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BIO CONTROL OF *RUMEX DENTATUS*

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Development of biological alternatives to chemical pesticides is an essential agenda for agricultural scientists faced with the daunting tasks of protecting crops and livestock on a large scale from the wide range and ever shifting spectrum of agricultural pests such as weeds and insects, microbial pathogens and nematodes. Use of chemicals may be hazardous. Toxic residue can accumulate in food, soil ground and surface water. Biological control of weeds with their natural enemies can raduces our dependence upon toxic synthetic chemicals. However, only limited attention has been paid to the potential of weed populations with co-occuring plant species.

Keywords :Bio-control; *Rumex dentatus*.

Weed is a plant where it is not desired, Tull[1] was the first to coin the term weed. The definition is simple as one may note, it may be a crop plant but it is not desired where it is not growing. Weed causes enormous loss in the crop yield both in quantity and quality. The losses are of subtle nature, and are not recognized immediately but if not controlled timely and properly, the yield losses in different cereals, pulses, fibre and oilseed crops vary from 16 to 58 percent under different cereals, pulses, fibre and oilseed crops vary from 16 to 58 percent under different agro climatic conditions. Weeds also compete with crop plants for soil materials[2]. Over and misuse of agrochemicals including herbicides can put many species at risk and so jeopardize the preservation of functional ecosystem and also allow some herbicide resistant weeds to proliferate in crop lands[3]. Therefore, now a days emphasis is given on weed control through other means, such as biological control.

The use of biotic agents to reduce or suppress post population is referred to as biological. Bioherbicides can be defined as microorganisans or their secondary products that are used, or have potential for use, in weed control when inundative applied. Fungal pathogens used in this manner for weed control are often referred "mycoherbicides". The development, marketing and use of living organisms as bioherbicides is considerably more complex than the developmental protocols for synthetic phytotxins. In the present investigation emphasis has been given to control of weed *Rumex dentatus* by natural pathogen *Alternaria alternata* and *Puccinia barkeliana*. *Rumex dentatus* is a most noxious weed found in the fields of maize, wheat and sorghum. This weed draws the naturients from the soil and makes the soil naturient deficient. That effects the seed formation and nutrient status of the crops.

A survey of weeds was made in Delhi and its adjoining area. *Rumex dentatus* was found to be a great nuisance weed, which competes freely with other crops in the fields of maize and sorghum. It is responsible for yield loss in the field. The seeds of *Rumex dentatus* were collected and were plated on Czapek's agar medium for 7-8 days at 25±2°C for isolation of fungi. *Alternaria alternata* was isolated from the seeds, which was further maintained on Czapek's agar medium. *In vivo* and *In vitro* studieswere made on *Rumex dentatus* weed by the pathogen *Alternaria alternata*. For the *in vitro* studies the seeds of *Rumex dentatus* were put on the knop's medium. After 7-8 days germination of seeds takes place, then the spraying of the *Alternaria alternata* spores was done $4x10^{-4}$ spore

per ml. For the *in vivo*, studies, the seeds were sown in the beds. Beds were prepared by sterlizing the soil by 0.1 percent formalin (v/v ml). The culture of *Alternaria alternata* isolated from the seeds of *Rumex dentatus* was used for the spraying of spore suspension. Two ml of spore-suspension was sprayed on each leaf $4x10^{-4}$ spore per ml. To observe the wide host range studies were made on wheat, sorghum, maize, mung and urd. Same amount of spore suspension was sprayed on the leaves of these plants.

After 20-25 days spots of *Alternaria alternata* appeared on the leaves of *Rumex dentatus*. The growth of the plant was stunted. With this *Puccinia barkeliana* appeared naturally on the leaves of the *Rumex dentatus*. Symptoms of *Alternaria alternata* were not found on the leaves of wheat, sorghum, maize, urd and mung. The leaves on which both the pathogens were present necrosis was more distinct, than when both the pathogens were present independently. Auld *et al*[4]. studied the effect of *Colletotrichum orbiculare* on *Xanthim occidentale. Phompsis emicis* pathogen was used for the control of weed *Emex australis* under controlled environment[5]. Barreto *et al*[6]. studied the mycobiota of the weed *Mikania micrantha* in Southern Brazil *Mycosphaerella mikania micranthae* was found to be damaging the host plant. *Alternaria alternata* a common leaf spot pathogen on *Rumex* sps which caused about 50% damage to the plant with even reduction in seed production[7]. In recent years particular attention has been paid to the use of plant pathogens, especially fungi for the biological control of weeds. Any plant pathogen causing disease in a weed can be used as a bioherbicide. The pathogen has to be highly virulent and host specific. COLLEGO, DEVINE, BIOMAL, CASST and LUBAO-2 are commercially available mycoherbicides. Barreto and Evans[8] studied the mycobiota of *Cyperus rotundus* commonly known as purpule nutsedge in english speaking countries, is native of the old world and widely regarded as the world's worst weed[9,10]. Listed twelve pathogenic fungi from *Cannabis sativa Rhizoctonia, Curvularia, Sphaerotheca and Pestalotiopsis* are common[11].

Most attempts at using pathogens for weed control have involved fungi. The spares of many fungal species require several hours of free moisture or dew to germinate and infect the intended host. The mass production of genetically stable, viable, and efficacious inoculum with an adequate shelf life is a paramount obstacle in the development of microbes useful as bioherbicides[12]. Such formulated living materials must also be easily applied to weed targets. It is important that bioherbicidal pathogens exhibit sufficient host specificity and efficacy with minimal impact on non target organisms.

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