

# The first records of two Asian Invasive pest thrips species in Croatia

Prvi nalazi dvije azijske invazivne štetne vrste tripsa u Hrvatskoj

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## Abstract

*Thrips hawaiiensis* Morgan, 1913 and *T. parvispinus* Karny, 1922 are tropical thrips species originating from Asia, taxonomically classified in family Thripidae and subfamily Thripinae. They were recorded for the first time in Croatia in 2023. Both species are extremely polyphagous pests reported on numerous host plants. They have been spreading rapidly worldwide in the past three decades, including some European countries. Their geographical distribution continues to expand, particularly due to the intensive international trade of plants and global climatic changes, but also because of their small size, high reproductive rate, short life cycle, cryptic behaviour and wide host range. Consequently, *T. hawaiiensis* and *T. parvispinus* have become important pests globally. Thrips specimens for laboratory analysis were collected during visual inspections of ornamental plants within the official national survey of EU quarantine thrips species *Thrips palmi* Karny, 1925 (Thysanoptera: Thripidae) performed in 2023 and 2024. Subsequently, collected specimens were identified to the species level based on morphological characters of adult thrips females by using relevant diagnostic keys. Species *T. hawaiiensis* and *T. parvispinus* were identified in samples collected on different ornamental plants in garden centres. In case of successful domestication, these newly recorded Asian invasive thrips species will pose a serious phytosanitary risk to agricultural crops in Croatia.

**Keywords:** Thysanoptera, *Thrips hawaiiensis*, *Thrips parvispinus*, first record, Croatia

## Sažetak

*Thrips hawaiiensis* Morgan, 1913 and *T. parvispinus* Karny, 1922 tropske su vrste tripsa podrijetlom iz Azije, taksonomski svrstane u porodicu Thripidae i potporodicu Thripinae. Zabilježene su po prvi puta u Hrvatskoj 2023. Obje vrste su izrazito polifagni štetnici na brojnim biljnim vrstama. Tijekom posljednja tri desetljeća brzo su se proširile diljem svijeta, uključujući neke europske države. Njihov areal rasprostranjenosti nastavlja se širiti zbog intenzivne međunarodne trgovine biljem i globalnih klimatskih promjena, ali i zbog njihove male veličine, visokog potencijala razmnožavanja, kratkog životnog ciklusa, skrivenog načina života i širokog spektra biljaka domaćina.

Posljedično, *T. hawaiiensis* i *T. parvispinus* postali su štetnici od globalnog značaja. Primjerci tripsa za laboratorijsku analizu prikupljeni su tijekom vizualnih pregleda ukrasnih biljaka u sklopu nacionalnog programa posebnog nadzora za EU karantenske vrste tripsa *Thrips palmi* Karny, 1925 (Thysanoptera: Thripidae) provedenog 2023. i 2024. Nastavno, prikupljeni primjerci tripsa su identificirani do razine vrste na osnovi morfoloških karakteristika odraslih ženki, uz pomoć relevantnih dijagnostičkih ključeva. Vrste *T. hawaiiensis* i *T. parvispinus* su identificirane u uzorcima prikupljenim na različitim ukrasnim biljnim vrstama u vrtnim centrima. Ukoliko se uspješno udomaće, ove novo zabilježene azijske invazivne vrste tripsa predstavljat će ozbiljan fitosanitarni rizik za poljoprivredne kulture u Hrvatskoj.

**Ključne riječi:** Thysanoptera, *Thrips hawaiiensis*, *Thrips parvispinus*, prvi nalaz, Hrvatska

## Introduction - Uvod

The genus *Thrips* Linnaeus, 1758 is the most species-rich genus in the order Thysanoptera, with almost 280 species worldwide, distributed within many different ecosystems (Mound and Masumoto 2005). Zur Strassen (2003) lists 71 *Thrips* species recorded in Europe, of which 17 are known from Croatia according to the last published Thysanoptera check-list in 2003 (Raspudić et al. 2003). According to the literature, four more species from the genus *Thrips* have been recorded in Croatia since then: *Thrips simplex* (Morison, 1930) (Šimala and Masten Milek 2008), *Thrips setosus* Moulton, 1928 (Šimala et al. 2017), *Thrips mediterraneus* Priesner, 1934 (Šimala et al. 2017a) and *Thrips viminalis* Uzel, 1895 (Šimala et al. 2019). In 2023, two invasive *Thrips* species of Asian origin were recorded in Croatia for the first time, *Thrips hawaiiensis* (Morgan 1913) and *Thrips parvispinus* (Karny 1922).

*Thrips hawaiiensis* is a tropical thrips species originating from Asia and the Pacific (Reynaud et al. 2008). It is widely distributed in Asia and the Pacific region, Africa, North America and Jamaica (Goldarazena 2011). *Thrips hawaiiensis* is an invasive phytophagous and polyphagous species with a high reproductive capacity and adaptability to various climatic conditions (Atakan 2024). An established population of *T. hawaiiensis* was recorded outdoors for the first time in either Europe or the Western Palearctic in the south of France on *Abelia* R. Br. sp. and *Nerium* L. sp. in 2006 (Reynaud et al. 2008). In 2010, it was discovered outdoors on *Rosa* L. flowers, *Nerium oleander* L. and *Gerbera* L. sp. in Spain (Goldarazena 2011). Afterward, the species *T. hawaiiensis* was recorded for the first time in Italy (Marullo and De Grazia 2017) and Turkey in 2015 (Atakan et al. 2015), as well as in Russia in 2019 (Poushkova 2020). The species *T. hawaiiensis* was described by Morgan in 1913 from Hawaii, under the name of *Euthrips hawaiiensis*. It is a very variable species because of the variability in the number of antennal segments (7 or 8-segmented antennae), which has in the past resulted in several re-descriptions and generated 25 recognized junior synonyms (Reynaud et al. 2008; Goldarazena 2011; Marullo and De Grazia 2017). *Thrips hawaiiensis* is a widely polyphagous, strictly flower-dwelling thrips species that can feed on numerous host plants. It causes direct damage by puncturing flowers and fruits, inducing spot lesions, scarring, necrosis or malformations (Murai 2001; Reynaud et al. 2008; Goldarazena 2011). *Thrips hawaiiensis* is reported as a pest of roses in Georgia, citrus in India, coffee and mangoes in Thailand and banana in Australia (Ng and Zaimi 2018).

Also, feeding on pollen can negatively affect the host plant's fertility. Therefore, *T. hawaiiensis* has become an important agricultural pest globally. *T. hawaiiensis* is not a virus vector. Besides that, it is also considered a useful pollinating agent on oil palm (*Elaeis* Jacq. sp.), *Cosmos bispinnatus* Cav. and *Lantana camara* L. (Reynaud et al. 2008).

*Thrips parvispinus* is native to the Asian tropics, and most likely originates from Thailand. It is widely distributed in southeast Asia. The international trade of planting material and changing climate are considered major factors in its rapid spread to Oceania, North America, Africa and Europe, making it a cosmopolitan pest species (Rachana et al. 2022; Timmanna et al. 2023). In Europe, *T. parvispinus* was reported for the first time on the *Gardenia Ellis* plants in Greece in 1988 (Mound and Collins 2000), followed by Spain in 2017 (EPPO 2019) and France in 2018 (EPPO 2019a). It was found in crops in the Netherlands in 2019 (EPPO 2019b) and in Germany in 2021 (EPPO 2022). The species was also found in Belgium in 2022 (CABI 2023). *Thrips parvispinus* is the most common polyphagous pest thrips, with a wide range of different fruit, vegetable and ornamental crops. It became the dominant thrips species in Indonesia, replacing *T. palmi* in several vegetable crops (Murai et al. 2010). In Europe, it has been found damaging protected potted ornamental plants, such as *Gardenia*, ornamental *Citrus* L., *Mandevilla* Lindl. (*Dipladenia* A. DC.), *Ficus* L. and *Hibiscus* L. (Mound and Collins 2000; Lacasa et al. 2019; EPPO 2019b; EPPO 2022). In Spain, serious damage was observed in sweet peppers (CABI 2023). *T. parvispinus* causes direct damage to host plants by feeding and reproducing on young leaves and flowers. Overall, the symptoms of an infestation are typical of thrips feeding (CABI 2023). *Thrips parvispinus* can also cause certain indirect damage to the plants. Feeding of thrips on young developing leaves of papaya plants in Malaysia damages tissue and provides a suitable site for infestation by the normally saprophytic fungus *Cladosporium oxysporum* Berkeley and Curtis (Lim 1989). *Thrips parvispinus* is a vector of *Tobacco streak virus-Ageratum* strain. Klose et al. (1996) have reported transmission of the virus from infected tomato pollen to *Chenopodium amaranticolor* (H. J. Coste and A. Reyn.) seedlings.

The aim of this paper is to present the first records of species *T. hawaiiensis* and *T. parvispinus* and provide information about the species' morphology, damage on host plants and potential phytosanitary risk for Croatian agriculture.

## Materials and Methods – Materijali i metode

Samples of thrips were collected in 2023 and 2024 from various ornamental plant species in greenhouses and in the open space of garden centres and nurseries in continental and coastal part of Croatia. Host plants were visually inspected for the presence of thrips or the symptoms of their feeding on flowers and leaves, such as silvery spots, scars and bronzing. Adult thrips specimens were sampled by beating of infested plants on a white paper surface or directly from plant organs with a fine brush. Several adult thrips specimens (1-10) were collected from each plant species and immersed into Eppendorf vials containing AGA mixture (10 units of 60 % ethyl-alcohol, 1 unit of glycerine and 1 unit of glacial acetic acid) for the purpose of storage until laboratory analysis.

All sampled thrips specimens were slide-mounted in Canada balsam according to the modified method for preparation from Mound and Kibby (1998) and examined using an Olympus BX 51 high power optical microscope (magnification 100-400x), equipped with a DP 25 Digital Camera. Thrips in collected samples were identified to the species level on the basis of microscopic morphological characters of adult females, using the identification method according to morphological keys by Palmer (1992), Mound and Collins (2000), Zur Strassen (2003), Mound and Masumoto (2005) and Mound (2010). Male specimens of two new Asian species from genus *Thrips* recorded in collected samples were morphologically identified according to Zur Strassen (2003) key for *T. hawaiiensis* and based on description following Mound and Collins (2000) and Mound and Masumoto (2005) for *T. parvispinus*. Additionally, verification of thrips species identification was done through personal communication and assistance by expert taxonomist for order Thysanoptera, G. (Bert) Vierbergen from NIVIP, Wageningen, The Netherlands. Slide-mounted specimens were labelled with all data relevant for faunistic entry and deposited in the collection of Laboratory for zoology of Centre for Plant Protection (CAAF).

## Results and Discussion – Rezultati i rasprava

Invasive thrips species *Thrips hawaiiensis* and *Thrips parvispinus* were detected for the first time in Croatia in 2023 in garden centres on different potted ornamental plants.

Based on common individual morphological characters, Palmer (1992) classified 91 species from the genus *Thrips* of the Oriental and Pacific regions into five groups. *Thrips hawaiiensis* belongs to group V, which is characterised by having abdominal sternites III-VII with discal setae, pleurotergites without discal setae, tergite VIII posteromarginal comb usually present, but often of irregularly spaced microtrichia and metanotum usually striate or with some median reticulations. According to the same classification, *T. parvispinus* belongs to group III, whose characteristics are: abdominal sternites III-VI usually with discal setae, but abdominal sternite VII always without, tergite VIII posteromarginal comb rarely present medially and metanotum usually distinctly polygonally reticulate.

Species *T. hawaiiensis* was the first time reported on *Gardenia jasminoides* J. Ellis plants in 2023 in greenhouse of garden centre in Poreč in Istria county. After that first finding, several subsequent findings of *T. hawaiiensis* were recorded in 2023 and 2024, not only in the greenhouses but also outdoors on different ornamental plant species in garden centres in 3 more counties (Table 1).

**Table 1** Locations of species *Thrips hawaiiensis* records in Croatia in 2023 and 2024

**Tablica 1.** Lokalizacije nalaza vrste *Thrips hawaiiensis* u Hrvatskoj u 2023. i 2024.

County	Locality (Geographic position)	Plant species	Plant family	Number of specimens and sex	Date of sampling	Laboratory sample number
Istria	Poreč – greenhouse (N 45°13'37.35" E 13°36'13.46")	<i>Gardenia jasminoides</i> J. Ellis	Rubiaceae	1♀	June, 6 <sup>th</sup> 2023	49/ŠM/23
	Poreč – open field (N 45°13'37.35" E 13°36'13.46")	<i>Rosa</i> spp.	Rosaceae	1♀	October, 5 <sup>th</sup> 2023	101/ŠM/23
	Poreč – open field (N 45°13'37.35" E 13°36'13.46")	<i>Rosa</i> spp.	Rosaceae	4♀ 3♂	October, 14 <sup>th</sup> 2024	88/MP/24
	Žbandaj – open field (N 45°12'35.62" E 13°41'32.76")	<i>Rosa</i> spp.	Rosaceae	7♀	October, 14 <sup>th</sup> 2024	134/ŠM/24
Zadar	Bibinje – greenhouse (N 44°4'36.31" E 15°17'13.18")	<i>Lagerstroemia indica</i>	Lythraceae	1♀	August, 30 <sup>th</sup> 2023	74/ŠM/23
	Murvica – greenhouse (N 44°8'12.45" E 15°18'51.65")	<i>Rosa</i> spp.	Rosaceae	5♀ 1♂	October, 2 <sup>nd</sup> 2024	121/ŠM/24
	Murvica – open field (N 44°8'27.70" E 15°18'54.35")	<i>Sedum spectabile</i> Boreau	Crassulaceae	2♀ 1♂	October, 2 <sup>nd</sup> 2024	119/ŠM/24
	Murvica – open field (N 44°8'27.70" E 15°18'54.35")	<i>Rosa</i> spp.	Rosaceae	5♂	October, 2 <sup>nd</sup> 2024	118/ŠM/24
Split-Dalmatia	Kaštel Novi – greenhouse (N 43°32'44.73" E 16°19'0.08")	<i>Rosa</i> spp.	Rosaceae	1♀	October, 3 <sup>rd</sup> 2024	130/ŠM/24
Zagreb	Zagreb – open field (N 45°46'49.1" E 15°57'17.7")	<i>Rosa</i> spp.	Rosaceae	1♀	October, 20 <sup>th</sup> 2024	107/ŠM/24



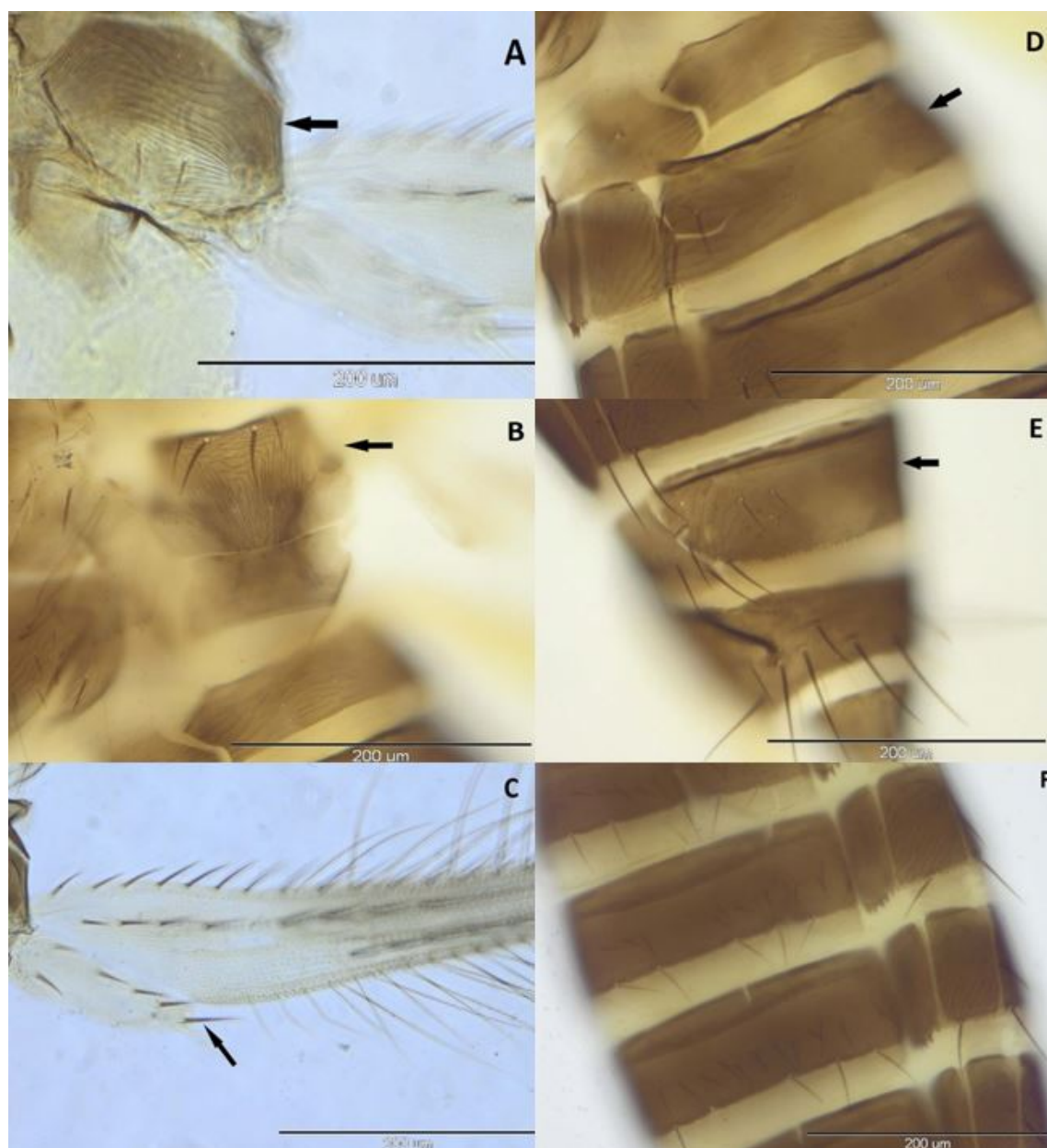
Despite its tropical origin, according to Reynaud et al. (2008), *T. hawaiiensis* appears to tolerate low temperatures and shows a greater voltinism potential than other economically important pest thrips species present in Croatia, e.g. *Frankliniella occidentalis* (Pergande, 1895) and *Thrips tabaci* Lindeman, 1889. Although European climatic conditions appear to be potentially suitable, *T. hawaiiensis* is not a virus vector and has so far not been proven to be very harmful in the non-native zones where it is newly established (Reynaud et al., 2008). Low population density of *T. hawaiiensis* was discovered both in greenhouse ornamental crops and outdoors in Croatia (Table 1). Consequently, no symptoms characteristic of a thrips infestation was recorded, nor any damage was detected on the plants. Since the species was recorded in the open field at the same location in coastal Croatia (Poreč) on the same plants of the same plant species (*Rosa* spp.) for two consecutive years, it can be assumed that the pest has probably successfully acclimatized and became domesticated in the Adriatic part, same as in France, Spain and Italy (Reynaud et al. 2008; Goldarazena 2011; Marullo and De Grazia 2017). In the Mediterranean region of Turkey, *T. hawaiiensis* is considered a serious pest in lemons and nectarines (Atakan et al. 2021). Therefore, this thrips species poses a potential future phytosanitary problem for Croatian citrus production.

The external characters of *T. hawaiiensis* adult female specimens (Figure 1) collected in Croatia are: head and prothorax yellow to orange brown, 8-segmented brown antennae, except segment III, the apex of segment II and the base of segment IV and V which are yellow, greyish forewing with the paler basal quarter and brown setae, yellowish legs and brown abdomen. The nominal form of species is dark brown (Reynaud et al. 2008), but this form was not recorded in Croatia. Also, all specimens of *T. hawaiiensis* collected on different plant species in Croatia have 8-segmented antennae, although according to published literature, a form with seven antennal segments exists in certain countries (Reynaud et al. 2008).



**Figure 1** Permanent microscope slide of *Thrips hawaiiensis* adult female (dorsal view) (photo: M. Šimala, 2023).  
**Slika 1.** Trajni mikroskopski preparat odrasle ženke *T. hawaiiensis* (leđni prikaz) (fotografija: M. Šimala, 2023.).

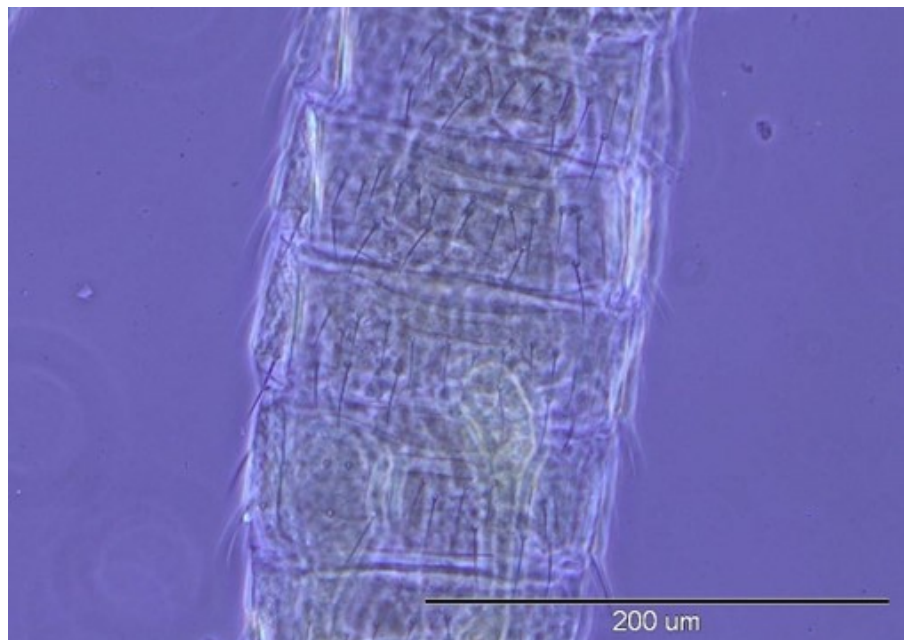
The microscopic morphological characters of adult female *T. hawaiiensis* important for the identification are: ocellar setae III lateral of anterior ocellus, just outside of ocellar triangle; four pairs of postocular setae, the first one the longest; pronotum with transverse markings and about 60 short discal setae; mesonotum (Figure 2A) completely striated including around anterior campaniform sensilla; metanotum (Figure 2B) longitudinally reticulated medially with a pair of campaniform sensilla, the median metanotal setae are long and arise close to the anterior margin; forewing with three distal setae, clavus (Figure 2C) with terminal seta longer than subterminal seta; abdominal tergite II (Figure 2D) with four lateral setae; pleurotergites without discal setae; abdominal tergite VIII (Figure 2E) with a complete, but short and irregular comb; long setae B1 and B2 on abdominal tergite IX; abdominal sternites III-VII (Figure 2 F) with 6-14 discal setae.



**Figure 1** *Thrips hawaiiensis*, morphological details of adult female: A: mesonotum; B: metanotum; C: clavus; D: abdominal tergite II; E: abdominal tergite VIII; F: abdominal sternites V and VI and pleurotergites (photos: M. Šimala, 2023).

**Slika 1.** *Thrips hawaiiensis*, morfološki detalji odrasle ženke: A: mesonotum; B: metanotum; C: clavus; D: abdominalni tergiti II; E: abdominalni tergiti VIII; F: abdominalni sterniti V i VI i pleurotergiti (fotografije: M. Šimala, 2023.).

Adult males of *T. hawaiiensis* are morphologically similar to females, but smaller and paler, without posteromarginal comb on abdominal tergite VIII and with transverse glandular area anterior to discal setae on abdominal sternites III-VII (Figure 3).



**Figure 3** Glandular area on abdominal sternites V-VII of *Thrips hawaiiensis* adult male, phase-contrast (photo: M. Šimala, 2025).  
**Slika 3.** Žlijezde na abdominalnim sternitima V-VII odraslog mužjaka *Thrips hawaiiensis*, fazni kontrast (fotografija: M. Šimala, 2025.).

Species *T. parvispinus* was intercepted in 2023 in two garden centers in Istria county on three different species of potted ornamental plants, originating from the Netherlands (Table 2). Detected population density of the pest on infested plants was relatively high, with the prevailing of pale yellow larval stages present on the underside of leaves (Figure 4). Symptoms typical for thrips were observed only on *G. jasminoides* plants. Infested plants showed slight leaf curling and deformation of the youngest leaves (Figure 5). In the case of its establishment, this tropical and polyphagous species could present a risk to protected ornamental and vegetable crops in Croatia.

**Table 2** Locations of *Thrips parvispinus* found in Croatia in 2023

**Tablica 2.** Lokaliteti nalaza vrste *Thrips parvispinus* u Hrvatskoj u 2023.

County	Locality (Geographic position)	Plant species	Plant family	Number of specimens and sex	Date of sampling	Laboratory sample number
Istria	Poreč – greenhouse (N 45°13'37.35" E 13°36'13.46")	<i>Gardenia jasminoides</i> J. Ellis	Rubiaceae	3♀	June, 6 <sup>th</sup>	49/ŠM/23
	Poreč – greenhouse (N 45°13'37.35" E 13°36'13.46")	<i>Gardenia jasminoides</i> J. Ellis	Rubiaceae	1♀ 1♂	October, 5 <sup>th</sup>	99/ŠM/23
	Umag – greenhouse (N 45°25'34.12" E 13°32'53.08")	<i>Diffenbachia</i> Schott spp.	Araceae	1♀	June, 5 <sup>th</sup>	43/ŠM/23
	Umag – greenhouse (N 45°25'34.12" E 13°32'53.08")	<i>Syngonium podophyllum</i> Schott	Araceae	2♀ 1♂	October, 4 <sup>th</sup>	96/ŠM/23





**Figure 4 and 5** Symptoms of infestation by *Thrips parvispinus* on *Gardenia jasminoides* (photos: M. Šimala, 2023).  
**Slika 4. i 5.** Simptomi infestacije *Thrips parvispinus* na *Gardenia jasminoides* (fotografije: M. Šimala, 2023.).

Specimens of adult females of *T. parvispinus* collected from the intercepted host plants had brown bodies with paler head and thorax, 7-segmented antennae, brown forewings with pale base and with complete row of setae on both forewing veins, as well as yellow legs (Figure 6).



**Figure 6** Permanent microscope slide of *Thrips parvispinus* adult female (photo: M. Šimala, 2023).  
**Slika 6.** Trajni mikroskopski preparat odrasle ženke *Thrips parvispinus* (fotografija: M. Šimala, 2023.).

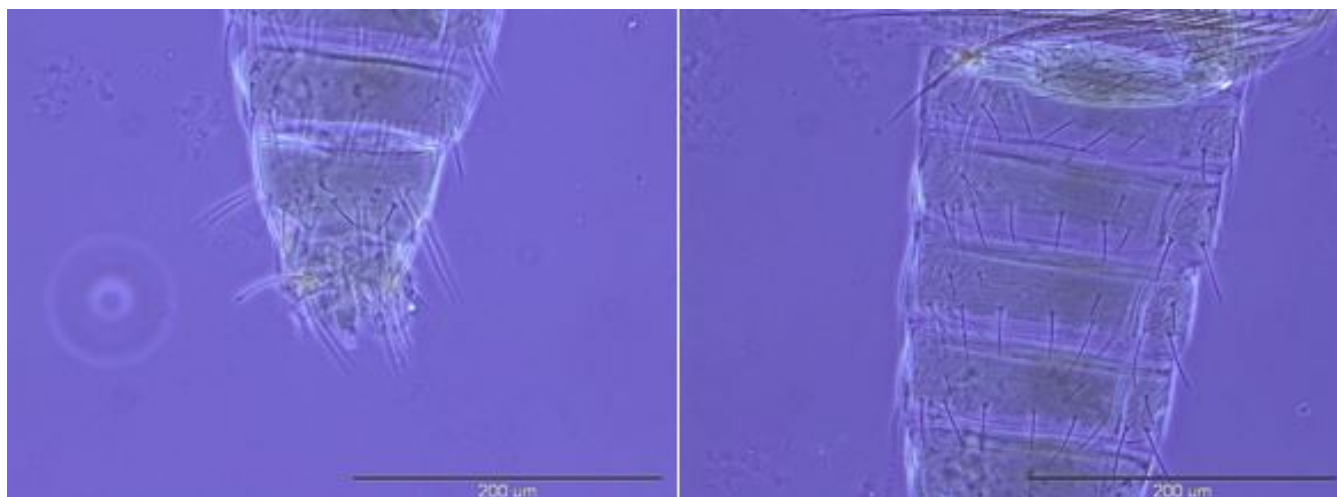
Under the optical microscope, females of species *T. parvispinus* can be identified by the possession of the following morphological characters: antennal segment III, basal half of segment IV and V yellow, forked sense cone on antennal segments III and IV (Figure 7A); ocellar setae III small, on anterior margins of ocellar triangle, postocular setae pair II minute (Figure 7B); pronotum with two pairs of long posteroangular setae and three pairs of posteromarginal setae (Figure 7B); metanotum reticulate medially, median setae long, arising behind anterior margin, campaniform sensilla absent (Figure 7C); forewing first vein with complete row of setae (Figure 7D); abdominal tergite II with three marginal setae (Figure 7E); abdominal tergite VIII comb almost absent or represented by few very small microtrichia laterally (Figure 7F); pleurotergites without discal setae; abdominal sternites III-VI with 6-12 discal setae in an irregular row, abdominal sternites II and VII without discal setae (Figure 7G).



**Figure 7** *Thrips parvispinus*, morphological details of adult female: **A**: antennae; **B**: head and pronotum; **C**: metanotum and mesonotum; **D**: fore wing; **E**: abdominal tergite II; **F**: abdominal tergite VIII-X; **G**: abdominal sternites II-VII (photos: M. Šimala, 2023).

**Slika 7.** *Thrips parvispinus*, morfološki detalji odrasle ženke: **A**: ticala; **B**: glava i pronotum; **C**: metanotum i mesonotum; **D**: prednja krila; **E**: abdominalni tergiti II; **F**: abdominalni tergiti VIII-X; **G**: abdominalni sterniti II-VII (fotografije: M. Šimala, 2023).

The species *T. parvispinus*, like *T. hawaiiensis*, shows sexual dimorphism, meaning the adult males are smaller than females and largely yellow. Abdominal tergite VIII has no posteromarginal comb. Setae S1 on abdominal tergite IX arise slightly anterior to the line joining bases of setae S2 (Figure 8). Each of the abdominal sternites III-VII has a small transverse glandular area with discal setae arising laterally (Figure 9).



**Figure 8 and 9** *Thrips parvispinus* adult male: abdominal tergites VIII-X (left) and abdominal sternites IV-VII (right), phase-contrast (photos: M. Šimala, 2025).

**Slika 8. i 9.** *Thrips parvispinus* odrasli mužjak: abdominalni tergiti VIII-X (lijevo) i abdominalni sterniti IV-VII (desno), fazni kontrast (fotografije: M. Šimala, 2025.).

Microscopic identification of thrips species *T. parvispinus* was challenging because the adult female specimens had a complete row of setae on both forewing veins. This is not morphological detail specific for European *Thrips* species, which usually have a gap in the first setal row on forewings. According to Mound and Collins (2000) a complete row of setae on the first forewing vein is not characteristic for any European member of the genus *Thrips*. Therefore, a colleague G. (Bert) Vierbergen from NIVIP, Wageningen was consulted, after which the collected specimens were identified using the adequate diagnostic keys (Mound and Masumoto 2005; Mound 2010) as a species *T. parvispinus*.

## Conclusion - Zaključak

*T. hawaiiensis* and *T. parvispinus* are newly recorded species for the fauna of Thysanoptera in Croatia. Given that the last published check-list of thrips species in Croatia from 2003 is still valid, and a certain number of new species, not only from the genus *Thrips* have since been recorded, the list should be updated. Considering that the species *T. hawaiiensis* was found on the same outdoor plants of *Rosa*, at the same locality for two consecutive years, it can be assumed that the pest has probably successfully acclimatized and became domesticated in coastal Croatia. Species *T. parvispinus* was detected only in 2023 in garden centres on shipments of ornamental plants originating from the Netherlands and currently has the status of intercepted species, with realistic prospects of becoming established in Croatia. So far, no significant damage has been noticed in Croatia. However, there is a possibility that both of these pests will spread and cause damage to agricultural crops over time, especially in greenhouses.



## Acknowledgments - Zahvale

The authors are thankful to Gijsbertus (Bert) Vierbergen from Netherlands Institute for Vectors, Invasive plants and Plant health (NIVIP), Wageningen for help and provision of useful information regarding the diagnostics of newly recorded thrips species.

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