease on many cereal crops. Different species of Puccinia causes different types of rust diseases. For example -

- i) Puccinia graminis tritici - Black rust - Wheat
- ii) P. glumarum - yellow rust - "
- iii) P. penicillata - Leaf rust - Bajra
- iv) P. graminis avenae - stem rust - oat

Due to such diseases farmers all over the world loose hundreds of tones of cereals every year. Thus it causes great loss to the nation.

(10)

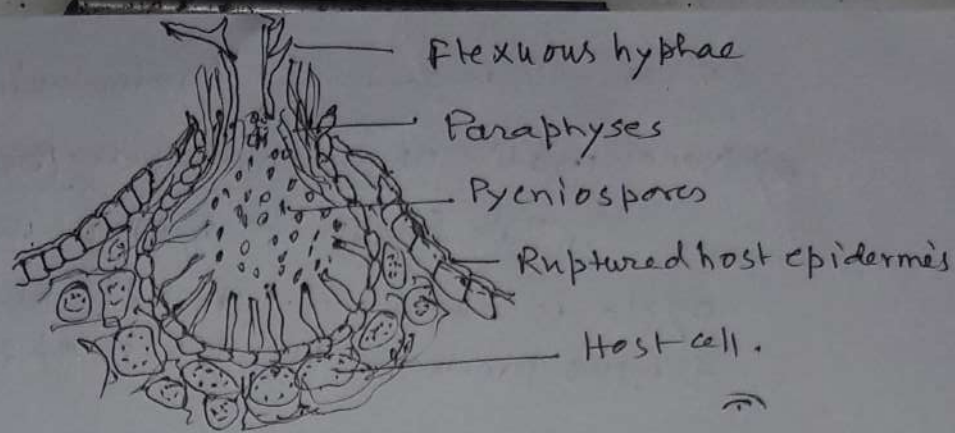


Fig. A section through Pycnium showing Pycniospores.

- At maturity of Pycnium, the nectar oozes out through the ostiole and hundreds of Pycniospores are released out. They are transferred by insects or other means to flexuous hyphae of opposite strain. Both fuse and form together leading to the dikaryotization.

b) Development of Aecia and Aeciospores:-

- As a result of the fusion of pycniospore and flexuous hyphae an aecial primordium is formed which develops into a cup-like ~~aecium~~ aecium on the under side of the barberry leaf. They are red or yellow in colour.
- Outer layer of the cup is made up of sterile tissues called Peridium. Flexuous hyphae develop from the base and produce aeciospores. At maturity the peridium ruptures and aeciospores are released from the aecium.
 - The liberated aeciospores are disseminated