

4-4. Antitermitic Activities of Glucosinolates Identified in Essential Oils from *Cochlearia armoracia* and *Brassica juncea* against *Reticulitermes speratus* (Isoptera: Rhinotermitidae)

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The insecticidal activity of materials derived from essential oils from *Cochlearia armoracia* L. and *Brassica juncea* L. Czern. et Coss. against *Reticulitermes speratus* (Kolbe) nymphs was examined using direct contact application and compared with that of the commercially available isothiocyanate analogues (isothiocyanic acid benzyl ester, isothiocyanic acid β -phenylethyl ester, isothiocyanic acid 4-penten-1-yl ester, isothiocyanic acid isobutyl ester, isothiocyanic acid 3-buten-1-yl ester, isopropyl isothiocyanate, and *tert*-butyl isothiocyanate). The biologically active constituents of *C. armoracia* and *B. juncea* oils were characterized as the glucosinolates allyl and butyl isothiocyanates. Allyl and butyl isothiocyanates caused 100% mortality at 0.07 mg/cm². At 0.04 mg/cm², both isothiocyanates did not exhibit the termiticidal activity. In a test with seven derivatives, isothiocyanic acid 4-penten-1-yl ester, isothiocyanic acid benzyl ester, and isothiocyanic acid β -phenyl ethyl ester gave 100% mortality, at 0.7 mg/cm², against the termite nymphs, whereas isothiocyanic acid isobutyl ester, isopropyl isothiocyanate and isothiocyanic acid 3-buten-1-yl ester, and *tert*-butyl isothiocyanate gave 100% mortality at 0.14 and 0.35 mg/cm², respectively. These results indicate that phenyl moiety in isothiocyanate molecules plays an important role in toxicity to *R. speratus* nymphs. Horseradish and mustard oil-derived isothiocyanates and their derivatives merit further study as potential termite-control agents or as lead compounds.