

OD6. Allelopathic effect on barnyardgrass(*Echinochloa crus-galli* P.Beauv.var.*oryzi-cola* Ohwi) and analysis of allelochemicals from different parts of rice in several varieties(*Oryza sativa* L.)

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Objectives

This study was performed to confirm allelopathic effect on barnyardgrass with different plant parts and characteristics of rice in several varieties and compare the allelochemicals from selected rice varieties.

Materials and Methods

Materials : 114 rice varieties including AC1423

Methods

- Bioassay

: 100 barnyardgrass seeds were sown to 1% mixture soil (sand with rice residues) and there was estimated about emergency percents, dry weight, plant height after two weeks.

- Selection : High inhibition group - Duchungjong, Damagung, Arongbyeon, Dadajo, IR 644-1-63-1-1

Low inhibition group - Baramdungkuri, AC1432, Deokjeokjodo, Eunjo, Olbyeon

- Analysis of allelochemicals using HPLC

Selection two groups were extracted under 3 conditions(distilled water at room temperature, warm water at 30°C, 80% MeOH) for 1 day

Solvent A : 98% water, 2% glacial acetic acid in 0.018M ammonium acetate

Solvent B : 70% solvent A and 30% organic solvent

(organic solvent : 82%MeOH, 16% n-BuOH, 2% glacial acetic acid in 0.018M ammonium acetate)

Results and Discussion

- In a total inhibition, Duchungjong was observed more than other varieties, 16 varieties including Dunchungjong was found more than high inhibitory effect. But three varieties including Deokjeokjodo was less than 10%.

- In emergence inhibitory effect, 18 varieties including Noindo was showed high inhibitory effect(>80%) by leaves and strews mixture. 16 varieties including Dagudo was showed high inhibitory effect(>80%) by hull. In plant height inhibitory effect, two varieties including San Chiao Tswen was showed high inhibitory effect(>60%) by leaves and strews mixture. four varieties including Basmati was showed high inhibitory effect(>60%) by hull. In dry weight inhibitory effect, 32 varieties and 29 varieties including Damagung were showed high inhibition of top and root(>80%) by leaves and strews mixture. 39 varieties and 32 varieties including Kasarwala Mundara were showed high inhibition of top and root(>80%) by hull.

- Inhibitory effect of domestic varieties were more than foreign varieties. Late and middle maturity varieties was more inhibitory effect than early maturity. The colored awn or not didn't influence on inhibitory effect of barnyardgrass. Colored hull was more inhibition percents than non-colored hull in dry weight of barnyardgrass root by hull.

- 10 varieties, select inhibitory effect test, was analyzed about allelochemicals by HPLC. These 10 varieties were extracted under 3 conditions. Three results showed that allelochemicals in highest varieties were more than lowest. In extract conditions, the results showed that 80% MeOH was the best solvent for extraction of rice.

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