COLONY COLOUR AND TEXTURE OF DIFFERENT ISOLATES OF *FUSARIUM SOLANI*, THE CAUSE OF ROOT ROT DISEASE OF OKRA (*ABELMOSCHUS ESCULENTUS* L) IN PESHAWAR

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ABSTRACT

The research work was conducted at department of plant pathology, University of Agriculture, Peshawar, Pakistan during 2012. The objective was to determine the fungal colony texture and colour of five different isolates of *Fusarium solani,* causing root rot of okra (*Abelmoschus esculentus* L) plant, in Peshawar. In this study, five isolates of *Fusarium solani* collected from different places of (Chamkani, Budhni, Palosi, Achinipayan and Jogian) were investigated for colony colour and texture. They were flat to cottony or woolly densely and densely floccose to fluffy. The colony colour was white to off white, creamy and chocolate colour or bright or silver coloured.
Keywords: *Abelmoschus esculentus* L, Colony texture and Colour, *Fusarium solani*

INTRODUCTION

Okra (*Abelmoschus esculentus* L.Moench) is one of the most widely known and utilized species of the family Malvaceae (Bayer and Kubitizki, 2003; Naveed *et al*., 2009). Okra is a tropical and subtropical crop, is widely distributed from Africa to Asia, in Southern European, the Mediterranean and all of the America (Oyelade *et al.,* 2003; Andras *et al.* 2005). Okra commonly known as "lady finger" is primarily a vegetable crop sown for its immature pods that can be consumed as a fried or boiled vegetable or may be added to salads, soups and stews (Kashif *et al.,* 2008). The crop grows well in hot weather, especially in the region with warm night (Ndungurn and Rajabu, 2004).

A number of fungi bacteria, viruses, mycoplasma, nematode and insect attack okra crop. The total loss of vegetable on this account has been estimated up to 20-30% but if the pathogen is allowed to develop, This loss may increase up to 80-90% (Hamer and Thompson, 1957). Okra plant is attacked by a number of diseases caused by fungi such as *Macrophomina phaseolina, Rhizoctonia solani Rhizoctonia bataticola, Fusarium solani, Pythium butteri, Cercospora abelmoschii, Phytophthora palmivora* and *Erysiphe cichoracearum* (Mital, 2006). Fusarium root rot are known to decrease the quantity and quality of major world crops including tomato (Parveen *et al*., 1993; Stephen *et al*., 1996), other vegetables (Ghaffar, 1995) and soybean (Mousa, 1994). This disease is caused by *Fusarium solani* (Rahim *et al*., 1992).

Greater variability exists in colony colour and texture of different isolates of *Fusarium solani.* Variations in coloris white to pale white (Dong *et al*., 2012), white, cream, tan, salmon, pink, purple (Hoog *et al*., 2000) and pink, light pink, yellowish with orange pigmentation and white (Sreedevi, 2007). Variability also reported in colony texture of various isolates of *Fusarium solani.* These are fluffy growth and wool to cottony and flat (Dong *et al*., 2012; Hoog *et al*., 2000; Sreedevi, 2007). Current research project was initiated with the objective to find out variability in colony colour and texture of different isolates of *Fusarium solani,* collected from different locations of district Peshawar.

MATERIALS AND METHODS

A survey was conducted in okra growing regions (Achini Payan, Palosi, Chamkani, Jogian and Budhni) of Peshawar district during 2012. Infected seedlings were collected from each location and brought to the laboratory of Plant Pathology Department, The University of Agriculture, Peshawar for further studies.

Isolation and identification of the pathogen from diseased okra seedlings

Infected okra seedlings were collected from five different areas of Peshawar district and it was washed with distilled water. Then it was

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surface sterilized with 0.1% solution of $HgCl_2$ for 15-30 seconds. After that it was rinsed 3 times with sterile distilled water to remove the extra disinfectant. The treated pieces were placed on potato dextrose agar (PDA) medium in Petri dishes supplemented with streptomycin to stop bacterial activity under aseptic condition and incubated at 25°C for mycelial growth of the fungus. The isolates were pure cultured on potato dextrose agar (PDA) medium. The fungus was identified by using the key of Barnet and Hunter (1972).

In vitro-study

An experiment was conducted in aseptic conditions using sterilized glass wares. Each isolate was replicated five times. Inoculum plug of equal diameter (3 mm) was maintained for all the isolates. Then all the petri plates were kept in incubators at 25°C for the fungal growth. Completely Randomized Design (CRD) was applied for conducting the study (Dana, 2001). Data were recorded on colony colour and texture.

RESULTS AND DISCUSSION

Identification of the Pathogen

The pathogen was identified as *Fusarium solani* by using the key of Barnet and Hunter (1972) (Fig 1, 2)

Colony colour and texture of different isolates of *Fusarium solani* at 25 °C

Table 1 indicated significant differences in colony colour and texture. The colony colour of Palosi, Jogian, Budhni, Achinipayan and Chamkani isolates were whitish, whitish and grayish, brightly coloured with brown yellow buff, creamy with chocolate colour in center and off white respectively. The texture of Palosi, Jogian, Budhni, Achinipayan and Chamkani isolates were aerial mycelium with cottony growth, aerial mycelium with densely floccose growth, cottony to wooly, aerial mycelium with densely floccose growth and flat to cottony in growth, respectively.

Proper identification of pathogenic species has a direct impact on epidemiological studies and disease management. Different isolates and species have different life histories, such as growth rate, timing of sporulation number of spores produced and optimal, condition for spore germination and growth. All of these factors are important in development of disease forecasting models, which is critical in optimizing effective and economical control programme. In summary, the most successful management of root rot of okra will be achieved only after making a definitive assessment of the diversity that exists among different isolates and species of *Fusarium* that occur on the okra and the potential of these distinct isolates and species that cause the disease. Similar results were also obtained by Dong *et al*., (2012), Hong *et al*., (2000) and Sreedevi (2007).

Fig: 1. Culture of *Fusarium solani*

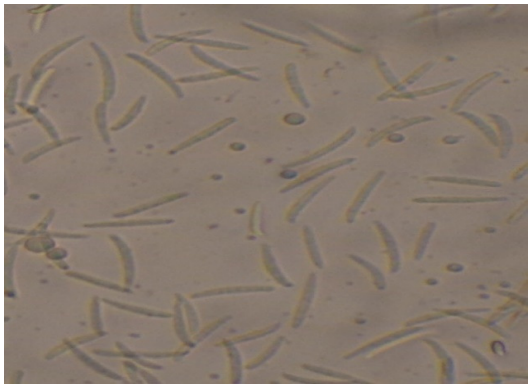

Fig: 2. Macroconidia of *Fusarium solani*

Table 1: Colony colour and texture of different isolates of *Fusarium solani*, causing okra root rot disease at 25°C.

S.No	Isolate	Fungal Colony texture	Fungal Colony Colour
1.	Palosi	Aerial mycelium with cottony growth	Whitish
2.	Jogian	Aerial mycelium with densely floccose growth	Whitish and grayish
3.	Budhni	Cottony to woolly	Brightly coloured with brown yellow buff
4.	AchiniPayan	Aerial mycelium with densely floccose	Creamy with chocolate colour in center
5.	Chamkani	Flat to cottony in growth	Off white

CONCLUSION

Variability were found between colony texture and colour of different isolates of *Fusarium solani*, the cause of okra root rot. On the basis of these results and as far as the problem is concerned, a detailed research work is needed in okra growing areas of Khyber Pakhtunkhwa to provide deep insight of the issue.

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