

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.

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, 1971).

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 griseovillaceus* 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. quetetrilla* 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).

***Coniotyrium 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

REFERENCES

- Ahmad, S. (1948). Fungi of Pakistan- I. *Sydowia* 2 (1–6): 72-79.
- Ahmad, S. (1951). Fungi of Pakistan. III. *Sydowia* 5: 390-395.
- Ahmad, S. (1956). Fungi of Pakistan *Biol. Soc. Pak. Lahore, Monogr.* 1: 1-126.
- Ahmad, S. (1960). Further Contributions to the fungi of Pakistan. II. *Biologia*, 6:117-136.
- Ahmad, S. (1962). Further Contributions to the fungi of Pakistan. II. *Biologia*, 8: 123-150.
- Ahmad, S. (1963). Further Contribution to the Fungi of Pakistan. III. *Biologia*, 9:43-68.
- Ahmad, S. (1964). Contribution to the fungi of Pakistan V. *Biologia*, 10: 89-98.
- Ahmad, S. (1967). Contribution to the Fungi of Pakistan.VI. *Biologia*, 13: 15-42.
- Ahmad, S. (1968). Contribution to the fungi of Pakistan.VII. *Biologia*, 14: 1-11.
- Ahmad, S. (1969a). Fungi of Pakistan. *Biol. Soc. Pak. Lahore, Monogr.* 5. pp: 110.
- Ahmad, S. (1969b). Contribution to the Fungi of Pakistan. IX. *Biologia*, 15: 1-10.
- Ahmad, S. (1971). Contribution to the Fungi of Pakistan XI. *Biologia*, 17: 67-85.
- Ahmad, S. (1972a). Basidiomycetes of Pakistan *Biol. Soc. Pakistan, Monogr.* 6. pp: 141.
- Ahmad, S. (1972b). Contribution to the Fungi of Pakistan. XIII. *Biologia*, 18: 1-6.
- Ahmad, S. (1978a). Ascomycetes of Pakistan.*Biol. Society of Pakistan, Monogr.* 7 pp: 236.
- Ahmad, S. (1978b). Ascomycetes of Pakistan. *Biol. Society of Pakistan, Monogr.* 8 pp: 144.
- Ahmad, S. (1980). Contribution to the fungi of Pakistan. XIX. *Bull. Mycol.* 1 (1): 27-32.
- Ahmad, S. and M. Arshad (1972a). Contributions to the fungi of Pakistan. XII. *Biologia*, 18 (1): 7-17
- Ahmad, S. and M. Arshad (1972). Contribution to the fungi of Pakistan. X. *Biologia* 18:113-119.
- Ahmad, S. and M. Arshad (1982). Contribution to the Fungi of Pakistan XX. *Bull. Mycol.* 2: 79-86.
- Ahmad, S., S. H. Iqbal and A. N. Khalid (1997). *Fungi of Pakistan*. Sultan Ahmad Mycological Society of Pakistan, Dept. of Botany, Univ. of the Punjab. pp: 248.
- Beg, A. R. (1973). Survey of Diseases of conifers and selected hardwoods in Pakistan. *Ann. Tech. Rept. Pak. For. Inst.* PL-480 Proj: 1/17-FS-15.
- Beg, A. and S. M. Jamal (1974). Survey of Diseases of conifers and selected hardwoods *Ann. Tech. Rept. Pak. For. Inst.* PL-480 Proj: A/17-FS-15. Pak. Forest Inst. Pp: 20 – 22.
- Beg, A. R., M. Ahmad, S. Hussain and M. Shah (1974). Records of some higher fungi in West Pakistan. *Pak. J. For.* 24, 2:120-136.
- Ellis, M. B. (1971). *Dematiaceous Hyphomycetes* (CAB, IMI) pp: 608.
- Ellis, M. B. (1976). *More Dematiaceous Hyphomycetes* (CAB, IMI) pp: 507
- Ghaffar, A. and A. Kafi (1968). Fungi of Karachi. *Pak. J. Sci.* 20 (1-2): 5-19.

- Gaffar, A. and S. Q. Abbas (1972). Fungi of Karachi. Suppl. 2, *Pak. J. Bot.* 4:195-208.
- Ghaffar, A., S. Q. Abbas and A. Kafi (1971). Fungi of Karachi Suppl. 1. *Pak. J. Sci.* 123: 261-266.
- Ghafoor, A. (1985). *Flora of Pakistan*. No.171. Deptt. of Bot. Univ, of Karachi and National Herbarium (Stewart collection) PARC., Islamabad, Pakistan.
- Ghafoor, A. and S. A. J. Khan (1976). *List of Diseases of Economic Plants in Pakistan*. Dept. of Plant Protection, Ministry of Food, Agriculture and Under Developed Areas, Government of Pakistan. pp: 85
- Giani, M. A. (1940). Further Contribution of our knowledge of Indian Coprophilous fungi. *J. Ind. Bot. Soc.* 15: 269-284.
- Hussain, S. S. and M. A. Ahmad (1971). Studies on stored food grain fungi, Part IV. Fungi from Pulses. *Pak. J. Sci. & Inds. Res.* 14: 507 – 511.
- Hussain, S. S., M. Hasany and S. I. Ahmad (1966). Study of the fungus flora of Karachi soils. *Pak. J. Sci. & Ind. Res.* 9: 265 – 268.
- Khan, A. H. (1952). Wood rotting fungi of Pakistan and their control. *Pak. J. Sci.* 4(2): 65-85.
- Khan, A. H. (1954). Some of the hardwood and coniferous rusts on the forest and avenue trees of Pakistan. *Pak. J. Forestry* 4(4): 261-270.
- Khan, A. H. (1955). A New disease of Mulberry in Forest plantation of Punjab. *Pak. J. Sci. Res.* 7(3): 92-99.
- Khan, A. H. (1960). The control of Wood Inhabiting Fungi. *Agric. Res. Council*, Karachi. pp: 176.
- Khan, A. H. (1989). *Pathology of trees*. Vol. II. Univ. of Agriculture Faisalabad. pp: 361-377.
- Khan, A. H. and A. S. Bukhari (1970). Damage due to Fungus disease in Bhagat Reservoir plantation, Lyallpur Forest Division. *Pak. J. For.* 20, 3: 293-311.
- Khan, S. A. (1959). Observation on *Cercospora salvadorae* Maire. *Biologia*, 6(2): 193-194.
- Khan, S. A. and M. Kamal (1963). *Cercospora* of Sind Region including 35 records from Pakistan. *Pak. J. Sci. & Ind. Res.* 6 (2): 118-119.
- Khan, S. A. and M. Kamal (1968). The Fungi of South West Pakistan, Part 1. *Pak J. Sci. & Ind. Res.* 11:61-8
- Kirk, P. (2015). CABI. Bioscience database, Index fungorum
- Lodhi, S. A. (1951). Some Myxomycetes from Pakistan. *Sydowia*, 5: 375-383.
- Malik, S. A. and Virk (1968). Contribution to the knowledge of parasitic fungi of Quetta and Kalat Region. *Biologia*, 14. Pp 27 – 35.
- Mirza, R., A. Kafi and H. Huque (1965). List of diseases in Pakistan. *Tech. Doc. No.* 43: 17
- Mirza, H. J. and M. S. A. Qureshi (1978). *Fungi of Pakistan*. Dept. of Plant Pathology. Univ. of Agriculture Faisalabad, Pakistan. pp. 311.
- Petrak, V.F. (1967). 1968. Uber eine neue *Hercospora* –Art aus Pakistan. *Sydowia* 21: 231.
- Qureshi, M.A. and M. Ahmad (1971). New fungal records on *Morus alba*. *Pak. J. Forest.*, 21(3): 303-312.
- Rizvi, S. R. H. (1966). A study of fungus flora of Karachi Cantt Soil. *Pak. J. Sci. & Ind. Res.* 9; 277 – 279.

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