

FUNGI ISOLATED FROM RHIZOSPHERE—I

BY V. AGNIHOTHRUDU, (MISS) K. BHUVANESWARI
AND S. SURYANARAYANAN

(University Botany Laboratory, Madras 5)

Received September 5, 1955

(Communicated by Prof. T. S. Sadasivan, F.A.Sc.)

THE following are some of the fungi frequently isolated from the rhizosphere of some crop plants, particularly pigeon-pea (*Cajanus cajan*). Three of them are new records for the country, viz., *Melanospora brevirostrata* C. Moreau, *Aspergillus giganteus* Wehmer and *Oedocephalum coprophilum* Kobayasi.

1. *Melanospora brevirostrata* C. Moreau in *Bulletin de la société Mycologique de France*, 1945, **61**, 53–60.

Perithecia subgregarious, superficial, (on incubated root fragments) hyaline, subspherical, 300–600 μ in diameter, surmounted by a short cylindrical neck measuring up to 80 μ in length covered sparsely with short hyaline setæ which are continuous and up to 200 μ in length. Asci clavate, diffluent, octosporous, measuring 70–90 \times 16–26 μ , paraphysate. Ascospores typically fusiform-elliptic, somewhat inequilateral, hyaline when young, becoming deep fuscous brown with age, mostly 27.2 \times 13.6 μ , range 24–30.8 \times 10.4–15.2 μ , average 26.8 \times 13.4 μ . Ascospores germinate through germinal pores present at either end of the spores. Ascospores are extruded in a long coiled chain through the neck of the perithecium.

2. *Stachybotrys atra* Corda in *Icon. Fung.*, 1837, **1**, 21; Saccardo, *Syll. Fung.*, 1886, **4**, 269; Bisby, G. R., *Trans. Brit. mycol. Soc.*, 1943, **26**, 133–43; 1945, **28**, 11–12; Subramanian, C. V., *Proc. Indian Acad. Sci.*, 1952, **36 B**, 48.

Colonies deep black in colour. Sterile hyphæ repent, branched sparsely septate, measuring 2.8–5.6 μ in diameter. Fertile hyphæ erect, branched, subhyaline to fuscous, up to 4 μ thick. Conidiophores disposed alternately, up to 80 μ long and 5 μ in diameter. Apex of the conidiophore not inflated, with 3–5 sterigmata which are obovate to clavate, subhyaline to fuscous, measuring up to 9.6 \times 4.8 μ . Conidia borne acrogenously, elliptic to ovate,

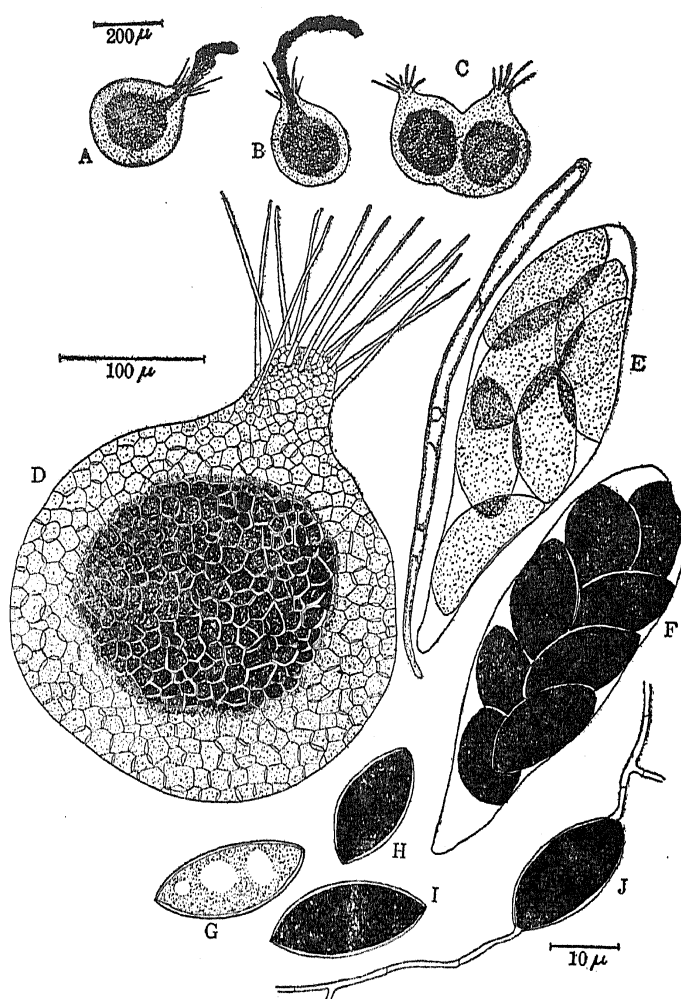


FIG. 1. *Melanospora brevisrostrata* C. Moreau. (Herb. M.U.B.L. No. 1351.)

- A-D Perithecia.
- E An immature ascus and a paraphysis.
- F A mature ascus.
- G An immature ascospore with guttules.
- H & I Mature ascospores.
- J Germinating ascospore.

average diameter $8.3 \times 5.5 \mu$, range $6.4-9.6 \times 4.8-6.4 \mu$, mostly $8.0 \times 5.6 \mu$, hyaline when young becoming deep smoky brown later, rough enclosing a guttule.

3. *Aspergillus giganteus* Wehmer in *Centraal. f. Bakt.*, 1907, **18**, 385; Thom and Raper, *A Manual of the Aspergilli*, 1945, pp. 95-98.

Colonies on Czapek's solution agar fast growing, floccose with abundant aerial mycelium. Conidiophore formation takes place in 2-4 days. Primarily

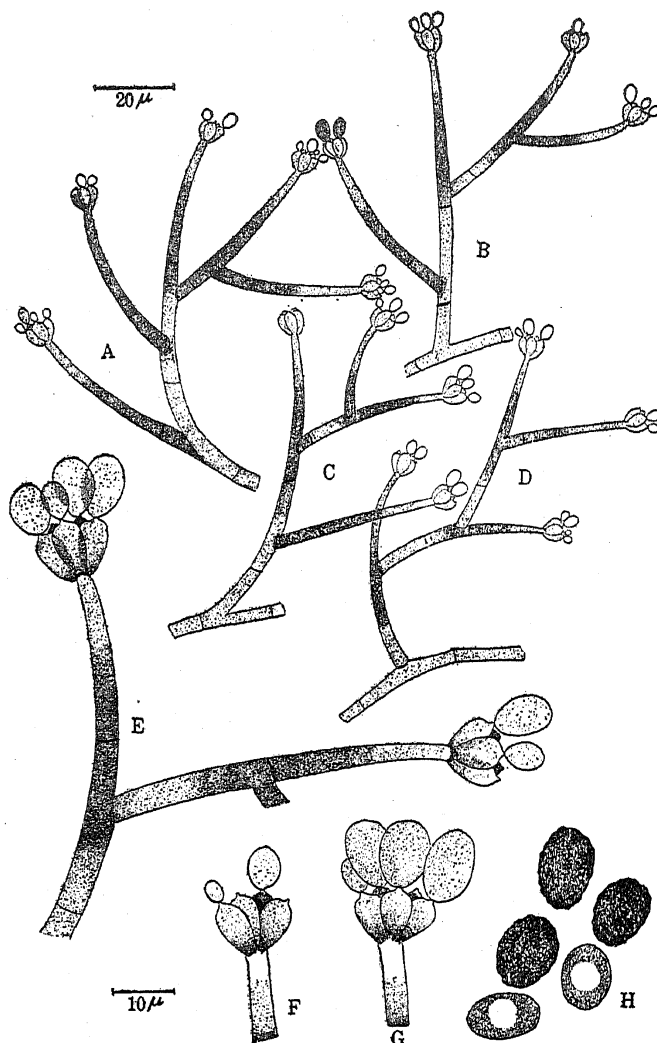


FIG. 2. *Stachybotrys atra* Corda. (Herb. M.U.B.L. No. 1352.)

- A-E Showing branching of the conidiophores.
 F & G Sterigmata bearing the conidia.
 H Mature and immature conidia.

short conidiophores measuring up to 5 mm. in length are formed followed by the development of long conidiophores which are highly phototropic. These are abundant on the fringes of the colony almost obscuring the central mass of short conidiophores. Colony at first white, gradually becoming pale blue-green in colour, reverse pale tan to deep brown with the advance in age of the culture. Conidial heads produced early during the growth of the culture measuring from 1-5 mm. in length bearing clavate heads measuring $120-230 \times 20-45 \mu$; conidiophores produced subsequently measure 8-20 mm. long, bearing heads that are $300-650 \times 100-200 \mu$. The heads are uniseriate, the sterigmata measuring $2.8-4.0 \times 2.4-3.0 \mu$ at the

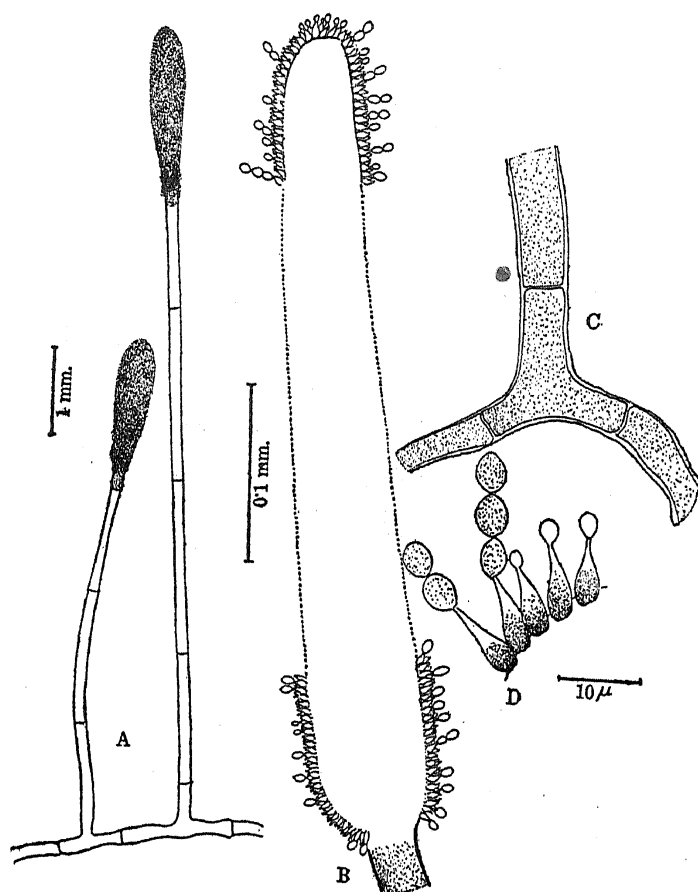


FIG. 3. *Aspergillus giganteus* Wehmer. (Herb. M.U.B.L. No. 1353.)

- A Conidiophores.
- B An enlarged clavate vesicle.
- C Foot cell.
- D Sterigmata with conidia.

base of the clavate vesicle and $6.4-8.0 \times 2.4-3.6 \mu$ at the apex. Conidia are elliptic, thin-walled, smooth, measuring on average $3.5 \times 2.6 \mu$, range $3.2-4.8 \times 2.4-3.2 \mu$, mostly $3.5 \times 2.6 \mu$.

4. *Oedocephalum coprophilum* Kobayasi apud Kobayasi and Tubaki in *Nagoa*, 1952, 1, 8-9.

Colonies on root segments effuse, white to yellow, becoming pale pinkish in colour. Vegetative hyphæ thin, hyaline, moniliform, highly ramified measuring $6.4-11.2 \mu$ in diameter interspersed by chlamyospore-like thickenings. Conidiophores abundant, erect, straight, simple, cylindrical, uniform in diameter or slightly attenuate at the apex, septate, not infrequently continuous, $120-350 \mu$ long, $4.8-9.6 \mu$ in diameter. The conidiophores end in a prominent vesicle, subglobose to spherical, rather truncate at the

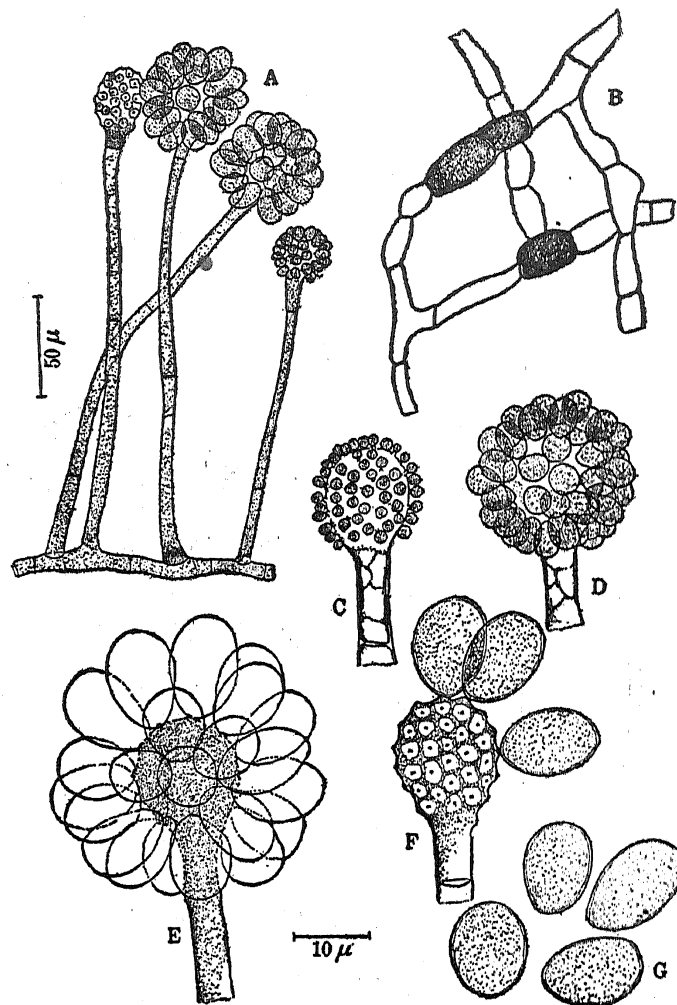


FIG. 4. *Oedocephalum coprophilum* Kobayasi, (Herb. M.U.B.L. No. 1354.)

- A Conidiophores.
- B Sterile mycelium with chlamydospore-like swellings.
- C-E Development of conidia.
- F Vesicle showing punctæ.
- G Conidia.

base, measuring $26-30 \times 20-25 \mu$, hyaline, covered with dense aggregations of conidia. The conidia fall away leaving distinct punctæ on the vesicle, each encircled by a shallow furrow which present the vesicle a faceted aspect. Conidia sessile, continuous, ovoid, thin-walled, hyaline, smooth, measuring on an average $16.3 \times 12.5 \mu$, range $11.2-21.6 \times 9-14 \mu$, mostly $17.6 \times 12.5 \mu$.

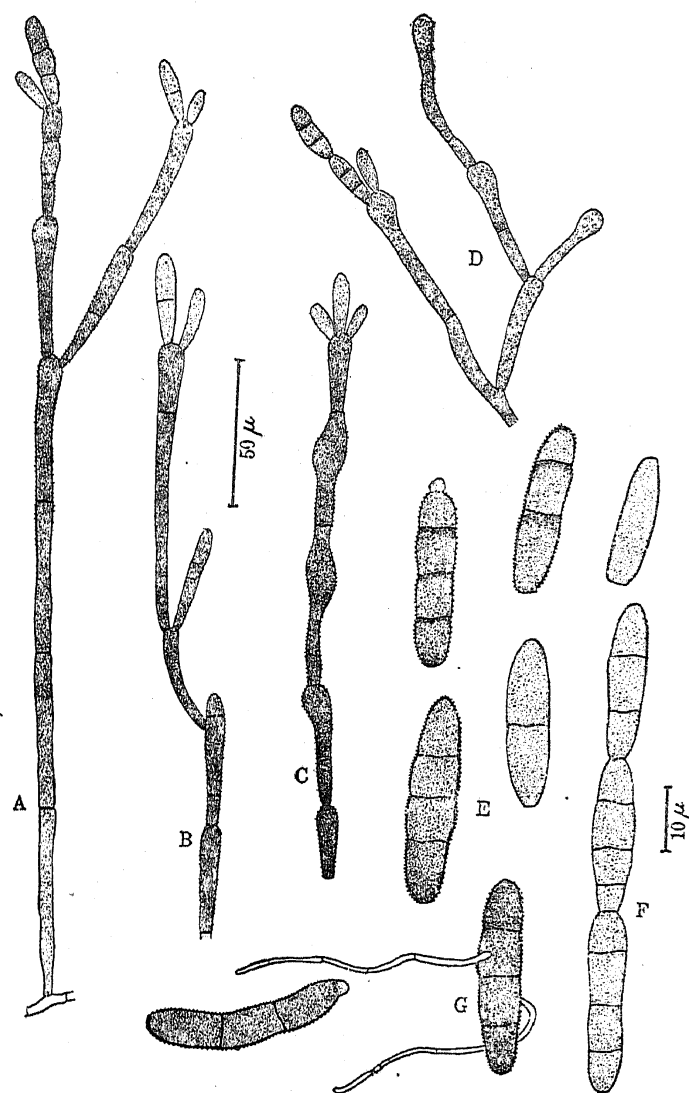


FIG. 5. *Dendryphion interseminatum* (Berk. and Rav.) Hughes. (Herb. M.U.B.L. No. 1355.)

- A-D Conidiophores.
- E Conidia.
- F Conidial chain.
- G Germinating conidium.

5. *Dendryphion interseminatum* (Berk. and Rav.) Hughes in *Canad. J. Bot.*, 1953, **31**, 638; Ellis, M. B., E. A., and J. P., *Trans. Brit. mycol. Soc.*, 1951, **34**, 158-61.

Colonies deep brown in culture, restricted, producing abundant conidial masses. Hyphae smooth, hyaline to subhyaline, 1-3 μ wide. Fertile hyphae erect or procumbent, thicker than the sterile mycelium, sparsely branched. The branches are alternate, widely spaced and arise from swollen nodes of

the conidiophore. The laterals arise as buds on the inflated apex of the conidiophore which may bear secondary branches. The conidiophores measuring 180–280 μ , mostly 250 μ ; diameter at the apex 3.2–8.4 μ , at the base 5.0–9.6 μ and 5.6–11.2 μ at the nodes, 3–12 septate, with 0–4 branches. The branches are stout, cylindrical, straight or slightly bent, measuring 15–98 \times 3.2–5.0 μ . The conidia are borne terminally or intercalarily on swellings or nodes, either singly or in groups up to 5. Some are often formed in short chains of 2–3. Conidia are cylindrical to clavate, septate and sometimes slightly constricted at the septa, obtuse apically, subtruncate at the base, pale yellow brown to deep brown, smooth when young becoming verrucose with maturity, 1–4 septate, measuring 12.8–24 μ , diameter at the apex 3.8–6.4 μ and 5.0–8.4 μ at the widest part.

ACKNOWLEDGMENT

We thank Professor T. S. Sadasivan and Dr. C. V. Subramanian for their suggestions and criticism in the preparation of this paper.