ANTIOXIDANT AND DIGESTIVE ENZYMES ALTERATIONS IN THE CORN APHID, RHOPALOSIPHUM MAIDIS (FITCH) (HEMIPTERA: APHIDIDAE) FED ON DIFFERENT VARIETIES OF BARLEY AND WHEAT

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Abstract:

Because of the serious damaging signs induced by aphids on cereal crops, changes in the biochemical parameters of these pests in response to feeding on different varieties of cereal crops require attention. This work addressed the effects of five varieties of barley (Giza 123, Giza124, Giza125, Giza132 and Giza 2000) and four varieties of wheat (Sids 1, Giza 168, Shanduel 1 and Gemeiza 11) that are cultivated in Egypt on the apterous adults of the corn aphid, Rhopalosiphum maidis. Giza 125 and Giza 132 of barley highly decreased catalase (CAT), superoxide dismutase (SOD) and the total antioxidants compared to other barley varieties. Giza123, Giza 124 and Giza 2000 caused a significant decrease in glutathione-S-transferase (GST) activity. Shanduel 1 and Giza 168 impaired the levels of CAT, SOD and the total antioxidant content in R. maidis. GST was in the lowest level in case of Sids 1 and Gemeiza 11 of wheat. Amylase was reduced by three varieties of barley (Giza 123, Giza 125 and Giza 132). The latter two varieties (Giza 125 and Giza 132) decreased the lipase activity in R. maidis. Lipase activity did not change in all varieties of wheat-fed R. maidis while a single variety (Shanduel 1) had the most negative impact on amylase activity in R. maidis. The present investigation emphasized that the cultivation of right field crops can manage aphids that attack them via targeting some metabolic pathways.

Keywords:

Rhopalosiphum maidis,Aphid, Oxidative stress, Digestive enzymes, Cereal crops

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