

## ALGAE AND FLAGELLATE PROTOZOA CAUSING PLANT DISEASES

**Aim: To acquaint the students with algae and flagellate protozoa causing**

### **plant diseases Algae**

- Parasitic algae are green in colour.
- *Cephaleuros* is the best known genus, and is a plant parasite living under leaf cuticle.
- It was first reported from India in the 19<sup>th</sup> century, causing damage to tea and coffee plantations.
- Now, over 400 hosts of *Cephaleuros* are recorded all over the world infecting hibiscus, orchids, euphorbias, citrus and forest trees, and 90 percent of its hosts are dicot.
- *Cephaleuros* belongs to phylum *Chlorophyta*, class *Ulvophyceae*, order *Trentepohliales*, and family *Trentepohliaceae*.
- There are 13 species of *Cephaleuros*, but 6 are more common. These are: *C. expansa*, *C. henningsii*, *C. karstenii*, *C. minimus*, *C. parasiticus*, and *C. virescens*. Among these, *C. parasiticus* and *C. virescens* are most common and cause maximum damage.
- *C. virescens* causes **red rust** of tea and mango.

### **Red rust**

- Fluffy, bright-orange red spots occur on leaves and stems that look very much like rust fungi.
- *C. virescens* has the misleading common name ‘red rust’.
- Species of *Cephaleuros* have fungus-like filaments, sterile hairs and produce sporangiophores and zoosporangia on the lower surface of leaves that look like downy mildew fungi. Necrosis may be limited to the epidermis or spread into the deeper tissues of the leaves. Severe damage usually occurs on older leaves leading to defoliation.

### **Lichens**

- Fungi parasitize *Cephaleuros* to form **lichens**.
- The lichenized state of *C. virescens* is identified as *Strigula elegans*.

- Early literature suggests that the fungus portion of the lichen (mycobiont) was responsible for plant damage.
- Recent findings show that the fungus parasitizes the alga, not the plant. Plant injury is caused by the alga much before a fungus colonizes it.
- Management of algal infections includes:
  - i) Plant spacing and pruning to increase air circulation and light
  - ii) Sanitation
  - iii) Appropriate use of fertilizers and irrigation to promote plant growth.

**Algal spot of magnolia  
trunk**

**Lichen growing on apple tree**

### **Protozoa**

- Certain protozoa, such as trypanosomatid flagellates belonging to class *Mastigophora*, order *Kinetoplastida*, family *Trypanosomatidae* are accepted as plant parasites even though Koch's postulates could not be established for them.
- However, evidence supporting their pathogenicity is more evident than that available for the fastidious bacteria and mollicutes, and so they are accepted as plant pathogens.
- The protozoa as such may be living freely, or living symbiotically or as parasites subsisting on organisms such as algae, yeasts, bacteria and other protozoa.
- Only the flagellates among the protozoa have been found to be associated with plant diseases.

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