

Research Article

**MORPHOLOGICAL STUDY OF A SUGARCANE PEST, *TRYPORYZA*
(*SCIRPOPHAGA*) *NIVELLA* FAB (LEPIDOPTERA: PYRALIDAE)**

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ABSTRACT

Sugarcane (*Saccharum officinarum* L.) is a major cash crop of India. Production of Sugarcane is heavily decreased by the attack of insect pests in India. *T. nivella* is one of the serious pest of sugarcane which reduces the cane production in great quantity as well as in quality. For the morphological study of selected pest in laboratory, adults were collected from all selected sugarcane fields during the experimental year from April, 2011 to March, 2012 and then, they were released in net house of selected field in village-Nagla Kalua of District Etah (UP) in natural conditions. All morphological observations were recorded closely in natural condition with the help of Hand lens (Steriomicroscope and camera Lucida in laboratory). Males were silvery white in colour, 2.54 to 3.14 mm in length while females were crimson white in colour, 2.24 mm to 3.09 in length. Antennae were filiform type, 11 segmented and 3.0 mm mm long. Eggs were oval in shape, white in colour, 1.2 mm long and 1.0 wide in size. The prothorax was evident but compressed and reduced. The mesothorax was the largest and most prominent segment of the thorax. The metathorax was relatively small as compared with the mesothorax (Wirioatmodjo, 1978). Abdomen of the male was slender and pointed while that of female was stout and covered with crimson hairy tuft. Full grown larva was creamy white or yellow in colour, 28 mm in length, 45 mm breadth. Pupa was bright yellow in colour 16-18 mm in length.

Key Words: Morphology, *Tryporyza* (*Scirpophaga*) *nivella* Fab, *Saccharum officinarum* L.

INTRODUCTION

T. nivella is a major devastator pest of sugarcane (Ansari *et al.*, 1992). Selected pest is a member of family Pyralidae. Pyralidae comes under a largest order Lepidoptera of class Hexapoda. *T. nivella* showed complete metamorphosis with four developmental stages viz, egg, larva, pupa and adult (Kumar and Rana, 2012) during the life cycle study of this pest. In all life stages of the selected pest, adults infected the sugarcane plants but the serious infestation was caused by the larvae of this pest (Prasad *et al.*, 2010). Larvae made a series of tiny holes and destructed the top region of the sugarcane plants, the destroyed leaves tunneled and fall comparatively earlier from the plants (Arain, 1981). As reported by preliminary investigators, *T. nivella* is silvery white in colour, small or moderate in size (Mandal and Jha, 2008).

MATERIALS AND METHODS

For the morphological study of *T. nivella*, adults (50 in number) were collected from selected sugarcane fields viz; a sugarcane field in village, Gopalpura of District-Aligarh, a sugarcane field in village Nagla Radhey (Block-Akarabad) of District Hathras during the experimental year April 2011 to March 2012 (Chang and Wang, 1995). Then, they were reared in rearing cages in laboratory for morphological study of selected insect in support of Chen and Romena (2006). All morphological observations of *T. nivella* were recorded every two days from egg stage to adult stage in laboratory carefully with the help of stereomicroscope and camera lucida (Cheng *et al.*, 1998). Sugarcane leaves and 10% honey solution with wet cotton were given to the selected pest in insect cage as food. A mesh net was used on which female laid eggs (Crampton, 1975). For mating studies only 20 pairs of healthy male and female of selected pest had transferred to rearing cages in favorable conditions. Females had allowed for oviposition on mesh net. After hatching the eggs, the larvae had placed in plexiglass containers with multilayer, semi-wet filter

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paper bed. The pupae were reared in rearing cages till adult emergence in support of Cuong and Cohen (2003).

RESULTS AND DISCUSSION

The length and breadth of female was recorded 2.24 mm and 3.12 mm respectively with an average of 2.68 ± 0.06 mm. The length and breadth of male was recorded 1.20 mm and 1.30 mm with an average of 1.25 ± 0.01 mm respectively. Antennae were usually filiform, generally filamentous, composed of eleven segments (Kamani and Vyas, 1985). Total length of the antennae was recorded 3.0 ± 0.08 mm. The scape was the longest segment measured about 0.48 mm, pedicel 0.25 mm. The third segment was the longest segment of the flagellum measured 0.4 mm. The fourth segment was slightly smaller than third and measure about 0.3 mm. Fifth segment was again slightly smaller than fourth (Mann *et al.*, 2006). It measured 0.25 mm sixth and seventh segment were somewhat unequal in length and measured 0.21 mm each eighth segment was 0.2 mm, the ninth segment was slightly larger than sixth and seventh measured 0.27 mm the tenth segment was the smallest in the series and measured 0.12 mm. The last eleventh segment was more or less equal to the second segment. The whole antenna was covered with fine sensory bristles and setae. The tarsi were usually segmented (YouChiashiens, 1943). The forewings were long, narrow and bore hairs on the outer and posterior margin. *T. nivella* was silvery white in colour, narrow in size. Head was small, usually hypognathous type and attached with the thorax by cervix. The labium was narrow, pointed. The maxillary palpi were usually 5-6 segmented and Hypopharynx was present on the floor of the mouth. The mesothorax was the largest and most prominent segment of the thorax. The metathorax was relatively small as compared with the mesothorax (Nair, 1971). A postnotum was present in the both mesothorax and metathorax but largely concealed. Wings were two pairs in which forewings were long, narrow and had hairs on the outer and posterior margins. The hind-wings were broad. The abdomen consisted of ten segments. The 1st was reduced and its sternum was wanting or completely membranous, the 7th and 8th were sometimes slightly modified in relation to the genitalia. The 9th segment or tegument was a narrow ring encircling the apex of the body and its sternal region or vinculum was usually invaginated to form a median saccus which extended into the preceding segment. 10th segments were greatly modified in the latter respect. In Legs, a meron was present in relation with the meso and meta thoracic coxae. The anterior tibia was comparatively short. The mid and hind tibia usually had one and two pairs of spurs, respectively. The tarsi were normally five segmented, the first segment being the longest and swollen (Kamani and Vyas, 1985). The sexes were different. There was a median ventral sclerite or gnathos lying on a short distance below it. A Pair of claspers or valves was hinged to the vinculum and forms the most prominent organs of the external genitalia. The herpes were spine-like structures often present in the inner aspect of the claspers (Halbe and Begal, 1950). Attached to the hind margin of the 9th tergum was a median process or uncus which was usually hook-like or bifid. The uncus and the gnathos were usually regarded as the tergum and sternum of the 10th segment. The anus opened just beneath that sclerite and the gnathos. The aedeagus was situated below the gnathos and was enclosed in a sheath and at the point where the latter joins the body there was a sclerotized support or juxta (Mukunthan and Mohanasundaram, 1996).

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