

Naturally Occurring House Dust Mite Control Agents: Development and Commercialization

Young-Joon Ahn

School of Agricultural Biotechnology, Seoul National University, Seoul 151-921, Republic of Korea

The house dust mites are a major source of multiple potent allergens. Changes in living environments have improved conditions for dust mite growth. Control of the mite populations worldwide primarily depends on continued applications of synthetic acaricides or repellents. Adverse effects and regulatory status of these chemicals have highlighted the need for the development of selective dust mite control alternatives. Because plant extracts, essential oils, and their constituents are relatively nontoxic to mammals and are even exempt from toxicity data requirements in many countries, they have been exploited as mite control agents, particularly for the most important house dust mites, *Dermatophagoides farinae* and *D. pteronyssinus*. Most promising botanical dust mite control agents are found in the families Annonaceae, Apiaceae, Brassicaceae, Cupressaceae, Lamiaceae, Lauraceae, Pinaceae, and Poaceae. The naturally occurring acaricidal compounds against the house dust mites are mainly composed of alkanes, alcohols, aldehydes, and terpenoids. Compared with commercial pesticides, certain plant-derived materials have some characteristics as follows: (1) some of them interfere with the octopaminergic nervous system in insects; (2) they have both contact and fumigant actions against the house dust mites due to their low molecular weights and high vapor pressure; and (3) they can be highly effective against insecticide-resistant insects. Because of these, some of them have served as new sources to the discovery and development of commercialized acaricidal products with selectivity, fumugant action, and effectiveness against acaricide resistant dust mites. Novel safer and more effective plant-based repellents or denaturing agents of dust mite allergens can be also useful for protection of human from mite-borne diseases. Commercial success of botanical mite control agents and denaturing agents of dust mite allergens has been increasing gradually. Example of commercialized *Cinnamomum cassia* Blume (Lauraceae) bark essential oil-containing acaricidal products will be presented.