STUDIES OF THE GLUTATHIONE S-TRANSFERASE ACTIVITIES AND THEIR LOCALISATION IN *ADALIA BIPUNCTATA L.* (COLEOPTERA : COCCINELLIDAE)

F. FRANCIS, D. BROON & E. HAUBRUGE
Zoologie Générale et Appliquée
Faculté Universitaire des Sciences Agronomiques
B-5030 Gembloux, Belgium

While there is considerable evidence for inductive interaction of plant allelochemicals and xenobiotic metabolizing enzymes (XME), little is known of allelochemical-mediated induction of XME- in other insect orders than Lepidoptera (Yu, 1984). The glutathione S-transferases (GSTs) catalyze the conjugation of reduced glutathione (GSH) with a wide range of electrophilic compounds and lead to the formation of products of increased water solubility and minimal toxicity (Clark, 1990). This group of enzymes plays an important role in xenobiotic detoxication.
Temperature associated to elevated concentrations of substrates or GST can influence the clear discrimination of low or high levels of enzymatic activity (Brogdon and Barber, 1989). In this study, we report the results of the investigation of a spectrophotometric method to measure GST activities in *Adalia bipunctata* L. A concentrations range of benzene substrates and GSH were tested. Dinitro-iodo-benzene (DNIB) and 1-chloro-2,4-dinitrobenzene (CDNB) were retained to monitor the enzyme activity using each developmental stage of the beetle. The optimal concentrations of GSH and substrates have been determined for each case. Moreover, the localisation of the GST were determined in adults of ladybirds. Enzymatic activities in abdomen were more important than in the head or thorax. Significant amounts of enzyme were also observed in the elytra.

References

BrogdonW.G. and Barber A.M. (1989). Microplate assay of glutathione S-transferase activity for resistance detection in single mosquito triturates. Comp. Biochem. Physiol., 96B, 339-342
Clark A.G. (1990). In: Glutathione S-transferases and drug resistance, Ed. Hayes J.D., Pickett C.B. and Mantle T.J., Taylor & Francis, London, 369-378.
Yu S.J. (1984). Interactions of allelochemicals with detoxification enzymes of insect-susceptible and resistant fall armyworm. Pest. Biochem. Physiol.22, 60-68.