



Sericologia 54(1): 49-58, 2014  
ISSN 0250-3980

*Research Paper*

## COMPARATIVE ANALYSIS OF THE MORPHOLOGY, STRUCTURE AND THERMAL PROPERTIES OF SILK PROTEIN FILMS OBTAINED FROM THE MANGO LEAF WEBBER, *ORTHAGA EXVINACEA* AND *BOMBYX MORI*

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### ABSTRACT

The silk protein from the silken web of *Orthaga exvinacea* and from the cocoon of *Bombyx mori* were isolated by solubilising degummed silk fibres in a saturated solution of lithium bromide and purified by dialysis. The purified silk protein of *O. exvinacea* was subjected to amino acid analysis using HPLC. The silk protein of pyralid moth was rich in Serine, Histidine and Alanine. After quantifying the protein in the purified sample, it was cast into films. The dried films were subjected to morphological, structural and thermal analysis using SEM, FTIR and TG-DTA, respectively. Comparative analysis of silk from *O. exvinacea* and *B. mori* showed that they differ in their  $\beta$ -sheet content. The strength of the film is dependent on its  $\beta$ -sheet which was more in *B. mori* than in *O. exvinacea*. But thermal stability of two protein films was almost equal. Anyhow, the temperatures of maximum degradation rate of both the protein films varied by a degree centigrade. This information suggests the potential of the silk of the mango leaf webber for use as a substitute for various biomedical and biotechnological applications.

**Key words:** *Bombyx mori*, FTIR, *Orthaga exvinacea*, silk fibroin, TG-DTA.