

# Eukaryotic microorganisms

Protozoa are simple unicellular animals which live in an aqueous environment such as pond or ditch water, sea or soil water. The majority are free living and harmless to man but a few species cause diseases.

Algae are simply-constructed plants, some of which are large (macroscopic), for example the large types of seaweed. Others are very tiny (microscopic) and are only visible under the microscope. All algae manufacture their own food by the process of photosynthesis.

Yeasts are single-celled organisms which can only be seen individually using a microscope, although a large mass of yeast cells can easily be seen with the naked eye. A few species are pathogenic – causing skin infections in man, others cause disease in plants. Yeasts are used in several industrial processes – in the making of beer, wines, spirits and bread – utilizing their ability to ferment sugars, to produce carbon dioxide and alcohol. Yeasts reproduce by a process known as ‘budding’.

Moulds, in contrast to yeasts and bacteria, can often be seen easily with the naked eye. The typical growth that they display is fluffy. In further contrast to bacteria and yeasts, moulds are multicellular.

Moulds are saprophytic organisms which break

down complex organic materials into simpler substances and in so doing contribute to the rotting of leaves and other material in the soil.

The same activity contributes to the widespread spoilage of foods, although in some cases mould growth in foods is sought, as when they are used in the ripening of cheeses such as Roquefort and Camembert. A further application of the biochemical activity of moulds is in the ability of some to produce antibiotics – notable among these is the *Penicillium* group of moulds.

A few moulds are pathogenic, causing diseases in plants and in man.

It is possible to see with the unaided eye that moulds are composed of many threads – the hyphae, the mass of which are known as the mycelium. The hyphae run over and through the medium on which the mould is growing, obtaining nourishment from it, although parts of some hyphae are primarily concerned with reproduction rather than feeding.

Moulds reproduce by the production of spores by asexual methods or by a mating process (sexual reproduction).

(from: Parry-Pawsey, *Principles of Microbiology for students of food technology*, Food & Nutrition Program)

## 1 Answer the following questions.

- a. Where do protozoa live?
- b. How do algae manufacture their food?
- c. What are some industrial processes which rely on the activity of yeasts?
- d. What is budding?
- e. When are moulds environmentally useful?
- f. Is mould activity in foods always harmful? If not, when is it useful?
- g. How are moulds employed by the pharmaceutical industry?
- h. What are hyphae?
- i. What is the mycelium?
- j. How do moulds reproduce?

2 Decide whether these statements are true or false and correct them if necessary.

- |   | T                        | F                        |
|---|--------------------------|--------------------------|
| a. Some protozoa are pathogenic.  | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Algae can only be seen using a microscope.   | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Individual yeast cells can be seen with the naked eye.   | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Most yeasts are useful, some are harmful.  | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Moulds are single-celled organisms.  | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Moulds of the <i>Penicillium</i> group are used in cheese making and in antibiotic production. | <input type="checkbox"/> | <input type="checkbox"/> |
| g. Hyphae have both nutritive and reproductive functions.   | <input type="checkbox"/> | <input type="checkbox"/> |