

Fumigant Activity of Isothiocyanates Identified in Hoseradish Essential Oil Against Stored-product Insect Pests

Kim, Soon-Il, Sang-Gil, Lee¹, Ji-Doo, Park¹ and Young-Joon, Ahn

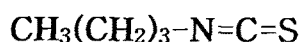
School of Agricultural Biotechnology, Seoul National University,
Suwon 441-744, Republic of Korea,

¹Korea Forest Research Institute, Seoul 130-012, Republic of Korea

The insecticidal activities of hoseradish essential oil against *Attagenus unicolor japonicus* (R.) larvae, *Callosobruchus chinensis* (L.) adults, *Lasioderma serricorne* (F.) adults, *Plodia interpunctella* (H.) larvae, and *Sitophilus oryzae* (L.) adults were examined using direct contact application and fumigation methods. In a test with the filter paper diffusion method, methanol extract of the oil gave 100% mortality, at 20 mg/paper, against all test insects within 24 hr after treatment. The biologically active constituents of the oil were characterized as allyl isothiocyanate (AIC) and butyl isothiocyanate (BIC) by spectroscopic analysis. These compounds revealed potent insecticidal activity (100% mortality) against adults of *C. chinensis* and *S. oryzae* at 1 mg/paper and against adults of *L. serricorne* at 2 mg/paper. Test compounds gave 100% mortality against *P. interpunctella* larvae and *A. unicolor japonicus* adults at 2 and 7 mg/paper, respectively. In a fumigation test with *A. unicolor japonicus*, *C. chinensis*, and *S. oryzae*, AIC and BIC were much more effective in closed cups than in open ones, indicating that the insecticidal activity of test compounds was largely attributable to fumigant action. As naturally occurring insect-control agents, hoseradish oil-derived materials could be useful for managing field populations of these stored-product insect pests.



AIC



BIC