

Scientific Note

First record of *Helicoverpa titicacae* (Hardwick) (Lepidoptera: Noctuidae) in ChilePrimer registro de *Helicoverpa titicacae* (Hardwick) (Lepidoptera: Noctuidae) en ChileFrancisco Santander^{1,2}, David Ilabaca-Soto² y Ismael Aracena³

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Abstract. The species *Helicoverpa titicacae* is reported for the first time in Chile outside its natural distributional range in Peru. During 2011-2013 adults of this moth were collected in forests of tamarugo (*Prosopis tamarugo* F. Philippi), located in the Pampa del Tamarugal National Reserve, Tarapacá Region, Chile (20°24'S - 69°44'W). There is no evidence of when this species could have expanded its range of distribution from southeast Peru to the Atacama Desert in Northern Chile. *Helicoverpa* is a particularly invasive pest and its presence in the country could represent a potential threat to several crops and native forests.

Key words: Tamarugo, *Prosopis tamarugo*, Atacama Desert, new record.

Resumen. La especie *Helicoverpa titicacae* se reporta por primera vez en Chile fuera de su rango de distribución natural en Perú. Durante el período 2011-2013 se recolectaron ejemplares adultos de esta polilla en bosques de tamarugo (*Prosopis tamarugo* F. Philippi) situados en la Reserva Nacional Pampa del Tamarugal, Región de Tarapacá, Chile (20°24'S - 69°44'O). No existen antecedentes respecto de cuando esta especie pudo haber expandido su rango de distribución al desierto de Atacama en el extremo norte de Chile. Las especies del género *Helicoverpa* se caracterizan por ser potencialmente invasivas, y su presencia en el país puede representar una posible amenaza para los cultivos y bosques nativos.

Palabras clave: Tamarugo, *Prosopis tamarugo*, desierto de Atacama, nuevos registros.

The Heliiothinae are a cosmopolitan subfamily of noctuid moths comprising about 400 species throughout the world, including several of the major crop pests (e.g., "corn earworm" *Helicoverpa armigera* Hübner and "tobacco budworm" *Heliothis virescens* Fabricius) (Hardwick 1965; Mitter *et al.* 1993). The genus *Helicoverpa* Hardwick is widely distributed in tropical and warm-temperate areas of the world. In South America exist four endemic species of *Helicoverpa* which form the gelotopoeon-group, including *H. gelotopoeon* Dyar, *H. titicacae* Hardwick, *H. bractea* Hardwick and *H. atacamae* Hardwick (Hardwick 1965).

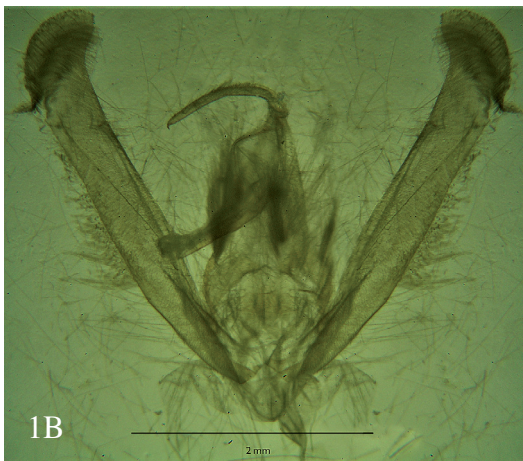
At the present, the distribution of *H. titicacae* is restricted to the Sierra region in Peru (2400-3800 m of elevation) (Hardwick 1965; Raven 1970). The biology of this species is

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poorly know, the host plants on which it feeds are *Amaranthus caudatus* L. and *Lupinus mutabilis* Sweet (Fabaceae) (Yábar-Landa and Baca 1981; Yábar-Landa 1987). There is no information about life history, development or population dynamics.

During spring (September to November) 2011-2012, summer (January and March) and fall (May) 2012-2013, we assessed moth abundance and diversity in 14 sample stations in the Pampa del Tamarugal National Reserve, Tamarugal Province, Chile. The study area is located in the Atacama Desert with a mean elevation of 1,000 m, the climate is desertic-interior (di Castri and Hajek 1976) with scarce annual rainfall and temperature that fluctuate between 5.3°C in July-August and 32. °C in October-February (Lanino 2004). The vegetation in sampling stations is sparse being mainly composed by *Prosopis tamarugo* Phil. (Fabaceae). In Bellavista and Pintados areas of the national reserve exists plantations of *P. tamarugo* and *P. alba* while in Salar de Llamara only exist native forests of *P. tamarugo*. Shrubs and grasslands are scarce and are represented by *Caesalpinia aphylla* Phil. (Fabaceae), *Tagetes glandulosa* L. (Asteraceae), *Atriplex atacamensis* Phil. (Amaranthaceae), *Tessaria absinthioides* Hook. & Arn. (Asteraceae), *Euphorbia tarapacana* Phil. (Euphorbiaceae), *Cressa cretica* L. (Convolvulaceae) and *Distichlis spicata* Greene (Poaceae) (Gajardo 1994; Porter 1994; Carmona and Rivadeneira 2006).



Figures 1A-1C. *Helicoverpa titicacae*. 1A. Male adult. 1B. Male genitalia. 1C. Female genitalia. (Photograph 1A: Oscar Chacón, 1B y 1C: Tania

Moths were captured by using a battery-operated UV light trap during 18 nights (6 hours/night). Every station was sampled one night per month with only one trap. The identification of individuals were made on basis of his genitalia (Hardwick 1965) and external characters.

In total, we captured 519 individuals of *H. titicacae* (Fig. 1). Most of the specimens were captured during spring (N=504) and only a small number in summer (N= 9) and fall (N=6). Specimens were found only in stations where *P. tamarugo* was present (Table 1).

In Chile, *H. gelotopoeon*, *H. atacamae*, and *H. zea* (Boddie) were described by attacking a great variety of crops (Klein and Waterhouse 2000; Mitter *et al.* 1993). *Prosopis tamarugo* was described like a host for *H. gelotopoeon* (Vargas and Bobadilla 2000). The genus *Helicoverpa* shows preference for feeding on the flowers and fruits of their food plants and preferences of host plants among species are very wide (Hardwick 1965). It is possible that individuals of *H. titicacae* are using *P. tamarugo* and other *Prosopis* species like host plant such as does *H. gelotopoeon* because this area is dominated by *Prosopis* forest cover. Further studies are needed to better understand the trophic biology of *H. titicacae* and to determine if it could become a species of economic importance in the country. According to its spatiotemporal distribution in northern Chile may be a strong possibility that *H. titicacae* occurred in Chile for many years, establishing a vital population and his presence could have remained unnoticed because his external morphology is very similar to *H. atacamae*.

Table 1. Sample stations, coordinates, elevation, principally vegetation associated and number of individuals collected by stations during all study period.

Sampling station	Coordinates		Elevation (m)	Vegetation	Number of individuals
PIET1	20°30'32.10"S	69°38'59.56"O	977	<i>P. tamarugo</i>	19
PIEA1	20°28'12.45"S	69°38'30.09"O	961	<i>P. alba</i>	0
BEE1	20°46'31.81"S	69°38'37.32"O	941	<i>P. tamarugo</i>	68
BEE2	20°47'51.58"S	69°37'2.93"O	943	<i>P. tamarugo</i>	73
BEE3	20°48'37.87"S	69°35'32.90"O	953	<i>P. tamarugo</i>	62
LLA31	21°13'27.15"S	69°37'7.96"O	900	<i>P. tamarugo</i>	43
LLA32	21°12'40.15"S	69°37'11.47"O	758	<i>P. tamarugo</i>	0
LLA33	21°11'11.95"S	69°37'2.38"O	751	<i>P. tamarugo</i>	41
LLA21	21°11'18.87"S	69°37'46.03"O	751	<i>P. tamarugo</i>	53
LLA22	21° 9'46.09"S	69°37'37.98"O	758	<i>P. tamarugo</i>	25
LLA23	21° 9'35.65"S	69°37'59.87"O	760	<i>P. tamarugo</i>	42
LLA11	21°10'57.35"S	69°38'14.55"O	749	<i>P. tamarugo</i>	31
LLA12	21°10'9.65"S	69°37'46.62"O	748	<i>P. tamarugo</i>	57
LLA13	21° 9'51.15"S	69°38'17.52"O	764	<i>P. tamarugo</i>	5

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