

Allelopathic effect of *Digera muricata* (L.) mart on *in vitro* seed germination of *Pennisetum typhoideum*

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SUMMARY

A laboratory experiment was conducted to assess the allelopathic effects of aqueous extracts of stem, root and leaf of *Digera muricata*, a weed, on *in vitro* seed germination of *Pennisetum typhoideum* (bajra). The results of the effects of aqueous extracts of different concentrations viz., 1%, 3% and 5% of different parts of *Digera muricata* were compared with those of the distilled water (control). Different concentrations of various parts of weed showed inhibitory effects on shoot and root growth of *Pennisetum typhoideum*. The leaf extract proved more inhibitory in nature than stem and root.

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Key words : Allelochemicals, Inhibitory effect, Stimulatory effect

Influence of weeds on crops, crops on weeds and crops on crops have important implications on agriculture as study of these influence help in formulating and planning suitable agricultural operations. For improving the crop productivity it is essential to study the weed crop relationship as it will help in eliminating un-wanted weeds from the field. Unwanted plants other wise called as weeds are the biggest threat to agricultural crops. Plants compete with each other not only for space, light and water but also defend themselves against harmful microbes. When ever two or more plants occupy the same niche in nature, they compete with each other for various life support requirements (Caton *et al.*, 1999).

The inhibition of one plant by another through the release of chemicals is well known. All plant species produce allelochemicals. These allelochemicals can be inhibitory or stimulatory to the neighboring plants. Weeds also produce allelochemicals which affect the neighboring crop plants. Allelochemicals are produced by plants as end products, by products, and metabolites and are contained in the stem, leaves, roots, flowers, inflorescence, fruits, and seeds of the plant. These allelochemicals were found to be released into the soil

ecosystem through volatilization, root exudation, root and stem leachates. The plant produces chemicals which interfere with other plants and affect seed germination and seedling growth (Alam and Islam, 2002). Water soluble substances, released as leachate from different plant parts especially plant leaf may adversely affect seedling growth due to the following reasons; (1) allelopathic effects as allelochemicals, (2) immobilizing nitrogen and (3) increased microbial population and hence enhanced competition with plants (Inderjit and Bhowmik, 2004; Inderjit, 2006). *D. muricata* is a common weed in bajra fields. Hence, the present study was conducted to determine the influence of *D. muricata* on seed germination and seedling growth of bajra.

MATERIALS AND METHODS

Laboratory experiment was conducted to study the allelopathic effects of different concentrations of aqueous extracts of root, stem and leaf of *D. muricata* on *in vitro* seed germination and seedling growth of bajra. Fresh samples of young weeds before flowering stage, were collected from bajra fields and considered as donor plant. The weeds were thoroughly washed and the root, stem and leaves were separated and sun dried to prepare the aqueous extracts. For each part of the plant 1g powder was shaken in required amount of distilled water (DDW) for 24hrs. The extract was filtered through Whatman's filter paper no.1. A concentration series of 1%,3% and 5% extracts from root, stem and leaf was prepared by taking powder of dried weed material and DDW in

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