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PREECHA PRATHEPHA: POPULATION GENETIC STUDIES OF TWO CLOSELY RELATED SPECIES OF THE GENUS *AFGEKIA* CRAIB (*LEGUMINOSAE*) IN THAILAND. THESIS ADVISOR: VISUT BAIMAL, Ph.D., CHALIW KUVANGKADILOK, Ph.D., SUJINDA THANAPHUM, Ph.D. 115p. ISBN 974-661-886-5

Afgekia sericea Craib and *A. mahidolae* Burt and ChermSirivathana have been recorded only in Thailand. *A. sericea* is widely distributed throughout the northeastern region. In contrast, *A. mahidolae* is confined to an open lime stone habitat, and is sporadically distributed in small populations in western region. The geographical ranges of these two species do not overlap being approximately 200 miles apart. These localities are separated by the whole width of the plains of the Chao Phraya river. To date, there have been very few genetic analyses of these two species.

The objectives of the present study were to: 1) determine genetic relationships between these two species by means of chromosome studies and RAPD analysis; and 2) measure the genetic diversity and study the population structure of these two species using RAPD analysis. Cytological investigation on *A. sericea* and *A. mahidolae* were carried out in 13 populations. All populations of these two species exhibited chromosome number of $2n = 16$. Karyotypic analysis of both species showed a preponderance of median and submedian centromere, and these two species had symmetrical karyotypes. Variation in karyotype between *A. sericea* and *A. mahidolae* was observed in pairs of metacentric and submetacentric chromosomes. In addition, based on the presence vs. absence of RAPD markers it is clear that the two species are closely related species. The genetic structure of *A. sericea* and *A. mahidolae* populations was measured by Shannon's information index. *A. sericea* and *A. mahidolae* exhibit genetic diversity for the species (H_{sp}) of 0.432 and 0.368, respectively. Genetic variability within populations (H_{pop}/H_{sp}) of *A. sericea* and *A. mahidolae* were 0.518 and 0.586, respectively. Furthermore, genetic divergence among populations of *A. sericea* and *A. mahidolae* populations, estimated by Nei' G_{st} value, were 0.426 and 0.266, respectively. These are consistent with low gene flow (Nm) found in among populations of each species.