

Evaluation of Potential and Biology of *Spodoptera pectinicornis* (Hampson) for the Biological Control of Aquatic Weed *Pistia stratiotes*

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Pistia is considered the most invasive aquatic monocot weed globally due to its high multiplication potential. The larvae of the phytophagous *Spodoptera pectinicornis* (Lepidoptera) were found to damage *P. stratiotes* extensively. Hence, this study aimed to investigate the biology and feeding potential of *S. pectinicornis*. Initially, aquatic weed *Pistia* was reared in a container with pond water, and the bioagent, *S. pectinicornis*, was inoculated on *Pistia* to study its life cycle. The life cycle of *S. pectinicornis* consists of four stages: egg, larvae, pupa, and adult. The mean diameter of an egg was 0.317 ± 0.020 mm. There were six larval instars in *S. pectinicornis*. The sex differentiation was observed in the 5th and 6th instars, and the testes' mean length and width were 1.187 ± 0.11 mm and 0.716 ± 0.085 mm, respectively. Sexual dimorphism was observed; male and female genital distances were 0.219 ± 0.021 mm and 0.701 ± 0.058 mm, respectively. Adult males had pectinate antennae, whereas females had filiform antennae. The leaf damage by different instars of larval *S. pectinicornis* were 1st instar 0.017 cm^2 (0.348%), 2nd instar 0.025 cm^2 (0.528%), 3rd instar 1.50 cm^2 (30.564%), 4th instar 2.634 cm^2 (58.132 %), 5th instar 3.306 cm^2 (67.342 %), 6th instar 4.482 cm^2 (91.256%) in 12 hours. The larvae cause significant damage to the leaves, apical buds, and flowers of *Pistia*, with leaf damage reaching 91%, adversely affecting photosynthesis. Most feeding occurred during the later larval instars, which correlates with maximum damage. But it was observed that *P. stratiotes* reproduced through stolons, producing 8–9 young plants per colony, which were relatively unaffected by phytophagy, while seed production was compromised. Even though the rapid reproductive cycle of *S. pectinicornis* minimizes photosynthesis and seed production, developing a management strategy focused on controlling stolon multiplication is essential to mitigate the spread of *P. stratiotes*.

Keywords: Feeding Potential, Morphometrics, *Pistia*, Sexual dimorphism, *Spodoptera pectinicornis*