

## Puff balls and stinkhorns:- Gasteromycetes

Spherical when immature.

Angiocarpic, i.e. ,the fruiting body is enclosed until the spores are mature.

Have a distinct outer wall or peridium.

Fertile portion of basidiocarp, the gleba, enclosed by the peridium until maturation.

Spores are produced on holobasidia.

Hymenium only visible in early stages of the fruit body development and is absent or indistinct at maturity.

Spores are not forcibly expelled from the basidia, but simply fall off the sterigmata.

Habitat:-Saprobic on soil, dead wood or dung.

Mostly epigeal.

Some are mycorrhizal.

A few are hypogean –false truffles.

### Orders within the Class

#### Phallales      Stinkhorns

These fungi have arms or stems bearing the spores in a gleba.

Young fruiting body is typically whitish and egg shaped .

The enlargement of the structures within the egg breaks the peridium and the spongy receptacle emerges carrying the gleba on the surface of the receptacle.

The “egg shell” remains in the soil as a volva.

#### Sclerodermatales

Hard skinned puffballs with Glebal cavities.

They lack an organised hymenium.

The tough peridium splits to allow the spores to disperse by wind.

Mature spores dark brown coloured.

This dispersal may occur weeks or months after the maturity of the spores.

*Pisolithus* sp mycorrhizal with eucalypts and pines.

Lycoperdales

Tulostomatales

Nidulariales

Hymenogastrales

#### Lycoperdales

Epigeal.

Glebal cavities are lined with a hymenium when young.

Two layered peridium.

Ostiole often present.

Spores khaki coloured.

#### Tulostomatales

Families

Calostomataceae:- single genus *Calostoma*

Tulostomataceae:- *Tulostoma* and *Batterrea*

Both families have the spore bearing body on a obvious stalk .

### **Nidulariales**

Basidiomata resemble birds' nests, 1 cm diameter.

Peridioles , containing the gleba, resemble eggs in the nest.

Peridioles are lentil shaped discs, 1 mm diameter.

The peridioles are dispensed by water splash.

A funiculus or cord attached to the peridiole attaches it to blades of grass.

Habitat ; on the ground in leaf litter, or old wood and dung.

### **Hymenogastrales** false truffles and pouch fungi

Basidiomata are hypogeous.

Compact gleba with many locules.

Fleshy with no true hymenium.

Many species previously in this order have been reclassified as they appear microscopically to be evolved from the gilled fungi or the Boletaceae.

### **Species Stinkhorns Phallales**

#### ***Aseroe rubra***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Phallales

**Fruit body.** This emerges from a white egg, The stem is white to pink with a spongy texture. At the top of the stem, six to eight lateral paired arms extend from a central disc with a central hole. An olive brown slimy foetid spore mass is present on the central disc. The arms and disc are bright red.

**Habitat.** On soil in sheltered spots.

#### ***Colus hirundinosis***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Phallales

**Fruit body.** Net-like red emerging from an "egg", 6-7 cm tall, the arms uniting at the apex and joining at the base to form a short tube-like stem.

The spore mass (gleba) is borne on the inner surface of the arms.

**Habitat.** On moist litter rich spoil.

### ***Ileodictyon cibarium***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Phallales

**Fruit body.** A spherical latticed globose fungus emerging from a white gelatinous egg, from which it detaches and can be blown around.

**The spores** are in the olive brown gleba on the inner surface of the lattice.

The gleba is slimy and has a foetid smell.

**Habitat.** On moist soil amongst the leaf litter

### ***Lysurus mokusin***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Phallales

**Fruit body.** Phallic fungus arising from a white gelatinous "egg". The stem is spongy, white to orange, angled, and up to 15 cm tall with 4-6 short orange arms at the summit bearing a foetid brownish spore mass.

**Habitat.** On humus enriched soil.

### ***Mutinus borneensis***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Phallales

**Fruit body.** Fragile phallic shaped fungus emerging from an egg-like sac on loose net-like rhizomorphs on leaf litter or dead wood. The "stem" is white to cream, and brownish orange near the tip, with a porous surface.

**Spores.** The gleba containing the spore mass is borne on the coloured tip of the stem.

### ***Phallus indusiatus***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Phallales

**Fruit body.** Phallic shaped fungus arising from a white gelatinous "egg". The spongy white stem has a reticulated top and is covered on the apex by a slimy olive brown foetid gleba containing the spores. A lacy white veil extends from beneath the cap to almost the ground .

**Habitat.** On moist soil in sheltered areas.

### ***Phallus multicolor***

prev. ***Dictyophora multicolor***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Phallales

**Fruit body.** Phallic shaped fungus arising from a white gelatinous "egg". The spongy pinkish stem has an orange reticulated top and is covered on the apex by a slimy olive brown foetid gleba containing the spores. A lacy orange veil extends from beneath the cap to almost the ground .

**Habitat.** On moist soil in sheltered areas.

### ***Phallus rubicundus***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Phallales

**Fruit body.**

Slender, orange to red spongy stem arising from "egg".

**Conical cap** on the apex has a foetid olive brown gelatinous gleba containing the spores.

**Habitat.** On soil.

### ***Pseudocolus fusiformis***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Phallales

**Fruit body.** Phallic shaped fungus arising from a white gelatinous "egg". The spongy pinkish stem has an orange reticulated top and is covered on the apex by a slimy olive brown foetid gleba containing the spores. A lacy orange veil extends from beneath the cap to almost the ground .

**Habitat.** On moist soil in sheltered areas.

## **Lycoperdales - Puffballs.**

### ***Calvatia sp.***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Lycoperdales

**Fruit body.** Globose puff ball. The peridium has a thin pale tan grainy surface. The gleba is white, becoming olive brown with age. The brown spores are released by the splitting and erosion of the peridial wall.

**Habitat.** On soil.

### ***Geastrum triplex***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Lycoperdales

**Fruit body.** Globose puff ball, with a 3 layered peridium, an outer layer or exoperidium , which splits into 5-8 tan to vinaceous coloured rays: an intermediate layer which splits to form a collar around the inner smooth peridium that encloses the gleba of brown spores. The inner peridial sack is cream to grey. The central stoma is surrounded by a fibrillose peristome on a depressed paler zone with a raised margin.

**Spores.** Rusty brown, ejected from the stoma.

**Habitat.** On soil amongst the leaf litter.

### ***Geastrum minimum***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Lycoperdales

- **Fruit body.** A small globose puffball, diameter to 2cm. Pale grey outer peridial wall divided into 6 rays, and slightly darker inner peridium containing the brown spores which are released through a central stoma.
- **Habitat.** On soil amongst leaf litter.

### ***Astraeus hygrometricus***

Division Eumycota .Subdivision Basidiomycotina, Class Gasteromycetes Order Lycoperdales

**Note.**This species is now placed in the Sclerodematales in its own monotypic genera, Asteraceae

**Fruit body.** Puffball with a central stoma . The outer peridium is divided into a number of creamy grey rays with fine lines. These rays open when moisture is present but close when the environment is dry.

**Spores .** Brown.

**Habitat.** On soil, often under exotic pines.

### ***Lycoperdon perlatum***

Division Eumycota Subdivision Basidiomycotina, Class Gasteromycetes Order Lycoperdales

**Fruit body.** Exoperidium has conspicuous spines surrounded by smaller warts. Spores are ejected through an apical pore.

**Spores.** Brown.

**Stem. Short** pseudostem.

**Habitat.** Gregarious on humus.

### ***Lycoperdon pyriforme***

Division Eumycota Subdivision Basidiomycotina, Class Gasteromycetes Order Lycoperdales

**Fruit body.** Covered with small, short, sharply pointed dark brown spines. Spores are ejected through an apical pore.

**Spores.** Brown,

**Stem.** Long pseudostem.

**Habitat.** Gregarious on damp leaf litter, or rotting logs.

### ***Morganella sp.***

Division Eumycota Subdivision Basidiomycotina, Class Gasteromycetes Order Lycoperdales

**Fruit body.** A puff ball with a central stoma, bluish smoky grey colour with small soft warts.

**Spores.** Brown.

**Habitat.** On dead wood.

### ***Pisolithus sp.***

#### **(Horse Dung Fungus)**

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Sclerodermatales

**Fruit body.** Globular to variable in shape, mottled brown and shiny.

**Spores.** Yellowish-brown, released from the splitting and eroding of the fruit body.

**Habitat.** On soil, often on road verges.

### ***Scleroderma sp.***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Sclerodermatales

**Fruit body.** Yellowish to rusty brown, mottled. The outer skin becomes cracked and then splits peeling back to expose the spore mass, which is dispersed by wind currents or disturbance.

**Spore mass.** Dark purplish brown.

**Habitat.** On soil, in clusters.

### ***Calostoma fuscum***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Tulostomatales

**Fruit body.** Puffball with a stout stem, the outer surface of the stem is lacunous with a gelatinous texture. The peridium is covered with a cap which falls off to expose the stoma through which the spores in the sac below are discharged on pressure.

**Habitat.** On damp soil.

### ***Tulostoma albicans***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Tulostomatales

**Fruit body.** Stalked puff ball, off white, thin, with collared ostiole. The stem is usually buried in the soil.

**Spore mass.** Light brown powdery.

**Habitat.** On soil.

### ***Cyathus stercoreus***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Nidulariales

**Fruit body.** Small cup shaped fungus. Reddish brown hairy outer cup surface, inner surface smooth and grey. The spores are contained in the smooth black lens shaped bodies inside the cup.

**Habitat.** On soil amongst leaf litter.

### ***Cyathus striatus***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Nidulariales

**Fruit body.** Small cup shaped fungus. Reddish brown hairy outer cup surface, inner surface striate and pale grey. The spores are contained in the smooth lens shaped bodies inside the cup.

**Habitat.** On soil amongst leaf litter, or on old wood

### ***Nidula emodensis***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Nidulariales

**Fruit body.** Small cup shaped fungus, with pale hairy outer surface, the inner surface is pale and smooth with a flared rim.. The spores are contained in the smooth brown lens shaped bodies inside the cup.

**Habitat.** On decaying wood.

### ***Zelleromyces australiensis***

Division Eumycota Subdivision Basidiomycotina Class Gasteromycetes Order Hymenogastrales

**Fruit body.** Small underground spherical stemless fruitbody, rusty brown to burnt orange colour. The interior is irregularly loculated , pale whitish cream in colour.

**Habitat.** In soil.

**Note.** Now classified in the Russulales.