

## Fungi of Pakistan. — I.

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With 3 textfigures.

### 1. *Valsella moricola* Ahmad sp. nov.

Stroma valseum corticale, innato-erumpens; perithecia (3—4) globosa vel subglobosa, atra, 360—390  $\mu$  diam.; ostiola brevia, convergentia, punctiformia; pariete pseudoparenchymatico 10—14,5  $\mu$  crasso; asci cylindrico-clavati, basi longe attenuati, 18,5  $\Rightarrow$  90  $\mu$ , polyspori; sporae continuae, allantoideae, flavo-fuscae, 2,5—2,8  $\Rightarrow$  7,5—9,5  $\mu$ ; paraphyses filiformes, hyalinae.

In ramis mortuis *Mori albae* L., Shahdara, Lahore, 14. II. 1948, leg. S. A. Lodhi, No. 2251, typus.

Stroma valsoid, corticolous, innate-erumpent; perithecia (3—4) globose or sub-globose, black, 360—390  $\mu$  in diameter; ostiole short, convergent, opening on the surface; wall pseudoparenchymatous, 10—14,5  $\mu$  thick; asci cylindric-clavate, base attenuated into a long stalk, 18,5  $\Rightarrow$  90  $\mu$  polysporous; spores 1-celled, attantoid, yellowish-brown, 2,5—2,8  $\Rightarrow$  7,5—9,5  $\mu$ ; paraphyses filiform, hyaline.

The species is close to *Valsella minima* Niessl, but differs in the size of the perithecia and the asci.

### \*2. *Nitschkia cupularis* (Pers. ex Fr.) Karst.

On dead wood, Gakkhar, Gujranwala, Sep. 28, 1947, leg. S. Ahmad No. 2024.

### 3. *Anthostomella Lodhii* Ahmad sp. nov.

Perithecia solitaria vel caespitosa, innato-erumpentia, globosa vel subglobosa, 120—215  $\mu$  diam., ostiolo brevi erumpenti; pariete hyalino, 10,5—14,8  $\mu$  crasso; asci 8-spori, cylindraco-clavati, 8,3—10  $\Rightarrow$  58,6—66,5  $\mu$ ; paraphyses simplices, filiformes, hyalinae, 2,5  $\Rightarrow$  58  $\mu$ ; sporae uniseriatae, ovato-oblongae, leves. fusco-brunneae, unicellulares, 5,8—6,5  $\Rightarrow$  11,6—15  $\mu$ .

In petiolis *Palmarum*, Hort. Bot. Lahore, 5. IV. 1948, leg. S. Ahmad, No. 2283, typus.

Perithecia solitary or caespitose, innate-erumpent, globose or sub-globose, 120—215  $\mu$  in diameter; ostiole short, opening on the surface;

wall formed of interwoven hyaline hyphae, 10,5—14,8  $\mu$  thick; the epidermal cells and the cells surrounding the perithecia containing numerous dark-brown hyphae; asci 8-spored, cylindric-clavate, 8,3—10  $\Rightarrow$  58,6—66,5  $\mu$ ; paraphyses simple, filiform, hyaline, 2,5—58  $\mu$ ; spores uniseriate, ovate-oblong, smooth, dark brown, 1-celled, 5,8—6,5  $\Rightarrow$  11,6—15  $\mu$ .

\*4. *Rosellinia aquila* (Fr.) De Not.

On dead branches of *Capparis aphylla*, Ladhar, Sheikhpura, Juli 18, 1947, leg. S. A h m a d, No. 1939; on dead branches of *Ficus palmata*, Ladhar, Sheikhpura, Sep. 16, 1947, leg. S. A h m a d, No. 2156.

\*5. *Rosellinia pulveracea* (B. et Br.) Ces. et De Not.

On dead wood, Rohtak; on peelings of Sugar cane, Ladhar, Sheikhpura, Sep. 14, 1947, leg. S. A h m a d, No. 2082.

\*6. *Hypoxyylon latissimum* Speg.

On dead branches of *Capparis aphylla* and *Gossypium* sp., Ladhar, Sheikhpura, Juli 18, 1947, leg. S. A h m a d, No. 1940; Nov. 28, 1947, No. 2217. Very common.

This was first collected in 1933 and sent to late H. Sydow for identification. He remarked, "*Rosellinia* sp. I am unable to determine the species. It is a very difficult genus which needs a thorough revision." It was later collected in very large quantities and sent to Dr. Julian H. Miller, who identified it as *Hypoxyylon latissimum* Speg. with the remark. "This is a species that often develops practically free perithecia as in *Rosellinia*." The perithecia occur in dense clusters but they never occur in a true stroma characteristic of other species of *Hypoxyylon*.

7. *Metasphaeria saccharicola* (Mundkur & Ahmad) Ahmad comb. nov.

Syn. *Clypeosphaeria saccharicola* Mundkur & Ahmad, Myc. Papers of Imp. Myc. Inst. Kew, No. 18, p. 2, 1946.

On dead decaying leaves of *Saccharum munja*, Ladhar, Sheikhpura, Sep. 15, 1947, leg. S. A h m a d, No. 2103.

8. *Penzigia capparidis* (Mundkur & Ahmad) Ahmad comb. nov.

Syn. *Bagnisiopsis capparidis* Mundkur & Ahmad, Myc. Papers of Imp. Myc. Inst. Wew, No. 18, p. 1, 1946.

Dr. Julian H. Miller remarks (in correspondence) "This on *Capparis* is an *Penzigia* rather than *Bagnisiopsis*. *Penzigia* differs from *Hypoxyylon* in the white internal stroma. Then it differs from *Bagnisiopsis* in possessing true perithecia with a wall and free paraphyses. Also all *Bagnisiopsis* species are parasites on leaves. It is very near *P. eterio* (B. & Br.) Petch and differs only in slightly larger spores."

9. *Phomatospora Salvadorina* Ahmad sp. nov. Fig. 1, a—c.

*Perithecia* innato-erumpentia, ostiolo minuto, pertuso praedita, globosa vel sub-globosa, 105—120  $\mu$  diam.; pariete pseudoparenchymatico, atro, 7—9,5  $\mu$  crasso; paraphyses desunt; asci clavati, 8-spori, 14,8—16,5  $\Rightarrow$  42—46,5  $\mu$ ; sporae uniseriatae, ellipsoideo-oblongae, hyalinae, unicellulares 12,5—15  $\Rightarrow$  3,2—3,5  $\mu$ . — *Pycnidia* innato-erumpentia, nigra, ostiolo parvo papilliformi praedita, globosa, 90—100  $\mu$  diam.; conidia ellipsoidea, hyalina, unicellularia, 4,5—6,65  $\Rightarrow$  8,5—10  $\mu$ .

In ramis mortuis *Salvadorae oleoidis*, Ladhar, Sheikhpura, 10. VII. 1947, leg. S. A h m a d, No. 1881, typus.

*Perithecia* innato-erumpent, opening on the surface by means of a minute ostiole, globose or sub-globose, 105—120  $\mu$  in diameter; wall pseudoparenchymatic, black, 7—9,5  $\mu$  thick; paraphyses absent; asci clavate, 8-spored, 14,8—16,5  $\Rightarrow$  42—46,5  $\mu$ ; spores uniseriate, elliptic-oblong, hyaline, 2-guttulate, 1-celled, 12,5—15  $\Rightarrow$  3,2—3,5  $\mu$ . — *Pycnidia* innato-erumpent, black, globose, 90—100  $\mu$  in diameter; conidia elliptic, hyaline, 1-celled, 4,5—6,65  $\Rightarrow$  8,5—10  $\mu$ .

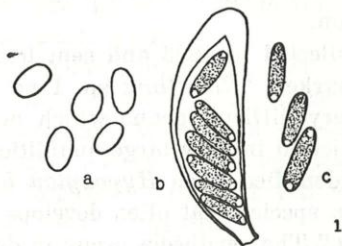


Fig. 1. *Phomatospora salvadorina*. — a) conidia  $\times$  600. — b) ascus  $\times$  600. — c) ascospores  $\times$  600.

10. *Didymosphaeria verrucispora* Ahmad sp. nov. Fig. 2, a—d.

*Perithecia* innato-erumpentia, globosa vel subglobosa, 225—345  $\mu$  diam.; pariete pseudoparenchymatico, 15—18,5  $\mu$  crasso, fusco-brunneo; asci clavati, 8-spori, 11,5—14,8  $\Rightarrow$  60—85  $\mu$ ; sporae biseriatae, ovatae vel ovato-oblongae, apice rotundatae, bicellulatae, medio septatae et constrictae, episporio verruculis papilliformibus, numerosis, prominulis obsito, fusco-brunneae, 10—12  $\Rightarrow$  15—20  $\mu$ ; paraphyses filiformes 1,5—2  $\Rightarrow$  55,8—80  $\mu$ .

In ramis mortuis *Gossypii* sp. Ladhar, Sheikhpura, 29. VII. 1947, leg. S. A h m a d, No. 2011, typus.

*Perithecia* innato-erumpent, globose or sub-globose, 225—345  $\mu$  in diameter, wall parenchymatous, 15—18,5  $\mu$  thick, dark-brown; paraphyses filiform, hyaline, 1,5—2  $\Rightarrow$  55,5—80  $\mu$ ; asci clavate, 8-spored,

11,5—14,8  $\Rightarrow$  60—85  $\mu$ ; spores biseriatae, ovate or ovate-oblong, apex rounded, 2-celled, constricted in the middle at the septum, epispore verrucosa, covered with numerous prominent papillae or warts, dark brown, 10—12  $\Rightarrow$  15—20  $\mu$ .

The species is characterised by the verrucose spores which have not been described in any other species of the genus.

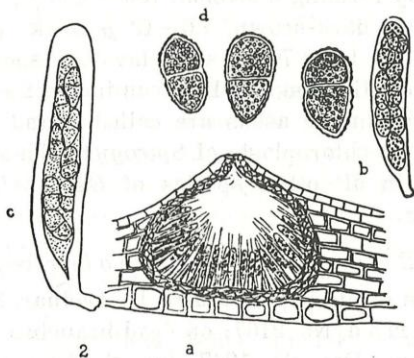


Fig. 2. *Didymosphaeria verrucispora*. — a) L. s. perithecium  $\times$  70. — b) an ascus with mature spores  $\times$  300. — c) a young ascus  $\times$  600. — d) ascospores  $\times$  600.

### 11. *Ophiobolus spirosporus* Ahmad sp. nov. Fig. 3, a—c.

Perithecia innato-erumpentia, globosa vel subglobosa, nigra, 180—255  $\Rightarrow$  120—195  $\mu$ ; raro complura aggregata et connata, quasi stromata, 180  $\Rightarrow$  450  $\mu$  metientia formantia; ostioli prominentibus; pariete pseudoparenchymatico, fusco-brunneo, 7,5—12,5  $\mu$  crasso; para-

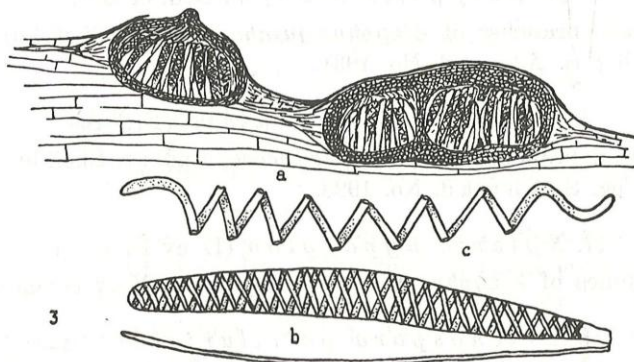


Fig. 3. *Ophiobolus spirosporus*. — a) L. s. perithecia  $\times$  70. — b) ascus and paraphyses  $\times$  600. — c) ascospores  $\times$  600.

physes numerosae filiformes, hyalinae,  $1,5 \rightleftharpoons 70 \mu$ ; asci clavati, 8-sporei,  $10,5 \rightleftharpoons 100 \mu$ ; sporae spiraliter convolutae, filiformes, hyalinae, continuae,  $2-2,5 \rightleftharpoons 150-180 \mu$ .

In culmis mortuis *Sacchari spontanei*, Lahore, 29. II. 1948, leg. S. A h m a d, No. 2276, typus.

Perithecia innate-erumpent, globose or sub-globose, black,  $180-255 \rightleftharpoons 120-195 \mu$ ; rarely forming a stroma,  $180 \rightleftharpoons 450 \mu$ ; ostiole prominent; wall parenchymatous, dark-brown,  $7,5-12 \mu$  thick; paraphyses numerous, filiform, hyaline,  $1,5 \rightleftharpoons 70 \mu$ ; asci clavate, 8-spored,  $10,5 \rightleftharpoons 100 \mu$ ; spores spirally coiled, filiform, hyaline, continuous,  $2-2,5 \rightleftharpoons 150-180 \mu$ .

The eight spores in the ascus are coiled round one another in a spiral manner like the chloroplasts of *Spirogyra*. This species is unique in this respect as in all other species of *Ophiobolus* the spores lie parallel in an ascus.

#### 12. *Emericella variecolor* Berk.

On fallen leaves of *Mangifera indica* L., Ladhar, Sheikhpura, Sep. 16, 1947, leg. S. A h m a d, No. 2167; on dead branches of *Gossypium* sp., Ladhar, Sheikhpura, Dec. 25, 1947, leg. S. A h m a d, No. 2293; on fallen leaves, Lahore, March 24, 1948, No. 2294.

#### 13. *Pleospora herbarum* (Pers.) Rabenh.

Syn. *Pleospora spinarum* Syd.

On spines of *Acacia arabica*, Rohtak; Ladhar, Sheikhpura.

#### 14. *Ceratostomella adiposa* (Butl.) Sartoris.

Syn. *Sphaeronema adiposum* Butler.

On dead culms of Sugar cane, Ladhar, Sheikhpura, Juli 14, 1947, leg. S. A h m a d, No. 1912.

#### 15. *Eutypella zizyphi* Syd. et Butl.

On dead branches of *Zizyphus jujuba*, Ladhar, Sheikhpura, Juli 18, 1947, leg. S. A h m a d, No. 1931.

#### \*16. *Eutypella stellulata* (Fr.) Sacc.

On dead branches of *Suaeda fruticosa*, Ladhar, Sheikhpura, Juli 18, 1947, leg. S. A h m a d, No. 1928.

#### 17. *Xylaria hypoxylon* (L. ex Fr.) Grev.

On stones of *Zizyphus jujuba*, Gujranwala. Very common.

#### \*18. *Teichospora patellarioides* Sacc.

On dead wood of *Salvadora oleoides*, Ladhar, Sheikhpura, Juli 16, 1947, No. 1920; on a dead branch of *Suaeda fruticosa*, Ladhar, Sheikhpura, Sep. 14, 1947, leg. S. A h m a d, No. 2085.

### 19. *Phyllosticta cycadis* Ahmad sp. nov.

*Pycnidia* innata, nigra, ostiolo minuto punctiformiter erumpentia, globosa vel subglobosa, 180—200  $\Rightarrow$  205—240  $\mu$ ; hyphis dilute brunneis, septatis, 4,5  $\mu$  crassis praedita; pariete ca. 10  $\mu$  crasso; conidiophora hyalina, simplicia, 15,5  $\Rightarrow$  1,5  $\mu$ ; paraphysibus nullis; conidia ellipsoidea, unicellularia, hyalina, 11—19,5  $\Rightarrow$  4,5—6  $\mu$ .

In foliis *Cycadis circinalis*, Lahore, 3. XI. 1948, leg. S. Ahmad. No. 2228, typus; in follis *C. revolutae*, Hort. Bot. Lahore, 3. XI. 1948, leg. S. Ahmad, No. 2227.

*Pycnidia* innata-erumpent, black, opening on the surface by a minute ostiole, globose or subglobose 185—200  $\Rightarrow$  205—240  $\mu$ , enveloped by numerous light brown, septate, branched hyphae, 3—4,5  $\mu$  in thickness; wall about 10  $\mu$  thick, outer part formed of interwoven hyphae, inner distinctly pseudoparenchymatous; conidiophores hyaline, simple, 15,5  $\Rightarrow$  1,5  $\mu$ ; paraphyses absent; conidia elliptic, rounded at the ends, 1-celled, hyaline, 11—19,5  $\Rightarrow$  4,5—6  $\mu$ .

### 20. *Phyllosticta ficina* Ahmad sp. nov.

*Pycnidia* innato-erumpentia, globosa vel subglobosa, 120—135,5  $\Rightarrow$  145—155  $\mu$ ; pariete pseudoparenchymatico, fusco-brunneo, 10,5—12  $\mu$  crasso; conidiophora simplicia, hyalina, 10,2—13,6  $\Rightarrow$  1,5  $\mu$ ; conidia ellipsoidea, unicellularia, hyalina, 13,6—16,5  $\Rightarrow$  3,5—4,5  $\mu$ .

In foliis *Fici elasticae*, Hort. Bot. Lahore. 8. IV. 1948, leg. S. Ahmad, No. 2289, typus.

*Pycnidia* innata-erumpent, black ostiolate, globose or subglobose, 120—135,5  $\Rightarrow$  145—155,5  $\mu$ ; wall pseudoparenchymatous, formed of 3 or 4 layers of polygonal cells, dark brown, 10,5—12  $\mu$  thick; conidiophores simple, hyaline, 10,2—13,6  $\Rightarrow$  1,5  $\mu$ ; conidia elliptic, 1-celled, hyaline, 13,6—16,5  $\Rightarrow$  3,5—4,5  $\mu$ .

### 21. *Phoma graminis* Ahmad sp. nov.

*Pycnidia* sparsa, primitus tecta, postea per epidermidem fissam erumpentia, globosa, raro subglobosa, ostiolo prominente, atro, praedita, 170—190  $\mu$  diam.; pariete pseudoparenchymatico, 3—4,5  $\mu$  crasso; conidiophora simplicia, hyalina, 9,5—12,5  $\Rightarrow$  2  $\mu$ ; conidia ellipsoidea, hyalina, unicellularia, 3,5—4,5  $\Rightarrow$  9—14,5  $\mu$ .

In stolonibus mortuis *Eleusines flagelliferae*, Ladhar, Sheikhpura, 8. VII. 1947, leg. S. Ahmad, No. 1850, typus; in culmis mortuis *Panicum antidotalis* Retz., Ladhar, Sheikhpura, 29. VII. 1947, leg. S. Ahmad, No. 2007 a; in culmis mortuis *Triticum* sp., Ladhar, Sheikhpura, 14. IX. 1947, leg. S. Ahmad, No. 2080.

*Pycnidia* innata at first, becoming exposed by the rupture of the epidermis, globose, rarely subglobose, ostiole very prominent, 170—190  $\mu$

in diameter; wall pseudoparenchymatous, formed of one or two layers of very small cells, 3—4,5  $\mu$  in thickness; conidiophores simple, hyaline, 9,5—12  $\Rightarrow$  2  $\mu$ ; conidia elliptic, hyaline, 1-celled, 3,5—4,5  $\Rightarrow$  9—14,5  $\mu$ .

22. *Phoma psidii* Ahmad sp. nov.

*Pycnidia innata*, ostiolo minuto erumpentia, depresso-globosa, nigra, 60—85  $\Rightarrow$  100—105,5  $\mu$ ; pariete e cellulis minutis composito, 7,6—9,6  $\mu$  crasso; conidiophora simplicia, hyalina, interdum nulla; conidia ellipsoidea, hyalina, unicellularia, 3,5—4,5  $\Rightarrow$  2,5  $\mu$ .

In ramis mortuis *Psidii Guajavae*, Lahore, 23. III. 1948, leg. S. A. L o d h i, No. 2255, typus.

*Pycnidia innata* becoming erumpent by a small ostiole, depressed globose, black, 60—85  $\Rightarrow$  100—105,5  $\mu$ ; wall pseudoparenchymatous, formed of very small cells, 7,6—9,6  $\mu$  thick; conidiophores hyaline, simple, sometimes absent; conidia elliptic, hyaline, 1-celled, 3,5—4,5  $\Rightarrow$  2,5  $\mu$ .

23. *Phoma zizyphina* Ahmad sp. nov.

*Pycnidia solitaria*, erumpentia, nigra, globosa vel subglobosa, 120—135  $\mu$  diam.; pariete pseudoparenchymatico, 6,5—8,6  $\mu$ , crasso e cellulis fusco-brunneis composito; conidiophora hyalina, simplicia, 9,5  $\Rightarrow$  1,75  $\mu$ ; conidia hyalina, unicellularia, ellipsoidea 3,5—4  $\Rightarrow$  5,5—6  $\mu$ .

In ramis mortuis *Zizyphi jujubae* Lamk., Ladhar, Sheikhpura, 5. VIII. 1947, leg. S. A h m a d, No. 2019, typus.

*Pycnidia* solitary, erumpent, black, globose or subglobose, 120—135  $\mu$  in diameter; wall pseudoparenchymatous, 6,5—8,6  $\mu$  thick, cells dark brown; conidiophora hyaline, simple, 9,5  $\Rightarrow$  1,75  $\mu$ ; conidia hyaline, 1-celled, elliptic, 3,5—4  $\Rightarrow$  5,5—6  $\mu$ .

24. *Phoma mangiferae* Ahmad sp. nov.

*Pycnidia sparsa* vel gregaria, innato-erumpentia, depresso-globosa, 74—110  $\Rightarrow$  115—150  $\mu$ ; ostiolo erumpente papilliformi; pariete pseudoparenchymatico, fusco-brunneo; conidia bacillaria, hyalina, unicellularia, 1,5  $\Rightarrow$  3,4—5  $\mu$ .

In ramis mortuis *Mangiferae indicae* L., Ladhar, Sheikhpura, 14. VII. 1947, leg. S. A h m a d, No. 1901, typus.

*Pycnidia* separate to caespitose, innate-erumpent, depressed-globose, 74—110  $\Rightarrow$  115—150  $\mu$ , opening on the surface by a papillate ostiole; wall pseudoparenchymatous, formed of 3 or 4 layers of dark brown cells; conidia hyaline, 1-celled, bacillar, 1,5  $\Rightarrow$  3,4—5  $\mu$ .

25. *Phoma nyctaginea* F. Tassi var. *boerhaaviae* n. var.

Conidia hyalina unicellularia, ellipsoidea, 3,5—4,5  $\Rightarrow$  7,5—10,6  $\mu$ .

In ramis mortuis *Boerhaaviae diffusae* Linn., Ladhar, Sheikhpura, 8. VII. 1947, leg. S. A h m a d, No. 1853, typus.

## 26. *Phoma chenopodii* Ahmad sp. nov.

*Pycnidia* sparsa, innato-erumpentia, nigra, 170—190  $\mu$  diam., globosa, ostiolo papilliformi praedita; pariete pseudoparenchymatico e cellulis minutis composito, 3—4,5  $\mu$  crasso; conidiophora hyalina, simplicia; conidia ellipsoidea, hyalina, unicellularia, 3,7—4,9  $\Rightarrow$  9,5—12,6  $\mu$ .

In ramis mortuis *Chenopodii albi* L., Ladhar, Sheikhpura, 24. VII. 1947, leg. S. Ahmad, No. 1972; 11. VIII. 1947, leg. S. Ahmad, No. 2047, typus; in ramis mortuis *Atriplicis crassifoliae* C. A. Mey, Ladhar, Sheikhpura, 14. VII. 1947, leg. S. Ahmad, No. 1896.

*Pycnidia* scattered, innate-erumpent, ostiole papillate, black, 170—190  $\mu$  in diameter, globose; wall pseudoparenchymatous, of one or two layers of very small cells, 3—4,5  $\mu$  in thickness; conidiophores simple, hyaline; conidia elliptic, hyaline, 1-celled, 3,5—4,9  $\Rightarrow$  9,5—12,6  $\mu$ .

## 27. *Macrophoma triticina* Ahmad sp. nov.

*Pycnidia* innato-erumpentia, atra, depresso-globosa, 120  $\Rightarrow$  180  $\mu$ ; ostiolo vix erumpente; pariete pseudoparenchymatico, 10—12  $\mu$  crasso; conidiophora hyalina, simplicia, 6—8,5  $\Rightarrow$  2  $\mu$ ; conidia hyalina, unicellularia, ellipsoidea, 13,5—16  $\Rightarrow$  5—5,7  $\mu$ .

In culmis mortuis *Triticii* sp., Sheikhpura, 2. II. 1948, leg. S. Ahmad, No. 2239, typus.

*Pycnidia* innate-erumpent, black, depressed globose, 120—380  $\mu$ ; ostiole hardly projecting above the surface; wall pseudoparenchymatous, 10—12  $\mu$  thick; conidiophores hyaline, simple, 6—8,5  $\Rightarrow$  2  $\mu$  conidia hyalina, 1-celled, ellipsoid, 13,5—16  $\Rightarrow$  5—5,7  $\mu$ .

## 28. *Macrophoma asphodeli* Ahmad sp. nov.

*Pycnidia* innato-erumpentia, atra, globosa vel subglobosa, 100—128,5  $\Rightarrow$  188,5—192,5  $\mu$ ; ostiolo papilliformi, erumpente praedita; pariete membranaceo, pseudoparenchymatico, 10—15  $\mu$  crasso conidiophora simplicia, hyalina, 25  $\Rightarrow$  2  $\mu$ ; conidia unicellularia, hyalina, fusoido-ellipsoidea, 7,5—9  $\Rightarrow$  20—22,5  $\mu$ .

In caule emortuo *Asphodeli tenuifolii*; Ladhar, Sheikhpura, 15. IX. 1947, leg. S. Ahmad, No. 2116, typus.

*Pycnidia* innate-erumpent, subglobose or globose, 100—128,5  $\Rightarrow$  188,5—192,5  $\mu$ , ostiole papilliform-erumpent; wall pseudoparenchymatous, membranous, 10—15  $\mu$  thick; conidiophores simple hyaline, 25  $\Rightarrow$  2  $\mu$ ; conidia 1-celled, hyaline, fusoid-elliptic, 7,5—9  $\Rightarrow$  20—22,5  $\mu$ .

My sincere thanks are offered to Dr. Julian H. Miller for helping me in the identification of several specimens; to Sher Ahmad Khan Lodhi, Head of the Botany Department for encouragement and advice through out the work.



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