

## **Potential allelopathic effects of rice plant aqueous extracts on germination and seedling growth of some rice field common weeds**

### **ABSTRACT**

Given the increasing emphasis on sustainable agriculture, and concerns about the adverse effects of extensive use of farm chemicals, research attention is now being focused on reducing the dependence upon synthetic herbicides, and finding alternative strategies for weed management. Allelopathic properties of crop plants may allow us to use lower amounts of herbicides with benefits for the environment and human health. Considering these aspects, the present study was conducted to investigate the allelopathic effects of six selected rice varieties (WITA-3, WITA-4, WITA-12, Woo-Co, Fukuhibiki and Kalizira) collected from Bangladesh Rice Research Institute (BRRI) on seed germination and seedling growth of five weed species; *Echinochloa crus-galli*, *Cyperus difformis*, *Cyperus iria*, *Fimbristylis milliacea* and weedy rice. The aqueous extracts of all the rice cultivars caused inhibitory effects on seed germination and seedling shoot-root length of all the weed species. However, the inhibitory effects of different rice varieties varied significantly based on the differences of weed species and weedy rice found to be the least affected compared to other weeds. WITA-12 resulted about 50% germination inhibition, 25% shoot length reduction and 23% root length reduction respectively compared to control. On the basis of average percentage inhibition, rice varieties ranked in order; WITA-12>WITA-4>Fukuhibiki>Kalizira>Woo-Co>WITA-3. Our results suggested that there is a possibility of developing a new ecological weed management strategy using rice cultivars with higher allelopathic potentials. This means breeding of rice cultivars with higher allelopathic potential may provide natural and sustainable weed management options for rice growers.