

10. Various other arthropods

10.1 Cockroach resistance

In a joint venture between Roskilde University Center and DPIL a comparative study of the effect of sub-lethal doses of chlorpyrifos on cockroach respiration has been carried out. Two strains of *Blattella germanica* were used: a susceptible and a organophosphate-resistant strain. Metabolism was quantified by the accurate measurement of carbon dioxide release.

About half an hour prior to the measurement the individual cockroaches were placed in air-tight vials with a rubber cover. Air samples were taken from the vials, and the carbon dioxide content was determined. Glutathione S-transferase and glutathione peroxidase activities were also measured. All three parameters were then determined at specific times after exposure of the cockroaches to the insecticide.

The results of this study showed a significant difference in GST activity, peroxidase activity and carbon dioxide release between the two strains when exposed to chlorpyrifos. GST activity ceased after 115 hours, being significantly higher in the susceptible strain compared to the resistant strain, whereas the opposite is the case with peroxidase. Carbon dioxide releases varied immensely in the susceptible strain between 4 and 50 hours after exposure, whereas it was slightly higher but steady in the resistant strain. After 50 hours the two curves overlap, and no further differences were seen between the strains.

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