Is *Taeniothrips inconsequens* (Thysanoptera: Thripidae) a pest of stone and pip fruit trees in Argentina?

¿Es *Taeniothrips inconsequens* (Thysanoptera: Thripidae) una plaga de frutales de carozo y de pepita en la Argentina?

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Abstract

The presence of the "pear thrips" *Taeniothrips inconsequens* has been cited in Argentina in 1921 by Teresa Joan. This has affected exports of fruit tree propagation materials. However currently there is a concern about that citation because it was probably an incorrect identification of the thrips species. The objective of this work was to confirm the presence of *Taeniothrips inconsequens* in fruit orchards in Argentina. Fruit orchards were sampled in the main producing areas of Argentina. A total of 10,696 specimens from 393 samples were examined and no *T. inconsequens* were found. The citation of this species for Argentina could be the result of misidentifications. Ninety percent of the collected specimens corresponded to four species of thrips: 37% *Frankliniella australis*, 29% *Thrips tabaci*, 14% *Frankliniella occidentalis* and 10% *Frankliniella gemina*. Of the remaining 10%, 2% were larvae and 8% corresponded to the species *Aneristothrips rostratus*, *Frankliniella frumenti*, *Frankliniella schultzei*, *Frankliniella inesae*, *Frankliniella juancarlosi*, *Frankliniella* spp, *Leptothrips mali*, *Aeolothrips fasciatipennis*, *Arorathrips texanus*, *Tenothrips frici*, *Haplothrips* spp, *Haplothrips fiebrigi*, *Haplothrips trellesi*, *Thrips australis*, *Karnyothrips* spp., and *Caliothrips phaseoli*.

Keywords
pear thrips • stone fruits • pome fruits • detection • pest

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Resumen

La presencia del "trips del peral" *Taeniothrips inconsequens* ha sido mencionada en el año 1921 por Teresa Joan. Esto afectó la exportación de material de propagación. Sin embargo, existen dudas sobre si la identificación de la especie fue correctamente realizada. El objetivo de este trabajo fue verificar la presencia de *Taeniothrips inconsequens* en Argentina y para esto se muestrearon distintos montes frutales en las principales zonas productoras. Se examinaron un total de 10696 ejemplares desde 393 muestras, y no se encontró *T. inconsequens*. La cita de esta especie para Argentina podría ser el resultado de identificaciones erróneas. El 90% de los especímenes recolectados correspondió a cuatro especies de trips: 37% *Frankliniella australis*, 29% *Thrips tabaci*, 14% *Frankliniella occidentalis* y 10% *Frankliniella gemina*. Del 10% restante, 2% fueron larvas y el 8% correspondió a las especies *Aneristothrips rostratus*, *Frankliniella frumenti*, *Frankliniella schultzei*, *Frankliniella inesae*, *Frankliniella juancarlosi*, *Frankliniella* spp, *Leptothrips mali Aeolothrips fasciatipennis*, *Arorathrips texanus*, *Tenothrips frici*, *Haplothrips* spp, *Haplothrips fiebrigi*, *Haplothrips trellesi*, *Thrips australis*, *Karnyothrips* spp. y *Caliothrips phaseoli*.

Palabras clave
trips del peral • frutales de carozo • frutales de pepita • detección • plaga

Introduction

Thrips are small, highly thigmotactic insects. Females of the suborder Terebrantia introduce their eggs in petioles, stems, leaves, and fruits, and therefore rapid visual detection is extremely difficult (11, 13). The "pear thrips" *Taeniothrips inconsequens* (Uzel) economically affects exports of stone fruit propagation materials. Then, certain requirements for the phytosanitary certification of shipments of apricot propagation material from Argentina to other countries such as Peru were required (18).

The pear thrips has a wide range of host plants, stone and pip fruit trees, as well as ornamental and forest plants (20). The common name of the species refers to its association with the pear tree. However, most of its damage is in *Acer saccharum* Marshall in the northern United States and Canada (19, 21, 22).

Taeniothrips inconsequens is native to Europe and entered America through the north of the United States and Canada (9, 15). In Argentina, it was cited on pear for the first time by Joan in 1921 (10). Then, De Santis and co-workers in 1978 (8) reported others host plants (almond, peach and apricot trees) and its geographic distribution (Buenos Aires, Mendoza and Neuquén provinces) in Argentina. In the last 20 years, the pear thrips has not been mentioned in studies involving the identification of thrips on fruit trees in Argentina (3, 4, 5, 6, 16, 23). We have never seen this thrips species in Argentina and we believe that the pear thrips is not present in this country. This study was conducted to verify the presence of *T. inconsequens* in Argentina.

Materials and methods

Sampling and collecting thrips from fruit branches

The sampling was carried out between 2017 and 2019 during the flowering or sprouting stages of nine species of fruit trees in the six main producing provinces of stone and pip fruits in Argentina (tables 1, page XXX and 2, page XXX).

The sampling was performed by manually shaking a branch over a 0.40 m x 0.30 m white tray. Thrips collected on the tray were transferred with a brush to vials with preservative liquid (10% ethyl alcohol aqueous solution, 5% acetic acid and 0.1% Triton; Bhatti, J., personal communication). Collected thrips were placed in a 70% ethanol aqueous solution for their final conservation.

Table 1. Number of fruit orchards, ordered by provinces and counties, with their respective geographic coordinates, altitude ranges and sampling times.

Tabla 1. Número de huertos frutales muestreados, ordenadas por provincias y departamentos, con sus respectivas coordenadas geográficas, rangos de altitudes y épocas de muestreo.

Province	County	Geographical coordinates	Altitude (meters above sea level)	Sampling Date	Number of plots
Buenos Aires	Baradero	S33°48′ W 59°31′	25	sep-2019	2
	Luján	S34°34′ W 59°06'	31-37	oct-2019	3
	Mercedes	S34°39′ W59°26′	35-38	sep-2019	1
	San Pedro	S33°40′ W59°40′	19-38	sep-oct-2019	22
Chubut	Gaiman	S43°17'' W65°29'	218	oct-2019	1
	Sarmiento	S45°36′ W69°05′	271-279	oct-2019	3
Mendoza	General Alvear	S34°58′ W67°42′	451-506	aug-oct-2017	49
	Junín	S33°08′ W68°28′	655-712	sep-oct-2017	13
	Lavalle	S32°43′ W68°35′	603-613	oct-nov-2017	13
	Luján de Cuyo	S33°01′ W68°52′	719-984	sep-2017	4
	Maipú	S32°58′ W68°45′	650-815	aug-oct-2017	24
	Rivadavia	S33°11′ W68°28′	658-662	aug-oct-2017	4
	San Carlos	S33°46 ′W69°02′	939-1030	oct-2017	6
	San Martín	S33°04′ W68°28′	600-658	aug-nov-2017	25
	San Rafael	S34°37'' W68°20′	478-726	aug-nov-2017	63
	Tunuyán	S33°34′ W69°01′	944-1115	aug-oct-2017	12
	Tupungato	S33°22′ W69°08′	979-1240	sep-2017	16
Neuquén	Confluencia	S38°57′ W68°03′	293-307	sep-oct-2017	8
	Añelo	S38°21′ W68°47′	350	oct-2017	1
Río Negro	General Roca	S39°02′ W67°35′	202-309	sep-oct-2017	25
San Juan	Albardón	S31°25′ W68°30′	626-676	aug-sep-2018	29
	Angaco	S31°24′ W68°22′	590	sep-2018	2
	Calingasta	S31°22′ W69°30'	1448	sep-2018	1
	Chimbas	S31°29′ W68°32′	608	sep-2018	1
	Jáchal	S30°14′ W68°45'	795-1262	sep-2018	4
	Nueve de Julio	S31°37′ W68°23′	580	sep-2018	1
	Pocito	S31°39′ W68°33′	581-684	aug-sep-2018	29
	Rawson	S31°34′ W68°31′	596	sep-2018	1
	Rivadavia	S31°31′ W68°36′	684-705	sep-2018	4
	San Martín	S31°30′ W68°17′	588-592	aug-sep-2018	5
	Ullún	S31°25′ W68°44'	791-794	sep-2018	3
	Veinticinco de mayo	S31°49′ W68°12′	555-564	sep-2018	4
	Zonda	S31°33′ W68°46'	774-785	aug-sep-2018	8
Santa Cruz	Lago Buenos Aires	S46°35′ W70°55'	210-229	jan-feb-2019	6

Table 2. Numbers of thrips collected by species and province on a total of 393 samples taken in Argentina.

Tabla 2. Números de trips recolectados por especies y provincia sobre un total de 393 muestras tomadas en la Argentina.

		Almond	Apple	Apricot	Cherry	Peach	Pear	Plum	Quince tree
Buenos Aires	*F. gemina*	-	-	-	-	638	16	12	-
	F. occidentalis	-	-	-	-	1	0	0	-
	T. tabaci	-	-	-	-	22	17	3	-
	Other	-	-	-	-	46	0	0	-
	Larvae	-	-	-	-	17	0	0	-
Chubut	*F. australis*	-	-	-	13	-	-	-	-
	F. occidentalis	-	-	-	36	-	-	-	-
	T. tabaci	-	-	-	7	-	-	-	-
	Haplothrips spp.	-	-	-	4	-	-	-	-
Mendoza	*F. australis*	139	70	135	67	831	69	383	149
	F. gemina	12	0	25	0	120	43	102	41
	F. occidentalis	15	3	126	27	204	35	180	163
	T.tabaci	58	25	236	67	572	467	502	820
	Haplothrips spp.	0	1	50	1	30	8	16	17
	Other	0	0	15	4	29	43	12	12
	Larvae	3	0	50	2	79	88	51	126
Neuquén	*F. australis*	-	12	-	-	-	26	-	-
	F. occidentalis	-	34	-	-	-	44	-	-
	T. tabaci	-	3	-	-	-	10	-	-
	Haplothrips spp.	-	25	-	-	-	29	-	-
	Other	-	1	-	-	-	1	-	-
Río Negro	*F. australis*	-	10	-	-	-	24	-	-
	F. occidentalis	-	67	-	-	-	89	-	-
	T. tabaci	-	30	-	-	-	26	-	-
	Haplothrips spp.	-	120	-	-	-	118	-	-
	Other	-	2	-	-	-	2	-	-
San Juan	*F. australis*	474	-	406	-	440	-	564	115
	F. gemina	8	-	6	-	7	-	12	16
	F. occidentalis	31	-	42	-	16	-	79	47
	T. tabaci	69	-	26	-	13	-	41	44
	Haplothrips spp.	1	-	0	-	0	-	0	-
	Larvae	15	-	16	-	9	-	24	2
Santa Cruz	*F. occidentalis*	-	-	-	308	-	-	-	-
	Other	-	-	-	27	-	-	-	-
	General *Total*	825	403	1133	563	3074	1155	1981	1552

Thrips were collected using systematic U sampling. For every ten plants one was sampled. One branch at 1.5 m height per tree was selected for the sampling. Thrips were collected completing approximately a sample of 30 specimens per orchard. When the number of thrips was low, all the specimens were collected in a time period of 30 minutes.

Geographic coordinates were recorded with a G.P.S., dates and plant species and phenological stage were registered.

Thrips identification

Most of the adult specimens were identified under a stereoscopic microscope with an 80 x magnification. Some specimens of each species were mounted on microscopic slides following the Mound and Marullo technique (12) and identified by keys and descriptions (1, 4, 7, 8, 9, 14) or by confrontation with previously identified material from the thrips collections of INTA Mendoza (EEA Mza INTA) and of the Museo de Ciencias Naturales de La Plata (MLP https://www.museo.fcnym.unlp.edu.ar/). All specimens collected were preserved in vials with 70% ethanol or microscopic slides at the Entomology Lab of the EEA Mendoza INTA.

Results

A total of 10,686 individuals of thrips from 393 samples of fruit branches from the main stone and pip fruit producing areas of Argentina were collected. *Taeniothrips inconsequens* (figure 1A, page XXX) was not found. Ninety percent of the collected thrips corresponded to four species: 37% *Frankliniella australis* (figure 1B, G y E, page XXX), 29% *Thrips tabaci* Lindeman (figure 1C, page XXX), 14% *Frankliniella occidentalis* (Pergande), and 10% *Frankliniella gemina* Bagnall. The remaining 10% consisted of 2% larvae and 8% adults of the following species, *Aneristothrips rostratus* De Santis, *Frankliniella frumenti* Moulton, *Frankliniella schultzei* (Trybom), *Frankliniella inesae* de Borbón & Zamar, *Frankliniella juan-carlosi* de Borbón & Zamar, *Frankliniella* spp, *Leptothrips mali* (Fitch), *Aeolothrips fasci-atipennis* Blanchard, *Arorathrips texanus* (Andre), *Tenothrips frici* (Uzel), *Haplothrips* spp, *Haplothrips fiebrigi* Priesner, *Haplothrips trellesi* Moulton, *Thrips australis* (Bagnall), *Karn-yothrips* spp., *Caliothrips phaseoli* (Hood).

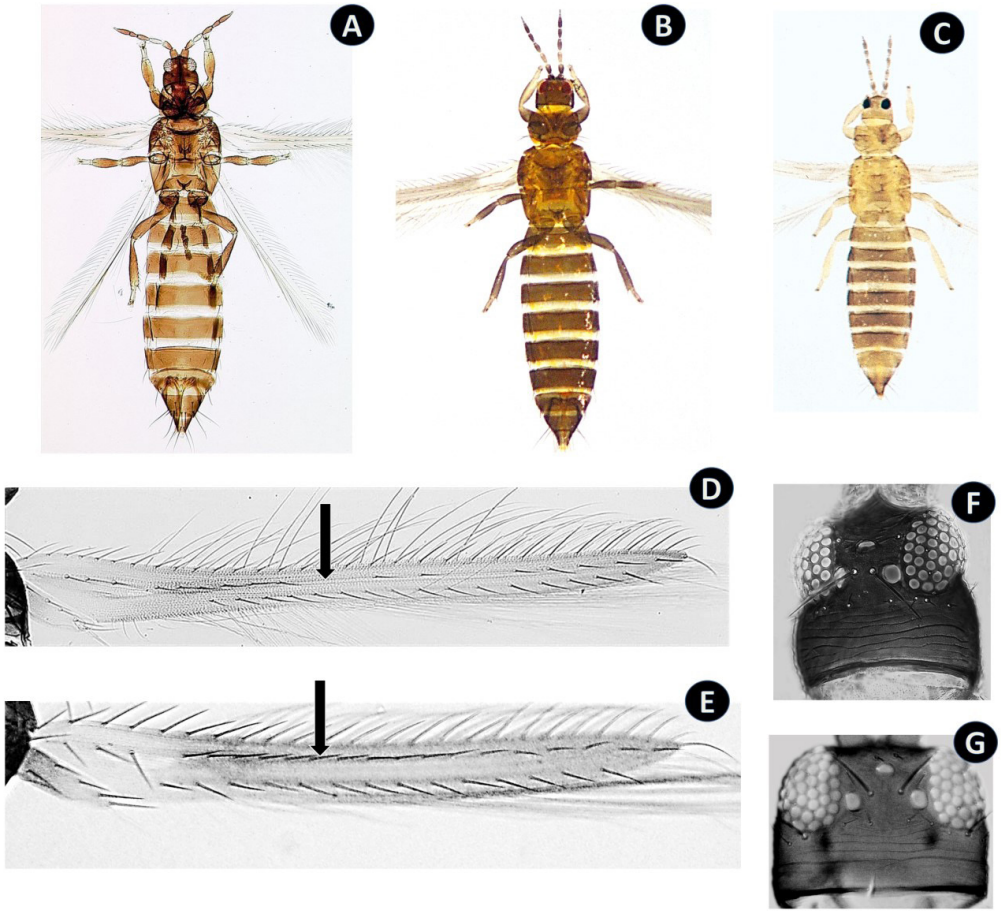
Regarding the distribution of the species in the studied areas, *F. gemina* was dominant in Buenos Aires, *T. tabaci* in Mendoza, *Haplothrips* spp. in Río Negro and Neuquén, *F. occi-dentalis* in Chubut and Santa Cruz, and *F. australis* Morgan in San Juan (table 2, page XXX). In relation to the host plants, *F. australis* was dominant in almond and peach trees, while *T. tabaci* was dominant in pear and quince trees.

Discussion

In Joan's work (1991), samples of pear flowers were collected only in the Ituzaingó county in the province of Buenos Aires. The characters used by Joan to describe and illustrate *T. incon-sequence* are shared by many other thrips species or are imprecise and diagnostic features of pear thrips are not specified. Furthermore, the author does not indicate where the examined material was deposited in order to study it. The citation about the pear thrips for the province of Buenos Aires (10) can be attributed to a misidentification. This error could be due to the limited knowledge about thrips taxonomy at that time, the limited availability of information and the non-corroboration of the species determination by a thrips specialist.

Joan (1991) describes a species of brown colour, with eight-segmented antennae, and a head that is wider than long. Although the first two features are correct, the last one is erroneous. The head of *T. inconsequens* is longer than wide (9, 14). Also in Joan's paper, the illustrations are imprecise, the larva drawing shows more information, with respiration spiracles in tergites II and VIII and numerous tooth-shaped processes in tergite IX. The distribution of the setae in the tergites and the shape of the antenna are those observed in species of the family Thripidae. If the illustration of Joan's larva is correct, the pear thrips is ruled out because the tooth-shaped processes of tergite IX are medium size and numerous, while in *T. inconsequens* they are large and scarce (three pairs) (17).

Other common species on fruit trees in Buenos Aires could also motivate erroneous identifications. Among the most common brown species that can be found is *T. tabaci*. This species differs from *T. incosequens* in that it has uniformly pale forewings and the head is wider than long, and it does not show constriction (figure 1A-G, page XXX). Another frequent, brown-coloured species is *Frankliniella schultzei*. It is distinguished from *T. incon-sequens* because adults have a pair of long setae on the anterior margin and another on the anterior angles of the pronotum. The forewings are uniformly pale, the head is wider than long and without posterior constriction to the eyes.



Adult female. A, *T. inconsequens* (image by Mound *et al.*, 2018); B, *F. australis;* C, *T. tabaci.* Fore wing. D, *T. inconsequens* (image by Mound *et al.*, 2018); E, *F. australis* (indicated with an arrow the first vein of the fore wing). Head, F, *T. inconsequens*; G, *F. australis.*

Hembras adultas. A, *T. inconsequens* (imagen de Mound *et al.*, 2018); B, *F. australis*; C, *T. tabaci*. Alas anteriores. D, *T. inconsequens* (imagen de Mound *et al.*, 2018); E, *F. australis* (indicado con una flecha la primera vena del ala anterior). Cabezas, F, *T. inconsequens*; G, *F. australis.*

Figure 1. Comparison between *Taeniothrips inconsequens, Frankliniella australis* and, *Thrips tabaci.*

Figura 1. Comparación de *Taeniothrips inconsequens* con *Frankliniella australis* y *Thrips tabaci.*

Pear thrips is also cited by De Santis and co-workers (8). These authors provide data on the host species (pear, almond, peach, and apricot) and their geographic distribution for Argentina (Buenos Aires, Mendoza and Río Negro). However, they do not indicate where this information was obtained from. On the other hand, no slides labelled as *T. inconsequens* with specimens collected in Argentina are at the Museo de la Plata.

The citations of *T. inconsequens* in Mendoza and Río Negro (2, 8) can be attributed to mistakes over mistakes which originated in erroneous identifications made by non-specialists and later mentioned in successive citations. *Frankliniella australis* (figure 1B) resembles *T. inconsequens* (figure 1A) in its body and antenna coloration. To distinguish them, it is necessary to observe in detail the pronotum setae, the venation of the forewings and the shape of the head, characteristics that can be visualized under a stereomicroscope at 80 x magnification. *Taeniothrips inconsequens* does not have long setae on the margin and anterior angles of the pronotum, it has the first vein with setae arranged discontinuously (figure 1D) and the head has a constriction posterior to the eyes giving the appearance of swollen genae; (figure 1F) while *F. australis*, (figure 1E) has a pair of long setae in the anterior margin and another in the anterior angles of the pronotum, the first vein has a continuous row of setae; the margins of the genae are almost parallel, with no obvious constriction behind the eyes (figure 1G). These species also have other important differences. *T. inconsequens* has only two pairs of ocellar setae and has a small spur on the tarsal apex of the forelegs (a character that differentiates it from other species of the genus *Taeniothrips*), and it does not have ctenidia placed anterior to the spiracles of respiration. While *F. australis* has three pairs of ocellar setae, a spur on the tarsi of the fore legs is not present, and tergite VIII has a pair of ctenidia located anterior to the spiracles of respiration.

Considering that no slides of specimens collected in Argentina of *T. inconsequens* were found at the Museo de La Plata, in De Santis and co-workers' paper (1978), it is considered that these authors make references to other articles that cite the species but no to identifications made by themselves.

In our research, the presence of some species of thrips in fruit trees was accidental due to the fact that they have other host plants. Thus, *Arorathrips texanus* and *Frankliniella frumenti* live on grasses, while *Tenothrips frici* is common on asteraceae, *Thrips australis* on eucalyptus, *Frankliniella inesae* on asteraceae, mainly of the *Baccharis* genus. Some species found in low frequency, which are predators or potential predators, were *Leptothrips mali*, *Aeolothrips faciatipennis* and *Karnyothrips* spp. Other species, such as *F. schultzei* and *Caliothrips phaseoli*, may have alternative fruit hosts.

Conclusions

It is possible, based on our findings, that the citation of *T. inconsequens* for Argentina is a misidentification of another species. The pear thrips was not found during blooming and or sprouting of nine kinds of stone and pip fruit in Argentina's primary producing regions. In addition, no slides of *T. inconsequens* from Argentina were found at the museum of La Plata. The pear thrips should be excluded from the Argentine fauna and considered as a quarantine species to prevent its presence.

References

1. Cavalleri, A.; Lindner, M. F.; Mendonça Jr., M. S.; Botton, M.; Mound L. A. 2018. Os Tripes do Brasil. http://http://www.thysanoptera.com.br (accessed January 2021).
2. Cucchi, N. J. A.; Becerra, V. C. 2006. Manual de tratamientos fitosanitarios para cultivos de clima templado bajo riego. INTA. EEA Mendoza. 279 p.
3. De Borbón, C. M.; Gracia, O.; De Santis, L. 1999. Survey of Thysanoptera occurring on vegetable crops as potential Tospovirus vectors in Mendoza, Argentina. Revista de la Sociedad Entomológica Argentina. 58 (3-4): 59-66. https://www.biotaxa.org/RSEA/article/view/32484/28876 (accessed October 2020).
4. De Borbón, C. M. 2005. Los trips del suborden Terebrantia de la provincia de Mendoza. INTA. 38 p.
5. De Borbón, C. M; Cardello, F. 2006. Daños en brotes de duraznero asociado a trips y su relación con las malezas. RIA. 35(3): 65-81. https://www.redalyc.org/articulo.oa?id=86435305 (accesses October 2020).
6. De Borbón, C. M.; Becerra, V.; Bonomo, V.; Mazzitelli, E.; Calvo, M. 2008. Trips (Insecta: Thsysanoptera) en montes de cerezo en Mendoza, Argentina. Revista de la Facultad de Ciencias Agrarias. Universidad Nacional de Cuyo. Mendoza. Argentina. 40(2): 1-10.
7. De Borbón, C. M.; Zamar, M. I. 2018. Two new species of *Frankliniella* (Thysanoptera: Thripidae) from Argentina with a key to species from Argentina and Chile. Zootaxa. 4369 (3): 419. https://doi.org/10.11646/zootaxa.4369.3.7
8. De Santis, L.; Gallego De Sureda, A. E.; Merlo, E. Z. 1978. Estudio sinóptico de los tisanópteros argentinos. (Insecta). Obra del Centenario Museo LP. VI: 91-166.
9. Hoddle, M.; Mound, L. A.; Paris, D. 2012. Thrips of California. https://keys.lucidcentral.org/keys/v3/thrips_of_california/Thrips_of_California.html (accessed March 2020).
10. Joan, T. 1921. El Trips del Peral. Ministerio de Agricultura de la Nación, Dirección de laboratorios e investigaciones agrícola-ganaderas. Laboratorio de Zoología. Buenos Aires. p. 7.
11. Morse J. G.; Hoddle, M. S. 2006. Invasion biology of thrips. Annual Review of Entomology. 51: 67-89. https://doi.org/10.1146/annurev.ento.51.110104.151044
12. Mound, L. A.; Marullo, R. 1996. The Thrips of Central and South America: An Introduction. Memoirs on Entomology International. 6: 1-488.
13. Mound, L. A. 2005. Thysanoptera: diversity and interactions. *Annual Review of Entomology.* 50: 247-269.
14. Mound, L. A.; Collins, D. W.; Hastings, A. 2018. Thysanoptera Britannica et Hibernica - Thrips of the British Isles. Lucidcentral.org, Identic Pty Ltd, Queensland. Australia. https://keys.lucidcentral.org/keys/v3/british_thrips/authors.html (accessed October 2020).
15. O' Neill, K.; Bigelow, R. S. 1964. The *Taeniothrips* of Canada (Thysanoptera: Thripidae). The Canadian Entomologist. 96: 1219-1239. DOI: https://doi.org/10.4039/Ent961219-9
16. Rodríguez, J.; Neira, P.; Carrizo, P. 2012. Variación estacional de los Thripidae en los montes de cerezo y la vegetación asociada al cultivo en el Valle Inferior del Río Chubut, Argentina. RIA. 38(1): 46-54. http://ria.inta.gob.ar/sites/default/files/numeros/ria-38-1-2012_0.pdf (accessed October de 2020).

17. Sánchez-Monge, A.; Rodríguez-Arrieta, J. A.; Sánchez-Ramos, I.; González-Nunez, M.; Pascual, S.; Retana-Salazar, A. P. 2014. Ultrastructural morphology of larva ii of *Taeniothrips inconsequens* (Terebrantia: Thripidae). Florida Entomologist. 97(2): 486-490. https://journals.flvc.org/flaent/article/view/83178/80045 (accessed October 2020).
18. Servicio Nacional de Sanidad Agraria de Perú. 2015. Resolución Directoral Proyecto. https://www.senasa.gob.pe/senasa/descargasarchivos/2014/12/634-Damasco-plantas-y-varas-Argentina.pdf (accessed May 2020).
19. Teulon, D. A. J.; Kolb, T. E.; Cameron, E. A.; Mccormick, L. H.; Hoover, G. A. 1993. Pear thrips, *Taeniothrips inconsequens* (Uzel) (Thysanoptera: Thripidae), on sugar maple, *Acer saccharum* Marsh.: a review. Zoology (Journal of Pure and Applied Zoology). 4: 355-380.
20. Teulon D. A. J.; Groninger J. W.; Cameron E. A. 1994. Distribution and host plant associations of *Taeniothrips inconsequens* (Thysanoptera: Thripidae). Environmental Entomology. 23 (3): 587-611. DOI: 10.1093/ee/23.3.587.
21. Teulon, D. A. J.; Cameron, E. A. 1996. The pear thrips in northern hardwood forests of the North-Eastern United States. Folia Entomologica Hungarica. 57(Suppl.): 143-150.
22. Teulon, D. A. J.; Leskey, T. C.; Cameron, E. A. 1998. Pear thrips *Taeniothrips inconsequens* (Thysanoptera: Thripidae) life history and population dynamics in sugar maple in Pennsylvania. Bulletin of Entomological Research. 88: 83-92. https://www.researchgate.net/publication/231996023_Pear_thrips_Taeniothrips_inconsequens_Thysanoptera_Thripidae_life_history_and_population_dynamics_in_sugar_maple_in_Pennsylvania (accessed October 2020).
23. Zamar, M. I.; Neder de Román, L. E.; Montero, T. E.; Linares. M. A.; Hamity, V. C.; Ortiz, F.; Contreras, E. F. 2009. Incidencia de Thysanoptera en cultivos ornamentales y frutales de la Quebrada de Humahuaca (Jujuy, Argentina). Agraria. Facultad de Ciencias Agrarias UNJu. 11: 15-20.

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