



Hypomyces luteovirens (Fr.) Tul. & C. Tul.

Hypomyces and Allies: Group of parasitic fungi growing on gilled or poroid fungi. Their texture is moldy, feathery or powdery having the tendency to deform and cover the entire substrate, i.e., host fruiting body. Representative Indian genus is *Hypomyces*.



Suillus lariciphilus K. Das, D. Chakr., K.P.D. Latha & Cotter

Fleshy poroid Fungi (Boletes): Fruiting bodies with distinct cap, stalk and sponge-like tubes being ended in pores on the undersurface. Major Indian genera are *Boletus*, *Leccinum*, *Strobilomyces*, *Suillus* and *Tylopilus*.



Lycoperdon perlatum Pers.

Puffballs: Fruiting bodies are ball, balloon or pear-shaped to typically stalked with head in which fertile portion bears brownish black powdery sporemass dispersing at maturity by rupturing of pouch. Major Indian genera are *Bovista*, *Calvatia*, *Lycoperdon* and *Vascellum*. Mostly edible when young.



Xylaria polymorpha (Pers.) Grev.

Carbon and Cushion Fungi: Fruiting bodies may be fibrous tough, woody to powdery and found mostly at decaying woods. Fertile surface are finely rough as sandpaper. Major Indian genera are *Daldinia*, *Hypoxydon* and *Xylaria*.



Turbinellus floccosus (Schwein.) Earle ex Giachini & Castellano

Pseudogilled Fungi: Fruiting bodies are fleshy, funnel to glass-like and with distinct cap and stalk. Undersurface of cap is folded to form vein to gill-like structure or sometimes completely smooth. Major Indian genera are *Cantharellus*, *Craterellus* and *Turbinellus*.



Trichoglossum variabile (E.J. Durand) Nannf.

Tongue Fungi and Allies: Fruiting bodies are distinctly stalked and fertile apical part becomes flattened to form tongue shape. Grow on soil among litters. Major Indian genera are *Geoglossum*, *Spathularia* and *Trichoglossum*.

THREAT AND CONSERVATION

Fungi are highly potential but underexplored group and needs thorough documentation. Nevertheless they are facing serious threats due to destruction/alteration of habitats, urbanization, mining, construction of roads, transformation of forests to land for cultivation, overgrazing, industrialization and pollution. Natural factors like global warming, succession of host trees, forest fires, frequent landslides and avalanches are also responsible for the declination of different mushroom species. These species lost today might have food, medicinal and industrial values that are presently even unknown to mankind. Conserving the entire habitat in a sustainable manner is the exigency to protect these mycobiota. Developing new habitats by undertaking plantation of the suitable native ectomycorrhizal host trees may also attract a number of different mushrooms. It will be worth to mention that providing legal protection to some charismatic/flagship species will not only be helpful but also act as the symbol for adopting future conservation strategies to protect different kinds of species growing in a similar habitat.



Mycoleptodonoides sharmae K. Das, Stalpers & Stielow

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WILD MUSHROOMS OF INDIA



Amanita rubrovolvata S. Imai



Ganoderma lucidum (Curtis) P. Karst.



Chlorociboria aeruginascens (Nyl.) Kanouse ex
C.S. Ramamurthi, Korf & L.R. Batra



Borofutus dhakanus Hosen & Zhu L. Yang



Mutinus bambusinus (Zoll.) E. Fisch.



Microporus xanthopus (Fr.) Kuntze



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FUNGI AND THEIR IMPORTANCE

Fungi, one of the largest and dominant kingdoms in the world are represented by over 1,05,000 species and probably represent 3.1 to 5.1 million species with 60–80% still undescribed. They play major role as decomposers, mycorrhizal symbionts, essential parasitic and saprophytic associates in ecosystem function, protector against phytopathogens, food sources, agents causing food spoilages, sources of enzymes/drugs and agents of numerous diseases. They are immensely diverse in nature showing unicellular to multicellular filamentous forms and ranging from simple mycelia (moulds) to comparatively complex fruiting bodies (macrofungi/mushrooms and lichenized fungi). Based on the recent system of classification, fungi have seven recognized phyla, namely, Microsporidia, Chytridiomycota, Glomeromycota, Blastocladiomycota, Neocallimastigomycota, Ascomycota and Basidiomycota. In India, the fungi are represented by about 15,000 species.

WILD MUSHROOMS

Wild mushrooms/macrofungi, an artificial but convenient assemblage of those fungi whose fructifications/fruiting bodies are visible through naked eye. These fungi belong to two major phyla, viz., Ascomycota (with asci) and Basidiomycota (with basidia). In Ascomycota, Eurotiales, Rhytismatales, Helotiales, Pezizales and Xylariales are the major mushroom producing orders, whereas Tremellales, Dacrymycetales, Agaricales, Boletales, Geastrales, Gomphales, Phallales, Auriculariales, Cantharellales, Hymenochaetales, Polyporales, Russulales and Thelephorales are the major mushroom forming orders in Basidiomycota. For convenience, mushrooms can better be macromorphologically categorized into 17 major groups, viz., Gilled fungi (Agarics), Fleshy poroid fungi (Boletes), Woody poroid/Bracket fungi (Polypores), Tooth fungi, Cauliflower fungi, Coral fungi, Jelly fungi, Carbon and cushion fungi, Pseudo-gilled fungi, Crust fungi, Bird's nest fungi, Stinkhorns, Earthstars, Cup and saucer fungi, Hyphomyces and allies, Puffballs, Tongue fungi and allies. A number of mushrooms are appreciated by people from different parts of the world and taken with delicacy. Many of them are considered nutraceuticals. Effective nutraceuticals are also extracted from some of the mushrooms. But a few are poisonous.



Bondarzewia zonata K. Das, A. Parihar & Hembrom



Aleuria aurantia (Pers.) Fuckel

Cup and Saucer Fungi: Fruiting bodies are saucer to cup-shaped with leathery to spongy texture. Light facing surface remains smooth and fertile. Grow on wood, debris and soil. Important Indian genera are *Aleuria*, *Chlorociboria* and *Peziza*.



Nidula candida (Peck) V.S. White

Bird's nest Fungi: Fruiting bodies are cup-like, housing fertile egg shaped smooth peridioles in it. They are found on woods, dead branches and humus rich soil. Major Indian genera are *Cyathus* and *Nidula*.



Auricularia auricula-judae (Bull.) Quéf.

Jelly Fungi: Consistency of fruiting body is gelatinous having tendency to absorb enormous amount of moisture from environment. Usually grow on soil or wood. Some genera found in India are *Auricularia*, *Dacrymyces* and *Phlogiotis*. Some members of this group are edible.



Fomes fomentarius (L.) Fr.

Polypores (woody poroid/bracket Fungi): Fruiting bodies are woody to leathery and wood-inhabiting to cause rot. Shape may be spreading, projecting shelf-like to stalked with cap. Fertile surface remains poroid. Major Indian genera are *Fomes*, *Phellinus*, *Polyporus* and *Trametes*.



Calocera viscosa (Pers.) Fr.

Coral Fungi: Fruiting bodies are of two types: either unbranched appendages like erected worm or repeatedly branched from the base. Growing on wood and soil. Major Indian genera are *Calocera*, *Clavaria*, *Clavulinopsis* and *Ramaria*.



Astraeus hygrometricus (Pers.) Morgan

Earthstar Fungi: Fruiting bodies are ball-shaped; outer layer ruptures to form star-shaped structure while inner remains fertile globose pouch with apical opening that bears powdery sporemass. Grow on soil and debris. Major Indian genera are *Astraeus* and *Geastrum*.



Hericium cirrhatum (Pers.) Nikol.

Tooth Fungi: Fruiting bodies are similar to polypores but fertile surface modified into teeth or spines-like structure. Mostly found on wood, debris and soil. Major Indian genera are *Auriscalpium*, *Hericium* and *Hydnum*. Some are highly edible.



Gyromitra infula (Schaeff.) Quéf.

Saddles: Fruiting bodies are stalked, hollow and spongy with saddle-shaped to irregularly ridged cap. Grow on wood, debris and soil. Major Indian genera are *Gyromitra* and *Helvella*. Some members are poisonous.



Russula sharmae K. Das, Atri & Buyck

Gilled Fungi (Agarics): Fruiting bodies are fleshy in texture with distinct cap and stalk, underside of cap is folded to form gills. Major Indian genera are *Agaricus*, *Amanita*, *Macrolepiota*, *Russula*, etc. They are saprophytic, parasitic or ectomycorrhizal. Some are edible, few are poisonous.



Sparassis crispa (Wulfen) Fr.

Cauliflower Fungi: Fruiting bodies are rounded cauliflower or lettuce-like, surface remains smooth. Grow on the ground at the base of trees. In India it is represented by the genus *Sparassis*.



Phlebiopsis flavidoalba (Cooke) Hjortstam

Crust Fungi and Allies: Fruiting bodies are hard, thin, spreading, crust-like, flat, projecting shelf-like caps. Fertile surface may be rough, warted, wrinkled, cracked, toothed or smooth but never poroid. Major Indian genera are *Hymenochaete*, *Phlebiopsis*, *Porostereum* and *Scytinostroma*. They mainly cause different types of rots in wood.



Phallus atrovolutus Kreisel & Calonge

Stinkhorns: Fruiting bodies are stalked; fertile part is gelatinous greyish brown gleba with distinct foul smell attracting insects for dispersion of spores. Mainly grow on soil among litters. Major Indian genera are *Mutinus* and *Phallus*.