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BIOLOGY OF *PLATYNASPIS SAUNDERSI* (COLEOPTERA: COCCINELLIDAE)

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ABSTRACT

Biology of *Platynaspis saundersi* (Crotch) was studied under laboratory conditions at the Department of Entomology, Dr YSP University of Horticulture and Forestry, Himachal Pradesh, India. The mean preoviposition period was 7.00± 0.21 days, while the oviposition period was 43.50± 0.35 days. The female lays 130.30± 5.96 eggs and the hatching was 86.32± 3.12%, with incubation period being 5.0± 0.47 days and the larval period was for 12.40± 0.35 days. The observed prepupal and pupal periods were 1.50± 0.48 and 7.50± 0.21 day, with longevity of male and female being 70.00± 2.00 and 79.00± 0.89 days, respectively.

Key words: *Plantynaspis saundersi*, *Solanum nigrum*, biology, egg, hatching, oviposition, longevity, prepupal period, male, female, total developmental period

Ladybird beetles have great economic importance as their larval and adult stages are predaceous on important crop pests such as coccids and other soft-bodied insects including aphids (Hippa et al., 1978; Kring et al., 1985). Species of the genus *Platynaspis* feed on aphids, and is found in association with those insects infesting bean, sorghum, tobacco, cotton, maize, potato, Lathyrus, soybean, *Solanum nigrum*, chili, sweet potato, lentil, mustard, brinjal, groundnut, sunflower and cabbage crop (Gautam et al., 1995; Duffieded,1995). Bean aphid *Aphis craccivora* Koch attacks the bean plant and leguminous crops (Srivastava and Singh, 1986), resulting in 20-40 % yield loss (Islam, 2007). In India, bean growers use various insecticides to control aphids, but these leave residues over the sprayed surface. The random use of pesticides causes phytotoxicity and destruction of beneficial organisms such as parasitoids, microorganisms, predators and pollinators (Luckman and Metcalf, 1978). These have led to compatible pest management programs Hodek (1970). One of these is biocontrol with predators, of which coccinellids are important. The study of biology of *Platynaspis. saundersi* would help in using such predators of black aphid towards biocontrol, and hence the present study.

MATERIALS AND METHODS

The experiment was conducted at the laboratory of the Department of Entomology, Solan, Himachal Pradesh, India, from April 2018 to May of 2019 (25.02± 4.5 ºC, 72.05 ± 0.95% RH), and at at the Biocontrol Laboratory at Nauni during April to May 2018 and 2019. A culture of *P. saundersi* was established with males and females collected by sweep net from the unsprayed horticulture field and reared in petridishes on *Solanum nigrum.* Aphids were also collected on a daily basis with infested *S. nigrum* leaves, twigs, stems and inflorescences from unsprayed fields and supplied as food. These beetles were sexed and paired in petridishes (6x 1 cm) having bottom covered with blotting paper (Whitman filter paper no1). After hatching of eggs, the grubs were transferred to petri dishes (11cm dia) and reared on aphids. The emerged adults were sexed and confined in pairs in petridishes and fed on aphids. Egg masses were collected and reared, and thus continued for obtaining a large number of larvae and adults. Eggs laid/ female during 24 hr was counted and thee kept in separate petridish to determine the eggs laid/ female, hatching period and (%); after hatching young larvae were transferred individually in petri dishes (6 cm dia) containing blotting paper at the bottom. Fresh *S. nigrum* shoots infested with aphids were provided as food, and larvae were observed twice daily at 12 hr interval until pupation. The number of instars and period of each instar were recorded. The pupae were kept undisturbed until the emergence of the adult, and pupal period was recorded with ten replications. Data were analysed for ANOVA and the mean values separated by Duncan's Multiple Range Test (DMRT) using SPSS, version 12.01 (SPSS, Chicago, IL, USA) and cross checked by ICAR GOA developed software WASP1.

RESULTS AND DISCUSSION

The time between the date of adult emergence and the first egg deposition was considered as the preoviposition period, and for *P. saundersi* it was 7.00± 0.21 days, which is similar to the results of Agarwala et al., (1988) as 6 to 10.33 days on *A. craccivora.* The oviposition period, the duration between first and last egg-laying was 43.50± 0.35 days. The incubation period was 5.0± 0.47 days, and Chowdhury et al., (2008) reported that it was 2 and 4 days, respectively using bean aphids as host. The total larval period (1st instar to 4th instar) was 12.40± 0.35 days. The number of eggs laid/ female was 130.30± 5.96, while the hatching was 115.40± 6.07 with % hatching being 86.32± 3.12%. Sakurai et al. (1991) reported that the quality of food and environmental factors like temperature, humidity also play an important role on the biology of coccinellid beetles. The newly hatched larva lasted for 1.82± 0.21 days; later instars lasted 3.21± 0.89, 4.20± 0.48, and 4.89± 0.32 days. The prepupal and pupal periods were 1.50± 0.48 and 7.50± 0.21 days, The number of eggs laid/ female was 130.30± 5.96, with longevity of male and female being 70.00± 2.00 and 79.00± 0.89 days. Ngammuang (1987) found the longevity of male and female as 37.8± 15.24 and 59.53± 23.53 days when fed on *A. craccivora.* The total developmental period was 77.41± 1.46 days.

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AUTHOR CONTRIBUTION STATEMENT

All authors equally contributed.

CONFLICT OF INTEREST

No conflict of interest.

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