Biochemical studies of some plant extracts on glutathione and its related enzymes in the desert locust (*Schistocerca gregaria*)

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Abstract

Ghada Soliman Ahmed, Biochemical studies of some plant extracts on glutathione and its related enzymes in the desert locust (*Schistocerca gregaria*)

Ph. D. Thesis: Biochemistry Department, Faculty of Science, Ain- Shams University.

The present study has focused on the investigation of the efficiency of the naturally occurring phenolic compounds extracted from some plants (Family: Umbellifera, Leguminosae and Malvacceae) on the *Schistocerca gregaria* glutathione S-transferase (GST) as a selective GST inhibitors. The second section of this study has focused on the purification and characterization of the major GST from *S. gregaria* fat body and ovary.

Comparing all the plant extracts for their IC_{50} values, ethanolic and aqueous extracts of *Glycyrrhiza glabra* and *Hibiscus sabdriffa* were the most effective inhibitors for *S. gregaria* fat body and ovary GSTs. Simple reproducible procedure for the purification of *S. gregaria* fat body GST was established using GSH-Sepharose and DEAE-Sepharose columns. While for *S. gregaria* ovary, one step purification was carried out using GSH-Sepharose column. The purified enzymes proved to be homogenous as judged by polyacrylamide gel

electrophoresis and sodium dodecyl sulfate-polyacrylamide gel electrophoresis, where one band could be detected.

Kinetic studies for both fat body and ovary GSTs display a typical Michaelis-behavior with respect to CDNB and GSH as substrates. Characterization of both fat body and ovary GSTs including optimum pH, substrate specificity and inhibitors effect were carried out. The effect of ethanolic and aqueous extracts of *G. glabra* and *H. sabdriffa* on purified fat body and ovary GSTs activity was carried out. Also the effect and the type of inhibition of quercetin and delphinidine chloride (the major component of *G. glabra* and *H. sabdriffa*, respectively) were carried out.

Key words: *Schistocerca gregaria, phenolic compounds, glutathione S-transferase, fat body, ovary, delphinidine chloride, quercetin.*

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