

## FUNGAL RECORDS ON *MORUS* SPECIES FROM PAKISTAN

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### ABSTRACT

Eighty two (82) fungi comprised of sixty (60) genera have been reported on *Morus* species from Pakistan. This fungal list also include addition of twelve species of fungi on *Morus alba* from the area.

**Key-words:** *Morus* species, Mulberry, fungi, Faisalabad, Pakistan.

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### INTRODUCTION

*Morus alba* (Mulberry) belongs to family *Moraceae* and is a native plant of China. Four species of *Morus* are reported from Pakistan. *M. alba* is cultivated throughout the Pakistan. *M. nigra* is the most widely cultivated species after *M. alba*. *M. macroura* (syn. *M. laevigata*) is cultivated in Punjab (Rawalpindi and Lahore), and often grafted on *M. alba*. *M. serrata* is frequently cultivated on higher altitudes, (Ghafoor, 1985).

The leaves of *Morus alba* are well-known as food for the silk-producing larvae. Other plant parts are used in making textiles, paper, pesticides, furniture, musical instruments, sculptures and medicines. The pollen grain of *Morus nigra* L. causing allergic asthma in Islamabad and its vicinity, that is why its cultivation is banned in Islamabad area.

#### Kingdom: Protista

#### Phylum: Myxomycota

#### Class: Myxomycetes

*Physarella oblonga* Berk. & M.A. Curtis Morgan (1896), [RSD]; Physaraceae (B & C). Morgan.

On bark of *Morus alba* from Sangla Hill (Lodhi, 1951; Ahmad, 1956).

*Reticularia lycoperdon* Bull., *Hist. Champ. France* (Paris) **1**: 95 (1791) Bull.

On hollow trunk of *Morus alba*, from Balakot (Lodhi, 1951; Ahmad, 1956, Ahmad *et al.*, 1997).

#### Phylum: Ascomycota

#### Class: Ascomycetes

*Botryosphaeria dothidea* (Moug.) Ces. & De Not., *Comm. Soc. crittog. Ital.* **1**(4): 212 (1863) (Moug. ex Fries) Les. & de Not.

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1956, 1972b, 1978a).

*Cryptovalsa mori* (Nitschke) Vassiljeva

On dead branches of *Morus alba*, from Changa Manga, Lahore; (Ahmad, 1962, 1978a).

*Cryptovalsa nitschkei* Fuckel,

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1978a; Khan, 1989).

*Cryptovalsa rabenhorstii* (Nitschke) Sacc., (1882) (Nitschke) Sacc.

On dead branches of *Morus alba*, from Rasul Head works, Daphar plantation; (Ahmad, 1978a).

*Eutypella iranica* Petrak in *Sydowia*, **18** (1964) p. 366 (1965)

On twigs (die back) of *Morus alba*, from Changa Manga; (Ahmad, 1972b; Ahmad *et al.*, 1997).

*Eutypella russodes* (Berk. & Broome) Berl., *Icon. fung.* (Abellini) **3**: 54 (1902) (Berk. & Br.) Berl.

On twigs (die back) of *Morus alba*, from Changa Manga, Lahore, Sargoda, Bhalwal, Kharian, Ladhar, Sheikhpura; very common in the area (Ahmad, 1962, 1969a; 1978a, Khan, 1989).

*Hercospora ahmadii* Petrak in *Sydowia* **21**, (1967) p. 231. 1968.

On branches of *Morus alba*, from W. Pakistan, Changa Manga; (Petrak, 1967; Ahmad, 1972b, 1978a, Ahmad *et al.*, 1997).

*Hypoxylon hypomiltum* Mont.

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1956, 1978a; Khan, 1989).

*Massaria epileuca* (Berk & Curt.) Winter.

On dead branches of *Morus alba*, from Ladhar, Changa Manga, Chicha Watni; (Ahmad, 1956; 1978b; Ahmad and Arshad, 1972a; Whemeyer and Ahmad, 1964).

***Massaria mori*** Miyake.

On dead twigs of *Morus alba*, from Pakistan; (Mirza *et al.*, 1965).

***Massarina polymorpha*** (Rehm) Sacc.

On branches of *Morus alba*, from Lahore; (Ahmad, 1978b; Ahmad *et al.*, 1997).

***Nectria sanguinea*** Pers. ex Fr.

On twigs (canker) of *Morus alba*, from Changa Manga; (Ahmad 1956; Khan, 1989)

***Nodulisporium gregarium*** (Berk. & Curtis) Mey.

From Changa Manga; (Ahmad, 1962, 1969a; Khan, 1998; Ahmad *et al.*, 1997)

***Phyllactinia corylea*** (Pers.) Karast.

On leaves (Powdery mildew) of *Morus alba*, from Lahore, Peshawar, Abtabad, Gujranwala, Faisalabad, Choa Siadan Shaha, Tandojam, and Haiderabad; (Khan and Kamal, 1968; Ahmad *et al.*, 1997)

***Pleospora intermedia*** Speg.

On leaves (leaf rust) of *Morus alba*, from Pakistan; (Khan, 1989).

***Rosellinia aquila*** (Fr.) De Not.

On dead branches of *Morus alba*, from Sheikhpura, Changa Manga Hassan abdal, Choa Saidan Shah; very common (Khan, 1989).

***Thyridaria cajugae*** Rehm.,

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1962, 1969a; 1978a; Khan, 1989; Ahmad *et al.*, 1997).

***Valsella moricola*** Ahmad in Sydowia

On branches (canker) of *Morus alba*, from Shadra, Lahore, Changa Mangha (Ahmad, 1948, 1956; Khan, 1989; Ahmad *et al.*, 1997).

***Xylaria hypoxylon*** L. ex Grev.

On stumps and logs of *Morus alba*, from Changa Manga; (Ahmad, 1956; Mirza and Qureshi, 1978; Khan, 1989; Ahmad *et al.*, 1997).

***Xylaria polymorpha*** (Pers. Ex St.Amans) Grev.

On roots (root rot) of *Morus alba*, from Murree Hills; (Khan, 1960, 1989).

### **Phylum: Basidiomycota**

#### **Class: Basidiomycetes**

***Aecidium mori*** (Barclay) Syd. & Butler.

On leaves (leaf Rust) of *Morus alba* and *Morus serrate*, from Mahandri (Kaghan valley); (Ahmad, 1969a; Khan, 1952, 1954; Khan, 1989; Ahmad *et al.*, 1997).

***Fomes conchatus*** (Pers. ex Fr.) Gill.

On stem (White wood rot) of *Morus* sp., from Punjab, Azad Kashmir; (Khan, 1952, 1960)

***Fomes ignarius*** (L. ex Fr.) Kickx.

On stem (White wood rot) of *Morus* sp., from Punjab; (Khan, 1952, 1960).

***Fomes lividus*** (Kalchbr. ex Cooke) Sacc.

On wood (White spongy rot) of *Morus alba*, from Punjab; (Khan, 1960).

***Ganoderma applanatum*** (Pers. ex Wahlr) Pat.

On stem (Heart rot) of *Morus alba*, from Changa Manga, Sialkot, Sangla Hill, Rawalpindi; (Ahmad, 1956, 1972a; Khan, 1952).

***Ganoderma lucidum*** (Leyss ex Fr.) Karast.

On the base of trees of *Morus alba*, from Lahore, Sialkot, Gujranwala, Sangla Hill, Changa Manga; (Ahmad, 1956).

***Ganoderma* sp.**

At the base of the main stem of *Morus alba*, from Gatwala Faisalabad; (Qureshi and Ahmad, 971).

***Irpex flavus*** Klotzsch.

On logs of *Morus alba*, from Changa Manga; (Ahmad, 1956, 1972b).

***Lenzites adusta*** Masee.

On stem (wood rot) of *Morus alba*, from Changa Manga; (Ahmad, 1956, 1967, 1969a, 1972a; Ahmad *et al.*, 1997) Ahmad (1967).

***Lenzites platyphyla*** Lev.

On logs of *Morus alba*, from Changa Manga; (Ahmad, 1967, 1969a, 1972a).

***Lentinus strigosus*** (Schw) Fr.

On trunk of *Morus alba*, from Changa Manga; (Ahmad, 1962).

***Lopharia fulva*** (Lev.) Boidin,

On dead branches of *Morus alba*, from Changa Manga, Kaghan; (Ahmad, 1956).

***Marasmiium griseovilloaceus*** petch.

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1962).

***Pistillaria filiformis*** Corner.

On fallen leaves. of *Morus alba*, from Changa Manga; (Ahmad, 1972a).

***Phellinus lividus*** (Kalchbr. ex Cooke).

On living tree of *Morus alba*, from Lahore, Changa Manga; (Ahmad, 1972a).

***Podoscypha pealodes* ssp. *rosulata*** Reid, Beith, Z.Nova.

On dead wood of *Morus alba*, from Cnanga Manga, Sheikhpura (Ladhar); (Ahmad 1967, 1969a, 1972a; Khan, 1989; Ahmad *et al.*, 1997).

***Polyporus adustus*** (Willd.) Fr.

On bark (Wood rot) of *Morus alba*, from Changa Manga; (Ahmad, 1956; Khan, 1989).

***Polyporus hispidus*** Bull. ex Fr.

On bark (Wood rot) of *Morus alba*, from Balakot (Ahmad, 1956; Quraishi and Jamal, 1972; Beg, 1973; Beg and Jamal, 1974; Khan, 1989).

***Polysticuts hirsutus*** Wulf ex Fr.

On dead wood (Wood rot) of *Morus alba*, from Changa Manga; (Ahmad, 1956).

***Polysticuts proteus*** Berk.

On dead wood (Wood rot) of *Morus alba*, from Sialkot, Sangla Hill, Changa Manga, Lahore; (Ahmad, 1956; Khan, 1952).

***Poria versipora*** (Pers.) Romell,

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1962, 1969a, 1972a, Ahmad *et al.*, 1997)

***Rigidoporus microporus*** (Sw.) Overem.

On bark of *Morus alba*, from Changa Manga; (Ahmad, 1980).

***Rigidoporus vinetus*** (Berk.) Ryvarden.

On stump (wood rot) of *Morus alba*, from Changa Manga, Chicha Watni; (Ahmad and Arshad, 1982).

***Stereum schomburzkii*** Berk.

On stump (wood rot) of *Morus alba*, from Changa Manga; (Ahmad, 1956; Khan, 1989).

***Trametes cingulata*** Berk.

On logs of *Morus alba*, from Lahore, Changa Manga., (Ahmad, 1969a, 1972a; Ahmad *et al.*, 1997).

***Trametes corrugata*** (Pers. ex Fr.) Bres.

On logs and stumps of *Morus alba*, from Changa Manga, Zafarwal; (Ahmad, 1969a, 1967, 1972a; Ahmad *et al.*, 1997)

***Trametes lactinea*** (Berk.) Sacc.

On logs (wood rot) of *Morus alba*, from Gujrat, Chicha Watni; (Khan, 1952; Ahmad, 1956, 1972a).

**Phylum: Ascomycota****Class: Deuteromycetes (Asexual state of Ascomycota and some Basidiomycota)****Hyphomycetes*****Cercospora mori*** Hara, Jou.

On leaves (Leaf spot) of *Morus alba*, from Faisalabad; (Ahmad, 1969a).

***Cercospora moricola*** Cooke, Rev.

On leaves (Leaf spot) of *Morus alba*, from Karachi; (Ghaffar and Kafi, 1968, Ghafoor and Khan 1976, 1969a; Ahmad *et al.*, 1997; Khan, 1989).

***Cercospora snelliana*** Richert.

On leaves (Leaf spot) of *Morus alba*, from Lahore, Faisalabad; (Ahmad, 1962; Khan and Kamal, 1963, 1968).

***Cladosporium mori*** Syd.

On *Morus alba*, from Quetta; (Malik and Virk, 1968).

***Clasterosporium mori*** Syd.

On leaves (Leaf spot) of *Morus alba*, from Changa Manga, Sangla hill, Sialkot; (Ahmad, 1956).

***Dictyosporium toruloides*** (Corda) Gueg.

On dead branches of *Morus alba*, from Changa Manga Ghoragali; (Ahmad, 1962, 1969a)

***Fusarium lateritium*** Nees.

On roots of *Morus alba*, from Hyderabad; (Mirza, Kafi and Huqee, 1965).

***Hansfordia ugandensis*** Hughes.

On leaves of *Morus alba*, from Changa Manga; (Ahmad, 1962, 1969a; Khan and Kamal, 1968).

***Memnoniella subsimplex*** (Cooke) Deight.

On the bark of stem of *Morus alba*, from Changa Manga; (Qureshi and Ahmad, 1971).

***Stilbella proliferans*** Stevens.

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1969a).

***Torula herbarum*** (Pers.) Fr. F. *quetetnrla* Sacc.

On dead branches of *Morus alba*, from Bhagat, Faisalabad; (Qureshi and Ahmad, 1971).

***Tricosporium masseei*** Sacc.

On the bark of *Morus alba*, from Changa Manga; (Ahmad, 1956).

***Trimatosporium* sp.**

On branches and bark of stem of *Morus alba*, from Changa Manga; (Qureshi and Ahmad, 1971).

**Coelomycetes*****Aplosporella mori*** (Berl.) Petr & Sd.

(As *Haplosporella mori*) On dead branches of *Morus alba*, from Pirawala; (Qureshi and Ahmad, 1971; Khan, 1989)

***Aplosporella moricola*** Berl. (as *Haplosporella moricola*)

On dead branches of *Morus alba*, from Lahore; (Ahmad, 1956, 1969a; Khan, 1989).

***Botryodiplodia anceps*** Sacc. & Syd.

On dead branches of *Morus alba*, from Changa Mang, DaulatalamKachai; (Ahmad, 1956, 1962; Ahmad and Arshad, 1972a).

***Camarosporium passerini*** Sacc.

On leaves (Leaf spot) of *Morus alba*, from Kohat; (Ahmad, 1968, 1969a; Khan, 1989).

***Coniocyrtium foedens*** Sacc.

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1963, 1969a).

***Coniothyrium murorum*** Briosi & Farn.

On branches of *Morus alba*, from Daulatala, Karachi and Kohat; (Ahmad and Arshad, 1972a).

***Coniothyrium olivaceum*** Bon. Apud. Fuuckl.,

On dead branches of *Morus alba*, from Changa Manga; (Qureshi and Ahmad, 1971).

***Coryneum mori*** Nomura.

On twigs (twig and girdling) of *Morus alba*, from Karachi; (Khan, 1955; Ahmad *et al.*, 1997).

***Cytospora atra*** (Bonrd.) Sacc.

On *Morus serrate*, from Kohat, Chikar and Muzaffarabad; (Ahmad, 1964, 1969a; Ahmad and Arshad, 1972a)

***Dichomera moricola*** Ahmad & Arshad, *Biologia* **18** (2): 115 (1972).

On branches of *Morus alba*, from Kohat; (Ahmad & Arshad, 1972b, Ahmad *et al.*, 1997).

***Diplodia mori*** Wested.

On dead branches of *Morus alba*. from Wazirabad, Lahore, Ladhar (Shiekhupora), Kohat, Rawalpindi; (Ahmad, 1951, 1956, 1962, 1967; Ahmad and Arshad, 1972a; Khan, 1989; Ahmad *et al.*, 1997).

***Diplodia natalensis*** Pole-Evans.

On dead branches of *Morus alba*, from Lahore; (Ahmad, 1962, 1969a)

***Dothiorella berengeriana*** Sacc.

On bark (canker) of *Morus alba*, from Changa Manga; (Ahmad, 1956, Ahmad and Arshad, 1972a; Khan, 1989; Ahmad *et al.*, 1997).

***Hendersonula toruloidea*** Nattrass.

On twigs (twig and girdling) of *Morus alba*, from Khanewal, Chichawatni, Changa Manga; On *Morus alba* die back disease in Sindh and Punjab (Khanewal, Lahore) Faisalabad; (Khan, 1955, 1956, 1959, 1989; Qureshi and Ahmad, 1971; Beg and Jamal, 1974).

***Lasiodiplodia undulata*** (Pat.) Abass, Sutton, Ghaffar and Abbas.

(as *Botryodiplodia theobromae*)

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1962; Ahmad *et al.*, 1997; Khan, 1989).

***Phoma cicatricula*** Briosi & Farneti.

On dead branches of *Morus alba*, from Changa Manga; (Ahmad, 1969a; Ahmad and Arshad, 1972a; Khan, 1989).

***Phomopsis moricola*** Grove.

On dead branches of *Morus alba*, from Charsadda; (Ahmad and Arshad, 1972; Khan, 1989).

*Phomopsis salmalica* Khan.

On dead branches of *Morus alba*, from Chichawatni; (Khan 1961; Qureshi and Ahmad, 1971).

On dead branches of *Morus alba*, from Charsadda; (Ahmad and Arshad, 1972a).

*Septogloeum mori* (Lev.) Broisi & Cav.

On leaves (Leaf rust) of *Morus alba*, from Punjab; (Khan, 1955, 1989, Ahmad *et al.*, 1997).

*Sphaeropsis tumefaciens* Hedges & L. S.

On dead branches of *Morus alba*, from Changa Manga, Lahore; (Ahmad, 1963, 1969a; Khan, 1989).

Table 1. Fungal records on *Morus* species from Pakistan.

Name of Taxa	No of Genera and their %	No of Species and their %
Myxomycetes	02 = 03.33	02 = 02.44
Ascomycetes	15 = 25.00	20 = 24.39
Basidiomycetes	17 = 28.34	27 = 32.93
Deuteromycetes	26 = 43.33	33 = 40.24
Total :	60 =100.00	82 =100.00
Subdistribution Of Deuteromycetes		
Coelomycetes	15 = 25.00	20 = 24.39
Hyphomycetes	11 =18.33	13 = 15.85
Total :	26 = 43.33	33 = 40.24

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