

**Studies on Salivary and Midgut Enzymes of a Major Sucking
Pest of Tea, *Helopeltis theivora* (Heteroptera: Miridae)
from Darjeeling Plains, India**

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ABSTRACT

Helopeltis theivora is a major pest of young leaves and buds of *Camellia sinensis*. To understand the feeding biology of this mirid bug, its digestive and oxidative enzymes from salivary glands and midgut were analysed. Three common hydrolytic enzymes, amylase, protease and lipase were detected both in its salivary gland and midgut homogenates. Catalase, peroxidase and polyphenol-oxidase were also detected from these homogenates. Catalase activity was higher in salivary gland than that of midgut, contrastingly, the activity of polyphenol-oxidase was greater in the midgut than in the salivary extract. Peroxidase activity was found to be similar. The presence of both hydrolysing and oxidoreductase enzymes in the salivary and midgut homogenates may be related to extra-oral digestion and defense, leading to tissue necrosis and phytotoxic effect in the tea leaves.

Key words: *H. theivora*, tea, hydrolytic enzyme, catalase, polyphenol-oxidase, Darjeeling

INTRODUCTION

Tea, *Camellia sinensis* (L.) O. Kuntze is grown as a monoculture over contiguous areas of Darjeeling hills, plains and North–East India. The tea mosquito bug, *Helopeltis theivora* Waterhouse injects watery saliva into plant tissues and causes severe injury to the growing shoots of tea bushes. Other than tea, the species also uses more than half a dozen alternate hosts, which include weeds, ornamental and fruit plants. The species has a wide distribution in S.E. Asia and China (Schuh, 1995). The chemical composition of the saliva of heteropteran insects is crucial for effective feeding. These insects rely heavily on saliva for extra-oral digestion