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Abstract: The present investigation was carried out in the research farm as well as laboratory of Birsa Agricultural University, Kanke, Ranchi on variability in *Fusarium oxysporum* f.sp. *udum* causing wilt of Pigeonpea and its management. The systematic investigation revealed that wilt disease in Pigeonpea was found to be infected with *Fusarium oxysporum* f.sp. *udum* at all ten locations surveyed in 2015-16 and 2016-17. Maximum wilt percentage was found at Bukru (32.14 %) followed by Kanadu (29.40 %) and Ranchi BAU (28.63 %). After conducting elaborate survey at 10 locations, forty isolates were collected for studying variations among isolates characters. To identify *Fusarium* pathogen as it's actual casual agent for the disease pathogenicity test was conducted by using different effective isolates (Isolate-1, 14, 35). It clearly revealed that *Fusarium oxysporum* f.sp. *udum* is the cause for wilt disease in Pigeonpea. Morphological studies of *Fusarium oxysporum* f.sp. *udum* revealed that the dimensions of macro conidia, micro conidia and chlamydospores shows larger variations among different isolates. The cultural characters observed on PDA medium and the mycelium colour was in white and pinkish at the center with dense to fluffy growth. The size of mycelial width varied from 3 µm (Fou-Bor -4) to 6.32 µm (Fou – Ran - 4). Where as microconidia were small, oval in shape and hyaline in colour, unicellular or with one or two septa, and measures in the range of size between 6.00 × 2.10 µm (Fou-Ran- 4) to 10.80 × 3.00 µm (Fou- Kok-1). The macroconidia were long, curved, sickle shaped, pointed at the tip, hyaline in colour and knotted at the base, septated (2-4 septa) and measured between 19.05 × 3.25 µm (Fou- Hoc-4) to 28.70 × 2.50 µm (Fou- Kok-1). Chlamydospores with spherical in shape and hyaline in colour and it's dimensions also varied in all 40 isolates of the pathogen. Chlamydospores dimension varied from 8.20 × 7.92 µm (Fou- Buk – 2) to 11.35 × 8.20 µm (Fou-Nag-3). Spore density also varied between conidia per ml of culture under 10 x microscopic field, it is varied for macro conidia in the range of 6 to 13, micro conidia it is between 20 to 42 and chlamydospores it is between 2 to 8 number per ml. Among all the four different semi solid media maximum radial growth 72.90 mm for Fou-Ran-1 was observed on PDA medium. All forty isolates performed well on PDA medium compared with remaining ones. After their growth different spores counting was taken under 10x microscopic field. It was also observed that there is a great variation in sporulation among isolates on different media and conidial characteristics. Among four liquid media, maximum and fastest mycelial growth was obtained in PDA medium followed by Richards medium, Czapeks medium, & Martins medium. In PDA liquid media isolate Fou-Ran-1 given maximum mycelial dry weight that is 470 mg. After in detailed study of all forty isolates regarding their cultural, morphological studies these isolates are grouped into different categories based on criteria like size of macro and micro conidia, septation of macro conidia, their growing speed on different semi solid mediums and number of spores under 10x microscopic field. Out of 19 medium entries most of them showed moderately resistant to wilt disease, in 43 late entries, 5 entries namely MA-6, PT0012(C), WRGE 102, CRG9701, WRGE 248 showed resistance against wilt disease, remaining most of varieties moderately resistant to wilt disease. In host differential reaction, ICP8868, BDN-2, BAHAR genotypes showed same reaction to the three different effective isolates (Isolate – 1, 14, 35), and these are grouped under variant 3 based on previous experiments results. In Fungicidal trail Saaf performed well against wilt disease both in lab and field conditions. In case of organic amendments (cakes) Neem+Mustard cake performed well in both lab and field conditions against wilt disease of Pigeonpea. In bioassay trial of bioagents against wilt disease of Pigeonpea *Trichoderma viride* performed well in both In-vitro and In-vivo conditions.

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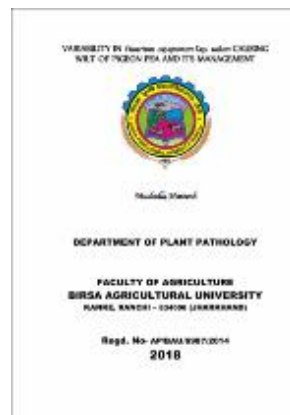
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