

3736421 ENTM/M : MAJOR : TECHNOLOGY OF ENVIRONMENTAL MANAGEMENT ; M.Sc.
(TECHNOLOGY OF ENVIRONMENTAL MANAGEMENT)

KEY WORDS : LC₅₀ (Lethal concentration at 50%) / EFFICIENCY / INSECT GROWTH
REGULATOR

SONGPORN JUNJANWIT : EXTRACTS OF *Pinus merkusii* Jungh & de Vriese FOR
CONTROL OF MOSQUITO VECTORS. THESIS ADVISORS : RUANGJARAT HUTACHAROEN, M.Sc.
(TECHNOLOGY OF ENVIRONMENTAL MANAGEMENT), YUPHA RONGSRIYAM, Ph.D., DLSHTM.,
CHUMLONG ARUNLERTAREE, Ph.D. (FISHERIES). 101 p. ISBN 974-662-923-9

Extracts of *Pinus merkusii* Jungh & de Vriese from the leaf and stem parts were tested against
the larva of *Aedes aegypti*, *Culex quinquefasciatus* and *Anopheles maculatus*. Extracts were prepared in
distilled water or 95% ethanol at 24 hours maceration.

The observed mortality data of these tests were analyzed for median lethal concentration at 95%
confidence limit. The leaf water extract LC₅₀ values were 5067.56, 4537.84 and 582.65 mg/l for *Ae. aegypti*,
Cx. quinquefasciatus and *An. maculatus*, respectively. The leaf ethanol extract showed the LC₅₀ values of
606.12, 134.77 and 351.97 mg/l against *Ae. aegypti*, *Cx. quinquefasciatus* and *An. maculatus*, respectively.

The LC₅₀ values for stem water extract were 581.18 for *Ae. aegypti*, >100000 for *Cx.*
quinquefasciatus and 741.80 mg/l for *An. maculatus*. The stem ethanol extract exhibited the LC₅₀ values of
209.96, 274.21 and 144.40 mg/l for *Ae. aegypti*, *Cx. quinquefasciatus* and *An. maculatus*, respectively.

Based on the overall results, stem ethanol extract yielded the best result and seemed to be
suitable to use in natural breeding places of *Cx. quinquefasciatus*. Moreover, *Pinus merkusii* caused
abnormality in mosquitoes which died during the course of adult emergence. The adults appeared to be normal
but failed to free themselves from the pupal exuvium. Sometimes the adults could free the head and thorax but
not the abdomen. These insects escaped almost completely, but the tarsi of the hind pair of legs remained stuck
to the pupal exuviae. According to the immense lethal effect obtained, it is suggested that *Pinus merkusii*
exhibited the Juvenile hormone type activity. In addition, the delayed development of about 2-3 days was
observed in mosquitoes exposed to all types of solvent extracts from either leaf or stem.