

Plants and Essential Oils for Pest Management

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Synthetic pesticides have played the most important role in managing pests occurring in agriculture, forest, human dwellings, gardens and managed landscapes for several decades, but worldwide concerns to human health and environmental contamination have resulted in their limited usage. For example, the methyl bromide used for controlling stored products insects and soil pests will be phased out in the near future because of potential of its ozone depletion and high toxicity. Government's restrictions on the use of many conventional pesticides have highlighted the need the development of new strategies for selective pest control, and botanical pesticides are occupying the paramount in the research fields. Recent investigations show that some oils or plant extracts and their components have a good bioactivity against various insect pests. Also it has been known that some among the compounds contained in plants are readily biodegraded by soil microorganisms and have relatively low mammalian toxicity. Based on these merits, our research to find pest-control agents has been largely focused on oriental medicinal plants and essential oils listed up in old medicinal books for 10 years. Strong bioactivity against tested insects has been observed in extracts *Cinnamomum cassia* bark, *Illicium verum* fruit, *Acorus gramineus* rhizome, *Foeniculum vulgare* fruit, *Cnidium officinale* rhizome, *Eugenia caryophyllata* flower buds, *Piper nigrum* fruit, cinnamon (*C. cassia*) oil, horseradish (*Cochleria aroracia*) oil, clove bud (*E. caryophyllata*) oil and mustard (*Brassica juncea*) oil. Their active components included salicylaldehyde from *C. cassia* and the oil, *trans*-anethole from *I. verum*, asarone from *A. gramineus*, (+)-fenchone from *F. vulgare*, butylidenephthalide from *C. officinale*, piperine alkaloids from *Piper nigrum*, eugenol and isoeugenol from *E. caryophyllata* and the oil, allylisothiocyanate and butylisothiocyanate from horseradish and mustard oil. These plant extracts or the active components exhibited insecticidal or antifeeding activity against stored products insects, insecticidal or repellent activity against mosquitoes and cockroaches, acaricidal activity against house dust mites and storage mites. Results described above indicate that the active plant extracts or components have a potential availability to be applied as alternatives of synthetic pesticides.