

LABORATORY REARING OF *ANOMALA DIMIDIATA* (SCARABAEIDAE: RUTELINAE) ON LIVE MAIZE ROOTS

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ABSTRACT : The biology of the polyphagous insect pest, *Anomala dimidiata* (Hope) was studied in FARMER laboratory during 2020-21. *Anomala dimidiata* beetles (all types mated, unmated, male and female) were collected by using Light traps (fitted with 6-8 Watts mercury tube light; ACTINIC BL, PHILIPS) placed nearby host trees viz., toon (Mahogany family), poplar (Salicaceae family), shisham (Fabaceae family) and neem (Meliaceae family) in evening time from 7:45 to 9:45 pm in the months of May to July from Noorpur village in Ghaziabad district of Uttar Pradesh, India (28.7444° N, 77.5526° E) and identified by ICAR-National Bureau of Agricultural Insect Resources, Bengaluru. The field-collected females were released individually in the desiccators that contained 30% moist soil for oviposition. The mated female laid eggs an average of 34.80±6.27 eggs singly at a depth of 5-10 cm in the moist soil. The incubation period of the eggs was 14.01±0.38 days. The first instar lasted for 19.60±0.70 days; subsequent second and third instars lasted for 39.47±2.00 and 113.16±7.32 days, respectively. The pupal period was recorded at about 18.76±0.61 days and adult longevity was observed at 32.08±0.86 days. The total life cycle recorded 236.3±8.71 days with 43.78±4.38% survival. Three grub stages of *A. dimidiata* fed on live maize roots till pupation. The simple methodology for the rearing of root grubs on live maize roots under laboratory conditions was attempted and the life cycle of *A. dimidiata* was studied successfully.

Key words : *Anomala dimidiata*, biology, white grub, maize.

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INTRODUCTION

The Apple-green dorsally, ventral surface and blue-green legged beetle of *Anomala dimidiata* belong to the family Scarabaeidae and subfamily Rutelinae and its C-shaped grub stage responsible for economic losses in a variety of *Kharif* crops grown under rain-fed conditions and damaging various vegetables cabbage, cauliflower, brinjal, tomato, capsicum, cucurbits, okra, pea, potato, garlic, rose, carnation, gladiolus, chrysanthemum and marigold. All three stages of *A. dimidiata* grubs live underground and feed aggressively and easily move from root to root within the row; causing stunting, nutritional deficiencies, and stand loss easy to uproot.

The grubs are often exposed during weeding operations or during land preparation otherwise not possible to become conscious of their presence and level

of damage in the crop field. Among all of these crops, sugarcane, maize, potato and paddy are the worst affected. The second and third instars grubs feed on the roots and underground stems of the host plants. The losses incurred due to white grubs are huge in the case of commercial crops like sugarcane; groundnut, potato, maize, and upland rice (Ranga Rao *et al*, 2006). In spite of its economic importance, no sufficient information is available on the detailed biology of *A. dimidiata*, therefore, the present study was carried out on the biology of *A. dimidiata* under laboratory conditions. The present pest study was not done earlier, however, the work on the detailed biology of *Holotrichia consanguinea* (Blanchard) and *H. nagpurensis* Khan and Ghai was done by Rani *et al* (2021a) and Rani *et al* (2001b), respectively.

Table 2 : Developmental indexes of *Anomala dimidiata* reared on maize roots.

Larval Growth Index	0.38
Pupal Growth Index	4.38
Developmental Index	0.23

2), these findings are in agreement with Rani *et al* (2021a) in which biology of sugarcane beetle was studied on maize root in controlled conditions. However, white grub-rearing methodologies in field conditions and the laboratory, with soil and rooted saplings, were reported by Mishra (2001) and Sharma *et al* (2021). In the present study, white grub rearing on natural food in controlled conditions was successfully achieved by weekly sowing the maize seed in 1-lit capacity containers.

The detailed study of any pest biology is, therefore, a prerequisite for their management by establishing communication links between taxonomists, ecologists and local farmers to planning strategies. The laboratory culture of any pest population is also essential component of scientific research. At the same time, the methodology of rearing white grub on live maize roots provides disease-free spaceman with a known rearing history throughout the year thus reducing investigational unevenness. The biological and ecological aspects of white grubs were very less studied, hence a detailed study was carried out on the biology of *A. dimidiata* and a simple protocol for the rearing of white grubs on live maize roots under laboratory conditions was prepared in connection with earlier studies published by Rani *et al* (2021a) and Rani *et al* (2021b).

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