

HEME-DEGRADATION PATHWAY IN *Rhodnius prolixus* MIDGUT

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In the course of evolution, hematophagous arthropods have become food specialists. Knowledge of blood digestion is of great importance for a better understanding of their role as vectors of diseases, as in the case of the hemipteran insect *Rhodnius prolixus*, a vector of Chagas' disease. Free heme formed during digestion of hemoglobin is potentially toxic due to the formation of reactive oxygen species. Here we investigated the role of the oxidative degradation of heme to biliverdin, catalyzed by an heme-oxygenase activity as a defense of this insect against heme toxicity. We have previously shown that *Rhodnius* has a modified biliverdin (coupled to two cystein residues) that is the product of a unique heme degradation pathway in this triatomine vector and can be found in the heart, anterior midgut and posterior midgut. To characterize the biliverdin production, mated females were fed on blood or blood enriched with Sn-protoporphyrin (Sn-Pt), an inhibitor of heme oxygenases. All intermediates in the heme degradation pathway and the Rp-BV were evaluated by reverse phase HPLC using a diode array detector. Sn-Pt resulted in a significant reduction of Rp-Bv both in midgut lumen and in the intestinal epithelium. At the highest doses of Sn-Pt used a dramatic increase of soluble heme (>10 times) was observed in the midgut lumen, but not in the epithelium.

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