SAPROPHYTISM

DEFINITION, EXAMPLES IN THE ENVIRONMENT AND IN MAN

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SAPROPHYTISM

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DEFINITION

SAPROPHYTISM: definition

What does saprophyte mean? It comes from two Greek words:

σαπρός (*saprós*) meaning "rotten"
φυτόν (*phytón*) meaning "plant"

Okay, imagine a rotten, dead plant.

Rotting plant

SAPROPHYTISM: definition

Soon it'll be teeming with microorganisms having a feast on all the organic material it was made of. This material will go through transformations, eventually becoming minerals and forming humus.

Rotting plant

SAPROPHYTISM: definition

So, we could easily associate the term saprophyte with decomposers. Decomposers are essential organisms in food chains because they can finally convert complex organic molecules, after passing through various trophic levels (from producers to different levels of consumers), into simpler compounds like water, carbon dioxide and mineral salts.

This is how the natural cycle of matter closes.

SAPROPHYTISM: definition

However, it would be wrong to associate saprophytes only with dead plant organisms. Saprophytes find their food source also on corpses, excrement, urine, milk, wine; wherever there's something to decompose.

Camel feces

SAPROPHYTISM: definition

In short, without their help, we would live on an unimaginable pile of waste.

SAPROPHYTISM: definition

And that's not all! Several saprophytic microorganisms are also known to be regular guests in our bodies (oral cavity, vagina, gastrointestinal tract, to name a few organs and systems). An example is Candida albicans.

Candida albicans under the microscope

SOME EXAMPLES

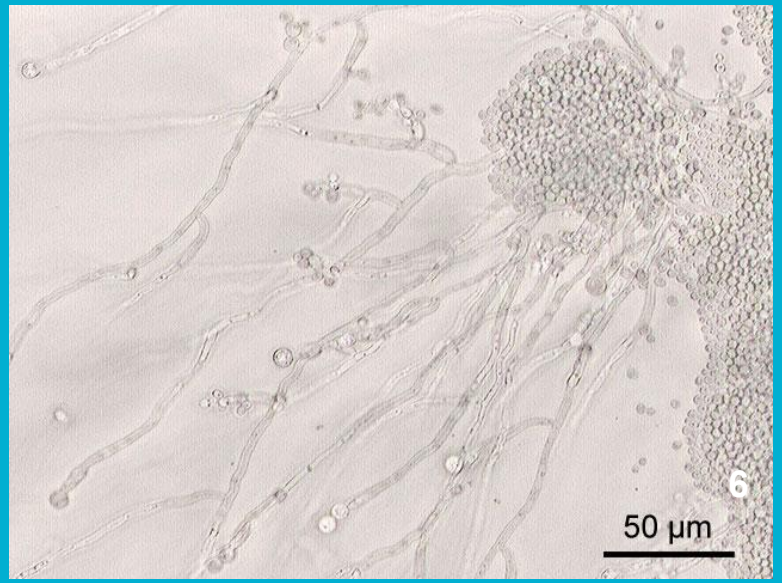
SAPROPHYTISM: Candida albicans

Let's start with Candida albicans. It's a fungus (Saccharomycetes family) that normally lives as a saprophyte in our oral cavity, gastrointestinal tract, and vagina.

Candida albicans under the microscope, isolated from sputum.

SAPROPHYTISM: Candida albicans

In cases of immunosuppression (e.g., terminal stages of HIV infection) or hormonal imbalances (women taking birth control pills), the fungus can become pathogenic (an example of **opportunism**), causing various infections.



Candida albicans under the microscope

SAPROPHYTISM: Candida albicans

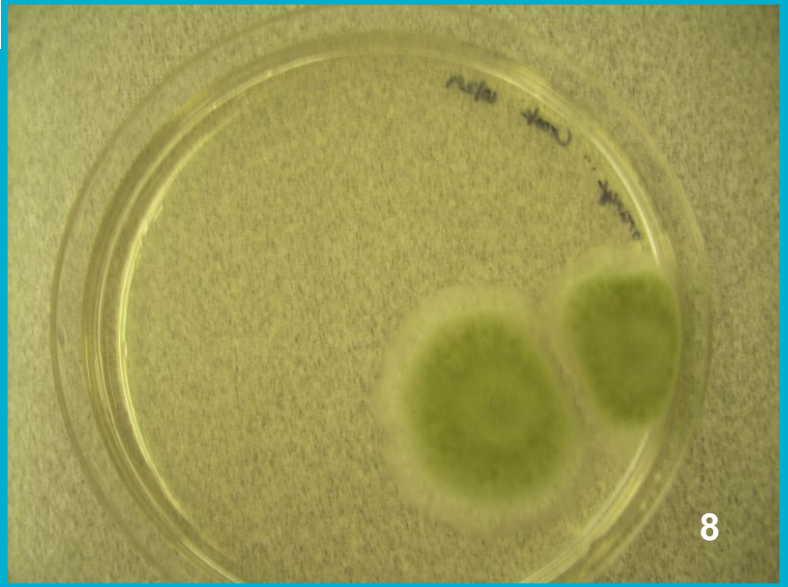
In the photo on the side you can see a plate in which Candida albicans has grown.

Regarding in vitro growth of bacteria and fungi you can find a reflection to do in the skills corner.

Colonies of Candida albicans on Sabouraud Agar

SAPROPHYTISM: Penicillium

Moulds such as Penicillium expansum and Penicillium crustaceum also belong to the kingdom of fungi, which are saprophytes normally present in soil. On the side, the photo of P. expansum obtained from an apple and grown on agar with the addition of potato infusion and dextrose.



Penicillium expansum

SAPROPHYTISM: Penicillium

But think carefully! While moulds of the genus Penicillium and other genera prefer organic substances, they can also become an economic problem for many crops and foods. Just think of grapes infested with mould even before the harvest.

Penicillium expansum

SAPROPHYTISM: Penicillium

And it doesn't end there! Penicillium expansum also produces patulin (a neurotoxin), a carcinogenic metabolite that should not be present in fruit juice, for example. Patulin is produced by the fungus when the host rots.

Penicillium expansum on a rotting pear

SAPROPHYTISM: putrefaction bacteria

Let's continue the examples with putrefaction bacteria.
Putrefaction is a fundamental aspect of decomposition because it allows the transformation of complex protein molecules normally produced by living beings into other much simpler and reusable molecules.
The main protagonists of putrefaction are obligate or facultative anaerobic bacteria.

SAPROPHYTISM: putrefaction bacteria

Among the products of putrefaction, we find a wide range of compounds, from indole to cresol, from skatole to various gases (which are responsible for the typical smell of the dead).

Operator studying the decomposition processes of a cow

SAPROPHYTISM: putrefaction bacteria

The decomposition and therefore also the putrefaction of corpses are studied very carefully in the USA, in the so-called "Body Farm" (Warning! the article contains photos that could be upsetting to some). Here, corpses are kept under observation for a long time. The main goals are to solve murders and identify bodies. The FBI works closely with these centres to train specialised personnel.

SAPROPHYTISM: putrefaction bacteria

But putrefaction also occurs in living organisms, carried out by saprophytes. For example, in the large intestine, where undigested protein substances are broken down. The products of this degradation generally do not cross the intestinal barrier. Another example of putrefaction is on the proteins of exfoliated cells, and many more could be made.
Why don't you try to find other examples?

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