

**HYPHOMYCETES OF NAGAPUR FOREST FROM NEWASA TALUKA DISTRICT
AHMEDNAGAR (MS)**

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Abstract:

The present paper deals with the hyphomycetes of Nagapur forest. The forest decomposed plant parts. The dead and decaying wood, litter, old leaves, and fallen twigs were collected and for the colonization of hyphomycetes. Ten species were encountered which were illustrated and described. Out of which *Cladosporium oxysporium* Berk and Curt, *Curvularia richardiae* Alcorn, *Fusariella atrovirens* Sacc. Were new records to Maharashtra *Alternaria longissima* Deighton and Macgarvie, *Cordanamusa* (Zimm) Hohnel, *Echinobotryum atrum*. Corda, *Gyothrix podosperma* (Corda) Rabenhorst, *Scytalidium lignicola* Pesante are very common.

Key words: Hyphomycetes diversity of Nagapur forest.

Introduction:

Study area: Newasa is an administrative division of Ahmednagar district in Maharashtra state of India located between 19.00° - 19.40° latitudes and 74.48° – 75.00° longitudes at an altitude of 480-522 M from mean sea level. Under this region 129 villages are included with a total area of 1, 29204 hectares of which about 88% is under cultivation.

Climate:

The climate of the Taluka on the whole is extremely suitable for agriculture and forest vegetation. In the winter season which lasts from November to February the average temperature is around 11-12 °c and the air is dry and invigorating. The rainfall on the whole is irregular and erratic and average rainfall is 52-56 cm per year. In summer season which is from February till May the days are hot and dry with an average temperature of 42° c and the sky as a rule remains cloudless.

Soil:

The soils are mainly of alluvial, barad, regular or black cotton type. Most of the area is covered by black cotton soil. The soil is rich in humus content with good moisture retentive capacity and is suitable for agriculture and forest vegetation in Taluka.

Vegetation:

The Nagapur forest of Newasa Taluka is of tropical dry deciduous type. The forests consist of the following plant species *Tectona grandis*, *Dalbergia sissoo*, *Hardwickia binata*, *Pongamia sp.* *Madhuca indica*, *Eugenia jambolina*, *Cassia fistula*, *Mangifera indica*, *Morinda sp.* *Capparis zeylanica*, *Bahunia racemosa*, *Albizia lebbek*, *Erythrina indica*, *Acacia catechu*, *Feronia elephantum*. *Acacia Arabica*, *Eugenia jambulana*, *Feronia elephantum*, *Prosopis spicigera* *Morinda citrifolia*, *Tamarindus indica* L. etc.

Hyphomycetes are the conidial fungi in which the conidiophores are either borne free on mycelium, in sporodochium or organized as synnemata but not in a pycnidium. They represent the asexual (anamorphic) phases of Ascomycotina or Basidiomycotina and are classified in Form genera and Form species under Deuteromycotina. Majority of these fungi are without sexual stage but a few have sexual (teleomorphic) states of Ascomycotina or Basidiomycotina. Many members of this group have an enormous reproductive capacity and mechanism for survival in diverse habitats and extreme environments (Subramanian, 1983). To the naked eye hyphomycetes colonies are conspicuous as black, green, grey, yellow, orange or white growths on the natural substrates and on culture media. The study of this group is called as Hyphomycetology. The asexual spores are the conidia produced by mitosis (mitosporic), hence hyphomycetes are also mitosporic fungi. The conidia originate from conidiogenous cells either singly or in chains in acropetal or basipetal succession or aggregated as conidial heads. They are considered as modified hyphae (Descals, 1985). The conidiophores may be mononematous, micronematous, macronematous or synnematosus. The conidia show a great variation in size, shape, septation and coloration which formed the basis for artificial classification by Saccardo (1880). They are distributed worldwide both in terrestrial and aquatic habitats. Hyphomycetes draw nourishment from living or dead organic matter and are adapted to grow, reproduce and survive in a wide range of ecological situations due to the metabolites they produce and wide genetic diversity. The growth

and activity of hyphomycetes are a response of physical, chemical and biological factors of a particular habitat (Subramanian, 1983). The product of metabolism particularly the secondary ones have great commercial value and relevance to human welfare. The great diversity in habit, habitat, growth, reproduction and structure exhibited by these fungi inspires a hyphomycetologists towards a thorough understanding of this fascinating group. So far 1800 genera and 16000 species are reported of which 6000 species are from India (Manoharachary, 2008).

Materials and Methods:

Substrates collected from terrestrial habitats:

Plant parts: Fallen twigs, leaf litter, degrading bark and wood.

Seasons during which hyphomycetes were collected:

Monsoon

Winter

Summer

All the species described in this paper were collected by the author on various substrates from different terrestrial habitats in Nagapur forest of Newasa division of Ahmednagar district during 2017-2018. Frequent visits were paid to the sites to collect the specimens. The collection of these hyphomycetes required a pocket lens (10x), polythene and paper bags. The method of collection, through simple, needed an extensive survey and close observation of fallen or living twigs, decaying leaf litter, wood and bark, plant. The substrates from terrestrial habitats were collected in polythene or paper bags in adequate quantities and incubated in the laboratory and observed frequently for hyphomycetes.

Result and conclusion:

1. *Alternaria longissima* Deighton and Macgarvie.

Mycol. Pap. **113**:10 (1968).

Mycelium immersed conidiophores erect or ascending, simple, straight, flexuous, swollen at the apex, septate, pale brown, smooth, up to 145 µm long, 3.3-6 µm thick with 1 to several conidia. Conidia solitary, extremely variable in shape and size, pale to brown, very long up to 500 µm, beaked, septate with 5.46 transverse septa, 4-14 µm thick in the broadest part and about 2.5 µm thick at the apex.

Matrix: On decaying stems of *Eugenia jambulana*.

Loc: Nagapur forest

Date: November 2017.

The species was first reported from India by Bilgrami (1972) as a pathogen on leaves of *Lycopersicon esculentum*. The present collection is found as a saprophyte.

2. *Cladosporium oxysporium* Berk and Curt.

J. Linn. Soc. **10**(46):362 (1868).

Conidiophores often arising in fascicles through stomata, flexuous, brown, smooth, up to 450-500 µm × 3.3-6.6 µm thick terminal and intercalary swelling 3.3 × 8 µm diam. Conidia arising terminal swelling, which later becoming intercalary, in simple or branched chain, cylindrical, rounded at the ends, ellipsoidal or sub spherical, subhyaline or pale olivaceous brown, smooth 3.3-25 µm × 3.3-6.6 µm.

Matrix: On fallen twigs of *Tamarindus indica* L.

Loc: Nagapur forest

Date: Dec, 2017.

This species is very commonly found on leaves, stems, fruit, of several hosts as saprophyte and pathogen. Wangikar, *et al.*, (1969) reported this as a mold on grapes berries and leaves in Maharashtra. It is collected on fallen twigs of *Tamarindus indica*.

The species is collected as saprophyte on leaf litter of *Lepidium sativum* and is being reported **first time from Maharashtra state.**

3. *Curvularia richardiae* Alcorn.

Trans Br. Mycol. Soc. **56**: 155-157 (1971).

Colonies amphigenous, effuse, hairy, grey. Conidiophores solitary or in small group mid to dark brown, paler at the apex up to 245 long 6-12 thick some time basal cell tapering to 4-5 at apex, some time basal cell swollen to 16 µm. Conidia usually straight, some time slightly curved, clavate, 2-4 (most commonly 3) septate, mostly 20-40 µm long, 16-22 µm thick in the broadest part, mid to dark brown, with the basal tapering to 4-5 at apex, some time basal cell and sometimes the cell above it paler than the others, smooth.

Matrix: On decaying leaf *Pongamia* sp.

Loc: Nagapur forest.

Date: May, 2018.

The characters of present collection are similar to that of original description except for slightly smaller conidia. **This species collected on a new host forms a new record to Maharashtra.**

4. *Cordanamusae* (Zimm) Hohnel.

Zentbl. Bakt. Parasitkede. Abt.2, 60:7 (1923).

Conidiophores straight or flexuous, often nodes pale to mid brown, smooth up to 225 µm long 3.3×6.6 µm thick usually at the base to 8×12 terminal and intercalary swelling 6.6-8 µm diam. Conidia solitary or small pegs arising from terminal swelling which later become intercalary, bovid or pyriform 1-, pale brown, smooth, 8×18 µm long 6.6×12 µm thick in the broadest part.

Matrix: Decaying leaf *Madhuca indica*

Loc: Nagapur forest.

Date: August, 2018.

The species is responsible for diamond leaf spot disease of banana (Subramanian, 1957) and also curd rot in cauliflower ((Harbola and Khulbe, 1994). The conidiophores and conidia in the present collection are slightly larger.

5. *Drechslerabiseptata* (Sacc. & Roum.) Richardson & Fraser.

Trans.Br. Mycol.Soc. 51:148 (1968).

Conidiophores arising either solitary from hyphae or in large fascicles from very dark brown pulvinate stromata. Conidiophores are of 2 kinds, flexuous or geniculate pale to mid brown, thin walled up to about 77 µm. long and 3.3 to 9 µm thick and subulate, straight or flexuous, dark brown, thick walled up to 750 µm, long and 9.9 µm thick at the base tapering to 6-9 µm at the paler apex. Conidia straight, typically obovoid or broadly clavate, occasionally ellipsoidal, pale to mid brown, smooth or varicose, with almost always 2-3 pseudosepta 17 to 38 µm long, 11 to 19 µm thick in the broadest part; mostly 21-29 µm × 9.9 × 16 µm long.

Matrix: On decaying fruit of *Morinda sp.*

Loc: Nagapur forest.

Date: Sept. 2018

Singh, *et. al.*, (2002) collected this species on *Parthenium* seeds. The characters of present collection are similar to that of original description however the conidiophores and conidia are slightly shorter. **This is a new record to Ahmednagar District.**

6. *Drechslerahalodes* (Drechs) Subram. & Jain.

Curr.Sci. 35: 345 (1966).

Conidiophores arising singly or pairs, straight or flexuous, brown up to 145 µm long 4.5-9 µm thick. Conidia straight or slightly curved, cylindrical to ellipsoidal with up to 12 commonly 6-10 pseudosepta, end cells hyaline or very pale and cut off by thick, dark septa, intermediate cell golden brown 30-120 µm long 10-22 µm thick in the broadest part.

Matrix: On decaying stem of *Dalbergia sissoo*.

Loc: Nagapur forest

Date: Sept, 2018.

Kulkarni, *et. al.*, (1976) first reported this species from Maharashtra as a pathogen causing leaf spot disease of *Glycine max*.

7. *Echinobotryum atrum*. Corda.

In strums Deut. Fl. III, 2, 12:51 (1831).

Colonies effuse, brown, olivaceous, conidiophores semi - macronematous, mononematous, straight or flexuous, unbranched, or branched, pale brown, smooth, up to 28µm long, 2-4.5µm. thick. Conidia solitary, acropleurogenous, in clusters, simple, obpyriform or obturbinate, mucronate, with a broad, flat base, brown to dark brown, smooth verrucose, 0-septate, 9-12×5-6.8 µm.

Matrix: On decaying fruit of *Pongamiapinnata* L. & in agriculture soil.

Loc: Nagapur forest

Date: Oct. 2018.

The characters of present collection are similar to that of original description except for slightly smaller conidiophores and conidia.

8. *Fusariella atrovirens* Sacc.

Attilst. Veneto. Sci. 6 Ser. 2:463 (1854).

Colonies compact, black, Conidiophores up to 75µm~3µm, or colourless to pale brown, often verruculose. Phialides curved, 16-28×2.5-4 µm, tapering to 2 µm. Conidia mostly curved, fusiform, pointed at the apex, blunt at the base, olive brown, black in mass, 3-septate, sometime constricted at the septa, 22-29×4.5-6 µm.

Matrix: On decaying leaf of *Calotropisprocera*(Ait) R. Br.

Loc: Nagapur forest

Date: Oct, 2018.

This species was reported from India by Rajak and Rajak (1982) collected on deadtwigs of *Ailanthesexcelsaat* Jabalpur in Madhya Pradesh state. The conidiophores and conidia are slightly larger in the present collection. **This is a new record to Maharashtra state.**

9. *Gyrothrix podosperma* (Corda) Rabenhorst

Krypt.FL. 1: 72 (1844).

Colonies dark, reddish brown, seta 4-6 times sub dichotomously branched, 118-250µm, high, trunk 3.3-6 µm, thick just above the basal swelling. Conidiogenous cell 6.6-12.5 µm, long. 3.35µm, thick at the base tapering to 1 µm. Conidia straight or slightly curved. 10-16.5 × 1.5-3µm.

Matrix: *Cocos nucifera* L. decaying fruit.

Loc: Nagapur forest

Date: Nov, 2018.

The characters of present collection are similar to that of original description but setae are slightly smaller. This species was first reported from Maharashtra state by Desai and Patwardhan (1974) Sarwar, *et. al.*, (1980) described it as a pathogen causing leafspot disease in *Cymbopogon winterianus*.

10. *Scytalidium lignicola* Pesante.

Annalisper.Agr. N.S. 11, Supp: CCLXI-CCLXV (1957).

Hyphae, 1.5-6.6µm, thick except for swollen cells which may be up to 8-10 µm thick. Conidia hyaline, 5.5-10µm x 1-2.5µm brown, 6 -12.6 × 4.5-9.3 µm.

Matrix: On leaf-litter.

Loc: Nagapur forest.

Date: Dec, 2018.

The characters of present specimen are similar to that of original description except for slightly smaller conidia.

Acknowledgement:

The Authors thankful to the Principal Dr. Kalhapure, Shri Dnyaneshwar Mahavidyalaya Newasa Vice- Principal Ghanwat A.J. Shri Dnyaneshwar Mahavidyalaya Newasa for providing Laboratory and Library facilities and also for encouragement.

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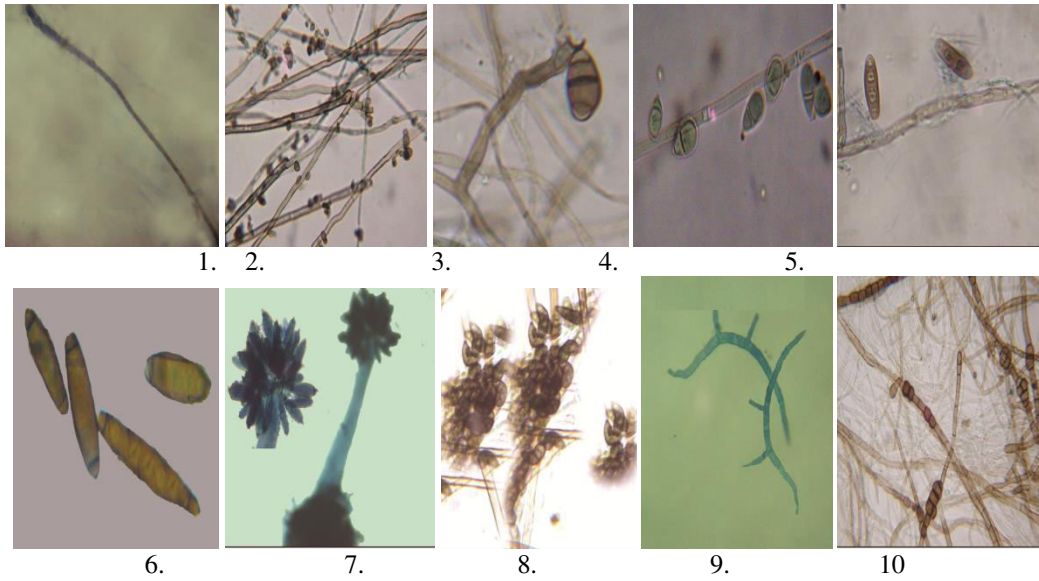


Fig. 1. *Alternaria longissima* Deighton and Macgarvie,
2. *Cladosporium oxysporium* Berk and Curt,
3. *Curvularia richardiae* Alcorn,
4. *Cordananmusae* (Zimm) Hohnel,
5. *Drechslerabiseptata* (Sacc. & Roum.) Richardson & Fraser,
6. *Drechslerahalodes* (Drechs) Subram. & Jain,
7. *Echinobotryum atrum*. Corda,
8. *Fusariella atrovirens* Sacc,
9. *Gyrothrix podosperma* (Corda) Rabenhorst,
10. *Scytalidium lignicola* Pesante.