

Title Partial characterization of glutathione S-transferases in pyrethroid-resistant and -susceptible populations of the maize weevil, *Sitophilus zeamais*

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Abstract

Glutathione *S*-transferases (GSTs) from a susceptible (Sete Lagoas) and two pyrethroid-resistant populations (Jacarezinho and Juiz de Fora) of the maize weevil *Sitophilus zeamais* Motschulsky (Coleoptera: Curculionidae) were characterized through in vitro colorimetric assays. GSTs showed higher activity peaks at pH 9.0 and 30 °C. The K_m -values for GSTs were similar among the populations except for the resistant population from Juiz de Fora, which was about two-fold higher than the susceptible population from Sete Lagoas when using 1-chloro-2,4-dinitrobenzene (CDNB) as substrate (and a fixed concentration of reduced glutathione—GSH). The V_{max} of this same resistant population was also over two-fold higher than that of the pyrethroid-susceptible population when CDNB and GSH were used as substrates. The resistant population from Jacarezinho also had a slightly, but significantly, higher V_{max} than the susceptible population when using these two substrates. However, there were no significant differences among the kinetic parameters of GSTs from the maize weevil populations when DCNB and GSH were used as substrates. These results provide evidence of the involvement of enhanced GST activity as an additional pyrethroid-resistant mechanism in at least some maize weevil populations from Brazil.