

Isolation and identification of fungal pathogen from soybean weeds

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Abstract: Soybean a "miracle crop" is outstanding in its nutritive value. It has 43 percent biological protein and 20 percent fat. It is also rich in vitamins, mineral salts and essential amino acids. The intensity and distribution of weed species in the soybean crop are function of a complex interaction between soil properties, rainfall patterns, temperature and cultural practices. Soybean yield losses by the weed interference and the weed control constitute of maximum costs involve in soybean crop production. Looking to the potential of microbial herbicides, On the basis of primary screening 12 fungal strains isolated from various parts of selected weeds.

Key Words: Soybean, Mycoflora, Vindhya, soil fertility, fungal.

1. INTRODUCTION:

Legume crops are the second most important group of food plants and the major source of protein in the predominately vegetarian diet of the people of India. The annual production is about 12 million tones but our requirement is about 17 million tones indicating a deficiency of over 30%. Which can be overcome through increased production and crop protection.

Madhya Pradesh is most agricultural State; on 74% population of this state is rural, which directly or indirectly depends on agriculture. This State main economy depends on agriculture and their contribution about 31 % in state economy and 71 % people directly engaged in Agriculture. Weeds are ubiquitous and are considered to be unwanted plants agriculture and other settings. More specifically, the term is often used to describe native or nonnative plants that grow and reproduce aggressively (Freeman, 1979). It has been expected that one tenth of 300000 species of plants are weeds. About 1800 of the weeds cause mainly economic losses in agricultural production, and about 300 weed species are serious in cultivated crops throughout the world

They claim their own share of soil fertility and productivity at the cost of crop yield. Various microbial products have been patented and commercialized in progress countries. Critical analysis of literature published on microbial weed interactions clearly indicates that no serious and systematic research has been carried out in India to assess their herbicidal potential (Pandey et. al. 1996. 2001 Pandey 1999). There is no doubt about the problems of hazardous weeds in leguminous crops. Every year tonnes of productivity of these crops have reduced due to the weeds. Synthetic chemicals employed to control these plants are now gradually either ineffective or creating severe problems to only other non-target organisms. An extensive survey of literatures on microbial management of weeds clearly indicates that no serious effort has been made in case of leguminous crops. However, significant work has been done in case of microbial management of insect pests of legumes in India. Therefore, the present investigation has been proposed to isolate and identified most virulent strain.

2. MATERIAL AND METHOD:

- **Field Survey:** A systematic, periodical and thorough survey of the weedy soybean fields especially in different localities of was undertaken. The main Vindhya region different areas. In the soybean season monthly survey of the fields were carried out which helped in the understanding of the pattern of vegetative growth as well as different stages in the development of disease. Infected parts (leaves and stems) of the different weeds having distinct symptoms were collected in separate sterile polythene bags. Tentative collection number and detailed observation of fungal specimens were noted in field diary as well as on polythene bags.
- **Recovery of Pathogens:** The set of specimens collected during survey were brought to the laboratory and were used for the isolation of the fungal pathogens. Following procedures were followed for isolating the fungal pathogens from different parts of the weed.
- **Isolation from Infected Leaves, Stems :** Diseased portion of the weed were cut into small pieces (2 to 5 mm square) with the help of sterilized blade aseptically. They were then surface sterilized with 1 % sodium hypochlorite (NaOCl) solution for about three minutes, followed by rinsing with sterile water to remove any possible contamination. These were then transferred in presterilized petri dishes (9 cm diameter) containing potato-dextrose agar medium with 75 mg/l streptomycin and pinhead amount of rosebengal (Walker, 1981; Agarwal and Hasija, 1986).

- **Microscopic studies and identification of pathogens:** The organisms were identified with the help of various books, monographs, reviews, research papers etc. (Ellis, 1971, 1976; Subramanian, 1971; Barnett and Hunter, 1972; Ellis and Ellis, 1985). The slides were temporarily mounted in KOH, which was found quite useful for observation of conidiogenous cells and other hyaline structures. These were finally mounted in lactophenol with cotton blue. The slides were made semi-permanent by ringing them with nail polish and stored for further study and references.

3. RESULT:

Survey and collection of Strain all plants, including weeds, have natural enemies. These enemies can be manipulated to influence the abundance of their host plants. During a periodical survey of various soybean fields in Raipur-Karchuliyan, Semariya, Raghunathganj, Ahirgawon, Sagara area, it was observed that leaf spot, leaf blight, die back, etc. diseases were associated with soybean and its weeds. A total of 12 fungal isolate four major weeds, namely, *Echinochloa colonum*, *Euphorbia geniculata*, *Cyperus iria* and *Commelina benghalensis*.

Table 1: Fungal strains isolated from Soybean Fields

S. No.	Fungus isolated from Leguminous fields	Zone of occurrence	Symptoms
1	<i>Aspergillus candidus</i>	Leaf	Leaf spot,
2	<i>Alternaria alternata</i>	Lamina, petiole	Les symptoms
3	<i>Colletotrichum dematium</i>	Petiole, Lamina	Les symptoms
4	<i>Curvularia clavata</i>	Leaf	Leaf spot
5	<i>Curvularia lunata</i>	Lamina, petiole	Les symptoms
6	<i>Fusarium sp.</i>	Petiole, Lamina	Leaf spot
7	<i>Fusarium moniliforme</i>	Leaf	Leaf spot
8	<i>Fusarium oxysporium</i>	Leaf	Leaf spot
9	<i>Helminthosporium sp.</i>	Lamina, petiole	Les symptoms
10	<i>Penicillium sp.</i>	Lamina,	Leaf spot, Lesions
11	<i>Phoma sp.</i>	Leaf	Leaf spot
12	<i>Trichoderma sp.</i>	Leaf	Leaf spot

4. CONCLUSION :

A total no of 12 fungi isolate from soybean weeds and in further study we are select a bio-control agent from isolated strain for production of bioherbicide.

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