Scientific Note

María A. Payán-Arzapalo*, Francisco Infante*, José A. Ortiz, Hugo Suárez-Hernández, Pedro I. López-Cuén, Verónica Delgado-Pacheco, Wendy E. Gastélum-Acosta, Moisés G. Yáñez-Juárez and Mitzi D. Estrada-Acosta

# A new invasive pest in Mexico: the presence of *Thrips parvispinus* (Thysanoptera: Thripidae) in chili pepper fields

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**Abstract:** The southeast Asian thrips, *Thrips parvispinus* (Karny) (Thysanoptera Thripidae), one of the most invasive pests worldwide, is here recorded from Mexico for the first time damaging chilli pepper plants. Native to Asia, this species has spread throughout more than 30 countries across all continents (except South America). In the Americas, this thysanopteran had been accidentally introduced to the US, Canada and Puerto Rico, only. The discovery of this noxious organism in Mexico is unfortunate for national agriculture, as the insect feeds on around 45 species of plants, reducing agricultural yields and causing severe economic losses.

**Keywords:** exotic pest; southeast Asian thrips; *Capsicum*; Sinaloa; Thripidae

**Resumen:** El trips del sureste de Asia, *Thrips parvispinus* (Karny) (Thysanoptera Thripidae), una de las plagas más invasivas en el mundo, es reportado en México por primera vez, dañando plantas de chile. Originaria de Asia, esta especie se ha diseminado a más de 30 países en todos los continentes (excepto Sudamérica). En el Continente Americano, este tisanóptero había sido accidentalmente introducido a los Estados Unidos, Canadá y Puerto Rico, solamente. El descubrimiento de este organismo nocivo en México es una lamentable noticia para la agricultura nacional, debido a que el insecto se alimenta de aproximadamente 45 especies de plantas, reduciendo los rendimientos agrícolas y causando severas pérdidas económicas.

**Palabras clave:** plaga exótica; trips del sureste asiático; *Capsicum*; Sinaloa; Thripidae

Invasion of exotic species is among the most important problems in ecosystems (Lake and Leishman 2004). At a global scale, biological invasions are multi-causal events that are mainly favored by anthropogenic activities, such as, international trade, mass transportation, tourism, and ecosystem overexploitation (Gulzar et al. 2024; Rodríguez-Labajos et al. 2009; Street et al. 2023). Since 1970, more than 37,000 exotic species have been introduced into regions and biomes worldwide (IPBES 2023). Although invasiveness can also be a natural process, the recent enhanced rate of invasions is clearly a human-driven phenomenon (Gurevitch and Padilla 2004). Alongside the adverse impact on the ecosystem function, exotic species that feed on cultivated plants have the potential to be more dangerous than in their original habitats, mainly due to the plentiful food and the absence of natural enemies, causing severe damage to crops (Mooney and Cleland 2001; Pimentel et al. 2000). Economic damages associated with invasive exotic species have been estimated at more than US$423 billion annually (IPBES 2023).

María A. Payán-Arzapalo and Francisco Infante contributed equally to this work and share first authorship and corresponding authorship.

***Corresponding authors: María A. Payán-Arzapalo**, Universidad Autónoma de Sinaloa, Facultad de Agronomía, Carretera Culiacán-Eldorado km 17.5, Culiacán, 80000, Sinaloa, México,
E-mail: mariapayan@uas.edu.mx; and **Francisco Infante**, El Colegio de la Frontera Sur (ECOSUR), Carretera Antiguo Aeropuerto km 2.5, Tapachula, 30700, Chiapas, México, E-mail: finfante@ecosur.mx
**José A. Ortiz,** El Colegio de la Frontera Sur (ECOSUR), Carretera Antiguo Aeropuerto km 2.5, Tapachula, 30700, Chiapas, México,
E-mail: agiron@ecosur.mx
**Hugo Suárez-Hernández,** Tecnológico Nacional de México/ITS-Zacapoaxtla, Carretera Acuaco-Zacapoaxtla Km 8, Colonia Totoltepec, Zacapoaxtla, 73380, Puebla, México,
E-mail: hugo.sh@zacapoaxtla.tecnm.mx
**Pedro I. López-Cuén, Verónica Delgado-Pacheco, Wendy E. Gastélum-Acosta, Moisés G. Yáñez-Juárez and Mitzi D. Estrada-Acosta,**
Universidad Autónoma de Sinaloa, Facultad de Agronomía, Carretera Culiacán-Eldorado km 17.5, Culiacán, 80000, Sinaloa, México,
E-mail: lopezcuen13@uas.edu.mx (P.I. López-Cuén), veronicadelgado@uas.edu.mx (V. Delgado-Pacheco), wendygastelum@uas.edu.mx (W.E. Gastélum-Acosta), moisesyj@uas.edu.mx (M.G. Yáñez-Juárez), mitziestrada@uas.edu.mx (M.D. Estrada-Acosta)

Insects are the most common and damaging group of terrestrial animal invaders (Gippet et al. 2019). Species in the order Thysanoptera have been considered successful invaders as they pass almost unnoticed due to their small size and cryptic habits (Morse and Hoddle 2006). Thrips are usually detected in agroecosystems after the damage to cultivated plants is evident, and by then, the species have already become established in the new environment. In the case of Mexico, several invasive phytophagous species of thrips have been accidentally introduced in recent times. Examples include the banana thrips *Chaetanaphothrips signipennis* (Bagnall), the western flower thrips *Frankliniella occidentalis* (Pergande), the greenhouse thrips *Heliothrips haemorrhoidalis* (Bouché), the bean flower thrips *Megalurothrips usitatus* (Bagnall), the chili thrips *Scirtothrips dorsalis* Hood, the melon thrips *Thrips palmi* Karny, the gladiolus thrips *Thrips simplex* (Morison), and the onion thrips *Thrips tabaci* Lindeman (Cambero-Campos et al. 2022; Goldarazena et al. 2014; Ortiz et al. 2020). This paper aims to document the first occurrence of *Thrips parvispinus* (Karny) in Mexico and provide a general illustrated description that will help in its identification and monitoring.

Described from specimens collected in Thailand, *T. parvispinus* is believed to be native to South Asia (Ahmed et al. 2024). This is a pest thrips of quarantine importance that, in recent years, has spread throughout more than 30 countries across all continents (except South America) (Ahmed et al. 2024; EPPO 2024; Mound and Collins 2000). It is highly phytophagous, feeding on approximately 45 plant species, chili peppers being its main host. Due to the damage that *T. parvispinus* can cause to commercial crops and ornamental plants, it is considered a pest of great economic importance (Ahmed et al. 2024; Gleason et al. 2023). If *T. parvispinus* becomes established in Mexico, it will be an important limiting factor for the production of numerous crops.

While performing a routine entomological inspection in a commercial chili bell pepper field (*Capsicum annum* L.; Solanaceae), we noticed the presence of an unusual specimen of Thysanoptera. This led to additional samplings to identify the thrips species. Samples of thrips were obtained from a pepper field in November 2024 from an undisclosed location in the municipality of Navolato, Sinaloa, Mexico (24.7655556 °N, 107.7019444 °W; 10 m. a.s.l.). Thrips were collected at random from approximately one-hectare by zigzag sampling. Pepper leaves and flowers of approximately 50 plants were shaken against a plastic tray to detach insects. Using a camel-hair brush thrips were placed in vials with 70 % ethanol and taken to the laboratory. Once there, adult thrips were mounted on slides using Hoyer's medium. A total of 34 specimens (29 females and five males) of the species *T. parvispinus* were recovered from samples, confirming its presence in Mexico for the first time. Five voucher specimens were deposited at the entomological collection of El Colegio de la Frontera Sur in Tapachula, Chiapas, where they are available upon request (Accession numbers ECO-TAP-E L21 to L25).

The female is dark brown with yellow legs and paler head in the midline (Figure 1). Head broader than long. Antennae seven segmented; segment III and the basal half of IV and V, pale. Ocellar setae pair III small and arising from the anterior margins of the triangle. Postocular setae I and III slightly longer than ocellar setae III; ocellar pair II minute. Fore wing brown with a pale base; first and second vein with continuous row of setae. Pronotum with two pairs of long posteroangular setae; posterior margin with three pairs of setae. Clavus with five marginal setae; terminal seta longer than sub-terminal seta. Metanotum with polygonal reticulate sculpturing; median setae long and near the anterior margin; campaniform sensilla absent. Tergite II with three lateral marginal setae; tergite VIII with posteromarginal comb absent or represented by few small microtrichia laterally. Sternites III to VI with about six to 12 discal setae in an irregular row; II and VII with no discal setae. The male is yellow and smaller than the female. Sternites III to VI have a small transverse pore plate, while discal setae arise laterally. Posterior margin of tergite VIII without comb (Mound and Collins 2000; Mound and Tree 2020).

Adults and larvae of *T. parvispinus* were observed feeding on leaves, flowers and small fruits of chili bell pepper (Figure 2). When feeding on fresh leaves, most individuals of *T. parvispinus* were on the abaxial leaf surface, producing leaf deformation. Because of the presence of thrips larvae, we infer that this thysanopteran was breeding on the pepper plants.

Our paper is the first record of *T. parvispinus* in Latin America and the fourth in the Americas, after the US (Ahmed et al. 2024), Canada (Gleason et al. 2023), and Puerto Rico (Martínez-Cález 2023). Based on the closeness between the US and Mexico, we believe that the invasion of *T. parvispinus* was probably caused by infested material from that country. The entrance into Mexico of this noxious thysanopteran occurred despite the rigid plant protection protocols of the Mexican government to restrain exotic pests. In general, the phytosanitary measures of Mexico seem to be effective in this matter as the number of exotic introductions (approximately 800 species in all taxa) are lower than in other countries (Espinosa-García and Villaseñor 2017), despite the geographic position of the country, the high volume of commercial trade, and human mobility to and from the US, the Caribbean, and Central American countries. Although the discovery of *T. parvispinus* in Mexico is unfortunate for national agriculture, the present paper will be valuable from a pest control

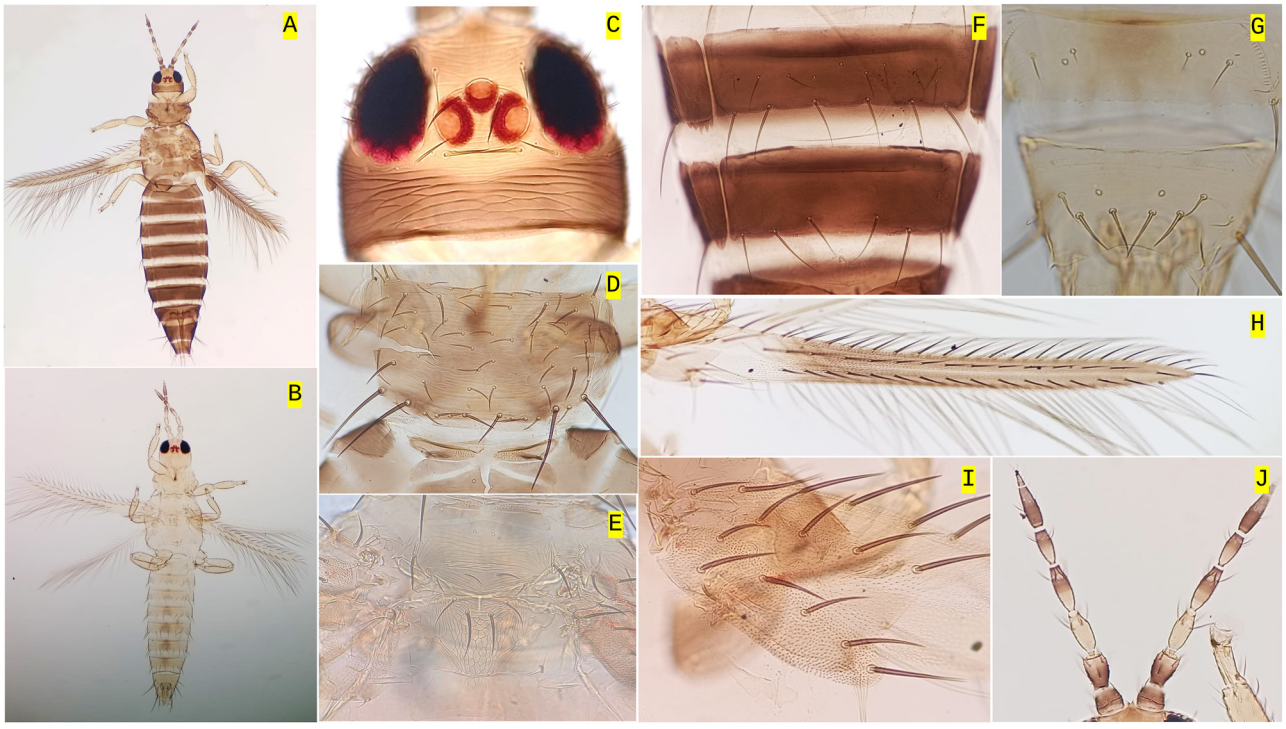


**Figure 1:** *Thrips parvispinus* (Karny): (A) female and (B) male habitus; (C) head; (D) pronotum; (E) metanotum; (F) sternites VI and VII; (G) male tergites; (H) fore wing; (I) clavus; and (J) antennal segments.


**Figure 2:** Chili pepper plants infested by *Thrips parvispinus* under field conditions: (A) leaves seriously damaged by thrips; (B) thrips adults inside a chili flower; (C) a damaged fruit with the typical thrips scarring; and (D) adults and larvae of *T. parvispinus* feeding on the abaxial leaf surface.

perspective. Accurately identifying invasive organisms is the first step for appropriate diagnostic and pest management strategies. For instance, it is well known that different thrips species that cohabit in the same crop differ in their visual attraction to color sticky traps, and this could have important implications for trapping efficiency (Carrillo-Arámbula et al. 2022). Likewise, the susceptibility of thrips to insecticides is variable among species (Warpechowski et al. 2024). In this sense, only precise and specific information on *T. parvispinus*, will be helpful for decision-makers to select the best pest management choices.

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