

Evaluation of Allelopathic Potential of Selected Traditional Rice (*Oryza sativa* L.) Cultivars in the Early Vegetative Stage on Barnyard Grass (*Echinochloa crus-galli*) Seedling Growth

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Abstract

There is a global pressure to develop sustainable weed management method that may reduce both herbicide dependency and the burden on manual weeding. Therefore, breeding rice cultivars with higher allelopathic potential has an increased attention as a sound alternative weed management strategy, which can ensure sustainability of the natural ecosystems. It has believed and scientifically proved that phytotoxicity of traditional rice varieties is greater than high yielding cultivating varieties. Furthermore, allelopathic potential of rice varies in great extent with its developmental stage, environmental and management conditions. In this study an experiment was carried out to evaluate the allelopathic potential of some traditional rice varieties (Suwadal –(5420), Kalu heenati-(3200), Handiran-(3688), Herathbanda-(3677), Rathkaya, Rath heenati, Sula, Pokkali (taken from Ambalanthota rice research station) Murungakayan-(3489),) on *Echinochloa crus-galli* (barnyard grass) seedling growth. Significant differences ($p \leq 0.05$) were observed among different rice cultivars in terms of inhibition of barnyard grass seedling growth. Overall, Pokkali (33.7%) and Herathbanda (29.5%) had the highest average inhibitory effects on barnyard grass seedling growth. Whereas, Kaluheenati accounted lowest average inhibition % (19.6%). The inhibition % of barnyard grass seedling height, Soot dry weight (SDW) and number of leaves of variety Pokkali were 27.1%, 61.5% and 15.8% respectively. It has been observed that the highest inhibition in SDW (61.5-32.7%) and lowest inhibition in number of leaves (15.8-5.8%). According to the results it can be concluded that out of nine varieties tested var. Pokkali has the highest allelopathic potential at its early vegetative stage against barnyardgrass seedling growth. However, several experiments in different environmental and management conditions and molecular studies on relevant gene expression are must to conduct to select varieties with higher allelopathic potential.

Keywords: *Allelopathy, Echinochloa crus-galli, growth inhibition, Oryza sativa*

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