

B: Sporocarp (Fruiting body) and spores :

In fungi, the sporocarp (also known as fruit body or fruitbody) is a multicellular structure on which spore-producing structures, such as basidia or asci, are borne.

The fruit body is part of the sexual phase of a fungal life cycle, with the rest of the life cycle being characterized by vegetative mycelial growth and asexual spore production. the sporocarp of a Basidiomycota is known as a basidiocarp or basidium, while the fruit body of an Ascomycota is known as an ascocarp.

Many shapes and morphologies are found in both basidiocarps and ascocarps: these features play an important role in the identification and taxonomy of fungi.

The sexual fruiting bodies are :

Basidium:

In fungi, a basidiocarp, basidium or basidioma (plural: basidiomata) is the sporocarp of a Basidiomycota, the multicellular structure on which the spore-producing hymenium is borne.

All basidiocarps serve as the structure on which the hymenium is produced.

Basidia are found on the surface of the hymenium, and the basidia ultimately produce spores. In its simplest form, a basidiocarp consists

of an undifferentiated fruiting structure with a hymenium on the surface; such a structure is characteristic of many simple jelly and club fungi.

In more complex basidiocarps, there is differentiation into a stipe, a pileus, and/or various types of hymenophores.

Apothecium:

is a wide, open, saucer-shaped or cup-shaped fruit body. It is sessile and fleshy.

The structure of the apothecium chiefly consists of three parts: hymenium (upper concave surface).

Cleistothecium :

is a globose, completely closed fruit body with no special opening to the outside. The ascomata wall is called peridium and typically consists of densely interwoven hyphae or pseudoparenchyma cells.

Gynoecium :

similar to a cleistothecium, a gynoecium is a completely enclosed structure containing globose or pear-shaped, deliquescent asci.

However, unlike the cleistothecium, the periodical wall of a gynoecium consists of a loosely woven "tuft" of hyphae, often ornamented with elaborate coils or spines. examples are the *Gymnoascus*, *Talaromyces* and the dermatophyte *Arthroderma*.

Perithecium:

a flask-shaped structure opening by a pore or ostiole (short papilla opening by a circular pore) through which the ascospores escape. The ostiolar canal may be lined by hair-like structures called paraphyses.

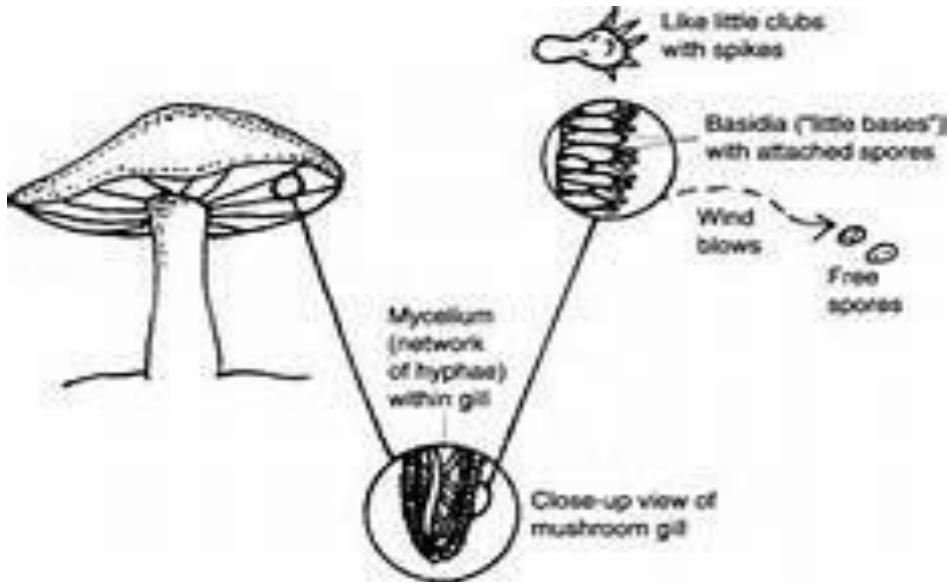
The unitunicate asci are usually cylindrical in shape, borne on a stipe (stalk), released from a pore, developed from the inner wall of the perithecium and arise from a basal plectenchyma-centrum.

Examples are members of Sphaeriales and Hypocreales. Perithecia are also found in *Xylaria* and *Nectria*.

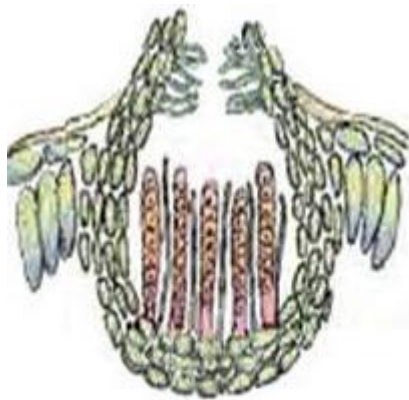
Pseudothecium (ascostroma):

This is similar to a perithecium, but the asci are not regularly organized into a hymenium and they are bitunicate, having a double wall that expands when it takes up water and shoots the enclosed spores out suddenly to disperse them.

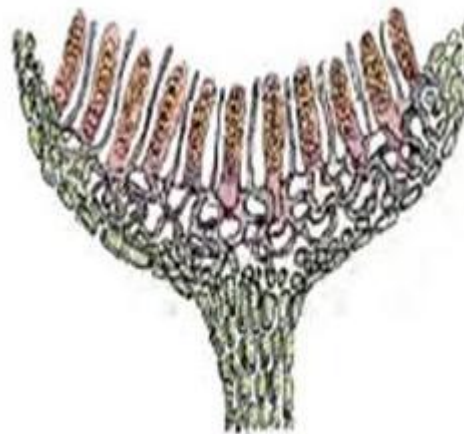
Example species are Apple scab (*Venturia inaequalis*) and the horse chestnut disease *Guignardia aesculi*.



Basidium



Perithecium



Apothecium



Naked asci



Cleistothecium

The sexual fruiting bodies In Ascomycota

In imperfect fungi (Deutromycetes), the Sporocarps are:

Pycnidium:

A flask-shaped, globose or oval-shaped structure that looks like a cleistothecium or a perithecium but has a cavity filled with conidiophores and conidia instead of asci- and ascospores and often identified incorrectly as an ascocarp.

Acervulus :

Functionally a structure similar to a pycnidium, but structurally different by being formed by hyphae of plant pathogenic fungi in association with plant tissue and often appears to be a pustule formed just under plant epidermis, which erupts and exudes conidia.

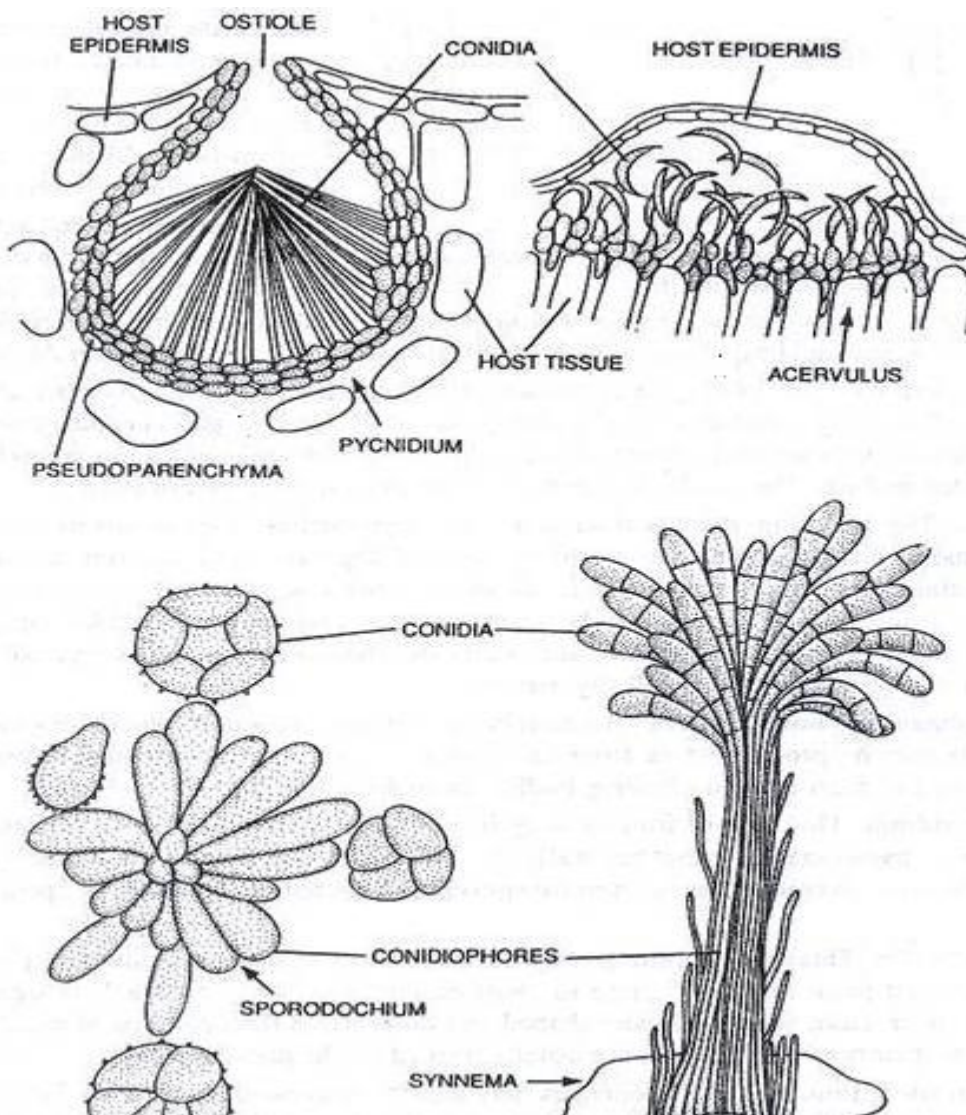
Sporodochium: the large mass of short conidiophores and hyphae which arise together from the surface of a structure (multihyphal aggregate) called a stroma (stromata).

A synnema :

(Derivation: Threads together) is a large, erect reproductive structure borne by some fungi, bearing compact conidiophores, which fuse together to form a strand resembling a stalk of wheat, with conidia at the end or on the edges, ex: *Aspergillus chelates*.

A Sporodochium:

Is a small, compact stroma (mass of hyphae) usually formed on host plants parasitized by mitosporic fungi of the form order Tuberculariales (subdivision Deuteromycota)? This stroma bears the conidiophores on which.



Sporocarps of imperfect fungi (Deuteromycetes)

Sporophores and Spores:

when the mycelium of a fungus reaches a certain stage of growth, it begins to produce spores either directly on the somatic hyphae or, more often, on special sporiferous (spore-producing) hyphae, which may be loosely arranged or grouped into intricate structures called fruiting bodies, or sporophores.

1- Asexual spores:- Which occurs by the process of mitosis. This is most common process by which spores are reproduced in fungi. There are four types of medically important:

a- Blastospores: The type of spore develop by budding.

b- Chlamydospores: In some fungi, the hyphal cell becomes specialized spore when the cell enlarged and develop thick walls.

c- Arthrospores: Other hyphal cells break apart and produce arthrospores. Fragmentation may also happen naturally by the action of wind, soil movement or insects.

d- Conidia: A conidium is produced on a specialized structure called conidiophore. A spore which is produced directly on hyphae or hyphal tips is called Aleuriospore when a fungus produces two sizes of aleuriospores :

The large one is called Macro- aleuriospore., The smaller one is called Micro- aleuriospore.

2- Sexual spores: Reproduce by meiosis.

a- Ascospores: Usually 4-8 spores found in a cell called ascus- asci.

b- Basidiospores: Usually 4- spores found in the surface of cell called basidium.

c- Zygosopores: Large-thick walled spore formed on hyphae.

d- Oospores: This type of spore formed inside the cell called Oogonium.

+ Microscopic features of spores(lecture 5).