Acaricidal Activities of Phenylpropenes Identified in *Cinnamomum cassia* Bark Against Two *Dermatophagoides* spp. (Acari: Pyroglyphidae)

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The acaricidal activities of materials derived from the bark of *Cinnamomum cassia* against adults of *Dermatophagoides pteronyssinus* and *Dermatophagoides farinae* were examined by direct contact application and fumigation methods and compared with those of the widely used benzyl bezoate, dibutyl phthalate and diethyl-*m*-toluamide. The biologically active constituents of the *Cinnamomum* bark were characterized as the phenylpropenes *trans*-cinnamaldehyde, cinnamyl alcohol and salicylaldehyde by spectroscopic analysis. In dry film and fabric diffusion tests, at 0.5 mg/tube, the three constituents of the *Cinnamomum* bark exhibited >90% mortality against adults of *D. pteronyssinus* and *D. farinae* but the acaricidal activity was significantly decreased at 0.3 mg/tube. In a dry film test with *D. pteronyssinus*, at 0.25 mg/tube, *trans*-cinnamaldehyde+cinnamyl alcohol+salicylaldehyde was more potent adulticidal agent (99% mortality) than benzyl benzoate (80% mortality), dibutyl phthalate (89% mortality) and diethyl-*m*-toluamide (28% mortality), whereas *trans*-cinnamaldehyde, cinnamyl alcohol and salicylaldehyde alone were almost ineffective. Similar results were also observed in *D. farinae* adults, although *D. pteronyssinus* adults were more tolerant than *D. farinae* adults. In a fabric test, triple mixture of the three constituents gave outstanding acaricidal effect than each constituent alone against adults of *D. pteronyssinus* and *D. farinae*. These results indicate a possible synergistic effect. In a fumigation test with adults of two *Dermatophagoides* spp, *trans*-cinnamaldehyde, cinnamyl alcohol and salicylaldehyde were much more effective in closed cups than in open ones, indicating that the acaricidal activity of these compounds was largely attributable to fumigant action. As naturally occurring dust mite-control agents, the *Cinnamomum* bark-derived materials described could be useful for managing populations of *D. pteronyssinus* and *D. farinae*.