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Isolation of different type of fungi species to cause the wilt disease in pigeon pea *(Cajanus cajan)*

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Abstract
Fusarium wilt is most important yield and growth-limiting factors of Pigeon pea (*Cajanus cajan*) cropping system. Further study was conducted in field in of wilted plot. These studies were repeated for two cropping seasons (2017-2018). Pigeon pea is an important pulse crop grown for its dhal and ranks sixth among legumes in area and production. It is a major source of protein to about 20 % of the world population and an abundant source of minerals and vitamins. The main constraints in boosting the yield of the crop are its susceptibility to diseases and insects. I am used two isolation tequenics for isolation of different types of *Fusarium* species in Pigeon pea infected plant samples and soil sample also. The Total fore fungal species was recovered from pigeon pea infected crop. The study result is maximum fungal species found in Varanasi district. I was notice that *F. semitectum* present in Varanasi but not recovered in Mirzapur and *Fusarium equiseti* also present in Varanasi but not recovered in Mirzapur district. But *Fusarium udum* recovered in all the sampling sights from Mirzapur district. *F. monilyformy* is present in Varanasi and Mirzapur sampling sights.

Keywords: *Fusarium wilt*, pea, sample, yield, isolation

Introduction
Cajanus cajan (Pigeon pea) commonly known as red gram or Arhar. It is a very old crop of this country. Pigeon pea is the second most important pulse crop in the country. It accounts for about 11.8 per cent of the total pulse area and 17 per cent of total pulse production of the country. It is a High source of protein and supplies a major share of the protein requirement of the vegetarian population of the country. It is mainly eaten in the form of pulse as "dal". Seeds of Pigeon pea are also rich in iron and iodine. The outer covering of its seed together with part of
Kernel provides a valuable free for mulch cattle. (Jeswani and Baldev, 1997). Pigeon pea finds an important place in the farming systems adopted by small and a marginal farmer in a large number of developing countries as it restores the soil fertility by fixing atmospheric nitrogen. (Reddy *et al*., 1990). Pigeon pea is reported to be grown in 50 countries of Asia, Africa and the Caribbean, where its name "pigeon-pea" is thought to have originated. India is the world's highest pigeon pea producer accounting for 77 % of the total world production. It is grown in an area of 3.53 m. ha with production of 2.46 m. tones and productivity of 723 kg/ha. In Karnataka, it is grown on an area of 597.0 thousand ha with an annual production of 315.0 thousand tones and productivity of 467 kg/ha (Anonymous, 2009).
Wilt of pigeon pea was recorded for the first time in India by Butler (1906). The causal organism described as Fusarium udum by Butler (1910), was subsequently described as *F. butleri, F. uncinatum, F. lateritium var. uncinatum, F. oxysporum f. sp. udum, F. lateritium f. sp. cajani and F. udum f. sp. cajani (Vishwa Dhār et al*., 2005). However, the name F. udum was accepted as an imperfect state (Booth, 1971) because of the macro-conidia having well distinguished prominent hook. *Fusarium udum* is host specific to Pigeon pea (Pad wick, 1940; Subramanian, 1963; Booth, 1971).

Study area
This study conducted in Varanasi and Mirzapur districts of utter Pradesh state In India. First study field situated 16 km from Varanasi, second is 13 km and third is 8 km. 1 at 25.31 76 N◦ latitude and 82.97 39◦ E longitude. Second Mirzapur districts of utter Pradesh state in India. First field situated 10 km from main districts Mirzapur, second is 15 km.
Study area –
Sampling sites Latitude Longitude
Varanasi 25.32 64° N 82.43 19° E
Mirzapur 25.13 37° N 82.97 39

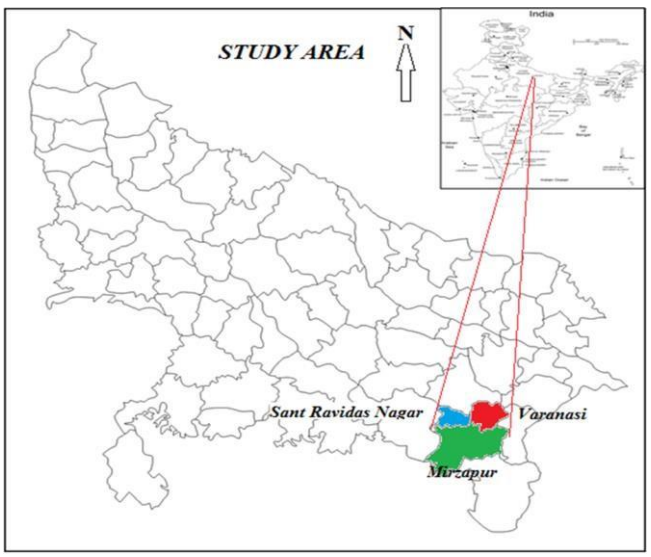

Fig 1

Survey and collection of samples
Eight infected plant samples were collected from Varanasi district of Uttar Pradesh which includes fore block reason via, Rajatalab, Pindra, Rohaniya, Shevapuri and Eight

samples also collected from Mirzapur district of Uttar Pradesh. The collected samples were put into polythene bags and stored at 4 C until further analysis.

Fig 2

Materials and Methods

The Research study was carried out between 20 August 2017 to 25 April 2018 in the Bhargawa Agricultural Botany laboratories, Department of Botany university of Allahabad Prayagraj (U.P) India.

Diseased plants where collected from survey conducted in Varanasi and Mirzapur district in the winter season 2017-18. 8 plants samples with Disease symptoms kind of wilt, is like fall of Leaves with or without chlorosis, were randomly selected from each of 35 further plants from the wilted chick pea plot. Samples collected in separate sterilized plastic bags and stored normal temperature in the laboratory. The infected tissues transferred in to petri dishes containing 20 to 25 ml of PDA medium. Incubate the dishes at 30.C For 5 days then petri dishes were examined and identified. In some cases the infected tissues were stained by cotton blue and Lacto phenol (M.C. Lean and Ivimey, 1965) observed under compound microscope. Identification of the pathogens was made with the help of available literature (Biligrami *et al*, 1981 and 1991, Subramanian, 1971).

Pathogenicity test

Some of isolated fungi were used to confirm their pathogenicity test in their respective hosts. Some fresh healthy samples were brought in to the laboratory and surface sterilized with 0.1% HgCl2. For inoculations cork borers of (2mm) diameter were used and sterilized by placing near spirit lamp flame, dipping in alcohol and excess alcohol Reduced by flaming. The inoculated samples and their respective controls were kept under bell jars. The inoculated samples is examined daily and the of damage percent was recorded continuously. The pathogens were re-isolated and disease symptoms were clearly evident, the culture and symptoms signs were compared with original.

Fig 3: After Pathogenicity test appear wilt symptoms

Results and Discussion

After collection of infected Pigeon pea diseased samples the isolation of fungi was done in Bhargava Agriculture Laboratory: Department of Botany University of Allahabad. The finding of laboratory work has been presented in Table (1).

Table 1

S.N.	Isolated fungi	Varanasi	Mirzapur
1	*Fusarium equiseti*	+	-
2	*Fusarium udum*	+	+
3	*Fusarium semitectum*	+	-
4	*F. monilyformy*	+	+

The total number of four fungal species was recovered from Pigeon pea crop. Namely *Fusarium equiseti, Fusarium udum, Fusarium semitectum F. monilyformy*

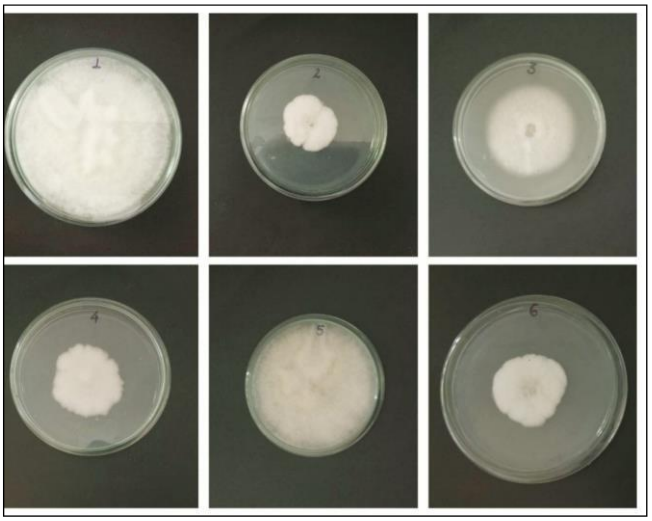

Fig 4: Colony c of *Fusarium* species

Conclusion

The Total four fungal species was recoverd from pigeon pea infected crop. The study result is maximum fungal species found in Varanasi district. I was notice that *F. semitectum* prasent in Varanasi but not recovered in mirzapur and Fusarium equiseti also prasent in Varanasi but not recovered in Mirzapur district. But *Fusarium udum* recovered in all the sampling sights from Mirzapur district. *F. monilyformy* is prasent Varanasi and Mirzapur sampling sights.

References

1. Je Mc Lean, Ivimey. Observed under compound microscope. Identification of the pathogens was made with the help of available literature (Biligrami *et al*, 1981 and 1991, Subramanian, 1971), 1965.
2. Anjaneya Reddy B. Variability of Fusarium udum and evaluation of pigeonpea (Cajanus cajan (L). Mills genotypes. MSc. (Agri) Thesis, Univ. Agril. Sci. Bangalore, 2002, 115.
3. Bidari VB, Dayanand M, Conda CR, Patil JR, Rao TM. Field evaluation of short, medium and long duration Pigeonpea varieties against wilt in Karnataka, India. Inter. Chickpea Pigeonpea Newsl, 1996, 3:88.
4. Chakraborty A, Gupta PKS. Some biochemical changes in susceptible pigeonpea seedlings in response to inoculation with nonpathogenic Fusarium and its

significance in induction of resistance against Fusarium udum. J Mycol. Pl. Pathol. 2001; 1:42-45.
5. Bharathi V, Rao KC, Reddy MV. Management of resistance against Fusarium udum. J Mycol. Pl. Path108-112 ol. 1:42-45. Pigeon pea wilt incited by Fusarium udum. Indian J Pl. Prot, 2006, 34.
6. Ibrahim HY. Virulence of entomopathogenic nematodes and fungi and their interaction in biological control of black cutworm, Agrotis ipsilon Hufnagel (Lepidoptera: Noctuidae). International Journal of Entomology Research. 2019;4(6):45-50.