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First Records of *Evania appendigaster*[1] at Baja California, México

Primeros registros de *Evania appendigaster*[1] en Baja California, México

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Abstract. Ensign wasps (Evaniidae) are parasitoids of cockroach oothecae. This report highlights *Evania appendigaster*, a species with broad distribution, now reported in Baja California, Mexico. We used citizen science platform iNaturalist to gather data, resulting in 44 confirmed records of *E. appendigaster* in the state, with the initial observation in 2015 at Ensenada. The presence of the species might be linked to distribution of synanthropic cockroaches such as *Periplaneta americana* and *Blatta orientalis*, which are common in urban environments of the region.

Resumen: Las avispas bandera (Evaniidae) son parasitoides de ootecas de cucarachas. Este informe destaca a *Evania appendigaster*, una especie con una distribución amplia, ahora registrada en Baja California, México. Utilizamos la plataforma de ciencia ciudadana iNaturalist para recopilar datos, lo que resultó en 44 registros confirmados de *E. appendigaster* en el estado, con la observación inicial en 2015 en Ensenada. La presencia de la especie podría estar relacionada con la distribución de cucarachas sinantrópicas como *Periplaneta americana* y *Blatta orientalis*, que son comunes en entornos urbanos de la región.

Introduction

Ensign wasps (Hymenoptera: Evaniidae) are a family of solitary, predatory wasps of cockroach oothecae (Insecta: Blattodea) distributed worldwide (Deans 2005). There are 486 taxa recognized in 30 genera (Integrated Taxonomic Information System 2023). Members of the family are distinguished by a metasoma with short tubular petioles and laterally compressed metasomal segments (Deans 2008).

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Evania appendigaster (Linnaeus) is a species in the ensign wasp family whose distribution is cosmopolitan (Deans 2005). It is distinguished by having long hind legs, widely separated coxae, and a large, flat face (Deans and Huben 2003). It parasitizes cockroach oothecae, mostly those of Oriental cockroach (*Blatta orientalis*, Linnaeus), American cockroach (*Periplaneta americana*, Linnaeus), Australian cockroach (*Periplaneta australiasea*, Fabricius) into which they deposit eggs from which an adult emerges (Cameron 1957). The species is thought to have originated in Asia (Townes 1949). In Mexico, *E. appendigaster* was observed in 30 states, lacking only from Puebla and Tlaxcala (iNaturalist 2023). This work described the first record of this wasp species in the State of Baja California.

Materials and Methods

Information on *Evania appendigaster* organisms was obtained through citizen science platform iNaturalist (www.inaturalist.org). The database was chosen because of scarcity of information on the group and absence of specimens in local collections. To avoid confusing the species with other visually similar ones, the description by Deans and Huben (2003) was used. Observations from the platform were downloaded, sorted by municipality, and a distribution map of *E. appendigaster* in the State of Baja California was created using QGIS Desktop 3.30 software.

Results

As of 5 September 2023, 44 iNaturalist records were confirmed of the species in the State of Baja California, with a research grade meaning their identification was confirmed by curators. The records are at the municipalities of Ensenada (26), Tijuana (12), Mexicali (4), Tecate (1), and San Quintín (1) (iNaturalist 2023; Fig. 1).

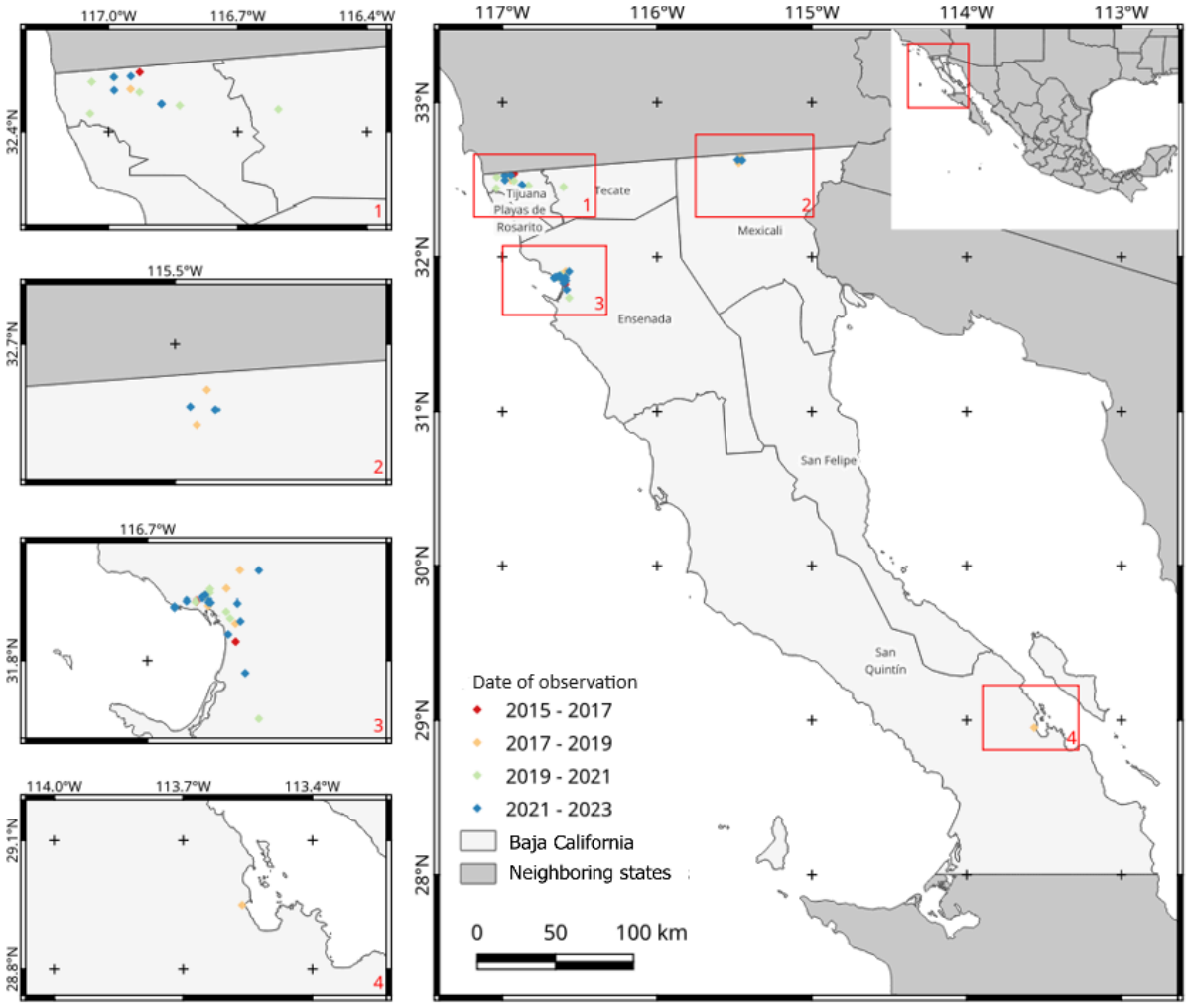

Fig. 1. Records of *Evania appendigaster* in Baja California, Mexico. Color indicates the year of observation. Each square includes records by municipality. Information from iNaturalist (2023).
Fig 1. Registros de *Evania appendigaster* en Baja California, México. El color indica el año de la observación. Cada cuadro incluye registros por municipio. Información de iNaturalist (2023).

All records were from observations by users of the iNaturalist platform. Curators B. C. Dagley (with 27 identifications) and Andrew R. Deans (with seven identifications) verified most of the observations. The first observation was recorded in the City of Ensenada on 14 October 2015, and the most recent on 28 August 2023. The closest previous record was for the City of Los Angeles, CA on 12 October 2006 (Gulmahamad 2007) that could indicate it might have been from this population. Considering the biology of the species, it is impossible to determine its origin. In addition to the iNaturalist records, a specimen was collected and deposited in the Baja California Arthropod Museum at the Centro de Investigación Científica y Educación Superior de Ensenada (CICESE).

A factor that enables this species is host species such as *P. americana* and *B. orientalis* that are common in urban areas of the four municipalities where the

species studied was observed (GBIF.org 2023). The synanthropic species have been in America since 1625 (Bell and Adiyodi 1982). More studies are needed to better describe distribution of the species, not only in the region but also in all of Mexico, to gain better understanding of colonization by the wasp species.

It also is necessary to understand how the species might impact local biodiversity. It is presumed the impact might be low because it parasitizes mostly non-native, invasive cockroach species that affect public health (Nasirian 2017). It is not known whether it might affect native cockroach species or compete with native wasps of the same family.

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References Cited

Bell, W. J., and K. G. Adiyodi [eds.]. 1982. The American Cockroach. Springer, Netherlands. https://doi.org/10.1007/978-94-009-5827-2

Cameron, E. 1957. On the parasites and predators of the cockroach II -- *Evania appendigaster* (L.). Bull. Entomol. Res. 48: 199-209. https://doi.org/10.1017/S0007485300054171

Deans, A. R. 2005. Annotated Catalog of the World's Ensign Wasp Species (Hymenoptera: Evaniidae). Contributions of the American Entomological Institute 34: 1-164.

Deans, A. R. 2008. Evaniidae. Ensign Wasps. Version 09 June 2008. http://tolweb.org/Evaniidae/23533/2008.06.09 *In* The Tree of Life Web Project, http://tolweb.org/

Deans, A. R., and M. Huben. 2003. Annotated key to the ensign wasp (Hymenoptera: Evaniidae) genera of the world, with descriptions of three new genera. Proceedings, Entomological Society of Washington 105: 859-875.

GBIF.org. 2023. GBIF Occurrence Download https://doi.org/10.15468/dl.2fh243

Gulmahamad, H. 2007. First California record of the cockroach ootheca parasitoid, *Evania appendigaster* (Linnaeus, 1758) (Hymenoptera: Evaniidae). Pan-Pacific Entomol. 83: 358-359. https://doi.org/10.3956/2007-06.1

Integrated Taxonomic Information System. 2023. *Evania appendigaster* (Linnaeus, 1758) TSN 697208. www.itis.gov. https://doi.org/10.5066/F7KH0KBK

Nasirian, H. 2017. Infestation of cockroaches (Insecta: Blattaria) in the human dwelling environments: a systematic review and meta-analysis. Acta Tropica 167: 86-98. https://doi.org/10.1016/j.actatropica.2016.12.019

iNaturalist. 2023. *Evania appendigaster*. https://www.inaturalist.org/observations?place_id=8501&subview=map&taxonid=264674 Retrieved 5 September 2023.

Townes, H. 1949. The Nearctic species of Evaniidae (Hymenoptera). Ptroceedings, United States National Museum 99: 525-539. https://doi.org/10.5479/si.00963801.99-3253.525