

Binding of Mistletoe (*Viscum album* L.) Toxin to the Midgut Tissues of Lepidoptera Pests

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Rustic Shoulder-knot (*Apamea sordens* Hufn.) (Lepidoptera: Noctuidae) is a very destructive polyphagous pest occurring on cotton, tomato, chickpea, pigeon-pea, chilli, maize and many other crops, inflicting substantial crop losses every year. The ability of insect species to thrive on diverse host plants is an adaptive advantage for their better survival in the ecosystem.

A. sordens is also characterized by its high mobility and fecundity. Exogenous chemical means to counteract an *A. sordens* attack have become less feasible, mainly due to the development of pesticide resistance and inherent possible environmental hazards.

European mistletoe (*Viscum album* L.) is considered to be a toxic plant, and its content of toxic lectins lends support to this. Poison centers report toxicity of the whole plant, but especially the berries. MChbL interacted exclusively with chitin and did not react with simple sugars and the oligosaccharides carrying GlyNAc residues. In the previous works MChbL showed obvious anti-nutritive effects against *A. sordens* and *A. segetum* larvae (Lepidoptera: noctuidae) at different stages of development. The determined N-terminal amino acid sequence of MChbL showed a high sequence similarity to deduced amino acid sequences of thaumatin protein family.

In the present work we analyzed the digestibility and localization of MChbL in guts using anti MChbL-antiserum and Western-blot analysis. Immunohistochemical localization showed that MChbL was detected predominantly in the brush border region and the peritrophic membrane of larval midgut tissues.

Binding of MChbL to the midgut epithelium or the peritrophic membrane has been shown to be required for expressing insecticidal activity, though the binding may not always be attributed to direct damage of gut epithelia. The insecticidal activity of MChbL may be attributed to the disruption of membrane function, such as transport and/or digestion of nutrients.