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Occurrence of green semilooper *Chrysodeixis acuta* Walker (Lepidoptera: Noctuidae) in onion (*Allium cepa* L.) (Amaryllidaceae)

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Green semilooper, *Chrysodeixis acuta* Walker (Lepidoptera: Noctuidae), is a major soybean pest in India (Singh & Singh 1991). The pest also is called soybean semilooper and tomato semilooper. It is a polyphagous pest spread across the soybean growing states of India (Singh et al. 1987; Singh & Singh 1987, 1991; Gurule & Nikam 2013), Oman (Wiltshire 1984), Vietnam (Ronkay 1989), Japan (Hirashima 1989), Africa (Deiber 1985), the Canary Islands (Dufay 1970), and Australia (Nielsen et al. 1996).

Chrysodeixis acuta is a defoliator pest that damages a variety of other crops, including sorghum (*Sorghum bicolor* [L.] Moench; Poaceae); linseed (*Linum usitatissimum* L.; Linaceae); barley (*Hordeum vulgare* L.; Poaceae); tomato (*Solanum lycopersicum* L.; Solanaceae); cotton (*Gossypium hirsutum* L.; Malvaceae); banana (*Musa paradisiaca* L.; Musaceae); tobacco (*Nicotiana tabacum* L.; Solanaceae); and citrus (*Citrus indica* Tanaka; Rutaceae) during the vegetative stage, capable of defoliating plants to the point of significant crop loss (Sharma & Shukla 1993; Mishra et al. 1995; Meena & Sharma 2006; Patil et al. 2014; Shailesh & Patel 2014; Shashank et al. 2018).

The occurrence of *C. acuta* in onion (*Allium cepa* L.; Amaryllidaceae) was recorded for the first time in the state of Maharashtra, India. The incidence was observed in kharif onions planted during the 2017–2018 season (rainy season) while conducting surveillance for onion pests. *Chrysodeixis acuta* feeds on the leaves of onion; early instars scrape tissue from the leaves, and leaves often become translucent, showing caterpillars inside the circular leaves of the onion; later instars bore large feeding holes (Fig. 1).

The caterpillar is a glassy green in color with 3 pairs of abdominal legs (prolegs) that typically bend their body in a semi-loop while walking. The pupae, which is green at the beginning and later turns to brown, forms a white silken cocoon on the plants. Adult moths are brown, the forewing bears a dark brown pattern with 2 characteristic silver spots (Fig. 1). Black scales are on the median region with tiny silver spots on the median line of the forewing. This species also has a silvery figure of a faint 8 on each forewing, with the 2 halves separated, and the second half elongated. The wing span of the moth is 35 to 37 mm.

Once *C. acuta* was observed, a weekly observation was made in a 1 m² area of 5 spots to record damage and caterpillar population. The plants, which had a circular cut on the leaves, scraped leaves, and the presence of larval fecal material, was taken as a sign of infestation. Percentage of plant damage and the number of larvae in each spot was recorded. The occurrence was observed from early Sep (36th standard

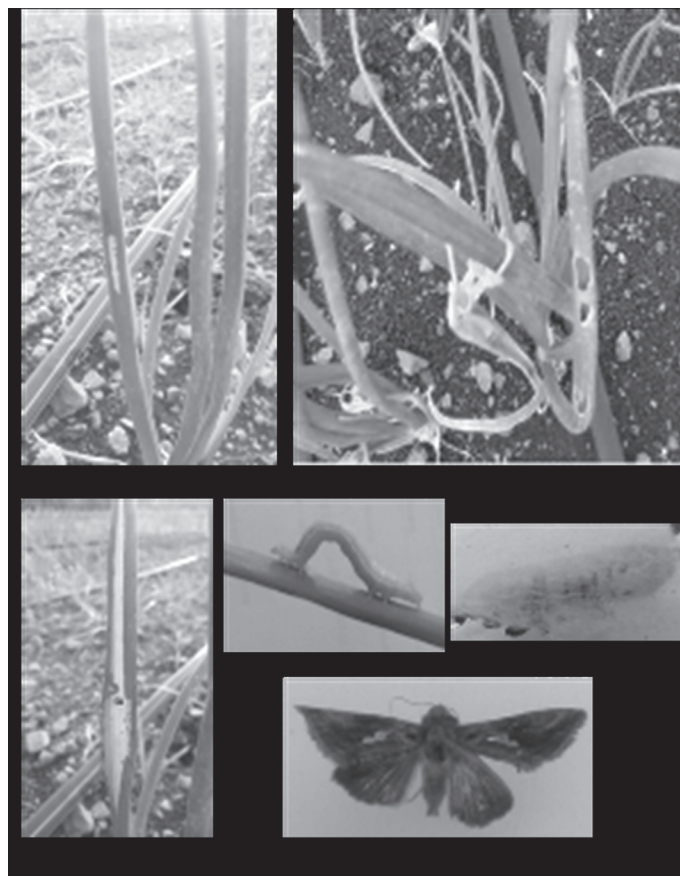


Fig 1. Damage of onion plant due to *Chrysodeixis acuta* feeding and life stages. (A) Onion plant showing leaf scrapping symptom; (B) bore holes on the leaf due to *Chrysodeixis acuta* feeding; (C) onion plant defoliated by *Chrysodeixis acuta*; (D) life stages of *Chrysodeixis acuta*; (D) caterpillar; (E) silken pupa; (F) adult moth.

meterological wk) and continued until late Oct (43rd standard meterological wk). Mean plant damage ranged from 1.0 to 4.1% damage, and was high during mid- to early Oct (Fig. 2). A maximum of 4.1% plant damage was recorded in the 40th standard meterological wk. The cat-

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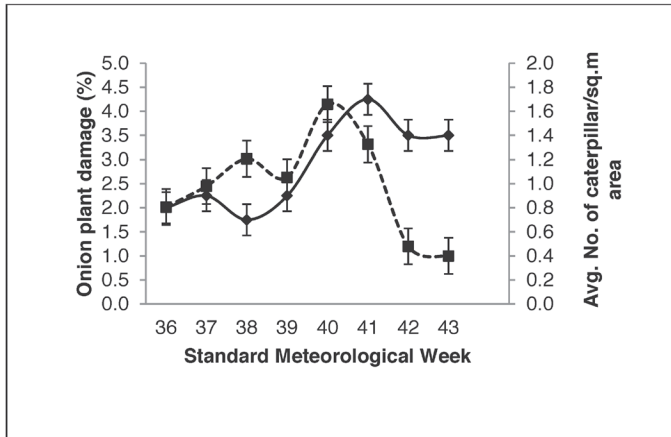


Fig 2. Green-looper population (Mean \pm SE) and damage (Mean \pm SE) in onion at weekly intervals in kharif onion (2017–2018).

erpillar population ranged from 0.7 to 1.4 per m^2 area. A maximum of 1.7 larvae per m^2 were recorded during the 41st standard meteorological wk. The correlation analysis between climate variables, including maximum temperature ($^{\circ}C$, T_{max} , $r = 0.397$), total weekly precipitation in mm (RF, $r = 0.125$), and caterpillar incidence revealed a non-significant positive correlation ($p > 0.05$). A non-significant adverse correlation was noted between minimum temperature ($^{\circ}C$, T_{min} , $r = -0.456$), % morning relative humidity (RH_m , $r = -0.521$), % evening relative humidity (RH_e , $r = -0.234$), and caterpillar population.

Although the *C. acuta* caused less than 5% damage to the onion, considering the nature of the damage caused and the characteristics of the pests (polyphagous), it appears to be a new issue for cultivation of the onion, because the pest is expanding its host range. Under favorable circumstances, caterpillars may cause significant defoliation in onion. As a matter of fact, whenever the soybean-onion cropping system is adopted, a fair amount of attention is needed because the magnitude of the occurrence is due more to pest pupal residuals remaining in the field. In addition, increasing onion-adjacent soybean also may favor the incidence of *C. acuta*. Further studies in this direction, therefore, are needed to determine the impact of the soybean-onion cropping system on *C. acuta* occurrence. In addition, seasonal pest biology, succession, seasonal dynamics, and host suitability also needs to be studied in order to determine an effective management approach.

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Summary

The occurrence of green semilooper, *Chrysodeixis acuta* Walker (Lepidoptera: Noctuidae) in onion was recorded for the first time from the Pune district of Maharashtra State of India. Weekly observations of the pest and its damage were made to assess the intensity of the caterpillar population and its impact to the onion crop. Early instar larvae of *C. acuta* feed by scraping the leaves, whereas the later instars make circular cuts in the leaves. The presence of large cuts and defoliation is a sign of infestation in onion. Since *C. acuta* is polyphagous, it may

spread to onion crops in the region and cause significant damage to the crop. Therefore, further research is required to monitor its spread and ability to become a pest in onion.

Key Words: tomato semilooper; host expansion; onion pests; *Chrysodeixis* sp.

Sumario

Se registró la aparición del falso medidor verde, *Chrysodeixis acuta* Walker (Lepidoptera: Noctuidae) en cebolla por primera vez en el distrito de Pune del estado de Maharashtra en la India. Con el fin de evaluar la intensidad de la población de orugas y su impacto al cultivo de cebolla, se evaluó el efecto de la oruga por medio de observaciones semanales de la plaga y su daño. Los primeros estadios de las larvas de *C. acuta* raspan las hojas al principio, y los estadios posteriores hacen cortes circulares en las hojas. La presencia de grandes cortes y defoliación es un señal de infestación en la cebolla. Como *C. acuta* es polífago, puede extenderse a la cebolla como un hospedero favorable y puede causar un daño significativo al cultivo. Por lo tanto, se requiere más investigación para evaluar la sucesión y la capacidad de convertirse en una plaga de cebolla.

Palabras Claves: falso medidor de tomate; expansión de hospedero; plagas de cebolla; *Chrysodeixis* sp.

References Cited

- Daiber KC. 1985. Technical Communication 200. Horticultural Sciences Series, Department of Agriculture, Republic of South Africa, Pretoria, South Africa.
- Dufay C. 1970. Insectes lépidoptères Noctuidae Plusiinae. Museum national d Histoire naturelle, Paris, France. Faune de Madagascar 31.
- Gurule SA, Nikam SM. 2013. The moths (Lepidoptera: Heterocera) of northern Maharashtra: a preliminary checklist. Journal of Threatened Taxa 5: 4693–4713.
- Hirashima Y. 1989. A Checklist of Japanese Insects. Fukuoka Entomological Laboratory, Kyuhu University, Japan.
- Meena NL, Sharma US. 2006. Effect of sowing date and row spacing on incidence of major insect-pests of soybean, *Glycine max* (L.) Merrill. Soybean Research 4: 73–76.
- Mishra BK, Mandal SMA, Mishra PR. 1995. Chemical control schedule for soybean green semilooper, *Chrysodeixis acuta* (Walker) and leaf miner, *Biloba subsecivella* Zeller. Journal of Insect Science 8: 73–75.
- Neilsen ES, Edwards ED, Rangsi TV. 1996. Monographs on Australian Lepidoptera, checklist of the Lepidoptera of Australia. CSIRO, Canberra, ACT, Australia 4: 1–529.
- Patil MU, Kulkarni AV, Gavkare O. 2014. Evaluating the efficacy of novel molecules against soybean defoliators. The Bioscan 9: 577–580.
- Ronkay L. 1989. Plusiinae (Lepidoptera: Noctuidae) from Vietnam. Folia Entomologica Hungarica 50: 119–135.
- Shailesh T, Patel ZP. 2014. A new record of semilooper, *Chrysodeixis acuta* (Walker) on banana. Bioinfolet 1: 15–20.
- Sharma AN, Shukla AK. 1993. Field screening of soybean germplasm for resistance to insect pests and diseases. Soybean Genetics Newsletter 20: 73–78.
- Shashank PR, Chattopadhyay P. 2018. Taxonomy of agriculturally important Plusiinae (Lepidoptera: Noctuidae). Indian Journal of Entomology 80: 748–760.
- Singh OP, Nema KK, Verma SN. 1987. New insect pests of soybean (*Glycine max*) in Madhya Pradesh, India. FAO Plant Protection Bulletin 35:100–102.
- Singh OP, Singh KJ. 1987. Green semilooper, *Chrysodeixis acuta*, as a pest of flowers and pods and its effect on the grain yield of soybean in Madhya Pradesh. Indian Journal of Agricultural Science 57: 861–863.
- Singh OP, Singh KJ. 1991. Economic threshold level for green semilooper, *Chrysodeixis acuta* (Walker) on soybean. Tropical Pest Management 37: 399–402.
- Wiltshire EP. 1984. Fauna of Saudi Arabia. Pro Entomologia, Natural History Museum, Basel, Switzerland 6: 405.