

## Research Note

# Report of fungus, *Nomuraea rileyi* (Farlow) Samson on defoliator caterpillars (Lepidoptera) in soybean crop

S. RAMESH BABU\*, P. P. JAMBHULKAR and G. S. AMETA

Agricultural Research Station, Borwat Farm, Maharana Pratap University of Agriculture and Technology, Banswara 327001, Rajasthan, India.

\*Corresponding author E. mail: babuento@yahoo.co.in

**ABSTRACT:** *Hipoepa biasalis* (Walker) is reported for the first time as a defoliator green semilooper of soybean in the zone. Epizootics of an entomopathogenic fungus, *Nomuraea rileyi* (F.) Samson was observed on all the defoliators of soybean field except *S. obliqua* for the first time from southern humid zone of Rajasthan. The cloudy condition coupled with high humidity has favored the growth of this fungus to infect the defoliators effectively in soybean. Initially larvae were infected with white spores then covered with the green spore mass. The prolegs were attached to the leaves while the front legs were hanging above the leaves. Most of the dead larvae were attached to the midrib of the leaves. The mean number of dead larvae was in the range of 3-4 per meter row length.

**KEY WORDS:** Green semilooper, *Hipoepa biasalis*, tobacco caterpillar, soybean, epizootics, *Nomuraea rileyi*

(Article chronicle: Received: 28.03.2014 Revised: 24.04.2014 Accepted: 10.05.2014)

*Nomuraea rileyi* is an important natural fungus of many lepidopteran larvae and is capable of causing epizootic in caterpillar pests of cabbage, clover, soybean (Ignoffo, 1981). The fungus causes severe natural infection of important lepidopteran pests viz., *Helicoverpa armigera* (Hubner), *Spodoptera litura* (Fab.) and *Chrysodeixis* spp. that attacks several economically important crops (Vimaladevi *et al.*, 2003). Survey of the soybean field at Agricultural Research Station, Banswara (located between 73°2' to 75° E' longitude and 23°11' to 24°23' N latitude in Humid Southern Plain Zone of Rajasthan) was carried out during the *kharif* season and it was observed that the defoliator caterpillars viz., green semiloopers, *Hipoepa biasalis* (Walker), *Chrysodeixis acuta* (Walker), *Gessionia gemma*, tobacco caterpillar, *Spodoptera litura* (Fab.) and Bihar hairy caterpillar, *Spilosoma obliqua* (Walk.) were infesting the soybean crop in the zone causing considerable yield losses of 30 - 40%. Among the observed defoliators, *H. biasalis* is a new report of defoliator of soybean of this zone. Initially, there was a severe outbreak of predominant defoliators like, *H. biasalis* and *G. gemma* during 32 and 33 standard weeks (6<sup>th</sup> to 19<sup>th</sup> August). This may be due to continuous rainfall as well as prevailing high humidity and cloudy conditions for a longer period i.e. at least for 2 weeks. Early generation of the defoliators has resulted in a severe damage in the soybean crop. During 36<sup>th</sup> standard week (September, 6 - 9)

however, due to the natural epizootics by the entomopathogenic fungus, *Nomuraea rileyi*, 20 - 30% of the green color larvae of defoliators were almost mummified. The culture was isolated, cultured and identified at National Bureau of Agriculturally Important Insects (NBAIL), Bangalore. The cloudy condition coupled with high humidity has favored the growth of this fungus to infect the defoliator populations effectively in soybean. Initially larvae were infected with white spores then covered with the green spore mass. The prolegs were attached to the leaves while the front legs were hanging above the leaves. Most of the dead larvae were attached to the midrib of the leaves. The mean number of dead larvae was in the range of 3-4 per meter row length. The dead larvae were collected from the leaves and soil. Fungus was cultured on Potato Dextrose Agar and also by standard Sabourauds Maltose Agar Yeast medium (SMAY). Pathogenesis proved to be positive to the *H. biasalis* and *S. litura*. The infection was also observed on *C. acuta* and *S. litura* except Bihar hairy caterpillar. This is the first report of fungus infection of soybean leaf eating caterpillars from Southern Rajasthan. Gupta (2003) has reported the similar occurrence of *N. rileyi* on *C. acuta* from Rajasthan.

During the period of *N. rileyi* infection in soybean field, the temperature ranging from 24.8°C to 31.8°C and relative humidity ranging from 69 to 87% with a sunshine

hour of 2.9 was recorded. Environmental conditions were favourable for the infection of *N. rileyi* as reported by da Silva 1993; Vimaladevi *et al.* 1996; Gupta 2003. The formulation of *N. rileyi* can be used for the control of important defoliators of soybean.

#### ACKNOWLEDGMENTS

We are grateful to Dr. B. Ramanujam, Principal Scientist, Division of Insect Ecology, National Bureau of Agriculturally Important Insects (NBAIL), Bangalore, India for isolating and identifying the fungus culture and we are also thankful to Dr. V.V. Ramamurthy, Principal Scientist, Division of Entomology, Indian Agricultural Research Institute (IARI), New Delhi, India for the identification of defoliators in soybean.

#### REFERENCES

- da Silva MTB. 1993. Control of the soyabean caterpillar (*Anticarsia gemmatilis* (Hübner)) (Lepidoptera: Noctuidae). IV. Natural biological control. *Cienc Rural* **23**: 127-132.
- Gupta VP. 2003. Natural occurrence of the entomopathogenic fungus *Nomuraea rileyi* in the soybean green semilooper, *Chrysodeixis acuta*, in India. Online. *Plant Health Progress* doi:10.1094/PHP-2003-0113-01-HN.
- Ignoffo CM. 1981. The fungus *Nomuraea rileyi* as a microbial insecticide, pp. 513-538 In: *Microbial control of pests and plant diseases*, 1970-80 H. D. Burges, (Ed.) Academic Press, London, UK.
- Vimaladevi PS, Prasad YG, Anitha Chowdary D, Mallikarjuna Rao L, Balakrishnan, K. 2003. Identification of virulent isolates of the entomopathogenic fungus *Nomuraea rileyi* (F) Samson for the management of *Helicoverpa armigera* and *Spodoptera litura*. *Mycopathologia* **156**: 365-373.
- Vimaladevi PS, Prasad YG, Rajeshwari B, Vijay Bhaskar L. 1996. Epizootics of the entomofungal pathogen, *Nomuraea rileyi*, on lepidopterous pests of oilseed. *J Oilseed Res.* **13**: 44-148.