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Check List of Fungi in Bangladesh: [Lower Fungi]

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Abstract

A check list of the members of Chytridiomycetes, Zygomycetes and Oomycetes upto species has been provided which were previously reported in Bangladesh. A systematic arrangement of 40 species in 16 genera belonging to 3 classes, 5 orders and 13 families has been presented.

Chytridiomycetes and Zygomycetes are lower fungi defined as a fungus with hyphae absent or rudimentary and nonseptate (coenocytic). In the lower fungi, the asexual spores are contained in sac-like structures known as sporangia and the spores are referred to as sporangiospores. In some of the more simple water molds, the organisms do not produce mycelia; instead, they produce a system of fine, branched threads known as rhizoids that are used to anchor them to the solid substrate. Chytridiomycetes is a class of fungi, members are found in soil, fresh water, and saline estuaries. They are primitive fungi and the major class of the phylum Chytridiomycota which contains a number of parasitic species. At least two species in this class are known to infect a number of amphibian species (Taylor et al. 1992). Zygomycota is a phylum of fungi. Zygomycetes are usually fast growing fungi characterized by primitive coenocytic (mostly aseptate) hyphae, forming septa only where gametes are formed or to wall off. Asexual spores include chlamydoconidia, conidia and sporangiospores contained in sporangia borne on simple or branched sporangiophores. Sexual reproduction is isogamous producing a thick-walled sexual resting spore called a zygospore. They are mostly terrestrial in habitat, living in soil or on decaying plant or animal material. Some of them are parasites of plants, insects and small animals while others form symbiotic relationships with plants. Some members posses rhizoids. According to Pre-Whittaker (1969) fungal classification, lower fungi were placed under class Phycomycetes (Barnett and Hunter. 2000).

The Oomycetes, also known as water molds, are a large group of terrestrial and aquatic eukaryotic organisms. Although they superficially resemble fungi in mycelial growth and mode of nutrition, molecular studies and distinct morphological characteristics place them in the kingdom Chromalveolata (phylum Heterokontophyta, the 'Stramenopiles') with brown and golden algae and diatoms. Although Oomycetes have previously been referred to as lower fungi but they differ from other fungi in several features.

Cell walls contain cellulose, beta glucans, and the amino acid hydroxyproline, but do not contain chitin which occurs in the cell walls of true fungi. The vegetative state of Oomycetes is diploid, whereas true fungi are haploid or dikaryotic. Oomycetes produce hyphae that are nonseptate (coenocytic), i.e. lacking in cross walls. Asexual reproduction occurs in most Oomycetes by the formation of a structure called a sporangium (pl. sporangia) that arises on a specialized hypha termed a sporangiophore. Sporangia differ among various Oomycetes pathogens with respect to the shape of the

sporangium, its mode of germination, the location of sporangia with respect to the host tissue and the structure of the sporangiophores. In *Aphanomyces*, sporangia are filamentous and resemble to vegetative hyphae.

The family Pythiaceae contains obligate and nonobligate parasites, including the important pathogenic genera *Pythium* and *Phytophthora*. *Pythium* species cause a variety of diseases including root rots of numerous plant species, Pythium blight of turf and damping-off which involves seed rot and pre- and post-emergence seedling death. *Phytophthora* species cause late blight of potato and tomato, foliar blights on peppers and cucurbits.

The family Albuginaceae includes *Albugo*, an obligate parasite that produces a generally mild disease called white rust (not a true rust) on the stems, leaves and fruit of cruciferous plants such as radish, horseradish and several weed species.

All the works and reports on fungi which have been published so far from Bangladesh starting from 1967 to date are listed here and are arranged systematically according to their taxonomic position.

Phylum Chytridiomycota

Class Chytridiomycetes

Order - Chytridiales		Family	Habitat	Reference
1.	*Synchytrium collapsum* Syd	Synchaytriaceae	On *Clerodendron viscosum*	Ishaque and Talukder, 1967
2.	*Synchytrium endobioticum* (Schilb.) Percival	Synchaytriaceae	On *Solanum tuberosum*	Dastogeer, 2013
Order - Blastocladiales				
3.	*Physoderma maydis* Miyabe	Physodermataceae	On *Zea mays* L.	Talukder, 1974

Phylum Zygomycota

Class Zygomycetes

Order - Mortierellales		Family	Habitat	Reference
4.	*Mortierella spinosa* Linnem.	Mortierellaceae	Soil or contaminated food	Siddiqui 2007
5.	*M. subtillissima* Oudeman	Mortierellaceae	Rice straw, soil	Siddiqui 2007
Order - Mucorales				
6.	*Choaenophora cucurbitarum*	Choanephoraceae	On *Capsicum annum*	Talukder 1974
7.	*Choaenophora infundibulifera*	Choanephoraceae	On *Hibiscus rosa-sinensis*	Talukder 1974
8.	*Cunnighamella bertholletiae* Stadel	Cunnighamellaceae	On contaminated stored food	Talukder 1974
9.	*C. verticillata* Paine	Cunnighamellaceae	On stored grains	Hosain 2007
10.	*Mucor circinelloides*Tiegh.	Mucoraceae	*Arthrospira platensis*	Kibria *et al.* (Nordstedt) Gomont 2016
11.	*M. hiemalis* Wehmer	Mucoraceae	*Arthrospira platensis*	Kibria *et al.* (Nordstedt) Gomont 2016
12.	*Mucor microsporus* Namyowska	Mucoraceae	on *Triticum aestivum*	Talukder 1974
13.	*Mucor pusillus* Lindt	Mucoraceae	on *Triticum aestivum*	Talukder 1974
14.	*Rhizopus atrocarpi* Racib.	Mucoraceae	On *Atrocurpus heterophyllus* Lan	Talukder 1974

15.	*R. oryzae* Went & Prins. Geerl	Mucoraceae	On *Gossypium hirsutum* L.	Talukder 1974
16.	*R. nigricans* Ehrenb	Mucoraceae	On *Zea mays* L.	Talukder 1974
17.	*R. stolonifer* (Ehrenb.: Fr.) Vuill.	Mucoraceae	On *Zea mays* L.	Talukder 1974
18.	*Syncephalastrum racemosus (Cohn)* Schroeter	Syncephallastraceae	Soil and dung	Azad and Shamsi, 2011

Phylum Oomycota

Class Oomycetes

Order - Saprolegiales		Family	Habitat	Reference
19.	*Albugo candida* (Pers.) Kuntz	Albuginaceae	On *Brassica campestris*	Talukder 1974
20.	*Aphanomyces* sp.	Leptolegniaceae	associated with ulcer type disease of fishes.	Siddique *et al.* 2009
21.	*Aphanomyces invedan*s	Leptolegniaceae	water	Siddique *et al.* 2009
22.	*Branchiomyces* sp.	Not assigned	associated with gill rot of fishes	Siddique *et al.* 2009
23.	*Saprolegnia* sp.	Saprolegniaceae	associated with gill rot of fishes	Siddique *et al.* 2009

Phyllum Oomycota

Class Oomycetes

Order - Peronosporales		Family	Habitat	Reference
24.	*Bremia lactucae*	Pernosporaceae	On *Lactuca sativa*	Talukder,1974
25.	*Perenosporales destructor*	Pernosporaceae	On *Allium cepa* L.	Talukder,1974
26.	*Perenosporales prasitica* (Pers.) Fr.	Pernosporaceae	On *Brassica oleracea*	Talukder,1974
27.	*Perenosporales trifoliorum*	Pernosporaceae	On *Glycine max* Merr.	Talukder,1974
28.	*Perenosporales viciae (*Berk.) de Bary	Pernosporaceae	On *Pisum sativum* L.	Talukder,1974
29.	*Pseudoperonospora cubensis* (Berk. et Cert.) Rost	Pernosporaceae	On *Luffa acutangula* Robx.	Talukder,1974
30.	*Phytophthora arecae*	Pernosporaceae	On *Areca catechu* L.	Talukder,1974
31.	*Phytophthora colocasiae*	Pernosporaceae	On *Colocasia esculenta*	Talukder,1974
32.	*Phytophthora infestans* (Mont.) de Bary	Pernosporaceae	On *Solanum tuberosum*	Talukder,1974
33.	*Phytophthora meadii* McRae	Pernosporaceae	On *Hevea brasiliensis*	Talukder,1974
34.	*Phytophthora palmivora* (Butler) Butler	Pernosporaceae	On *Cocos nucifera* L.	Talukder,1974
35.	*Phytophthora parasitica* Dastur	Pernosporaceae	On *Ricinus communis*	Talukder,1974
36.	*Phytophthora* sp.	Pernosporaceae	On *Ananas sativus* L.	Talukder,1974
37.	*Pythium aphanidermatum* (Edson) Fitzp.	Pythiaceae	On *Lagenaria valgaris*	Talukder,1974
38.	*Pythium debaryanum* R. Hesse	Pythiaceae		Talukder,1974

39.	*Pythium ultimatum*	Pythiaceae	On *Zea mays* L.	Talukder,1974
40.	*Pythium* sp.	Pythiaceae	On *Nicotinia tobacum*	Talukder,1974

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