Peritrophins and mucus-forming mucins from *Abracris flavolineata*

Terra W.R. ¹, Cardoso C. ¹, Ribeiro J.M.C. ², Ferreira C. ¹

¹Departamento de Bioquímica, Instituto de Química, Universidade de São Paulo, São Paulo, Brazil.

²Laboratory of Malaria and Vector Research, National Institute of Allergy and Infectious Diseases, Rockville, MD 20852, USA

There is a fluid (peritrophic gel, PG) or membranous (peritrophic membrane, PM) film surrounding the food bolus in insects. PM is found in most insects, whereas PG occurs in midgut caeca of grasshoppers and anterior or whole midgut of some beetles. PM is composed mostly of chitin and proteins with chitin-binding domains (peritrophins) (Terra W.R. Arch.Insect Biochem.Physiol 47 (2001). The aim is to identify the composition of PG. Mucus-forming mucins (MC-Mucins) are heavily-glycosylated proteins with sections rich in proline, threonine, and serine (PTS repeats). The possibility that PG is made of MC-mucins was evaluated with the use of deep sequencing cDNA samples obtained from ventriculus (tubular regions of the midgut), midgut caeca, salivary glands, Malpighian tubules, and carcass from the grasshopper *Abracris flavolineata*. Peritrophins were divided based on the number and spacing between cysteines of their chitin-binding domains in: (a) peritrophic membrane proteins (PMPs) and (b) chitin-binding proteins analogous to peritrophins (CPAPs). Twelve PMPs were found and all of them were more expressed (reads/contig) in ventriculus, whereas 28 CPAP, were more expressed in tissues other than midgut. Two types of MC-mucins were found: one with PTS repeats and the motif CKC or CRC at the C-terminus of the protein (14 contigs) and another with only PTS repeats (9 contigs). The first type, which may polymerize forming gels, are typical of ventriculus. The other type, expected to generate viscous solutions, is characteristic of midgut caeca. The results support the hypothesis that PG is composed of a MC-mucin and that MC-mucin with CKC or CRC may associate with PMPs and chitin to form PM. This may explain the jelly-like substance associated with the fibrous matrix of PM and from which it is possible to water-extract many soluble and also some membrane-associated enzymes (Bolognesi et al. Arch.Insect Biochem.Physiol 47 (2001):62). Supported by FAPESP, CNPq, INCT-Entomologia Molecular

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