



Research Paper

MODULATION OF CYTOTOXIC MOLECULES AND ENZYME ACTIVITIES DURING MOULTING CYCLE OF TASAR SILKWORM, *ANTHERAEA MYLITTA*

K. Jena^{1*}, J. P. Pandey¹, P. K. Kar², Anshu Priya³, V. P. Gupta¹,
G. P. Singh¹, H. Yadav¹ and A. K. Sinha¹

¹Central Tasar Research and Training Institute, Central Silk Board, P.O. Piska-Nagri, Ranchi 835303, India.

²Regional Tasar Research Station, Central Silk Board, Baripada, Mayurbhanj, Odisha 757001, India.

³Vellore Institute of Technology, Vellore, Tamil Nadu 632014, India.

*E-mail: jenakb2010@gmail.com

ABSTRACT

Moulting is a stressful event in insect development, particularly in silkworm. As four incidences of moulting occur during larval stages of tasar silkworm, *Antheraea mylitta*, a baseline study of physiological responses during moulting period is necessary for a better management of tasar crop. The information would serve as a base to form strategies to counteract the high oxidative pressure encountered during the moulting stages so that a well-regulated larval phase could lead to higher productivity. With this aim, the study focussed on the analysis of physiological events, such as oxygen consumption and estimation of biochemical components viz., superoxide radicals, nitric oxide, total hydroperoxide, phenol oxidase, glutathione-S-transferase, reduced glutathione and ascorbic acid in haemolymph of *A. mylitta* during pre-moult, inter-moult, ecdysis and post-moult conditions. Superoxide radical level enhanced during inter-moult and ecdysis. Besides, levels of oxygen consumption, nitric oxide, and hydrogen peroxide also significantly increased during the period of ecdysis. Similarly, enhanced phenol oxidase, glutathione-S-transferase activities and ascorbic acid content were also observed during ecdysis. However, lower, reduced glutathione content was noticed during ecdysis, which may be interpreted as a strategy to prevent post-hyperoxic oxidative damage in tasar silkworm during ecdysis. The understanding of such physiological strategies of tasar silkworm may provide insight on how the insect combats the ill effects of oxidation through its innate defence mechanism in order to maintain the functional homeostasis.

Key words: Antioxidant defences, moulting, oxidative stress, tasar silkworm.