

VENTRICULOME: A RAPID INSIGHT INTO THE MIDGUT MOLECULAR PHYSIOLOGY OF THE HEMIPTERA, *DYSDERCUS PERUVIANUS*

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The seed sucker *Dysdercus peruvianus* is a pest in cottonseed crops. As an approach to the midgut molecular physiology of that bug, a normalized expression midgut cDNA library was randomly sequenced. Analysis of 1053 high-quality expressed sequence tags (ESTs) yielded 903 unique sequences comprised of 62 contigs and 841 singlets. The extent of library screening was followed by the novelty rate. Library screening stopped when the novelty rate becomes approximately constant at 0.1. Sequences were analyzed based on homology to sequences in data banks. This EST library provided an insight into mechanisms of amino acids absorption. According to a model proposed by us, microvillar membranes actively transport potassium ions from the perimicrovillar space into the midgut cells, generating a concentration gradient between the gut luminal sap and the perimicrovillar space. This gradient is used as a driving force for the active absorption of amino acids by appropriate carriers in the perimicrovillar membranes. Amino acids, once in the perimicrovillar space, diffuse to carriers in the microvillar surface. Ion transporters complete the model. Among the homologous sequences found, the following fit in to our model: transmembrane amino acid protein, cation transport ATPase, dipeptide/tripeptide permease, amino acid permease, ion transport protein (a family with sodium, potassium or calcium ion channels), ABC transporter and V-ATPase.

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