

REPORT: SOME NOTEWORTHY FUNGI OF BURMA

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Abstract

The records include 55 spp. of fungi in 11 taxonomic classes. Collections are held in Herb. IMI and UC (= LAM) and cultures of yeasts in Food Technology Section of State Research Institute, Rangoon, Burma.

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Introduction

This report refreshes and resurrects groups of fungi that have fallen behind in the passage of time. They are a minority that refuses to be consigned to the archive of mycohistory without proper representation. They are diverse in form and function, disparate in location and vocation, but similar in a desire for a note and probe. They are among plant and insect killers, soil dwellers and food spoilers of Burma. These fungi are therefore annotated, updated and enumerated hereunder in eleven taxonomic classes.

Herbarium acronyms are taken from the Index Herbariorum database (<http://sciweb.nybg.org/science2/IndexHerbariorum.asp>), author abbreviations for plant names from the IPNI database (http://www.ipni.org/ipni/plantname_search.do) and fungus names from the Index Fungorum database (<http://www.indexfungorum.org/Names/Names.asp>).

1. Dothideomycetes

1. ***Aphanostigma solani*** Syd. on *Magnolia grandiflora* L., Botanical Garden, Maymyo, 16-iv-1980 (LAM 220918). **Note:** A loculoascomyce with very small ascomata about 37-40 µm in diam., bearing hyphal hairs and immature bitunicate asci and ascospores, occurring as a saprophyte or a leaf hair parasite. Cf. ***Nematostoma parasiticum*** (R. Hartig) M.E. Barr.

2. Blastocladiomycetes

1. ***Allomyces arbusculus*** E.J. Butler 1911 as '*arbuscula*' in soil from a pond in Rangoon (Rhind & Seth 1945).
2. ***Allomyces cystogenus*** R. Emers. 1941 in soil from a pond in Rangoon (Rhind & Seth 1945).
3. ***Allomyces javanicus*** Kniep 1929 in soil from a pond in Rangoon (Rhind & Seth 1945).

3. Chytridiomycetes

1. ***Synchytrium australe*** Speg. 1881 on *Gossypium neglectum* Tod. var. *burmanica*, Monywe village near Monywa, 20-i-1974 (IMI 182572).
2. ***Synchytrium piperi*** Mundk. & Mhatre 1945 on *Piper betle* L., Madaya, 1-ii-1973 (IMI 179288); Thandaung, near Yawnshwe, S.S.S., 1-v-1974 (IMI 185236). **Note:** dense, amber-coloured bodies inside epidermal cells –resting stage.
3. ***Synchytrium ?macrosporum*** Karling on *Eucalyptus tereticornis*, Nandayan Plantation, Katha, 15-ix-1973 (IMI 179298); *Eugenia* sp., Tuntse (Shwebo District), 2-ii-1972 (IMI 172448).
4. ***Synchytrium*** sp. in leaves of *Vitis carnosia* Wall. (galls and resting sporangia), Mandalay, 2-x-1979 (LAM

220748a); *Bixa orellana* L., Rangoon, 30-i-1975 (IMI 192818).

4. Laboulbeniomyces

1. ***Clematomyces pinophili*** Thaxt. 1900 on the inferior surface of *Pinopilus* sp., Burma (Rhind & Seth 1945).
2. ***Laboulbenia crassipes*** Speg. on elytrae of *Orechtochilus lucidus*, Tenasserim Division (Butler & Bisby 1931).
3. ***Laboulbenia euschizomeri*** Speg. on coleoptera beetle, *Euschizomerus aenus* Chaudoir 1869, Tikela, Burma (Butler & Bisby 1931, Rhind & Seth (1945).
4. ***Laboulbenia orechtochili*** Thaxt. 1902 on the margin of elytrae of coleoptera waterbeetles, *Orechtochilus typus*, Tenasserim Division (Rhind & Seth 1945).
5. ***Laboulbenia orechtochilicola*** Speg. on coleoptera waterbeetles, *Orechtochilus feae*, Tenasserim Division (Butler & Bisby 1931, Rhind & Seth 1945).

5. Myxomycetes

1. ***Arcyria umbrina*** Fr. {? Schumach. 1803}, Pellowa (*Pa-let-wa*), Evergreen Forests, Tonkyeghat (*Toung-chay-gut*), Pegu, No.2626, collected by Mr. Wilhelm Sulpiz Kurz in 1864-1866 (Currey 1875). Note: this record precedes and thereby supersedes the report of myxomycetes being discovered for the first time for and in Burma by Reynolds and Alexopoulos in 1971 and Thaug in 1978 (Thaug 2007).

6. Oomycetes

1. ***Albugo achyranthis*** (Henn.) Miyabe 1935 on *Achyranthes aspera* L., Mandalay, 1-vii-1975 (IMI 199732).
2. ***Albugo bliti*** (Biv.) Kuntze 1891 (≡ *Cystopus bliti* (Biv.) de Bary) on *Achyranthes aspera* L., Mandalay, 7-vi-1973 (IMI 176165); *A. blitus* L., Meiktila, 1-x-1971 (IMI 160472); *Amaranthus* sp., Bogyokeze Bazaar, Rangoon, 3-iii-1978 (LAM 220349), Moulmein (Rhind & Seth

1945); *Digera arvensis* Forsk., Mandalay, 7-vi-1973 (IMI 176167); Burma (Butler & Bisby 1931).

3. ***Albugo candida*** (Pers.) Kuntze 1891 (≡ *Cystopus candidus* (Pers.) Lév. 1847) on leaves of *Brassica campestris* L., Maymyo (Rhind & Seth 1945).
4. ***Albugo ipomoeae-panduratae*** (Schwein.) Swingle 1892 (≡ *Cystopus ipomoeae-panduratae* (Schwein.) Stev. & Swingle 1889) on *Ipomoea ?bona-nox* L., Pyinmana, 10-xii-1977 (LAM 220350); *I. reniformis* Choisy, Mandalay, 4-ix-1972 (IMI 169359); 7-vi-1973 (IMI 176166); (Rhind & Seth 1945); *I. reptans* Poir, Mandalay, 20-ix-1971 (IMI 160353); Mandalay, 2-vii-1975 (IMI 199733); *Merremia chrysoides* (Ker) Hallier f., Mandalay, 25-xi-1971 (IMI 163858).
5. ***Albugo platensis*** (Speg.) Swingle 1894 on *Boerhavia diffusa* L., Mandalay, 2-vii-1975 (IMI 199734).
6. ***Albugo portulacae*** (DC. ex Duby) Kuntze 1891 (≡ *Cystopus portulacae* (DC. ex Duby) Lév. 1847) on leaves of *Portulaca quadrifida* L., Bassein (Butler & Bisby 1931, Rhind & Seth 1945).
7. ***Hyaloperonospora brassicae*** (Gäum.) Göker, Voglmayr, Riethm., Weiss & Oberw. 2003 (≡ *Peronospora brassicae* Gäum. 1918) on leaves and fruits of *Brassica campestris* L., Amarapura (Rhind & Seth 1945).
8. ***Peronospora farinosa*** (Fr.) Fr.1849 (≡ *Peronospora effusa* (Grev.) Rabenh. 1854) on leaves of *Chenopodium album* L., Myingyan ((Butler & Bisby 1931, Rhind & Seth 1945).
9. ***Phytophthora colocasiae*** Racib. 1900 on *Colocasia antiquorum* Schott, Tavoy, *Colocasia* sp., Rangoon, 21-vii-1979 (LAM 220552), and causing foot rot of *Piper betel* L.in Madaya and Kume (Rhind & Seth 1945); Burma (Butler & Bisby 1931).
10. ***Phytophthora infestans*** (Mont.) de Bary 1876 on *Lycopersicum esculentum* Mill. and *Solanum tuberosum* L., Amarapura (Rhind & Seth 1945), and

Shan States. Note: late blight due to this fungus is the single most serious biological constraint to potato production and annually occurring, affecting primarily the summer crop during July to September in the Shan Hills.

11. ***Phytophthora meadii*** McRae 1918 on pod, leaf, tapping panel and twigs of *Hevea brasiliensis* (Willd. ex A. Juss.) Müll.Arg. in Burma, and also seen on *Cocoa* pods at Mudon, causing black thread/stripe on tapping panel and twigs and abnormal leaf fall of rubber (Butler 1918, Dastur 1916a, 1916b, McRae 1918, Turner & Myint 1980); Burma (Stamps, 1985).
12. ***Phytophthora nicotianae*** Breda de Haan 1896 (\equiv *Phytophthora nicotianae* var. *parasitica* (Dastur) G.M. Waterh. 1963) on *Nicotiana tabacum* L., causing black shank in Burma (Thaung 1970, Waterhouse & Waterston 1964a).
13. ***Phytophthora palmivora*** (E.J. Butler) E.J. Butler 1919 (\equiv *Phytophthora arecae* (L.C. Coleman) Pethybr. 1913, *P. faberi* Maubl. 1909) on *Areca catechu* L. mainly in the Irawaddy delta and coastal strips (Thaung 1970); leaves, twigs, and fruits of *Hevea brasiliensis* (Willd. ex A. Juss.) Müll.Arg., Thaton, Moulmein and Tavoy (Rhind 1926) and perhaps on fruits of *Carica papaya* L., Hawbi (Butler & Bisby 1931). Note: leaf-fall of rubber in both Burma and South India is due to *P. meadii* and not to *P. palmivora* (Butler & Bisby 1931, Dastur 1916b). However, leaf-fall and pod-rot could also be attributed to combined attacks by both *P. palmivora* and *P. botryosa* Chee 1969 as in neighboring Thailand and northern part of Peninsular Malaysia.
14. ***Plasmopara viticola*** (Berk. & M.A. Curtis) Berl. & De Toni 1888 on *Vitis vinifera* L., Mandalay (Rhind & Seth 1945).
15. ***Pseudoperonospora cubensis*** (Berk. & M.A. Curtis) Rostovzev 1903 on *Citrullus vulgaris* Schrad., Hlegu, 14-ii-1980 (LAM 220851a); *Lagenaria vulgaris* Ser. Amarapura (Rhind & Seth 1945); *Luffa acutangula* Roxb., Semegon, 10-i-1978 (LAM220551).

16. ***Pythium aphanidermatum*** (Edson) Fitzp. 1923 on seedlings of *Nicotiana tabacum* L., Mandalay and rhizomes of *Zingiber officinale* Rosc., Moulmein (Rhind & Seth 1945).

17. ***Pythium debaryanum*** R. Hesse 1874 causing damping-off of *Nicotiana tabacum* L. in nursery, Shangalekyun, Amarapura.

18. ***Pythium insidiosum*** De Cock, L. Mend., A.A. Padhye, Ajello & Kaufman 1987 on *Homo sapiens* in Burma (Spencer 2004).

7. Saccharomycetes

1. ***Candida guilliermondii*** (Castell) Langeron & Guerra 1938 from fermented rice, Rangoon, 0-iv-1973. (L.R. de Miranda, pers. comm., 18-ii-1977).

2. ***Candida krusei*** (Castell) Berkhout. 1923 from fermented rice, Rangoon and Belugyun, 0-iii-1973, 0-v-1973.

3. ***Candida parapsilosis*** (Ashford) Langeron & Talice 1932 from fermented rice, Rangoon, 0-iv-1973.

4. ***Candida saitoana*** Nakase & M. Suzuki 1985 (\equiv *Torulopsis candida* (Saito) Lodder 1934) from fermented rice, Rangoon, 0 Jan 1973.

5. ***Debaryomyces hansenii*** (Zopf) Lodder & Kreger 1952 from fermented rice, Rangoon, 0-i-1973.

6. ***Hansenula anomala* f. *anomala*** (E.C. Hansen) Syd. & P. Syd. 1919 from fermented rice, Pyinmana, 0-iii-1973.

7. ***Pichia myanmarensis*** Nagats., H. Kawas. & Tats. Seki 2005, isolated from palm sugar on the floor of a storage room in a rum distillery in Mandalay, Myanmar, in 2000 (the type strain M21^T (=NBRC 11090^T=JCM 12922^T=CBS 9786^T) per Nagatsuka *et al.* (2005).

8. ***Saccharomyces cerevisiae*** Meyen ex E.C. Hansen 1883 from fermented rice, Rangoon, 0-iii-1973.

9. ***Saccharomyces italicus*** T. Castelli 1939 from fermented rice, Rangoon, 0-v-1973.
10. ***Saccharomyces uvarum*** Beij. 1898 from fermented rice, Rangoon, 0-iv-1973.
11. ***Eremothecium coryli*** (Peglion) Kurtzman 1995 (≡ *Nematospora coryli* Peglion 1901) in young fruits of *Abutilon indicum* (L.) Sweet, Mandalay and in unripe bolls of *Gossypium hirsutum* L. and *G. neglectum* Tod., Mandalay (Rhind & Seth 1945). Note: the fungus follows attack by red cotton bug *Dysdercus eingulatus*.
12. ***Eremothecium gossypii*** (S.F. Ashby & W. Nowell) Kurtzman 1995 (≡ *Nematospora gossypii* S.F. Ashby & W. Nowell 1926) in young fruits of *Abutilon indicum* (L.) Sweet, in unripe bolls of *Gossypium hirsutum* L. and *G. neglectum* Tod., Mandalay; *Hibiscus cannabinus* L., *H. panduriformis* Burm. f., and *H. sabdariffa* L., Mandalay (Rhind & Seth 1945); Burma (Mukerji 1968b). Note: the fungus follows attack by red cotton bug *Dysdercus eingulatus*.
13. ***Eremothecium*** (≡ *Nematospora*) sp in fruits of *Citrus nobilis*, Hsipaw (Rhind & Seth 1945).

8. Sordariomycetes

1. ***Chaetomium indicum*** Corda on decayed paper, Moulmein, Tanasserim Division (Butler & Bisby 1931, Rhind & Seth 1945).
2. ***Chaetomium*** spp. on *Annona squamosa* L., Kyaukme, N.S.S., 20-i-1978 (LAM 220418a); *Sorghum vulgare* Pers., Kyaiklut, 12-xii-1977 (LAM 220422); on dried fruits of *Theobroma cacao* L., Mudon Farm, 11-xii-1977 (LAM 220330a).
3. ***Neocosmospora vasinfecta*** E.F. Smith 1899 on roots of *Cicer arietinum* L., Padu (Rhind & Seth 1945).

9. Urediniomycetes

1. ***Macabuna thaungae*** Buriticá & J.F. Hennen 1994 on *Heterophragma*

sulfureum Kurz, Burma (Buriticá & Hennen 1994, Buriticá 1999).

10. Zygomycetes

1. ***Choanephora cucurbitarum*** (Berk. & Ravenel) Thaxt. 1903 on flowers of *Capsicum annuum* L., Mandalay (Rhind & Seth 1945).
2. ***Choanephora infundibulifera*** (Currey) D.D. Cunn. 1891 on flowers of *Hibiscus rosa-sinensis* L., Mandalay (Rhind & Seth 1945).
3. ***Rhizopus oryzae*** Went & Prins. Geerl. 1895 in culture -(IMI 193705); mixed with dried yeast culture, Rangoon, 0-vi-1974 (IMI 205491); Moulmein, 0-vi-1974 (IMI 205492); Pyinmana, 0-vii-1974 (IMI 205493); rice bran, Rangoon, 0-vii-1974 (IMI 205494); bread, Rangoon, 0-vii-1974 (IMI 205495); rice cake, Rangoon, 0-vii-1974 (IMI 205495).
4. ***Rhizopus stolonifer*** var. *stolonifer* (Ehrenb. ex Fr.) Vuill 1902 (≡ *Rhizopus artocarpus* Racib. 1900, *Rhizopus nigricans* Ehrenb. 1821) on fruits of *Artocarpus integrifolia* L.f. (fruit-rot), Rangoon, 16-x-1979 (LAM 220664); *Artocarpus integra* Merr., and from soil, Mandalay (Rhind & Seth 1945); post-harvest fruits of *Ficus carica* L., Rangoon, 27-v-1979 (LAM 220488); mixed with dried yeast culture, 0-v-1974 (IMI 205490).

11. Incertae sedis

1. ***Chaetotrichum pterocauli*** Petrak 1956 as '*pterocaulonis*', on *Pterocaulon cylindrostachyum* Clarke, Sagaing, 25-xi-1971 (IMI 162854).
2. ***Pseudoschizothyra thaungii*** Punith. 1979 on leaves of *Bambusa*, Maymyo, 20-i-1974 (IMI 185673a) and *Bambusa ?polymorpha* Munro, Zayatgyi, 20-xi-1973 (IMI 180790) in Burma (Punithalingam & Sharma 1979).

These fungi are distinct and worthy of note based overall on their rarity, paucity, individuality, diversity of habitat and activity as they are found here in Burma.

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