Thesis Title Electrophoretic Studies of Natural Populations of the *Bactrocera dorsalis* Complex (Tephritidae) in Thailand

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Abstract

Horizonthal polyacrylamide gel electrophoresis of thirteen enzyme systems which comprised of twenty-three loci were used to study genetic variations in natural populations of ten sibling species of the *Bactrocera dorsalis* complex in Thailand. The average proportion of polymorphic loci is 54.79 $\pm$ 23.99%. The average heterozygosity is 0.0686 $\pm$ 0.0343 and the average number of alleles per locus is 2.13 $\pm$ 0.54. Genetic similarity average for ten species is 0.709 (range 0.369-0.913). The amount of genetic polymorphism varies considerably from locus to locus. The amount and pattern of genetic variations among populations of the same species are quite similar.

However, at some loci the differences sometimes occur between local populations of the same species.

Diagnostic enzyme loci with specific relative mobilities which can be used as the genetic markers for species identification were discovered in three species, i.e., *Bactrocera propinqua* (*B. sp. I*), *Bactrocera sp. J* and *Bactrocera sp. K.* No diagnostic locus were found to express in seven other species of the *B. dorsalis* complex.

Data analysis were performed using a computer program BIOSYS-1. Intrapopulation genetic variability estimates such as percentage of polymorphic loci, mean heterozygosity per locus and number of alleles per locus for each population in a species including Nei's (1978) unbiased genetic identity and distance the estimates for genetic differentiation among populations of each species were presented. Phenograms showing possible phylogenetic relationships among populations of a species using UPGMA clustering analysis based on Nei's (1978) unbiased genetic distance were also presented.

Genetic analysis of different species within the *Bactrocera dorsalis* complex followed the same procedure using pooled data of genotype frequencies from all populations of a species.

The used of enzyme electrophoresis for the identification of species within the *Bactrocera dorsalis* complex were compared to the mitotic chromosomal analysis which based on two staining techniques i.e. Giemsa staining and Hoechst 33258 staining for the pattern of heterochromatin bands.