

Identification of plant growth inhibitors from rice

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Abstract

Rice (*Oryza sativa* L.) is one of major crops of Vietnam. Rice plant contains many secondary metabolites that are potent to inhibit growth of other plants. This study was carried out to find potential plant growth inhibitors from rice plants. Seven rice varieties were cultivated in the fields affiliated to Hiroshima University, Japan; Mature stems and leaves from each variety were collected, and then they were extracted with methanol, hexane, ethyl acetate, butanol, and water. Total phenolic content and total flavonoid content were the highest in ethyl acetate extract. DPPH antioxidant assay results showed that the ethyl acetate extract also had higher IC₅₀ value. Therefore, the ethyl acetate extracts were selected for laboratory bioassay. Results showed that the two-local variety Re nuoc and Nan chon inhibited the germination of radish and barnyard grass seedlings at the greatest levels, as compared to other cultivars. HPLC quantification indicated that the ethyl acetate extracts of Re nuoc and Nan chon rice plant parts consists of phenolic and flavonoids compounds which are potent as plant growth inhibitors. Further laboratory bioassay and field experimentation will be conducted to validate the laboratory bioassay findings.

Keywords: allelopathy, bioassay, *Oryza sativa*, isolation

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