

Effect of plant extracts on the fungal pathogen causing wilt of sugarcane in *in vitro*

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SUMMARY

Fungi are an important group of microorganisms responsible for various diseases of plants and cause a considerable loss in yield. Plants are the richest source of organic chemicals, which can be used as defensive weapons. Number of plants has been found to possess antifungal properties, which are able to control certain fungal diseases of crops. Effect of *Boswellia serrata* Roxb ex. Coleb., *Gnidia glauca* (Fresen.) Gilg., *Ocimum americanum* L., *Mundulea sericea* (Wild.) A. Chev., and *Woodfordia fruticosa* (L.) Kurz. extracts were tested in *in vitro* by poisoned food technique to know their inhibitory effect on the growth of *Fusarium moniliforme* Sheldon. Extracts of *Boswellia serrata* leaves were found significantly superior in inhibiting the mycelial growth 24.51 %, 30.42 % and 47.89 % of *F. moniliforme* at 5 per cent, 10 per cent and 15 per cent, respectively. Extract of *Woodfordia fruticosa* and *Ocimum americanum* were found second best after *Boswellia serrata*, while extracts of *Gnidia glauca* and *Mundulea sericea* were least effective in growth inhibition as compared to other plant extracts at all the three concentrations tried.

Key words : Antifungal, *Fusarium moniliforme*, Plant extracts and inhibition

Fungi are an important group of microorganisms responsible for various diseases of plants and cause a considerable loss in yield. A number of chemical fungicides are available in market for the crop protection. Some of them are excellent in terms of efficacy and cost benefit. However, their indiscriminate use has created the problems of air, soil and water pollution, development of resistance in target organisms and serious health hazards due to the toxicity of their residues. Efforts are being done for finding alternatives to chemical fungicides to overcome these problems. Plants are the richest source of organic chemicals on the earth and produce a wide variety of secondary metabolites, which can be used as defensive weapons. Plant extracts can be the potential alternatives to chemical agents that are hazardous to human and animal health. Number of plants has been found to possess antifungal properties, which are able to control certain fungal diseases of crops instead of spraying chemical fungicides.

Fusarium moniliforme Sheldon is an important pathogen causing wilt of sugarcane and mango malformation. McRae (1932) for the first time from Bihar, India identified and reported *F. moniliforme* as a causal

agent of sugarcane wilt. Joffe *et al.* (1973) reported *F. moniliforme* pathogenic to onion and all dicotyledonous plants in Israel. Mauto *et al.* (1976) isolated *F. moniliforme* from rice, soyabean, maize and sorghum.

Danej (1980) reported that phenolic compounds are good inhibitors of fungal pathogens and useful in controlling fungal diseases. Garg (1974) studied the antifungal activity of essential oil of *Boswellia serrata* against seventeen pathogenic fungi. From the above reports it was clear that plants containing natural phenols could be used as biofungicides against the *Fusarium moniliforme*. Therefore, leaves of *Boswellia serrata* and *Woodfordia fruticosa* were tested for their antifungal properties against the important pathogen *Fusarium moniliforme* as they contain natural phenols. In addition *Mundulea sericea*, *Gnidia glauca* and *Ocimum americanum* were also tested for their fungicidal properties.

MATERIALS AND METHODS

Healthy leaves of *Boswellia serrata*, *Ocimum americanum*, *Mundulea sericea*, *Woodfordia fruticosa* and *Gnidia glauca* collected from the Harishchandragad-Kalsubai Wild Life Sanctuary were tested in *in vitro* by poisoned food technique to know their inhibitory effect on the growth of *F. moniliforme*. Pathogen was isolated from wilted sugarcane. Surface sterilized pieces were placed on potato dextrose agar medium in Petriplates. Petriplates were then incubated at 28^o C to 30^o C temperatures. Repeated sub culturing was practiced to obtain pure fungal culture. During all these operations

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