

Effect of dietary antioxidants on growth and development of Taro caterpillar, *Spodoptera litura* (Fab.)

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In India, crop yield losses due to various factors including insect-pests range from 15-25% amounting to INR 0.9-1.4 lakh crores annually. IPM including on-line pest monitoring and real time advisory dissemination system may help minimizing such yield losses. With regard to insect pests, it becomes imperative to understand their biology, life history, behaviour and feeding habits, susceptibility and resistance to insecticides. On the other hand, insect diets in rearing room are highly susceptible to microbial growth as well as oxidative destruction by reactive oxygen species (ROS) which can damage macromolecules, such as DNA, RNA and proteins, and thereby check the growth and development of insects. However, not much attention has been paid on the role and nature of antioxidants in rearing insect. Free radicals have been implicated as relevant players in the biology of the insect midgut and as mediators of the relation with the indigenous micro biota. Furthermore, insect feeding contributes to acceleration of oxidative deterioration of diets due to introduction of extra-oral digestive secretions and increased surface area of the diet that is directly exposed to atmospheric oxygen. Here, we studied the effects of five dietary antioxidants in various combinations on the biological attributes like developmental period, survival, fecundity and growth index of tobacco caterpillar *Spodoptera litura* (Fab.) (Lepidoptera: Noctuidae) using meridic diet. The larval weight at 14th day of development, total developmental period and per cent survival were 708.28 mg, 28.07 days and 88.0% in modified diet as compared to 498.64 mg, 30.22 days and 84.1%, in control. The combinations of α -tocopherol at 1500 ppm and ascorbic acid at 3200 ppm enhanced the survival by 1.33%, fecundity by 73 eggs per female and larval growth index (LGI) by 0.31 points. It also enhanced the reproductive potential of *S. litura* in combination with β -carotene at 200 ppm by enhancing survival to 89.33%, fecundity by 139 eggs per female, LGI by 5.04 and total developmental index (TDI) by 3.24 which were significantly higher over all other treatments.

Keywords: Cotton leaf worm, Fecundity, Growth index, Meridic diet, Tobacco cutworm