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Levels and mechanisms of insecticide resistance were studied in six species of insect pets *(ie*. Five aphid species, *Aphis gossypii, A. craccivora*, *Myzus persicae, Lipaphis erysimi* and *Toxopetera citricidus* and the diamondback moth Plutella xylostella) and two species of natural predators of aphids (*ie.* two species of ladybird beetles *Coccinella sexmaculatus* and *Thea cincta*), collected from vegetable fields at Gannoruwa Agriculturral Research Station, Kandy.

Insects were colonized and adult biossaya were carried out using insecticide impregnated papers of organophosphates malathion & chlorpyrifos, carbamate propoxur and pyrethroid permethrin. LD_{50} & LD_{90} values were obtained using log probit mortality curves. Highest pest resistance to all three insecticide groups was shown by *P. xylostella* and *M. persicae.* LD_{50} µg/ cm^2 values of P. xylostella for malathion, propoxur and pernethrin were 16820, 1028 and 60 respectively. Values for M. persicae were 408, 128 and 24 respectively. Resistances of predatory insects were higher than these levels. *P. xylostella* and L. erysimi showed high DDT (organocholorine) resistance (13 % and 16 % respective mortalities at 200 µg/ cm^2).

Activity levels of insecticide detoxifying enzymes were also investigated. Highest carboxylesterase activity for the substrate para-nitrophenylacetate was present in *M. persicae* and *A. gossypii* (1.006 ± 0.647 and 0.705 ± 00.543 µmol /min/ mg respectively). Native polyacry lamide gel electrophoresis revealed elevated carboxylesterase bands in all except *T. citricidus* and *Thea cincta*. Higher activity levels of glutathione S-transferases, for the substrate reduced glutathione/ chlordinitrobenzine, were observed in

L. erysimi and *P.xylostella* (1.344 ± 0.933 and 0.928 ± 0. 764 µmol/ min/ mg). oxidase levels were not significant in all the insects. Activity of the organophosphate and carbanmate target site, acetylcholinesterase, was not inhibited by propoxur in *Thea cincta*. Malathion metabolism studies showed the presence of qualitatively changed (highly reactive) carboxylesterases in *P. xylostella* and *M. persicae*.

Results show that carboxylesterases cause organophosphate and carbonate resistance in *M. persicae*, *L. erysimi* and *A. gossypii*. Glutathione-S-transferases are responsible for the high DDT resistance in *P. xylostella* and *L. erysimi*. High organophosphate and carbamate resistance of predatory insects in mainly due to the altered insecticide target-site, acetylcholinesterases.

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