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Percentage damage to tomatillo crops by *Heliothis subflexa* (Lepidoptera: Noctuidae) at various altitudes

Néstor Bautista-Martínez, Everardo López-Bautista, and Haidel Vargas Madriz*

Heliothis subflexa (Guenée) (Lepidoptera: Noctuidae) is a monophagous insect specialized in feeding on *Physalis* (Solanales: Solanaceae) species (Brazzel et al. 1953; Laster 1972). As far as it is known, the larva feeds only on the fruit and can consume several of them by the end of its development. The *Physalis* spp. plants characteristically have an inflated and developed calyx that envelops the fruit, which in turn provides *H. subflexa* structural protection from its natural enemies (Sisterson & Gould 1999; Oppenheim & Gould 2002). In Mexico, this noctuid is considered an important pest in tomatillo (*Physalis ixocarpa* Brotero) crops, and is present in all producing regions with different degrees of infestation. Huerta-Paniagua et al. (2003) mention that at an altitude of 1,800 m, they found high densities of the pest, whereas above this altitude the population fell below 5% of those densities. To our knowledge, there are no precise data on the impact that *H. subflexa* has at different altitudes. Therefore, the objective of the present research was to provide data on the damage percentage caused by *H. subflexa* at different altitudes in tomatillo plantations.

The study was carried out from early Apr to the end of Jul 2008 in 8 tomatillo fields in different locations, at different altitudes in Morelos State, Mexico. Each field was divided into 5 collection sites (4 corners and center) for a representative sampling. Biweekly, 60 tomatillo fruits were collected from the plants at each collection site, totaling 300 per field. Fallen fruits were not considered in the study. All fruits with larvae present were considered damaged. Likewise, abandoned fruits with signs of larval feeding (0.4%) were taken into consideration.

The percentages of infested fruits at different altitudes were as follows: Coatlán del Río (660 m asl, 48%); Miacatlán (810 m asl, 52%); Yautepec (1,120 m asl, 42%); Tlayacapan (1,320 m asl, 55%); and Tlanepantla (1,550 m asl, 21%; 1,800 m asl, 9%; and 2,300 m asl, 2%). The results show that as altitude increased, *H. subflexa* larval infestations decreased (Fig. 1). This indicates that this species has damaging densities at altitudes below 1,320 m asl and is not considered a problem above this altitude.

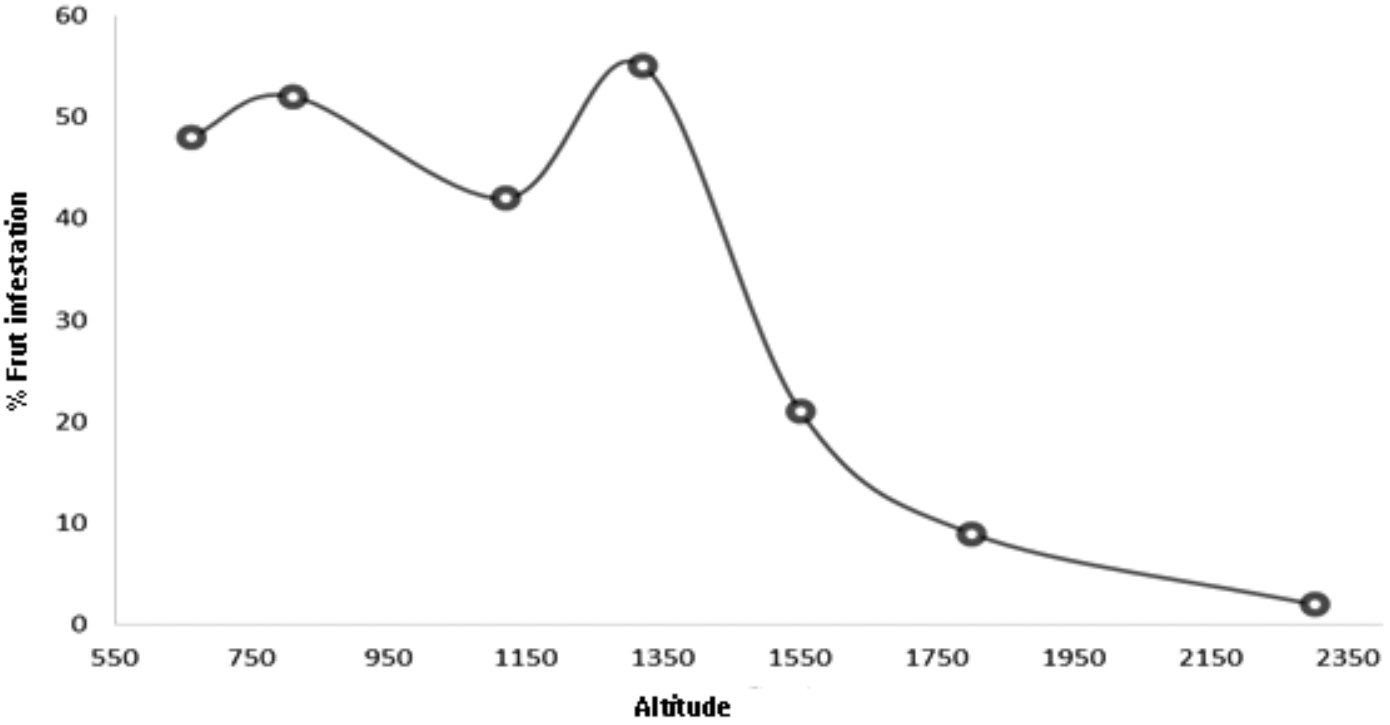


Fig. 1. Percentages of tomatillo fruits infested by *Heliothis subflexa* along an altitudinal transect of tomatillo production areas in the state of Morelos, Mexico. The tomatillo field locations, m asl, and percentages of damaged fruits were as follows: Coatlán del Río (660 m asl, 48%); Miacatlán (810 m asl, 52%); Yautepec (1,120 m asl, 42%); Tlayacapan (1,320 m asl, 55%); and Tlanepantla (1,550 m asl, 21%; 1,800 m asl, 9%, and 2,300 m asl, 2%).

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Summary

Heliothis subflexa (Guenée) (Lepidoptera: Noctuidae) is a monophagous insect specialized in feeding on fruits of the genus *Physalis* (Solanales: Solanaceae). In Mexico this fruitworm is present in all producing tomatillo areas but at very different levels of infestation. The present study aimed to provide data on the damage percentages caused by *H. subflexa* along an altitudinal transect ranging from 660 to 2,300 m asl. Evaluations were carried out biweekly on 8 plantations located at various altitudes (m asl) at various locations in the state of Morelos. By random sampling of tomatillo fruits in 5 locations per plot, the percentage of damage was estimated. The results obtained indicate that this species is very damaging at all altitudes in the range of 660 to 1,320 m asl, whereas at altitudes progressively higher than 1,320 m asl, populations become progressively less dense and progressively less damaging, so that at the higher altitudes the pest is not considered to be a phytosanitary problem.

Key Words: altitudinal infestation gradient; fruitworm; *Physalis ixocarpa*

Sumario

Heliothis subflexa (Guenée) (Lepidoptera: Noctuidae) es un insecto monófago especializado en alimentarse de frutos del genero *Physalis* (Solanales: Solanaceae). En México, esta especie se localiza en todas las regiones productoras de tomatillo a diferentes niveles de infestación. El presente estudio tiene como objetivo proveer datos en el porcentaje de daño de *H. subflexa* a lo largo de un transecto altitudinal que va de los 660 a 2,300 msnm. Las evaluaciones se llevaron a cabo quincenalmente en 8 plantaciones localizadas a varias altitudes (msnm) en diferentes localidades en el estado de Morelos. Mediante muestreos aleatorios de frutos de tomatillo en 5 sitios por parcela, se estimó el porcentaje de daño. Los resultados obtenidos indican que esta especie causa graves daños a diferentes altitudes en un rango de los 660 a 1,320 msnm, mientras que en altitudes superiores a los 1,320 msnm, las densidades poblacionales decrecen progresivamente al igual que el daño, por lo tanto a mayores altitudes la plaga no es considerada un problema fitosanitario.

Palabras Clave: gradiente altitudinal de infestación; gusano del fruto; *Physalis ixocarpa*

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