Trends in Commerce, Economics & Life Sciencess

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Studies on Growth of *Macrophomina phaseolina* isolated from infected roots of Sarpagandha on Selected Media

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Abstract:

Macrophomina phaseolina (Tassi) Goid is a soil borne fungus causes root rot diseases to Sarpagandha (*Rauwolfia serpentina*). The fungus infects the root and lower stem of over 500 plant species and is widely distributed in the United States (Wyllie, 1988). Root rot disease occurs during unfavorable environmental conditions. *Macrophomina phaseolina* causes diseases to soybean, peanut, and corn. In peanut, it causes seed and seedling rots, wilt, root and stem rots, leaf spot, and rotting of developing pods and seed. In the present study, infected roots of *Rauwolfia serpentina* were collected from different plant gardens and preserved in research laboratory. In vitro the growth of *Macrophomina phaseolina* was studied on selected media. It was observed that more growth on potato dextrose agar media than the Capek's dox agar media.

Key words- *Macrophomina phaseolina*, Root rot, Sarpagandha

Introduction:

The fungi cause heavy yield losses of crop and medicinal plants. The medicinal plants are also infected by fungi causing seed and seedling rots, wilt, root and stem rots, leaf spot, and rotting of developing seedlings. Among the different fungi, *Macrophomina phaseolina* causes root, seedling and seed rot. The mycelium of *Macrophomina phaseolina* is septet and black colored. The conidiophores were formed in groups, straight, brown in colored. The conidia were solitary straight or slightly flexuous oblong or muriform or ellipsoidal tapering to beak, pale or olivaceous brown, length 300 µm and 15µm thick in the broadest part with 8 transverse and 4 longitudinal septa. The beaks were flexuous, pale and branched. Thus, the pathogen causing root rot of *Rauwolfia serpentina* has been **identified as** *Macrophomina phaseolina* (White, 1999 and Mukadam et al, 2006). In the present investigation comparative growth of *Macrophomina phaseolina* was studied on different media.

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Materials and Methods:

Collection of Infected Plant material:

The collection of infected roots of *Rauwolfia serpentina* L. Benth ex Kurz was carried out from different medicinal plant gardens viz. Nagarjun medicinal plant garden, PDKV Akola and MPKV Rahuri (MS). Roots were stored at research laboratory for further study.

Fig.1 Diseased plants of *Rauwolfia serpentina* Fig.2 Diseased roots

Isolation of the pathogen:

The infected roots were collected from two medicinal plant gardens i.e., Nagarjun medicinal plant garden, PDKV Akola and MPKV Rahuri. **The fungal pathogen** *Macrophomina phaseolina* (Tassi) Goid was isolated **from the infected roots of** sarpagandha **showing typical root rot symptoms. The healthy and infected roots were brought to laboratory and preserved for further study. The infected roots were sterilized with 0.1% sodium hypochlorite solution. The sterilized root were used for isolation of fungal pathogen i.e. *Macrophomina phaseolina*. The isolation of pathogen was made by inoculating small portion of the infected root aseptically on Potato Dextrose Agar medium (PDA). The plates were incubated for 7 days at room temperature (Cloud, and Rupe, 1991 and Dhingra et ai., 1977).**

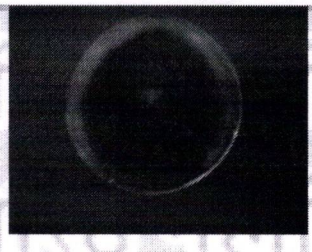

Fig3 *Macrophomina phaseolina*

***In vitro* Growth on different media:**

The composition and preparation of different media are given below (Tuite, 1969).

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1. **Potato Dextrose Agar media (PDA):**

Composition:

Potato - 200g

Dextrose - 20g

Agar - 15g

Distilled water - 1000 ml

39.0 gm Potato Dextrose Agar suspend in 1000 ml distilled water. Boiled it to dissolve the medium completely. It was sterilized and plated.

2. Czapek's Dox agar:

Composition:

Sodium nitrate (NaNo3) - 3 g

Potassium dihydrogen phosphate (K2HPO4) - 1 g

Magnesium sulphate (MgSO4. 7H20)- 0.5 g

Ferrous sulphate (FeSO4. 7 H2O)- 0.19 g

Sucrose (C12 H22O11) - 30 g

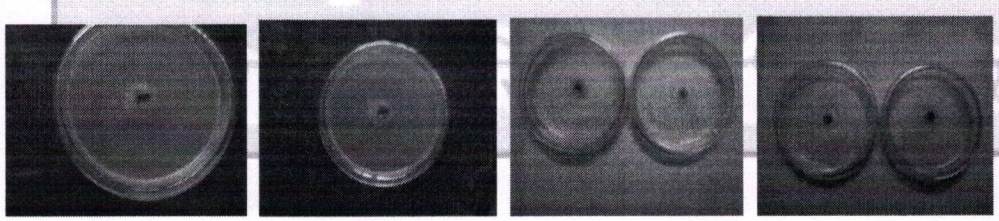
Agar - 15 g

Distilled water - 1000 ml

Agar was melted in 500 ml distilled water and ingredients were thoroughly dissolved in 500 ml distilled water. Both the preparations were mixed and the final volume was made up to 1000 ml and then autoclaved.

Fifteen ml of each medium listed above was poured in to Petri plates. After solidification, 5 mm discs from 9 days old ***Macrophomina phaseolina*** culture were cut by using a cork borer and a single disc was inoculated at the centre of plate. The plates were incubated at room temperature for seven days. The fungal growth was measured in millimeter (mm) and recorded up to seven days.

Experimental results and discussion:



PDA Czapek's Dox agar PDA Czapek's Dox agar

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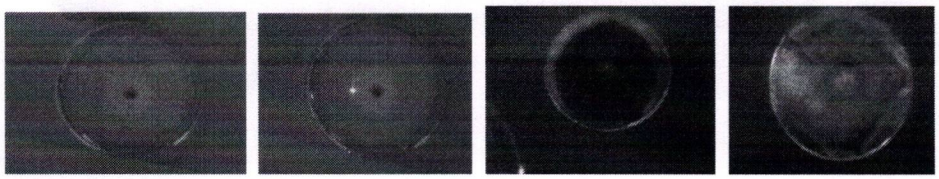

PDA Czapek's Dox agar PDA Czapek's Dox agar

Table.1: *In vitro* Growth *Macrophomina phaseolina* on PDA

Sr. No.	Incubation period (Days)	Growth (mm)
1	1	00
2	2	11
3	3	22
4	4	36
5	5	55
6	6	72
7	7	90

Table.2: *In vitro* Growth of *Macrophomina phaseolina* on Czapek's Dox agar

Sr. No.	Incubation period (Days)	Growth (mm)
1	1	00
2	2	15
3	3	24
4	4	39
5	5	58
6	6	82
7	7	90

These two solid media were used to study *in vitro* the growth of *Macrophomina phaseolina.* The growth was recorded from incubation day to seven maximum days (Table 1, 2). On seven day the maximum growth was observed on PDA as compared to Czapek's Dox Agar. It is clear that potato dextrose agar is favorable media for growth of *Macrophomina phaseolina*.

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