



RESEARCH NOTE

A report on foliar damage by beetles of *Holotrichia serrata* (F.) (Coleoptera: Scarabaeidae) on French bean

KOLLA SREEDEVI*, JUDITH COROLIN CORREYA, N. V. VEENA and M. MOHAN

Division of Germplasm Collection and Characterization,
ICAR-National Bureau of Agricultural Insect Resources, Hebbal, Bengaluru - 560 024, India

*E-mail: kolla.sreedevi@icar.gov.in

ABSTRACT: White grubs are the serious pests of several agricultural and horticultural crops. Recent surveys in Krishnagiri Dt., of Tamil Nadu, India had revealed the occurrence of adult beetles of white grub species, *Holotrichia serrata* (F.) in abundance infesting French bean. The adult beetles were found in huge numbers feeding on the leaves, flowers and pods of the crop. The incidence of the white grub species and the damage inflicted are presented in this paper. This is the first report of adult beetle damage on French bean in South India.

Keywords: Damage, French bean, *Holotrichia serrata*, white grubs, adults

Holotrichia Hope, 1837 is the largest genus in the subfamily Melolonthinae and tribe Melolonthini (Coleoptera: Scarabaeidae) comprising more than 100 species in Indian subcontinent. Most of the species of this genus are serious pests of several economically important crops like sugarcane, groundnut, potato, ginger, turmeric, etc. Certain species like *Holotrichia rustica* (Burmiester) and *H. mucida* Gyllenhal are pestiferous on forest trees too (Kulkarni *et al.*, 2009). The species of the genus are known commonly as chafer beetles or white grubs and are pests at both larval and adult stages. The larva is the most damaging stage, which feeds extensively on the roots, rootlets and underground portions of the plant and thus damaging the root system and thereby hindering the nutrient and water supply to the aerial parts, which ultimately results in drying and wilting of the plants.

Of all the species of the genus *Holotrichia*, *H. serrata* (F.) and *H. consanguinea* (Blanchard) are the most predominant and major pests of several economically important crops in India. *Holotrichia consanguinea* occurs widely in groundnut and sugarcane fields in North India and the species was reported to contribute to nearly 50% of the total white grub species occurring in groundnut in Rajasthan (Sreedevi *et al.*, 2017) while *H. serrata* was reported to be predominant in sugarcane in the western Uttar Pradesh, North India (Sreedevi *et al.*, 2014; 2017). It is also recorded as a serious pest in western and South Indian states *viz.*, Gujarat, Maharashtra, Tamil Nadu, Karnataka, Andhra Pradesh (Wightman and Ranga Rao, 1994; Yadava and Sharma, 1995; Musthak Ali, 2001). Anitha *et al.* (2006) reported *H. reynaudi* and *H. serrata* as the major species associated with groundnut, where *H. reynaudi* found to be predominant in the central Deccan

area, while *H. serrata* was most abundant in South and West India. In Maharashtra, *Holotrichia* species *viz.*, *H. akolana*, *H. nagpurensis*, *H. serrata*, *H. fissa* and *H. reynaudi* were found to be widely distributed across agro climatic zones, of which, *H. serrata* was found to be predominant in almost all agro climatic zones except South Konkan (Dadmal and Khadkar, 2014).

The adult beetles of scarab species are known to cause damage to the foliage by feeding on the leaves of the avenue trees *viz.*, neem, ber, *Acacia*, khezri, etc. during night times soon after their emergence from soil following monsoon rains in May and June months. Apart from these avenue trees, the adult beetles were also found to feed on foliage, flowers and fruits of several perennial crop plants. In Himachal Pradesh, *H. longipennis* (Blanchard) beetles are considered as important defoliators of apple, walnut, cherry, strawberry, etc. (Haq, 1962). Around 10-40% defoliation by scarab adult beetles was reported in mango, where *H. serrata* was the major species on mango in Thrissur dt., Kerala (Sreedevi *et al.*, 2019). Of late, the adult beetles were observed to feed on mulberry leaves in and around Bengaluru, Karnataka causing considerable foliage damage. So, surveys were taken up to monitor the adult beetle damage on economically important crops in Karnataka and Tamil Nadu during 2020-2021.

As part of the surveys, the vegetable growing areas in Krishnagiri district were explored for the white grub beetle damage. It was observed that the French bean crop in Bettamugilalam Village of Krishnagiri dt., Tamil Nadu was heavily infested with the scarab beetles. The adult beetles were brought to the laboratory and identified up to



Fig.1. *Holotrichia serrata* damage on French bean a) adult beetles b) feeding on leaves c) feeding on flower

species level with help of identification keys (Frey, 1971; Khan and Ghai, 1982). The infestation was monitored to assess the damage due to scarab beetle infestation.

The species was identified as *Holotrichia serrata* (F.) belonging to subfamily Melolonthinae of Scarabaeidae (Coleoptera). The beetles were found emerging in huge numbers like a swarm in the area during the dusk as soon as the sunlight fades. The beetles soon after emergence landed on the crop and started feeding on the flowers, tender French bean pods and leaves. As a result, huge dropping of the flowers and tender pods was observed and 10-20% damage was recorded in a single night. It was found that *H. serrata* beetle damaged almost all French bean fields in that village. Also, the adult beetle feeding was limited to perennials so far and the record of *H. serrata* on French bean is a switch over to the annuals. The farmers expressed that this is the first time they were experiencing *Holotrichia* adult beetle damage on this crop. French bean is a legume vegetable grown and consumed widely and hence this is of serious concern towards its management.

ACKNOWLEDGMENTS

Authors are thankful to the Director, ICAR-National Bureau of Agricultural Insect Resources (NBAIR), Bengaluru for facilitating the study. Thanks are also due to Dr. Sunil Joshi, Head, Dr. Sampath Kumar, Scientist, Division of Germplasm Collection and Characterization, ICAR-NBAIR, Smt. Anitha, ADH, Kelamangalam, Krishnagiri dt. Tamil Nadu and farmers for their support during the study.

REFERENCES

- Anitha, V., Rogers, D. J., Wightman, J. and Ward, A. 2006. Distribution and abundance of white grubs (Coleoptera: Scarabaeidae) in groundnut in southern India. *Crop Protection*, **25**:732-740.
- Dadmal, S. M. and Khadakkar, S. 2014. Revision of *Holotrichia* Hope (Scarabaeidae: Melolonthinae) in different agro – climatic zones of Maharashtra, India. *Journal of Entomology and Zoology Studies*, **2** (3): 50-58
- Frey, G. 1971. Bestimmungstabelle der indischen und ceylonesischen arten der Gattung *Holotrichia* Hope (Col., Melolonth.). *Entomologische Arbeiten aus dem Museum G. Frey*, **22**:206-225.
- Haq. A. 1962. Notes on the bionomics of *Lachnosterna longipennis* Bl. (Melolonthidae: Coleoptera). *Indian Journal of Entomology*, **24**(3): 220-221
- Khan, K.M. and Ghai, S. 1982. Taxonomic status of genus *Holotrichia* Hope (Melolonthini: Melolonthinae: Scarabaeidae) with descriptions of five new species from India along with redescription of two poorly described species and a key to species. *Bulletin of Entomological Research*, **23**:28-45.
- Kulkarni, N., Sanjay, P., Joshi, K.C. and Rogers, J. 2007. White grubs, *Holotrichia rustica* and *Holotrichia mucida* (Coleoptera: Scarabaeidae) as pests of teak (*Tectona grandis* L. f.) seedlings. *Insect Science*, **16**, 519– 525.
- Musthak Ali, M. 2001. Biosystematics of phytophagous Scarabaeidae - an Indian overview. In Sharma, G., Mathur, Y.S., Gupta, R. B.L. (Eds): Indian phytophagous Scarabaeidae and their management. Present status and future strategies. Agrobios, India, pp. 5-37.
- Sreedevi, K., Sakshi Tyagi and Veena Sharma. 2014. Species abundance of white grubs associated with sugarcane in Uttar Pradesh. *Indian Journal of Entomology*, **76**(3): 241-244.

Occurrence of white grub on French bean

- Sreedevi, K., Sakshi, T. and Veena Sharma. 2017. Species diversity of white grubs (Coleoptera: Scarabaeidae) in the sub-Himalayan and northern plains of India. *Current Science*, **103**(2):1-8.
- Sreedevi, K., Reddy, P.V.R., Sandeep Singh, Badal Bhattacharyya and Sudhansu Bhagwathi. 2019. Emergence of white grubs (Coleoptera: Scarabaeidae) as serious pests of fruit crops. *Pest Management in Horticultural Ecosystems*, **25**(2):263-267.
- Wightman, J. A. and Ranga Rao, G. V. 194. Groudnut pests. In: Smartt, J. (Ed). The groudnut crop: a scientific basis for imporvement. Chapman and Hall, London. pp.395-469.
- Yadava, C.P.S. and Sharma, G.K. 1995. Indian white grubs and their management. All India Coordinated Project on white grubs. Technical Bulletin no. 2, Indian Council of Agricultural Research.

MS Received 19 October 2021
MS Accepted 22 November 2021