



Revista Mexicana de Biodiversidad

ISSN: 1870-3453

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Universidad Nacional Autónoma de
México
México

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Revista Mexicana de Biodiversidad, vol. 88, núm. 2, junio-, 2017, pp. 467-470

Universidad Nacional Autónoma de México
Distrito Federal, México

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Research note

First report of the entomophagous *Enoclerus zonatus* (Coleoptera: Cleridae) associated with stalks of the mezcal maguey in Guerrero, Mexico

Primer registro del entomófago Enoclerus zonatus (Coleoptera: Cleridae) asociado con el qurote de maguey mezcalero en Guerrero, México

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Received 8 September 2016; accepted 9 December 2016

Available online 10 May 2017

Abstract

Enoclerus zonatus (Klug) is a clerid beetle predator distributed in northern and central Mexico. Specimens were reared from fruits (bolls) of mezcal maguey (*Agave vivipara* L., Asparagaceae) collected from Quetzalapa, Huitzuc de los Figueroa, Guerrero, Mexico. Bolls showed small holes as well as seeds. All adults reared were determined as *E. zonatus*, a general predator of insects associated with Asparagaceae. This is the first report of *E. zonatus* associated with the stalk of mezcal maguey for Guerrero, and extends its geographic distribution to southern Mexico. © 2017 Universidad Nacional Autónoma de México, Instituto de Biología. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Keywords: Cleridae; Predator; Weevil; Mezcal maguey

Resumen

Enoclerus zonatus (Klug) es un escarabajo clérido distribuido por el norte y el centro de México. Los especímenes fueron criados de frutos de maguey mezcalero (*Agave vivipara* L., Asparagaceae) recolectados en Quetzalapa, Huitzuc de los Figueroa, Guerrero, México. Los frutos y semillas mostraban perforaciones pequeñas. Los adultos emergidos fueron determinados como *E. zonatus*, un depredador general de insectos asociados con Asparagaceae. Este es el primer registro de *E. zonatus* asociado al qurote de maguey mezcalero en Guerrero, e incrementa su distribución geográfica al sur de México. © 2017 Universidad Nacional Autónoma de México, Instituto de Biología. Este es un artículo Open Access bajo la licencia CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Palabras clave: Cleridae; Depredador; Picudo; Maguey mezcalero

Enoclerus zonatus (Klug) (Coleoptera: Cleridae) is a predator of insects associated with Asparagaceae in northern Mexico (Guerrero, Juárez, & Acevedo, 1985). Older studies reported

the beetle feeding on weevils (i.e., *Peltophorus polymitus* Boh.) and borers within flowers, fruits, leaves, pods, stems, stalks, and seed clusters of *Yucca* and *Agave* spp. in Mexico and the United States (Foster, 1971; Foster & Barr, 1972; Guerrero et al., 1985; Mawdsley, 2002). However, many of these records were erroneously assigned to *E. zonatus* as a result of misidentifications. Our current concept of *E. zonatus* restricts its distribution to northern and central Mexico. In October 2015, during insect

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Peer Review under the responsibility of Universidad Nacional Autónoma de México.

pest samplings in a 4-yr-old mezcal maguey (*Agave vivipara* L. = *A. angustifolia* Haw.) plantation (El Rancho Frío) located in Quetzalapa, Huitzuc de los Figueroa, Guerrero (18°23'12.4" N, 99°09'58" W, 1120 m asl), the first 3 authors observed maguey fruits (bolls) bearing signs of infestation (small holes with necrotic areas) (Fig. 1A and B). One stalk was collected (October 2, 2015) bearing approximately 3 kg of immature fruits (light green color; with holes); these fruits were placed in plastic containers (2 L) and maintained under laboratory conditions (Cuernavaca, Morelos, Mexico). Weekly observations were recorded to check for insect emergence.

Larvae (Fig. 1C and D) of a beetle were recorded from October 5, 2015 to April 3, 2016. On November 3, 2015, the first pupal chamber was observed inside a boll. Pupal chambers were whitish, fibrous, 1–2 mm in thickness, and were constructed mainly in basal boll areas, although in some cases in the middle (Fig. 1E and F). First pupa (Fig. 2A and B) was observed on April 4, 2016. The timing of adult emergence was not uniform: the first adults (Fig. 2C–E) emerged on April 26, 2016 and the last adult emerged on May 3, 2016. The entire developmental cycle of the insect occurred inside the boll. Usually

one adult, and less frequently 2 adults, emerged from a single boll. The emerged adults were placed individually in a glass container (size 150 mL) with small holes (2 mm diameter) in the top, and were fed with abdomens of adult cactus and agave weevils, and with larvae of agave weevils (Fig. 2F). Specimens were preserved in 70% alcohol, pinned, and identified by Víctor H. Toledo and Jacques Rifkind. Voucher specimens were deposited in the Colección de Insectos (CIUM) del Centro de Investigación en Biodiversidad y Conservación de la Universidad Autónoma del Estado de Morelos, Cuernavaca, Morelos.

Specimens were identified as *Enoclerus zonatus* (Fig. 3A–D), a clerid beetle predator (Guerrero et al., 1985; Waring, 1987), previously collected from Chihuahua, Coahuila, Hidalgo, Nuevo León, Tamaulipas, and Zacatecas (Barr, 1975). The present Guerrero record expands its distribution to southern Mexico, into the Balsas Basis biogeographic province (Fig. 4). This distribution could be the result of a close relationship to insects associated with Asparagaceae in Mexico.

E. zonatus belongs to a group of similarly marked (boldly colored in red and black), shining and robust *Enoclerus* species, all of which appear to be associated with species in the plant genera

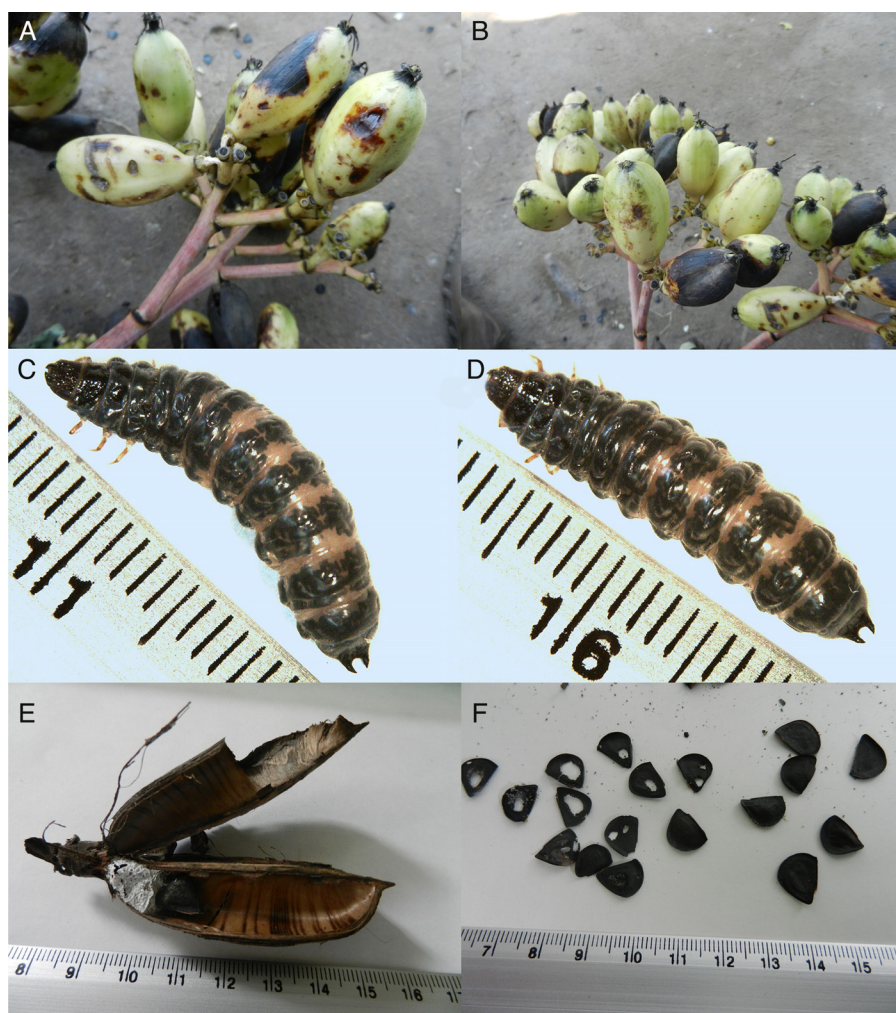


Figure 1. Agave fruit (bolls) with small holes and necrotic areas (A, B). Infested bolls yielded *Enoclerus zonatus* larvae (C, D). Pupal chamber of *E. zonatus* in base of boll (E). Damage to agave seeds presumably by seed feeding weevils (F).

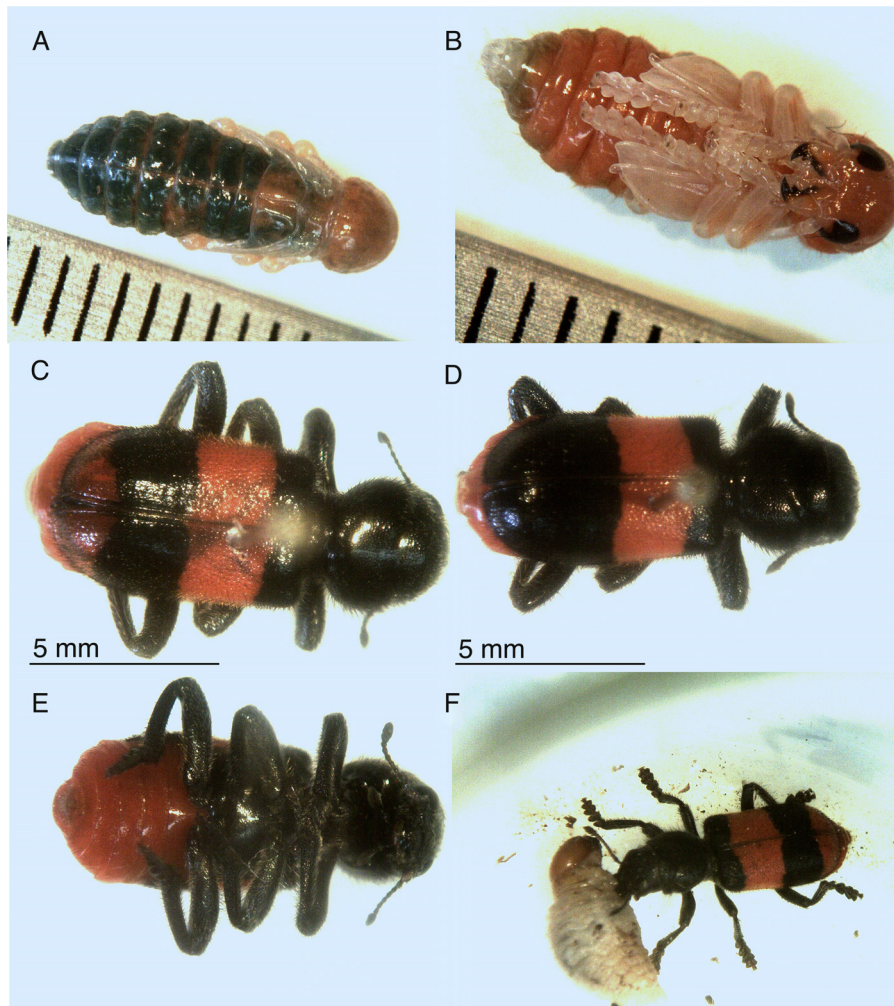


Figure 2. *Enoclerus zonatus*: pupa, dorsal view (A); pupa, ventral view (B); adult, dorsal habitus (C, D); adult, ventral view (E); adult feeding on larva of *Scyphophorus acupunctatus* in laboratory (F).

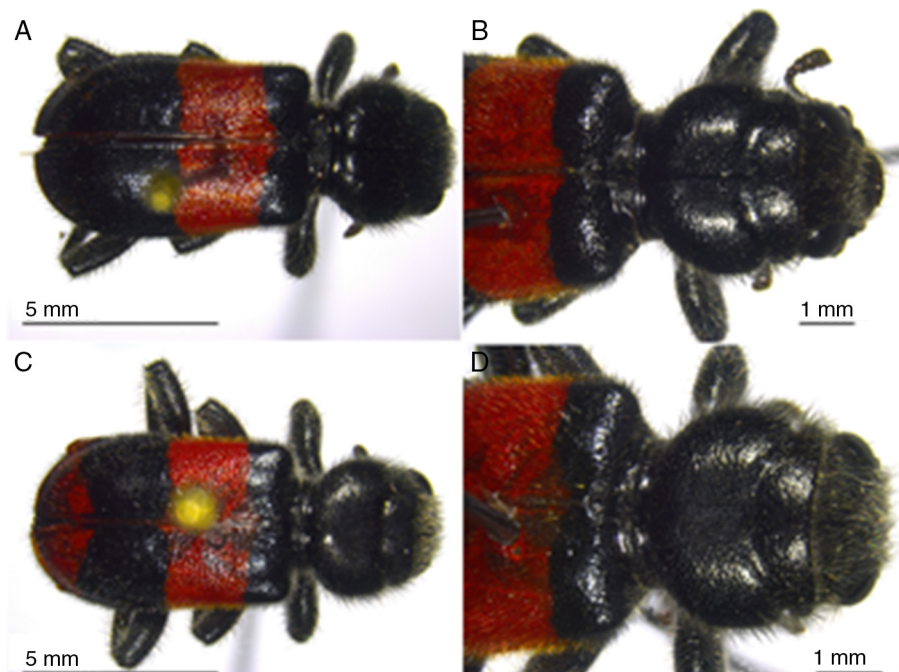


Figure 3. *Enoclerus zonatus*: specimen with single antemedian red fascia (A, B); specimen with antemedian and posterior red fasciae (more common morph) (C, D).

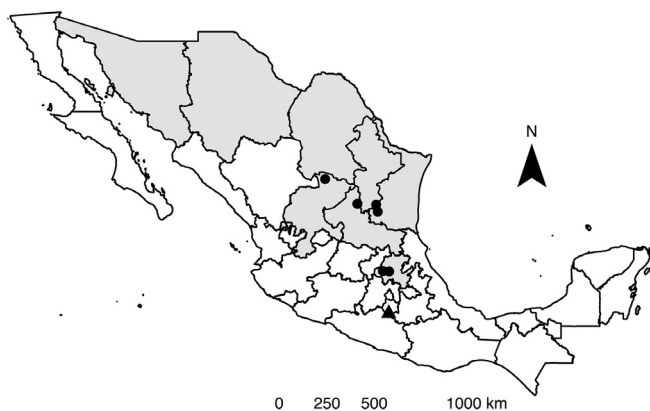


Figure 4. Distribution of *Enoclerus zonatus* in Mexico, based on state (gray color) or localities records (black dots) (Barr, 1975; Guerrero et al., 1985, and material deposited in CIUM). New locality record indicated with black triangle.

Agave and *Yucca* (Asparagaceae). The group includes *E. agave* Barr, *E. spinolae* (LeConte), *E. vernalis* Barr and Rifkind, and *E. zonatus*. *E. zonatus* is distinguishable from these congeners by its broadly darkened elytral base, and its postmedian elytral black marking in the shape of a transverse fascia. In addition, it has a more southerly distribution than *E. spinolae* and *E. vernalis* (Barr & Rifkind, 2009).

We thank Daniel Castro Rodríguez (producer of mezcal maguey) for allowing our use of facilities at his maguey plantation in Quetzalapa, Guerrero. Our gratitude to Francisca Silva

García, Luis Figueroa Ocampo, and Daniel Castro Rodríguez for their invaluable help in field collections. Finally, thanks to the Consejo Nacional de Ciencia y Tecnología (Conacyt), for providing a Posdoctoral scholarship to the first author at the Facultad de Ciencias Agropecuarias, Universidad Autónoma del Estado de Morelos.

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