Antifungal Activity of Medicinal Plants Against Chickpea Wilt Pathogen *(Fusarium oxysporum* f.sp. *ciceri)*

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SUMMARY

Extract of different parts of ten medicinal plants were evaluated against chickpea wilt pathogen (*Fusarium oxysporum* f.sp.) *ciceri* with three concentrations (1000, 500 and 250 µg ml^{-1}) at five different time internals. The fungitoxicity of alcohol extract of medicinal plants against wilt causing pathogen significantly varied with concentration and time intervals. All plant extracts inhibited the mycelial growth of the fungus *in vitro*. As concentration of extracts decreased, the effectiveness of extracts were also decreased against wilt pathogen. The maximum growth inhibition was recorded at 1000 µg ml^{-1} concentration and the per cent inhibition was observed maximum in Bawchi at 8 th DAI (45.55%) and at 7 th DAI (38.17%) followed by Ashwagandha at 8 th DAI (37.84%) and at 7 th DAI (36.25%) . At 4 th , 5 th and 6 th DAI, the per cent inhibition in alcohol extract at 500µg ml^{-1} concentration increased with increased in time upto 8 th DAI. Maximum per cent inhibition was observed in Bawchi at 8 th DAI (44.44%) and at 7 th DAI (36.36%) followed by Ashwagandha at 8 th DAI (33.33%) and at 7 th DAI (32.38%) . Bawchi treatment showed significantly highest per cent inhibition at 8 th DAI over rest of the treatments. The extracts at 250 µg ml^{-1} concentration were failed to inhibit the mycelial growth of these pathogens. At 250 µg ml^{-1} concentration, only Ashwagandha. Bawchi and Kali Haldi were found to inhibit the mycelial growth of the pathogen to some extent.

Key words : *Fusarium*, Chickpea, Medicinal plants, Wilt.

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Among pulse crops grown in India, chickpea occupies the premier position in terms of area as well as production. Chickpea is grown over an area of 10.6 m ha in the world and productivity with 820 kg ha^{-1}. India accounts for about 5.77 m tonnes (66.62%) of world chickpea production and 68.77 per cent (7.29 m ha) area with productivity 792 kg ha^{-1} (USDA, 2004). During the past 10 years, India accounted for 60-70 per cent world chickpea production. One of the major constraints limiting agriculture production is the difficulty in managing diseases caused by pathogens specially of soil borne nature. This problem further compounds when the diseases is incited by more than one pathogen. "Chickpea wilt complex" is one of the best example of such diseases for which four pathogens accounts *viz. Sclerotium rolfsii* Sacc., *Rhizoctonia bataticola* (Taub.) Butler, *R. solani* Kuhn and *Fusarium oxysporum* f.sp. *ciceri* (Padwick) Snyder and Hansen. These pathogens cause significant loss in yield and primarily responsible for wide gap in the yield levels in farmers field as also reported earlier (Dahiya, 2003). Chickpea wilt complex pathogens belong to a group of ubiquitous and diverse plant pathogens that occur widely in India as a root pathogens on different crops and also could be isolated from different varieties of the same host species. Therefore, these pathogens differ in their cultural, morphological and pathogenic behaviour.

MATERIALS AND METHODS

In vitro studies on *Fusarium oxysporum* f.sp. *ciceri* (Padwick) Snyder and Hansen were conducted in the Department of Plant Pathology, Indira Gandhi Agricultural University, Raipur (C.G.).

Evaluation of medicinal plant extracts against wilt complex fungi:

Different parts of the ten medicinal plant species such as leaves of Kalmegh (*Andrographis paniculata*), Vatraj (*Argyreia speciosa*), Ashwagandha (*Withania somnifera*), Roots of Kali haldi (*Curcuma ceasea*), Jangli Haldi (*Curcuma aromatica*), Kali musli (*Carculigo orchioides*), Shatavari (*Asperagus racemosus*) and seeds of Bawchi (*Psorolea carylifolia*), Vanjeera (*Vernonia anthelmintica*), Jangli sem (*Canavalia gladiata*) were collected from medicinal plants garden, Indira Gandhi Agriculture University, Raipur (C.G.) and used in the present study.