

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 fruitbody 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 fruitbody 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).

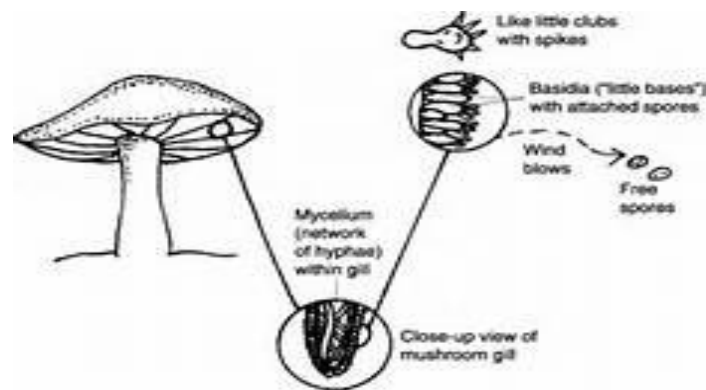
Cleistothecium : is a globose, completely closed fruit body with no special opening to the outside. The ascomatal wall is called peridium and typically consists of densely interwoven hyphae or pseudoparenchyma cells.

Gymnothecium : similar to a cleistothecium, a gymnothecium is a completely enclosed structure containing globose or pear-shaped, deliquescent asci. However, unlike the cleistothecium, the peridial wall of a gymnothecium consists of a loosely woven

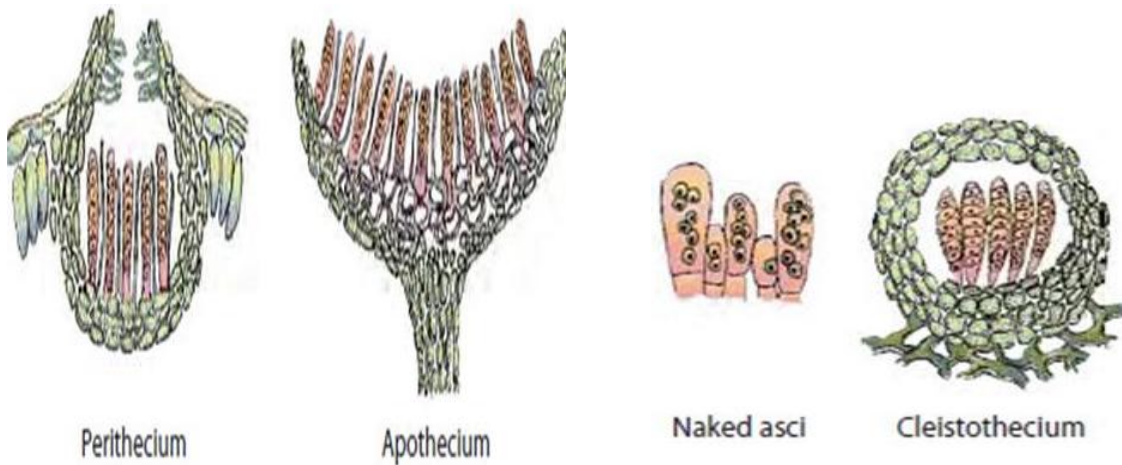
"tuft" of hyphae, often ornamented with elaborate coils or spines. examples are the *Gymnoascus*, *Talaromyces* and the dermatophyte *Arthroderma*.

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 periphyses. 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 organised 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



The sexual fruiting bodies In ascomycota

In imperfect fungi (Deutromycetes), the Sporocarps are:

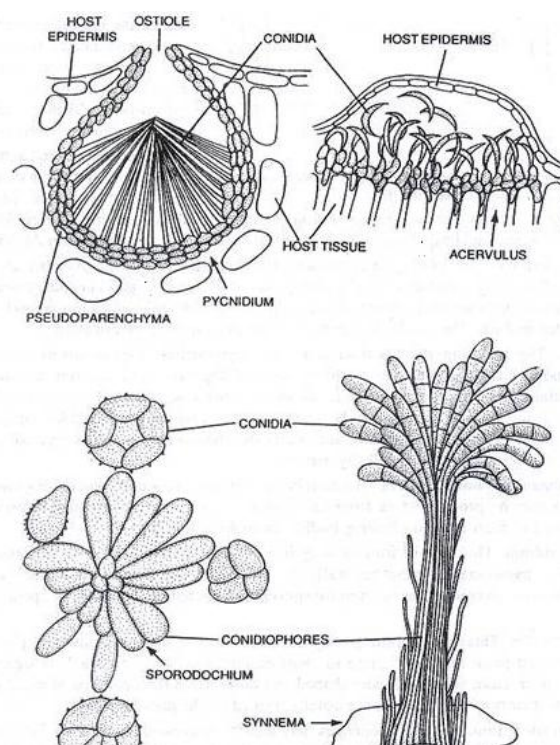
Pycnidium: a flask-shaped, globose or oval-shaped structure that looks like a cleistothecium or a perithecium but has a cavity filled with conidiophores and conidia instead of asci- and ascospores and often identified incorrectly as an ascocarp.

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: 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,^[1] which fuse together to form a strand resembling a stalk of wheat, with conidia at the end or on the edges, ex:

Aspergillus caelatus .

A **Sporodochium**: is a small, compact stroma (mass of hyphae) usually formed on host plants parasitised by mitosporic fungi of the form order Tuberculariales (sub - division 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- Chlamyospores: In some fungi the hyphal cell become 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 a hyphae or hyphal tips is called Aleuriospore, when a fungus produce two sizes of aleuriospores : The large one is called Macro-aleuriospore., The smaller one is called Micro-aleuriospore.

2- Sexual spores: Reproduce by meiosis

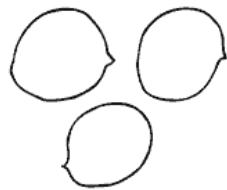
a- Ascospores: Usually 4-8 spores found in a cell called ascus- asci.

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

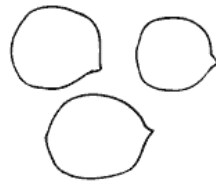
c- Zygosopores: Large-thick walled spore formed on hyphae.

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

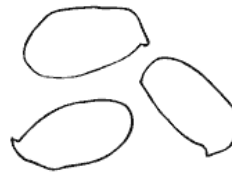
SPORES



Globose



Subglobose



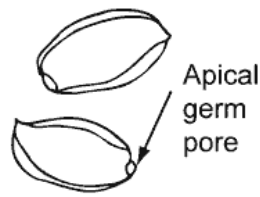
Elliptical



Oblong



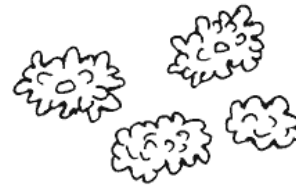
Subfusiform



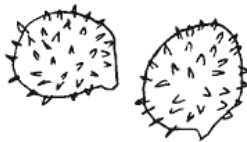
Thick walled with apical germ pore



Cylindric



Warted



Spiny



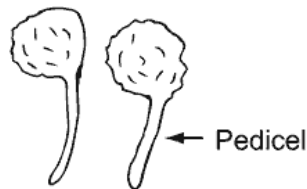
Wrinkled/rugose



Reticulate



Longitudinally striate



With a pedicel



Angular

Microscopic features of spores