

Chama Inson 2012: The Bees (Hymenoptera: Apoidea) as Insect Pollinators on Physic nuts (Euphorbiaceae: *Jatropha curcas* L.) in Thailand. Doctor of Philosophy (Entomology), Major Field: Entomology, Department of Entomology. Thesis Advisor: Associate Professor Savitree Malaipan, Ph.D. 306 pages.

Study on diversity of insect pollinators and pollination on physic nuts (*Jatropha curcas* L.) was conducted in a survey and identification of insect pollinators on physic nut flowers in 20 provinces of Thailand from April to August, 2009. The pollination experiments on toxic and non-toxic varieties of physic nut plantations were conducted during 2007-2011 at four locations (Kamphaeng Saen, Agriculture Research and Development Center, Aviation School, and Bangkhen) in the central part of Thailand. Because of unisexual, female and male flowers separated, insect pollinators are very important for fruit setting of physic nut. The results of this survey revealed 311 species, 138 genera and 64 families in eight orders namely Hymenoptera (with 45.02% of the species) which exhibited the highest diversity followed by Lepidoptera (20.58%), Diptera (15.43%), Coleoptera (9.97%), Hemiptera (7.40%), Mantodea and Orthoptera (0.64%) while the lowest diversity percentage was found in Blattodea (0.32%). All insect species were divided into major and minor groups according to their behavioral activities and importance to physic nuts. The insect pollinators in 20 provinces were compared by species diversity index and distribution. The highest species diversity index was observed in the north while the lowest values were found in the northeast and the south. Sixty species of superfamily Apoidea were identified. The most widely distributed species were *Apis cerana indica* Fabricius, *A. florea* Fabricius and *Trigona pagdeni* Schwarz. These bees were considered to be the most common and effective pollinators. Increasing potential of oil content around 14.16-15.41% was associated with *A. cerana indica*, *A. mellifera ligustica*, and *T. pagdeni*. Physic nut plants absolutely need cross-pollination by honey bees and stingless honey bees. In addition, some factors (variety of physic nuts, location, season, and environment) influenced the botanical characteristics (flower sex ratio, pollen germination, and growth development), species diversity of insect pollinators, bee behavior, weight and oil content of physic nut production.

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Thesis Advisor's signature