NEW HOSTS OF SOME PARASITIC FUNGI FROM N.W.F.P., NORTHERN AREAS AND AZAD KASHMIR

Zakaullah, Jehan Ara and Abdul Jabbar*

During several surveys carried out in 1986 and 1987 in the North-West Frontier Province, Northern Areas and the State of Azad Jammu and Kashmir, a sizeable collection of fungi was made. Of this, 12 fungi were recorded parasitising a dozen new hosts including timber species, orchard plants, condiments, medicinal herbs and weeds. However, earlier workers (Ahmad 1956, 1956, 1978; Spaudling 1961; Sadiq and Shah 1986) have significantly contributed to the records of fungi and their hosts occurring in different regions of the country. The present article describes the fungi comprising 3 Classes: Ascomycetes, Basidiomycetes and Fungi Imperfecti with information on habitat, locality and date of collection etc. Five types of diseases, i.e., powdery mildews, rusts, needle blight, leaf spot and root rot were found incited by the fungi on previously unreported hosts as follows:

A. POWDERY MILDEWS (Ascomycetes; Erysiphales)

1. *Erysiphe pisi* DC. ex St. Amans; Blumer 1933: 187.

Mycelium amphigenous, white. Perithecia scattered or gregarious, 80—120μ in diam.; appendages 10—30, as long as the diameter of fruit body, brownish. Asci 3—10, mostly 4—8, 50—60 x 30—40μ, 3-spored. Ascospores oval, 22—25 x 12—13μ.

On leaves of *Robinia pseudoacacia* L., Azad Jammu & Kashmir Muzaffarabad; October 1986, FPH no. 2944 A.H. Fatimi.

2. *E. ranunculi* Grev.; Blumer 1933: 229 sub. *E. nitida*.

Mycelium amphigenous, white. Perithecia scattered, globose, 110—140μ in diam., appendages numerous, 1-2 times as the diam. of the fruit body, pale brown. Asci 4—10, 3—5 spored, 55—70 x 25—35μ. Assospores oval, 20—25 x 10—12μ.

On leaves of Clematis graveolens Lindl., Northern Areas: Hunza; 19-10-1986, FPH no. 2947 Zakaullah & Abdul Jabbar.

3. *E. galeopsidis* DC. ex Merat; Blumer 1933; 265.

Mycelium hypophyllous or caulicolous, well developed, white. Perithecia scattered or gregarious, 100—120μ in diam., appendages numerous, 1-2 times the diameter of the fruit body. Asci 8—15, 36—45 x 25—30μ. Ascospores 5—8, oval, 8—17 x 8—15μ.

---

* The authors are Forest Pathologist and Research Investigators respectively at the Pakistan Forest Institute, Peshawar.

On leaves of *Plectranthus rugosus* Wall. ex Btth., Northern Areas: Hunza; 19-10-1986, FPH no. 2946 Zakaullah & Abdul Jabbar.

4. *E. cichoracearum* DC.; Morbin Plant. Leningrad, xvii, 118, 153; Plant Path. Butl & Jones 1949, p. 645.

Mycelium white, confined to blossoms; oidia oblong, 19—56 x 16—26μ. Imperfect state (*Oidium mangiferae*) collected.

On blossoms of *Mangifera indica* L., Peshawar; 10-4-1987, FPH no. 2951 Zakaullah.

5. *Sphaerotheca ferruginea* (Schlecht. ex Fr.) L. Junell; Blumer 1933: 113 as *S. sanguisorbae*.

Mycelium hypophyllous, seriously affecting the development of the leaves and forming a distinct crust. Perithecia 61—88μ in diam.; wall cells 25—35μ large; appendages numerous, 3-4 times the diam. of the fruit body, thick, stiff, brown. Asci 8-spored, 42—83 x 42—72μ. Ascospores usually badly formed, 17—22 x 12—15μ.

On leaves of *Conyza bonariensis* (L.) Cronquist., Peshawar; 31-5-1987, FPH no. 2954 Zakaullah.

6. *Phyllactinia corylea* (Pers.) Karst.

Mycelium hypophyllous, well developed. Perithecia 165—250 (300μ) in diam.; appendages 4—18 in number, 120—600μ long, stiff, sowllen at the base and pointed at the tip. Asci 70—100μ long, 25—40μ broad. Ascospores 25—35 x 14—20μ.

On leaves of *Populus x-euramericana*, Peshawar; November 1986, FPH no. 2948 Zakaullah & Jehan Ara.

7. *Uncinula necator* (Schw.) Burr.

Amphigenous; mycelium subpersistent; perithecia usually epiphyllous, occasionally hypophyllous or on the inflorescence more or less scattered, 70—128μ; appendages circinate, number 7—23, rarely upto 40, 1—4 times the diameter of the perithecium, septate, thin walled, light or dark amber-brown basally, rarely branched, asci 4—6 rarely upto 9, broadly ovate-oblong to subglobose, with or without a short stalk, 50—60 x 30—40μ; spores 4—7, 18—25 x 10—12μ.

On branches and leaves of *Vitis vinifera* L., Pesawar; 22-12-1986, FPH no. 2949 Zakaullah.

B. RUSTS (Basidiomycetes; Uredinales)

8. *Puccinia jorstadii* nom. *P. nitida* (Ste.) Asiatic

Society Bengal 59: 107, 1890, nom. *P. nitida* (Str.)
Reehl; Syd. Monogr. Ured. 1: 574; Sacc. Syll. Fung. IX: 307; Malik & Khan, p. 424.

Uredia hypophyllous, on brown spot, scattered, brown, pulverulent. Uredospores grobose, subglobose or ovate, echinulate, yellowish brown, 22—25μ in. diam., germ pores 2, supra equatorial. Telia similar but dark brown. Teleutospores ellipsoid or oblong, rounded at both ends, apex not thickened, epapillate, not or very slightly constricted at the septum, smooth, brown, 22—30 x 18—22μ, pedicel hyaline, very short.

On *Polygonum viviperum* L., Northern Areas: Rama Forest, Astore; 15-10-1986, FPH no. 2945 Zakaullah & Abdul Jabbar.

9. *Puccinia allii* (DC.,) Rud, in Lininaea IV: 392, Winter Die pilze p. 184, Xyloma? Allii DC. Flor. France. VI: 156, *Puccinia alliorum* Corda Icon. Fung. IV: 12, *Uredo alliorum* DC. 1. c; p. 82 proparte.

Uredosori elliptical, lanceolate and achinulate. Uredospores irregularly elliptical or obovate, very oblong, 22—30 x 17—23μ. Teleutosori elliptic, oblong.

On leaves of *Allium sativum* L., Peshawar; April 1987, FPH no. 2950 Zakaullah.

C. ROOT ROT (Basidiomycetes; Agaricales)

10. *Armillaria mellea* (Vahl.) Quel.

Setal hyphae, setae, and fibre hyphae lacking; cuticular cells present, hyaline at first and buffy-brown when mature, closely packed to form pseudoparenchymatous areas. Rhizomorphs present; characteristic hyphae with minute hair-like projections on side walls, present in tufts on older parts of the mat; no odour; associated with butt-and root-rot.

Results positive in tests for extracellular oxidase, thin walled hyphae consistently simple septate, hyphae differentiated to form cuticular cells, closely packed to form pseudoparenchyma, hyphae aggregate to form compressed strands or rhizomorphs. Conidia, chlamydospores and oidia lacking. Hyphae yellow or brown when mounted in KOH solution and mats yellow brown, atleast in parts, reverse brown atleast in parts, plates not covered in 6 weeks in 2% MA (Nobles 1965).

On roots and at the base of stem of *Diospyros kakl* L., Peshawar: Qadeem Killi, Charsada Tehsil, in a Persimmon orchard; August 1986, FPH no. 2952 Jehangir and Ahmad Gul.

D. NEEDLE BLIGHT (Fungi Imperfecti; Sphaeropsidales)

11. *Dothistroma pini* Hulbary

Stroma black, subepidermal, later erumpent, scattered in red band areas and visible as minute dots with unaided eye, linear upto 300μ long, 125μ wide and 100μ high; conidiophores hyaline, branched, nearly of same size as conidia, bearing conidia at the tips; conidia straight or slightly curved, filiform, upto 3 septate, blunt at ends, 13.4—30.0 x 2.0—2.5μ.

On needles of *Pinus wallichiana* A.B. Jackson, Swat: Changlapar & Yakhtangi; October 1986, FPH no. 2943 Zakaullah.

E. LEAF SPOT (Fungi Imperfecti; Melanconiales)

12. *Septogloeum mori* Briosi & Cavara

Acervuli amphigenous, mostly hypophyllous. The spores form in gelatinous masses, appearing on drying, as pinkish incrustations. Conidiophores in fesicles. The conidia are curved, blunt, hyaline, multiseptate, 20—60 x 5—8μ.

On leaves of *Morus nigra* L., Peshawar: PFI; 9-4-1987, FPH no. 2953 Zakaullah.

The material has been deposited in the Forest Pathology Herbarium (FPH), Pakistan Forest Institute, Peshawar.

ACKNOWLEDGEMENTS

We wish to express our sincerest thanks to Dr. Jehandar Shah, Islamia College, Botany Department, University of Peshawar; Dr. A.R. Beg and Mr. Sayeed Ahmad Khan, Pakistan Forest Institute Peshawar, for critically going through the manuscript and confirming the identifications.

LITERATURE CITED

1. Ahmad, S. (1956). Fungi of West Pakistan. Biological Society of Pakistan, Monograph No. 1, Published by the Society at the Biological Laboratories, Government College, Lahore, Pakistan. pp. 126.

2. ———— (1956). Uredinales of West Pakistan. Biologia 2(1): 26—101.

3. ———— (1978. Ascomycetes of Pakistan. Part-I, Biological Society of Pakistan, Monograph No. 7, Published by the Society at the Biological Laboratories, Government College, Lahore, Pakistan. pp. 236.

4. Bakshi, B.K. (1978). Forest Pathology-Principles and Practice in Forestry. Published by the Controller of Publications Delhi. Printed at the F.R.I. Press, Publicity and Liaison Branch, Forest Research Institute, and Colleges, Dehra Dun, India. pp. 400.

5. Bakshi, B.K.; Reddy, M.A. Ram; Puri, Y.N., and Sujan Singh (1972). Forest Disease Survey (Final Technical Report), PL—480 Project: Grant No. FG-IN-288, pp. 117.

6. Browne, F.G. (1968). Pests and Diseases of Forest Plantation Trees. Clarendon Press, Oxford, pp. 1330.

7. Bulter, E.J. and Jones, S.G. (1949). Plant Pathology. p. 645. London Macmillan & Co. Ltd.

8. Hepting, George H. (1971). Diseases of Forest and shade trees of the United States. U.S. Deptt. Agric. For. Serv. Agric. Hand book No. 386, p. 239.

9. Laemmlen, F. and Bega, R.V. (1974). Hosts of *Armillaria mellea* in Hawaii. Plant Dis. Reptr. 58 (2): 102—103.

10. Nobles, Mildred K. (1965). Identification of cultures of wood-inhabiting Hymenomycetes. Canadian Jour. Bot. 42:1097—1139.

11. Raabe, Robert D. (1979). Some previously unreported hosts of *Armillaria mellea* in California III. Plant Dis. Reptr. 63(6): 494—495.

12. Sadiq, A. and J. Shah (1986). Two new hosts of *Phyllactinia mespili* (Cast.) Blumer, from Pakistan. Pakistan J. For 36 (4): 185—187.

13. Spaudling, P. (1961). Foreign Diseases of Forest Trees of the World. An Annotated list. Agric. Hand book No. 197. U.S. Deptt. Agric.

14. Stevens, F.L. (1913). The fungi which cause Plant Disease. New York. The Macmillan Company. pp. 754.