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Biology 102 assignment answers

Pharmacy

19/mhs11/028

1 The majority of grasses and trees require a mycorrhiza relationship with fungi to survive.

* Yeasts have been used for thousands of years in the production of beer, wine, and bread.
* Fungi not only directly produce substances that humans use as medicine, but they are also versatile tools in the vast field of medical research.
* Some fungi attack insects and, therefore, can be used as natural pesticides.

Although we often think of fungi as organisms that cause disease and rot food, fungi are important to human life on many levels. They influence the well-being of human populations on a large scale because they are part of the nutrient cycle in ecosystems. They also have other ecosystem uses, such as pesticides. Fungi figure prominently in the human diet. Morels, shiitake mushrooms, chanterelles, and truffles are considered delicacies. The meadow mushroom, Agaricus campestris, appears in many dishes. Molds of the genus Penicillium ripen many cheeses. They originate in the natural environment such as the caves of Roquefort, France, where wheels of sheep milk cheese are stacked to capture the molds responsible for the blue veins and pungent taste of the cheese. Many secondary metabolites of fungi are of great commercial importance. Fungi naturally produce antibiotics to kill or inhibit the growth of bacteria, limiting their competition in the natural environment. Important antibiotics, such as penicillin and the cephalosporins, can be isolated from fungi. Valuable drugs isolated from fungi include the immunosuppressant drug cyclosporine (which reduces the risk of rejection after organ transplant), the precursors of steroid hormones, and ergot alkaloids used to stop bleeding. Psilocybin is a compound found in fungi such as Psilocybe semilanceata and Gymnopilus junonius, which have been used for their hallucinogenic properties by various cultures for thousands of years.

As simple eukaryotic organisms, fungi are important model research organisms. Many advances in modern genetics were achieved by the use of the red bread mold Neurospora crassa. Additionally, many important genes originally discovered in S. cerevisiae served as a starting point in discovering analogous human genes. As a eukaryotic organism, the yeast cell produces and modifies proteins in a manner similar to human cells, as opposed to the bacterium Escherichia coli, which lacks the internal membrane structures and enzymes to tag proteins for export. This makes yeast a much better organism for use in recombinant DNA technology experiments. Like bacteria, yeasts grow easily in culture, have a short generation time, and are amenable to genetic modification.

2.Illustrate the cell structure of unicellular fungus with a well labeled diagram

**Answer**



**Cell Structure of a unicellular fungus**

1. First, two mating types of hyphae grow in the same medium.
2. A chemical interaction between them causes growth perpendicular to the hyphae in opposite directions, so they can meet with one another.
3. The growths are the delimited by a wall just so the nuclei are isolated in differentiated sex organs called gametangia (plural).
4. The gametangia fuse in a process called plasmogamy and together they form a zygote which may undergo dormancy for a period.
5. The nuclei in the zygote fuse in twos and undergo meiosis independently, it then moves on to germinating under favorable conditions so as to liberate haploid spores at maturity through the production of a fruiting.
6. In summary, sexual reproduction in fungi consists of three stages; plasmogamy, karogamy and meiosis.
7. Two adaptations made **the** move from water to land possible for **Bryophytes**: **a** waxy cuticle and gametangia. **The** waxy cuticle helped to protect **the** plants tissue from drying out and **the** gametangia provided further protection against drying out specifically for **the** plants gametes. Like the amphibians, the **Bryophytes** live on **land**, but are **not well adapted to life on land**. ... They are well suited to **life on land** because they are vascular plants. They have xylem and phloem to transport food and water long distances. Tracheophytes do not depend on water for reproduction. This absence of specialized tissues for transporting water and dissolved food throughout the organism limits terrestrial forms **to** being very short plants, since the only way **to move** substances through the plant body is by osmosis and diffusion from surface moisture.
8. Eustele: a stele typical of dicotyledonous plants that consists of vascular bundles of xylem and phloem strands with parenchymal cells between the bundles

Atactostele: **Atactostele** is a type of eustele, found in monocots, in which the vascular tissue in the stem exists as scattered bundles. ... The variation has numerous scattered bundles in the stem and is called as an **atactostele.**

**Siphonostle:**  A monostele  which appears in cross-section as 1 ring of phloem around the outside of the xylem and another around the inside of the xylem ring, but outside the pith. Compare ECTOPHLOIC **SIPHONOSTELE**. A Dictionary of Plant Sciences. × "**amphiphloic siphonostele.**

**Dictyostele**. : a stele in which the vascular cylinder is broken up into a longitudinal series or network of vascular strands around a central pith (as in many ferns)

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