

Preliminary studies in Esterase Related resistance and taxonomic status of *Rhynchophorus ferrugineus* Oliv. (Coleoptera:Curculionidae) populations collected from the areas of the coconut triangle in Sri Lanka

Rhynchophorus ferrugineus, the only reported species of the genus *Rhynchophorus* in Sri Lanka, is one of the major pests of coconut (*Cocos Nucifera*) in Southeast Asia. It has been reported that different individuals exhibit varying morphological characters and the possibility of having more than one species or populations among these weevils. Organophosphates are the main insecticides used in controlling these insects in Sri Lanka. The main objective of this study was to verify the taxonomic status of *Rhynchophorus* in Sri Lanka and to determine the insecticide resistance among the populations.

The weevils (61 individuals) were collected from five different areas namely, Kaduwela, Wadduwa, Madurankuliya, Mirigama and Dankotuwa; representing the coconut triangle of Sri Lanka and which had been exposed to different regimes of organophosphate spraying over the last ten years. The colour of all the collected individuals were reddish brown and displayed a male to female sex ratio of 1:2 and their mean total length was 33.3 mm \pm 0.016. A majority of individuals (55.73%) had even spots, while in other individuals spot number varies from six to three on their thorax. However the number of spots documented has been either four or six. The mitochondrial DNA analysis was carried out using the universal primer pair designed from the 5' end of the 12S gene in mitochondrial DNA of insects. In each study site at least six individuals were sequenced in both directions. A 355 dp sequence of 30 insects was obtained. Molecular differences were not present in the four populations except a one base pair change in two of the individuals (7% difference). Amino acid sequences reveal that, both changes are silent. The comparison of sequence data obtained for 12S ribosomal sequence with DNA database BLAST suggest the closest relative available is *Chrysolina varians* (63%).

The mean specific activity value of the esterases assay was 0.1328 μ moles/min/mg in the field populations. Native PAGE gels run and stained for esterase enzyme showed individual variations among and between populations. Studies suggest that *Rhynchophorus ferrugineus* is the only species of this genus present in Sri Lankan coconut plantations. However, to identify the genetic variations and resistance status among populations more studies are necessary.