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## Some species of *Alternaria*: From surrounding area of upper lake and lower lake of Bhopal, Madhya Pradesh, India

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### Abstract

By using serial dilution method ten species of *Alternaria* belonging to order Moniliales and group Deuteromycotina were isolated from the surrounding area of Upper Lake and Lower Lake of Bhopal, Madhya Pradesh, India.

**Keywords:** Soil Fungi, Moniliales, Around Water Bodies, Bhopal

### 1. Introduction

Over Bhopal is the capital of Madhya Pradesh and is also known as the city of lake. It is located in the north western part of the state of Madhya Pradesh in the central region of India. At Bhopal maximum work has been done in the field of aquatic mycology. Study on soil fungi around the Upper Lake and Lower Lake of Bhopal (M.P.) has been under taken for the first time. During the study period many species belonging to order Moniliales were isolated from the surrounding area of Upper Lake and Lower Lake of Bhopal. Present paper deals with nine species of *Alternaria* viz. *Alternaria alternata*, *Alternaria citri*, *Alternaria dianthi*, *Alternaria longipes*, *A. longissima*, *A. raphani*, *Alternaria solani*, *Alternaria tenuissima*, *Alternaria triticina* belonging to order Moniliales and group Deuteromycotina. Rane and Gandhe<sup>[8]</sup>, Ramesh<sup>[7]</sup> *et al.* had isolated some species of *Alternaria* in different soil environment from different region of the world.

### 2. Material and Methods

During the study period soil samples were collected randomly from surrounding area of both the Lakes by scraping a layer of soil up to 5-10 cm. depth. The suspension of the soil sample was made by serial dilution method (Waksman<sup>[9]</sup>). The fungal colonies were grown in Potato dextrose agar medium at 35 °c for 6-10 days. These fungal forms were identified up to species level with the help of monographs, manuals, relevant research papers and publication of some eminent scientist like Barnett and Hunter<sup>[1]</sup>, Ellis<sup>[3-4]</sup>, Vascant Rao<sup>[6]</sup> *et.al.*, Nagmani<sup>[6]</sup>, Domesh<sup>[2]</sup> *et.al.*, Gilman<sup>[5]</sup>.

### 3. Results

#### *Alternaria*

*Nees ex Fr; Nees*, 1816, *Syst. Pilze Schwamme*: 72; *Fries*, 1821, *Syst. Mycol.*, 1: XLVI.

Colonies effuse usually grey, dark blackish brown or black. Conidiophores macronematous or mononenatous, simple or irregular and loosely branched pale brown to brown. Conidia catenate or solitary, dry, typically ovoid or abclavate, often rostrate, pale or mid olivaceous brown or brown, smooth or verrucose with transverse and frequently also oblique or longitudinal septa.

*Alternaria alternata* (Fr.) Keissler, 1912, *Beih. Bot. Zbl.*, 29:434.

Colonies usually black. Conidiophore arising singly or in small groups, simple or branched, strate, smooth to 50 µm long, 3.75 µm thick. Conidia formed in long, often branched chain, ellipsoidal with a short cylindrical beak some time up to but not more than one third the

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length of the conidium, 5-6 transverse section, several longitudinal septa, length 20-63  $\mu\text{m}$ , 9-18  $\mu\text{m}$  thick, beak 2-5  $\mu\text{m}$  thick.

Previously reported from mud soils of Vikarabad by Manoharachary, 1984.

***Alternaria citri*** Ellis & Pierce *apud* Pierce, 1902, *Bot. Gaz.*, 33:234.

Colonies effuse, black, Conidiophores simple, flexous, septate, 300 $\mu\text{m}$  long, 3.75  $\mu\text{m}$  thick, with terminal scar. Conidia solitary, straight, clavate shaped, 5-7 transverse and several longitudinal septa, constructed at the septa, 21.875  $\mu\text{m}$  long, 6.25  $\mu\text{m}$  thick, beak 3.75  $\mu\text{m}$  thick, 6.25  $\mu\text{m}$  long.

***Alternaria dianthi*** Steven & Hall, 1909, *Bot. Gaz.*, 47: 409-413.

Colonies amphigenous. Conidiophore simple, straight or flexous, cylindrical, septate, up to 120  $\mu\text{m}$  long, 5-8  $\mu\text{m}$  thick. Conidia chain of 2-4, conical to obclavate, 68.75  $\mu\text{m}$  long, 15.625 $\mu\text{m}$  thick, beak swollen at the tip.

***Alternaria longipes*** (Ellis and Everh.). Mason, 1928, *Mycol. Pap.*, 2:19.

Conidiophore arising in groups or in singly, cylindrical septate, 80  $\mu\text{m}$  long, 3.75  $\mu\text{m}$  thick. Conidia solitary, length 37.5  $\mu\text{m}$ , 12.5  $\mu\text{m}$  thick, beak 2-5  $\mu\text{m}$  thick, one third of the total length, slightly swollen at the tip, 3-7 transverse septa and 1-2 longitudinal septa.

***A. longissima*** Deighton and Mac Garvie, 1968, *Mycol. Pap.*, 113:10.

Conidiophores simple, cylindrical, septate, up to 150  $\mu\text{m}$  long, with 3-5  $\mu\text{m}$  thick. Conidia solitary, variable in shape and size, many are very long (78.125- 218.75 $\mu\text{m}$ ) long and 6.25  $\mu\text{m}$  thick, narrow septate beak, 5-40 transverse septa.

***A. raphani*** Groves and Skolko, 1944, *Can. J. Res., Sect. C.*, 22:227.

Conidiophore simple, septate, up to 150  $\mu\text{m}$  long, 3.75  $\mu\text{m}$  thick, sometimes swollen at the tip and with a single conidial scar. Conidia in chain of 2-3, with short beak, 50-130  $\mu\text{m}$  long, 14-30  $\mu\text{m}$  thick.

***Alternaria solani*** Sorauer, 1896, *Z. Pflkrankh.*, 6:6.

Conidiophore arising singly or in small groups, straight, septate. Conidia solitary, straight, ellipsoidal tapering to a beak which is commonly the same length 150-300  $\mu\text{m}$ , 15-19  $\mu\text{m}$  thick, 9-11 transverse and 0 or a few longitudinal septa.

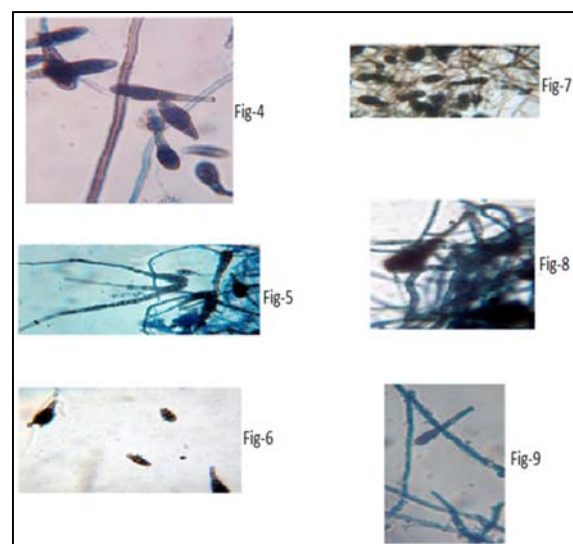
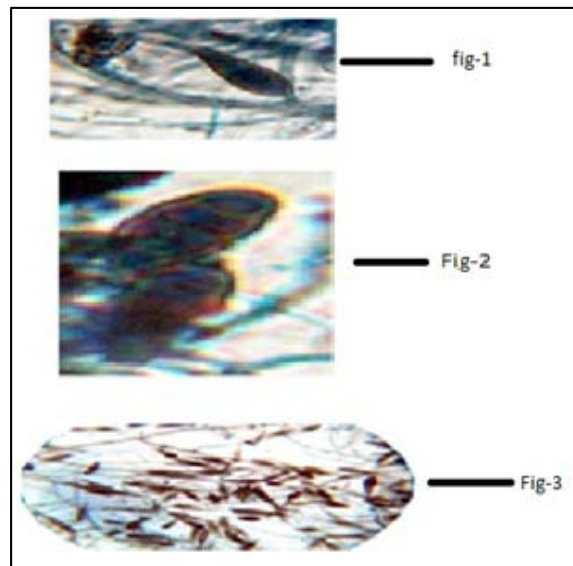
***Alternaria tenuissima*** (Kunze ex Pers.) Willshire, 1933, *Trans. Br. Mycol. Soc.*, 18:157.

Conidiophores solitary or in groups, simple, up to 115  $\mu\text{m}$  long, 4-6  $\mu\text{m}$  thick. Conidia solitary or in short chains, usually shorter, 5-7 transverse septa, length 54  $\mu\text{m}$ , 13.8  $\mu\text{m}$  thick, beak 2-4  $\mu\text{m}$  thick.

Previously reported from soil of Hyderabad by Padma, 1995.

***Alternaria triticina*** Prasada and Prabhu, 1963. *Indian Phytopath.* 15:292-293.

Conidiophores up to 30  $\mu\text{m}$  long, 3-6  $\mu\text{m}$  thick, occasionally branched. Conidia 20-90  $\mu\text{m}$  long, 9-30  $\mu\text{m}$  thick, beak cylindrical, 3-5  $\mu\text{m}$  thick.



**Fig 1:** *Alternaria alternate* Conidiophore and conidia

**Fig 2:** *Alternaria citri* Conidiophore and conidia

**Fig 3:** *Alternaria dianthi* Conidiophore and conidia

**Fig 4:** *Alternaria longipes*, Conidiophore and conidia

**Fig 5:** *A. longissima*, Conidiophore and conidia

**Fig 6:** *A. raphani* Conidiophore and conidia

**Fig 7:** *Alternaria solani* Conidiophore and conidia

**Fig 8:** *Alternaria tenuissima* Conidiophore and conidia

**Fig 9:** *Alternaria triticina* Conidiophore and conidia

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