



HYPHOMYCETES FROM VARIOUS TYPE OF SOIL IN AHMEDNAGAR DISTRICT (M.S)

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ABSTRACT

Total twenty species of Hyphomycetes collected from the agriculture, forest and sugarcane industries effluent soil. 16 species were isolated from Agriculture soil, 19 species from forest soil and 8 species from sugarcane industries effluent agriculture soil. Sugarcane effluent used in agriculture soils every year by farmer as fertilizer seems to be suppressing the occurrence of hyphomycetes in such soils.

Keywords: Forest soil, Agricultural soil; Hypomycetes; Sugarcane industry effluent agriculture soil..

INTRODUCTION:

Hypomycetes consist the major group of soil mycoflora (Gilman 1957), Domsch and Gams 1972, Domsch et.al, 1980). They are found mainly as decomposers of organic debris (Subramanian 1983), roots (Waid 1947), as soil borne pathogens (Garrett, 1979) or in association with living root in the rhizosphere zone pathogens (Garrett 1979) or in association with the wide distribution of Hypomycetes in soil is due their competitive saprophyte ability (Garrett 1956). As decomposers they help in the recycling process of Nature's cycle. The occurrence and distribution of Hypomycetes in the soil is influenced by the physical and biological factors of the soil (Subramanian, 1983).

MATERIALS AND METHODS:

Hypomycetes from various soils were isolated on the culture media by serial dilution technique (Waksman, 1931). Soil samples upto 15 cms deep collected from Agriculture, Forest and Sugarcane industries effluent were

brought to the laboratory in plastic bags and inoculated on PDA and Czapeks Dox Agar culture medium by serial dilution technique. The inoculated plates were incubated at $25 \pm 2^{\circ}$ C for the growth of fungi. After seven days the colony character were noted and a bit of colony was mounted in lacto phenol for studying microscopic characters.

RESULT AND DISCUSSION:

1) *Alternaria triticina* Prasad and Prabhu (1963),

Indian Phytopath. 15:292-293.

Colonies dark blackish brown to black. Conidiophores up to 344 μ m long. 3.3-6 μ m thick in the broad less part. Conidia solitary or in short chains (2-4) rostrate, golden brown smooth, 22-95 μ m long, 8-12 μ m thick in the broadest part.

2) *Aspergillus niger* Van Tiegh (1967).

Annls.Sci.Naf. (Bot). Ser. 5, 8:240.

Colonies effuse blackish brown conidiophore erect or flexuous often up to 3 long, 12.5–22 μm thick, upper part brown, swollen at the apex into spherical vesicle 42–68.3 μm diameter. Phialides in groups at the apices of the branches. Flask-shaped 6.3–12 μm long, 3–3.2 μm thick, 1–5 μm wide at the open end. Conidia catenate, dry, globose, brown, warts or spines arranged in discontinuous bands 3.3–6 μm diameter. Conidial head globose, blackish brown to black.

3) *Candida albicans* (Robin) Berkhout. (1923).

Deschimmelges Monilia, Oosporaen Torula Deisset. Utrecht 44.

Colonies white cream colour, pasty, smooth, mycelium largely, submerged, hyaline, pseudohyphae and true hyphae are also observed; budding cells (blastoconidia) of varying shape, produced, along the hyphae at the points of septa, usually rounded, or short oval, seldom elongated produced as multilateral budding 2.8–10.5 μm . Indian meter, Chlamydospores round, large, thick walled and usually terminal.

4) *Cephalophora irregularis* Thaxter (1903).

Bot. Gaz. **35**: 158

Conidiophores clavate, up to 100–120 μm long. 6.6–12 μm thick near the base; swollen conidiogenous cell 20–60 x 16–33 μm . Conidia variable in shape, often pyriform or turbinate, sometimes lobed, colourless to pale brown 1–2 septate, 2.2–45 μm long; 12–33 μm thick in the broadest part protuberant. Hilum 1.5x3.3 μm wide.

5) *Cladosporium chlorocephalum* (Fresen) Mason and Ellis (1953).

Mycol. pap. 56: 123–126.

Conidiophores, stipe dark brown to black up to 590 – 685 μm long, 12–22 μm thick at base. 6.6–

12.6 μm thick. Immediately below heads. Spherical or oval, olive green by reflected light, brown by transmitted light 40–66 μm primary branches 8–22 x 6.6–8 μm Conidia olive or pale brown smooth of verruculose, o- proximal and intermediate ones ellipsoidal or limoniform 6–12 μm x 3–8 μm distal or terminal ones spherical 3.3 μm x 6.6 μm .

6) *Corynespora longispora* Saikia and Sarbhoy. (1980)

Ind. Phytopath. **33**: 466–470.

Colonies effuse blackish brown to dark brown, velvety mycelium immersed. Pale brown and hyphae septate. Conidiophores arising singly or in group of 2.5 from the cells of Stromata of terminally or laterally onto hyphae, erect straight or flexuous, pale to mid brown 8–9 septate. 360–950 μm length 5.6–8 μm thick at the base and 3.3 – 4.5 μm at the apex. Conidia cylindrical as sub cylindrical, very rarely obclavate cylindrical straight or curved, sub hyaline to pale brown, smooth. 8.22 septate, 4.6–6.5 μm long and 3.3–5.2 μm thick wide at the truncate base.

7) *Curvularia fallax* Boedijn (1933).

Bull. Jrd. bot. Buitenz. III, (1) :120–134

Conidiophore's brown, thread like, unbranched, conidia acrogenous verticillate or spirally arranged 23–34 x 9–12 μm .

8) *Curvularia pallescens*. Boedijn (1933).

Bull. Jrd. bot. Buitenz. III, (1) :120–134

Common on different substratum especially in the tropics. Conidiogenous, brown, thread like, unbranched septate. Conidia acrogenous, brown, ellipsoid, curved, three or four central cell distinctly large dark brown than terminal cells. 18–30 x 7–10 μm .

9) *Drechslera rostrata* (Drechslera) Richardson and faster. (1968).

Trans. Br. Mycol. Soc. 51:148.

Colonies, effuse, brownish, blackish brown, mycelium immersed, velvety, conidiophores solitary or in small groups. Straight of flexuous, brown to dark brown up to 180 to 200 μm long 6 to 9 μm thick. Conidia thick or straight curved, post rate obclavate, 6-18 pseudo septate, end hyaline or very pale and cut off by thick, dark septa intermediate cells golden brown. 99 to 100 μm long, 19-20 μm thick, in the broadest part, hilum distinctly protuberant.

10) *Grallomyces portoricensis* Stevens. (1918).

Bot. Gaz. 65: 245-246.

Hyphal segments usually 45-85 x 4.6-6.6 μm , attachment organ 2.0 - 42 x 2.5 -3 μm vesicles 5-7 μm , diam. Conidiophores up to 70 μm long out usually about 33 x 3.3 - 5.2 μm . Conidia 45-65 x 3.6 - 6.6 μm branches 19.9 - 45 x 4.5 -6.6 μm

11) *Penicillium purpurogenum* Stoll, (1923)

*La cellule*33: 235-237.

Colonies velvety, white at first, becoming yellow to pinkish shades, and finally light grey green. Conodiophores arises from aerial mycelium, up to 100 μm -1179 μm long conidial fructification consist of long divergent chains, up to 80 μm long in the stages mutuale 9.9-14.5x2-2.3 μm phialides 10-13x2.2 μm conidia elliptical 3-3 μm x2-2.4 μm . Smooth pale green.

12) *Phialophora fastigiata*Lagerb, Lundber & Melin (1937).

Mycologia 29:598.

Conidiophores very variable in length, 2.5- 3.3 μm , thick phialides lageniform, 9-15 x 2.5-3.3 μm . Conidia colourless to very pale brown 3.3 - 6.5 x 1.2 - 2.5 μm .

13) *Scolecobasidium variable* Barrow Busch (1962).

Can. J. Bot. 40: 83-84.

Conidiophores pale olivaceous, 5-25 x 1.5-3.3 μm . Conidia Cylindrical rounded at the ends or ellipsoidal, 1-3 septate, sometimes constricted at the septa, pale olivaceous, Verruculose or finely echinulate, 7-19 x 2.5-5 μm .

14) *Scytilidium thermophilum* (cooneu & Emersion) Austwick. (1976).

N.Z.J. Agric. Res.

Colonies effuse; grey, to black, becoming powdery. Hyphae hyaline to brown, 2 - 4.5 μm thick except for mid to dark brown swollen cells which are up to 12.5 μm , diam. conidia (arthroconidia) mid to dark brown, smooth, mostly Spherical or sub-spherical and 8-13 μm , diam. But sometimes oblong or ellipsoidal 8.5-16 x 6.5-10 μm .

15) *Taeniolella muricata* (Elliss & Everh.) Hughes.

Can. J. Bot. 36: 817.

Colonies effuse, dark brown, conidiophores scattered rather thinly, brown, 3.6 - 6 μm , thick. Conidia brown verruculose, mostly 3. 22. Septate 26-110 x 6.5 -9 μm .

16) *Trichocladium asperum* Harz. (1871).

Bull. Soc. Imper. Moscow. 44:125-127.

Colonies effuse, cottony, grey, conidiophores 2.5 - 3.6 μm thick. Conidia mostly acrogenous predominantly 1 - Septate, clavate, obovoid or ellipsoidal narrowed to a truncate base, dark brown, coarsely verrucose 12-26.6 μm long 8 - 12.5 μm thick in a broadest part.

17) *Trichoderma aureoriride* Rifai (1969).

Maycol. Pap. 116:34.

Colonies white, mycellium with few aerial hyphae or changes from white to whitish green to dull grass green. Mycelium branched, septate colourless. 1.2-6 μm wide. Conidiophores

flexuous, compact, main. Conidiophores slender, regularly, vertically branches 4µm wide, side branches arise above the septa in groups of 2-3 in turn the side branches put forth smaller branches again length of the side branches increases with the distance away from the apex which results a in conifer like appearance. Phialides long and slende base little narrow than the middle part which project into a long conical or sub cylindrical neck, in verticals Of 2-3 or rarely single and form False verticils beneath the terminal Phialides, stand at right angles and frequently bend towards the apex 6.6 – 73.3 x 2 - 3.3 µm. Conidia smooth walled obovate with distinct truncate, base 2.3-3 x 2-3 µm. Produced singly on the tip of the phialides and accumulated into conidial heads.

18) *Trichoderma konilangbra* Samuels. Petrinis kubick (1998).

Stud. Mycol. 41:1-54.

Conidiophores profusely branched, branching regular in pairs and opposed, fertile to the tip or sterile about 80-100 µm. Septate within walled extension phialides arising singly over a distance of 25 µm. from - the first branch, primary branch re branch intercalary phialides present.

19) *Trichurus spiralis* Hesselbrina (1900)

Bot. Gaz. 29:321.

Synnamata up to 2.5-3 µm high, 8-8.5 µm thick often expanded at the head to 212 µm or more. Individual threads 2.5 - 3 µm thick, setiform apices and branches coiled or spirally twisted pale to mid brown, up to 145 – 150 µm long, 2.5-3.3 µm thick and annellides 5-8.5 µm long thick in the broadest part. Conidia mostly 4-6 x 2.5-3.3 µm.

20) *Veronea coprophila* (Subram. & Lodha) M.B.Ellis.

= *Sympodina coprophila* Subram. & Lodha, 1964, *Antonie van Leeuwenhoek* 30:317- 319 – 328 (1964).

Colonies effuse, dark brown, Conidiophore straight, or flexuous, septate, mid to dark brown, paler towards the apex where there are a number of small, flat, scars, up to 340 µm long 2.5-3.5 µm thick, Conidia straight, cylindrical, rounded at the apex, conicotruncate at the base or ellipsoidal, 1-23 septate, pale brown, smooth, 4.5-10.5 µm×3.3- 6 µm.

CONCLUSION:

Twenty species of Hyphomycetes collected from the agriculture, forest and sugarcane industries effluent soil. 16 species were isolated from Agriculture soil, 19 species from forest soil and 8 species from sugarcane industries effluent agriculture soil. Sugarcane effluent used in agriculture soils every year by farmer as fertilizer seems to be suppressing the occurrence of Hyphomycetes in such soils. The occurrence of species like *Alternaria triticina* Prasad and Prabhu, *Aspergillus niger* Van Riegh, *Candida albicans* (Robin) Berkhout, *Cladosporium chlorocephalum* (Fresen) Mason and Ellis, *Corynespora longispora* Saikia and Sarbhoy, *Curvularia fallax* Boedijn, *Penicillium purpurogenum* Stoll, *Trichoderma konilangbra* Samuels Petrini & Kubicek. In the soils irrigated with sugar industry effluents may have become tolerant which needs to be further investigated in detail.

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Table No: 01: - Hyphomycetes Isolated from various type of Soils.

Sr. No.	Name of the Species	AS	FS	SIE
1.	<i>Alternaria triticina</i> Prasad and Prabhu	+	+	+
2.	<i>Aspergillus niger</i> Van Riegh.	+	+	+
3	<i>Candida albicans</i> (Robin) Berkhout	+	+	+
4.	<i>Cephalophora irregularis</i> Thaxter	+	+	-
5.	<i>Cladosporium chlorocephalum</i> (Fresen) Mason and Ellis.	+	+	+
6.	<i>Corynespora longispora</i> Saikia and Sarbhoy.	+	+	+
7.	<i>Curvularia fallax</i> Boedijn.	+	-	+
8.	<i>Curvularia pallescens</i> . Boedijn	+	+	-
9.	<i>Drechslera rostrata</i> (Drechslera) Richardson and FASTER.	-	+	-
10.	<i>Grallomyces portoricensis</i> Stevens.	+	+	-
11.	<i>Penicillium purpurogenum</i> Stoll.	+	+	+
12.	<i>Phialophora fastigiata</i> (Lagerb, Lundberg & Melin) Conant.	+	+	-
13	<i>Scolecobasidium variable</i> Barron & Busch.	-	+	-
14	<i>Scytalidium thermophilum</i> (Cooney & Emerson) Austwick.	+	+	-
15.	<i>Taeniolella muricata</i> (Ellis & Everh.) Hughes.	+	+	-
16	<i>Trichocladium asperum</i> Harz.	-	+	-
17	<i>Trichoderma aureoviride</i> Rifai.	+	+	-
18	<i>Trichoderma Konilangbra</i> Samuels Petrini & Kubicek.	+	+	+
19	<i>Trichurus spiralis</i> Hasselbring.	+	+	-
20	<i>Veronaea coprophila</i> (Subram. & Lodha) M.B. Ellis.	-	+	-

(AS-Agriculture Soil, FS- Forest Soil, SIE- Sugarcane industries effluent agriculture soil).