

True and incidental plant hosts of *Frankliniella gemina* (Thysanoptera: Thripidae) associated with vineyards in Córdoba, Argentina

Hospederos verdaderos e incidentales de *Frankliniella gemina* (Thysanoptera: Thripidae) asociados a viñedos en Córdoba, Argentina

Adriana VIGLIANCO

Universidad Nacional de Córdoba, Argentina

aviglian@agro.unc.edu.ar

Delia S. ÁVALOS

Universidad Nacional de Córdoba, Argentina

d-avalos@agro.unc.edu.ar

Adriana SALVO

CONICET, Argentina

asalvo@unc.edu.ar

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Abstract: Spontaneous vegetation occurring in crop fields can provide resources for insect species. The aims of this study were to compile bibliographic information on the host plants of *Frankliniella gemina* Bagnall (Thysanoptera) in Argentina and to identify the species that act as true and incidental host plants in vegetation associated with vineyards in Colonia Caroya. A search of scientific articles was conducted using the keywords “*Frankliniella gemina*” and their synonyms *F. rodeos* and *F. allochroos* in Argentina, combined with “alternative hosts” and “weeds”, in Spanish and English, published between 1980 and 2024. Flowers were collected in three vineyards and their surroundings, from August to December for two years. In Argentina, 122 host species of *F. gemina* were recorded, while 26 plant species were identified in Colonia Caroya: six true hosts, 17 incidental and three fortuitous. *Nothoscordum gracile* (Aiton) Stearn (Amaryllidaceae) and *Melia azedarach* L. (Meliaceae) are reported for the first time as true hosts of *F. gemina*, worldwide. The importance of considering woody plant species when designing Thysanoptera control strategies is highlighted.

Keywords: Grapevine, Incidental hosts, Plant-insect interactions, Thrips, True hosts.

Resumen: La vegetación espontánea presente en campos cultivados puede proveer recursos para insectos plagas. Los objetivos de este trabajo fueron compilar información bibliográfica sobre plantas que hospedan a *Frankliniella gemina* Bagnall (Thysanoptera) en Argentina e identificar especies que actúan como hospederas verdaderas e incidentales en viñedos de Colonia Caroya (Córdoba, Argentina). Se recopiló información bibliográfica registrando las plantas hospederas de *F. gemina* en Argentina y se determinaron plantas hospederas verdaderas e incidentales en vegetación asociada a viñedos de Colonia Caroya. Se realizó una búsqueda de artículos científicos utilizando las palabras claves “*Frankliniella gemina*” y sus sinónimos *F. rodeos* y *F. allochroos* en combinación con “hospedadores alternativos” y “malezas”, en español e inglés, publicados entre 1980 y 2024. Se recolectaron flores en tres viñedos y su entorno, desde agosto hasta diciembre durante 2 años. En

Argentina, se registraron 122 especies de plantas hospedadoras de *F. gemina*, mientras que en Colonia Caroya se determinaron 26 especies: 6 verdaderas, 17 incidentales y 3 fortuitas. Se citan por primera vez a *Nothoscordum gracile* (Aiton) Stearn (Amaryllidaceae) y *Melia azedarach* L. (Meliaceae) como plantas hospedadoras verdaderas de *F. gemina*, a nivel mundial. Se destaca la importancia de considerar especies vegetales leñosas al diseñar estrategias de control de Thysanoptera.

Palabras clave: Interacciones planta-insecto, Plantas hospedadoras incidentales, Plantas hospedadoras verdaderas, Trips, Vid.

INTRODUCTION

Spontaneous vegetation is present within and outside crop fields and provides food, shelter, breeding, and overwintering sites for phytophagous insect species. Particularly for phytophagous thrips (Thysanoptera), the concept of host plant is very important since they can be associated with plant species that provide shelter and food for adults (incidental hosts) and those that are used for oviposition and larval rearing (true-breeding or reproductive hosts). The frequency of association between the insect and the true host is usually high (Mound & Marullo, 1996). Knowledge of the density of thrips in true host flowers in uncultivated margins could predict thrip density within vineyards and thus help to control their population growth (Canovas et al., 2023).

Among the insects cited in grapevine crops in Argentina are thrips (Viglianco, 2020; Viglianco et al, 2021; Dagatti et al., 2024). The presence of spontaneous vegetation or other species planted during the flowering period of the crop can be an important source of migration into vineyards (Hidalgo Fernández & Hidalgo Togares, 2011).

Viglianco et al. (2021) found that the most common thrips species in the vineyards of Colonia Caroya (Department Colón, province of Córdoba) is *Frankliniella gemina* Bagnall. The adults and larvae of this species cause scars or russet on the upper portion or the entire surface of grape berries affecting quality parameters such as average weight and seed weight (Viglianco, 2020). This is a Neotropical endemic species broadly distributed from Mexico to Argentina (Cavalleri & Mound, 2012), considered as a polyphagous pest due to the wide variety of host plants attacked (Zamar, 2011). *Frankliniella gemina* reproduces in spontaneous plant species in spring and subsequently colonises grapevines at the time of flowering (Botton et al., 2007).

In Argentina, Córdoba is the eighth largest wine-producing province, with over 50 % of vineyards near Colonia Caroya (Colón Department) (INV (Instituto Nacional de Vitivinicultura), 2023).

Plant species growing spontaneously in Argentine vineyards have been studied (Méndez, 2014; Rovai et al., 2017) but which of them are potential hosts of *F. gemina* is not yet known, despite its importance for planning thrips management strategies. The objectives of this study were to compile bibliographic information on the host plants of *F. gemina* in Argentina and to identify the species that serve as true and accidental hosts of *F. gemina* in the area around vineyards in Colonia Caroya, Córdoba, Argentina.

MATERIALS AND METHODS

Literature Review

In order to know the recorded plant hosts of *F. gemina* in Argentina, we searched for scientific articles published in the period 1980-2024, using the main bibliographic databases available on the Internet: Scopus, SciELO, ScienceResearch, ResearchGate, and Google Scholar. The keywords "*Frankliniella gemina*", their two synonymized species *F. rodeos* and *F. allochroos* (Cavalleri & Mound, 2012), in combination with "alternative hosts" and "weeds" were used as descriptors in both Spanish and English. The information was entered into a digital table in order to consider the following aspects: taxonomic family, the growth form of the host plant (herb, shrub, or tree), and its status in the study region as a cultivated or non-cultivated species.

Collection of plant hosts for *F. gemina* in vineyards of Colonia Caroya (Córdoba, Argentina)

In the initial phase (from August to December 2012), we conducted biweekly sampling of companion plant species in three commercial vineyards in Colonia Caroya, situated 50 km north of the city of Córdoba at 31°02'00" S and 64°05'00" W, at an altitude of 509 m a.s.l. The varieties were Malbec, Merlot, Chardonnay, Pinot Noir and Isabella. All fields were conventionally managed, i.e. using synthetic fungicides and herbicides.

In each vineyard, we selected three sampling plots, each measuring 1 m², between the rows of vines and three plots at least five meters away from the outermost row of vines. During each site visit and sampling date, the plant species present in the sampling area were collected and identified. In a second step, considering that *F. gemina* is an anthophilous species (Monteiro, 2002), simple flowers or inflorescences, depending on the plant species (from now on referred to as floral units "FU"), were collected in the three vineyards and their surroundings from the end of winter to the beginning of summer in 2013 and 2015. Plant species with an average frequency of occurrence equal to or greater than 20 % (data obtained in 2012) were sampled for floral resource analysis. Furthermore, the FU of *Prunus persicae* (L.) Stokes (peach) (Rosaceae), *Medicago sativa* L. (alfalfa) (Fabaceae) and *Melia azedarach* L. (chinaberry) (Meliaceae) were collected, as these are commonly occurring plant species in the area, typically found a few meters from the vineyards. Each sample consisted of 10-20 FU of each species, randomly selected from 1-4 plants. The total number of FUs collected depended on the availability of the plant species.

Sample processing and plant host determination

Samples were transported to the laboratory in polyethene bags for the specific identification of plants using keys (Marzocca, 1993; Carreras et al., 2005). Insects were removed from the FU and placed in AGA solution (60 % ethyl alcohol, glycerin and acetic acid in a ratio of 10:1:1) for preservation. On each date and sample, we recorded the presence of individuals (adult or larvae) of *F. gemina* on each plant species. We identified *F. gemina* specimens (larvae and adults) from temporary microscopic preparations using taxonomic keys (De Borbón, 2007, 2013; Mound, 2010; Cavalleri & Mound, 2012). In host plants where gravid females of *F. gemina* were found, the number of eggs in the ovarioles was counted. Adult specimens were deposited at the Entomological Collection of Córdoba (ENTOCOR).

RESULTS

We reported 122 host plant species for *F. gemina* by 17 publications from nine out of 23 provinces in Argentina (Table I). Plant species belong to 41 families, with Asteraceae and Fabaceae being the most frequently reported hosts. In the study region, we observed *F. gemina* on 26 plant species, primarily belonging to the same two plant families, representing 71 % of the evaluated plant species.



Table I.

List of plant species associated with *Frankliniellagemina* in Argentina, as reported in the literature.

Notes: ^a= status of cultivated for commercial purposes (C) or non-cultivated for commercial purposes plants (NC); ^b= presence of adults of *F. gemina* were marked with X; ^c= presence of larvae of *F. gemina* were marked with X; ^d= presence of *F. gemina* without indication of developmental stage (ND) were marked with X; ^e= Plant species commonly found in the study region.

Sixty-five per cent of the plant species associated with *F. gemina* in Argentina were herbs, with a nearly equal proportion of cultivated and non-cultivated species. The number of shrubs reported as hosts was twice that of trees. In the study region, the prevalence of non-cultivated herbaceous plants was even more pronounced, accounting for 85 % of the total.

In Argentina, only 22 % of all species associated with *F. gemina* are true hosts, as both larval and adult stages were found on them (Table I). Flower samples of 32 plant species with an average frequency of occurrence equal to or greater than 20 % (data 2012) showed that a total of 6 plant species harbored both stages within the regional dataset: *Conium maculatum* L. (Apiaceae), *Medicago sativa* (Fabaceae), *Melilotus albus* Medik. (Fabaceae), *Raphanus sativus* L.

(Brassicaceae), *Nothoscordum gracile* (Aiton) Stearn (Amaryllidaceae), and *Melia azedarach* L. (Meliaceae) (Table II)



Table II.

Plant families and species recorded in vineyards, associated with *Frankliniella gemina* in Colonia Caroya (Córdoba, Argentina) in the period 2013-2015

Notes: a= status of cultivated for commercial purposes (C) or non-cultivated for commercial purposes plants (NC); b= number of floral units (FU) observed for each species, plant species with low abundance and not selected for inspection of floral units are indicated with NS; c= presence (+) or absence (-) of adults (A) or larvae (L) of *F. gemina*, those plant species where *F. gemina* was observed only in a single sample were marked with an asterisk (*); d= new plant host records in the country; e= new records of true hosts in the country

Regarding the temporal distribution of *F. gemina*, adult and larval specimens were identified throughout the sampling period (August-December of both years) in a range of species of the surrounding vegetation. Some host plants were consistently associated with *F. gemina*, whenever they were present. These included *M. alba* (N= 10), *N. gracile* (N= 10), *R. sativus* (N= 10), *C. maculatum* (N= 6), *M. azedarach* (N= 6) and *M. sativa* (N= 6) (Table II). In October, a period before or coinciding with the beginning of grape flowering, 17 flowering plant species surrounding the vineyard were evaluated. We observed a maximum number of six true hosts in the vineyards. The highest number of flowering plant hosts of *F. gemina* was recorded in November (68 % of the total), coinciding with the grape flowering. In all samples (N= 6) of *M. azedarach* flowers, seven gravid females containing two to seven eggs were observed, while in the other hosts, females carried one to three eggs.

Some plant species, including *C. maculatum*, *N. gracile*, *R. sativus* and *M. sativa*, may be considered potential reservoirs of *F. gemina*, as they offered flowers over a greater temporal window and host both stages of the insect from the beginning of their flowering stage (Table III).



Table III.

List of plant species offering flowering resources for *F. gemina*, indicating the presence of open flowers in incidental (black cells) and true hosts (red cells) in the sampling period and the occurrence of adults (A) and larvae (L) in Colonia Caroya vineyards.

Notes: ^a= two to four eggs in ovarioles of females of *F. gemina* in flowers of the host plants; ^b= two to seven eggs in ovarioles of females of *F. gemina* in flowers of the host plants

DISCUSSION

Literature records from Argentina indicate that *F. gemina* is associated with 122 species in 41 plant families (Table I). Our study adds 11 new records of both, true and incidental hosts, representing 9 % of the total host species recorded in the country. Our data support

the conclusion that this species is extremely polyphagous, as *Frankiniella occidentalis* (Pergande), another relevant pest species in the genus (Pizzol et al., 2017). Asteraceae and Fabaceae were the dominant host families in both datasets studied here. Both families have been previously identified as the most commonly used hosts by several Thysanoptera species (Zamar, 2011; Carrizo & Amela García, 2017; Pizzol et al., 2017).

In considering the family Asteraceae, which includes the largest number of host species, it is evident that their capitulum inflorescences offer the benefits of a sequential and continuous availability of pollen and nectar, given the centripetal development of their floral units (Varatharajan et al., 2016). The higher representation of Brassicaceae observed in Colonia Caroya (sharing with Fabaceae the second place, with 14 % of the total) is rather similar to that observed in the horticultural belt of La Plata, where the families with the highest richness were Asteraceae (48 %), Fabaceae (19 %), and Brassicaceae (14 %) (Carrizo & Amela García, 2017). It could be attributed to the type of habitat in which we obtained the records. The study in La Plata and ours, from Colonia Caroya, were carried out in productive environments, while data in the rest of the publications were obtained in other habitats, such as urban and natural. Furthermore, *F. gemina* appears to attack a proportional number of species from each taxonomic family, as the most attacked families are also the most species-rich in the regional flora (Zuloaga et al., 2019).

In the study region, as well as in the horticultural fields of La Plata (Buenos Aires), *F. gemina* was associated with a lower number of host plants (26 and 21, respectively) (Carrizo & Amela García, 2017), compared to Jujuy, where more than 80 host plants were listed (Zamar, 2011). Two reasons may explain these differences: a higher sampling intensity in Jujuy (Zamar & Arce de Hamity, 1999; Muruaga de L'Argentier et al., 2005; Zamar, 2011; Tapia et al., 2014; Rodríguez, 2016), and climatic differences that probably favour *F. gemina* in the lower latitudes of northern Argentina. We identified only six plant species in which *F. gemina* larvae can feed (*Melilotus alba*, *Medicago sativa*, *Conium maculatum*, *Raphanus sativus*, *Melia azedarach* and *Nothoscordum gracile*). The first four species have been previously reported as primary hosts (De Borbón et al., 1999; Zamar & Arce de Hamity, 1999; Carrizo, 2002; De Borbón, 2005, 2007, 2013; Rodríguez, 2016; Carrizo & Amela García, 2017), while *M. azedarach* and *N. gracile* are new records. It is known that despite the adults of a certain species of Thysanoptera can be found on a large number of plants, their larvae will exploit relatively few plants (Kirk, 1985; Carrizo, 2002). This is consistent with the findings for *F. gemina* both regionally and in the study area, where only 23 % of the total plants associated with this thrips species can be considered as primary hosts. The important role of these primary host plants is

confirmed by the fact that we found *F. gemina* in 100 % of the samples collected from these plants. This constancy of association is required to determine a plant species as a true host in Thysanoptera (Mound & Marullo, 1996). We found adult thrips on 17 other plant species, but these can be considered secondary or incidental hosts. Specimens of *F. gemina* were observed in only one flower sample of three of these species [*Leonorus sibiricus* L. (Lamiaceae), *Passiflora caerulea* L. (Passifloraceae) and *Bromus catharticus* Vahl (Poaceae)], suggesting they are likely to be fortuitous hosts.

We found a significant regression between the mean frequency of plant species occurrence and the frequency of plant *F. gemina* association. It suggests that this species behaves as an opportunistic generalist, with no clear host preferences. In general, the presence of polyphagous thrips species is closely related to the availability of plants used as food sources (Pizzol et al., 2017). The ability of *F. gemina* to feed on different species present in the area would explain its presence throughout the five months analysed (August-December). It agrees with the observed in other horticultural crops, where thrips occur throughout the year in spontaneous vegetation (Carrizo & Amela García, 2017).

Between August and October, thrips visited 20-69 % of the flowering plant species near the vineyards. In October, a period preceding or coinciding with the flowering of the vines, the presence of *F. gemina* on nine plant species (six of which were true hosts) indicated that the surrounding vegetation represented a reservoir of populations that would later infest the crop. It was consistent with observations of *Thrips tabaci* (Linderman), *Thrips obscuratus* (Crawford) and *F. gemina* in vineyards in Italy, New Zealand and Brazil (Rigamonti, 2000; Schmidt et al., 2006; Botton et al., 2007).

Almost 90 % of flowering plants were visited by *F. gemina* in November and just over 70 % in December. It suggests that individuals may move to these spring-summer flowering plant species when the number of vine flowers decreases. This is consistent with Carrizo & Amela García (2017), who mentioned a strong increase in *F. gemina* on flowering plants in November and December.

Two primary hosts of *F. gemina* are recorded here for the first time and deserve special attention. The first is *Nothoscordum gracile*, an American herbaceous species with a wide distribution, naturalized in temperate regions of other continents (Hurrell, 2009) and frequently found in central Argentina (Flora Argentina, 2018). The only record of this plant species as a primary host of thrips was for *Frankliniella platensis* De Santis in Mendoza (De Borbón, 2018). Secondly, a new association with *Melia azedarach*, a tree species native to Asia (Hanan Alipi & Mondragón Pichardo, 2009), was recorded. Most importantly, it was demonstrated that this plant species is a true host for *F. gemina*. This finding is significant due to the wide distribution of *M. azedarach* in Argentina, especially in agricultural fields where it

is invasive (Ghersa et al., 2002). In its flowers, *F. gemina* females had a higher number of eggs than in other plant species, suggesting that this primary host provides good quality for thrips development. In this regard it is important to note that the nutritional value of a host plant for a Thysanoptera species is demonstrated by insect fecundity (Terry, 1997). Anthophilous species obtain the proteins necessary for reproduction mainly from pollen and improve some physiological functions (Lu et al., 2013). The medium size of *M. azedarach* pollen grains and their high nutritional quality (Marí Herguido, 2017) would allow *F. gemina* to fully exploit them, indicating that this plant species is an important reproductive host. Up to the present, associations between *M. azedarach* and thrips have not been reported in Argentina. However, in other countries, *Thrips hawaiiensis* Morgan (Singh & Varatharajan, 2014), *Thrips coloratus* Schmutz, *Scirtothrips dorsalis* Hodder (Zheng et al., 2005) and *Lefroythrips pictus* (Hood) (Mound & Ng, 2021) were reported on its flowers. It is important to emphasise the significance of considering woody plant species as potential hosts for thrips. These species are frequently disregarded in plant-thrips interaction studies and are not commonly targeted for sampling, despite their ecological relevance.

The richness of spontaneously flowering vegetation directly correlates with the number of insects attacking the crop (Schmidt et al., 2006; Botton et al., 2007; Silva et al., 2018). *Frankliniella gemina* can transmit tospoviruses to plants (De Borbon et al., 2006), although its role as vector of viral diseases to vineyards has not been demonstrated. However, the information about their true hosts is particularly relevant since transmission of thrip-transmitted viruses is usually only possible when the virus is acquired during the larval stages (Rotenberg et al., 2015). Therefore, understanding the identity of true hosts for *F. gemina* in Colonia Caroya is relevant for designing strategies within an Integrated Pest Management programme. Moreover, in order to reduce the population density of *F. gemina* in vineyards and therefore its damages, it is particularly recommended to avoid the presence of those true hosts that offer flowers in the months prior to the flowering of the vines, time of greatest vulnerability of the vines to be damaged by the thrips. Our results indicate that in vineyards of Colonia Caroya these species are *N. gracile*, *C. maculatum* and *R. sativus*. In relation to the woody *M. azedarach*, although its floration coincides with that of the vineyards, the high fecundity that the insect reaches in its flowers should be reason enough to consider its occurrence in vineyards.

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REFERENCES

- Agostini, E., Tapia, S., Zamar, M., & Aguirre, C. (2005). Diversidad de especies de trips y relación de sus poblaciones en cultivos de palto con diferentes tratamientos químicos, en Jujuy (Argentina). INTA. Estación Experimental de Cultivos Tropicales Yuto. Pages 7. <http://www.inta.gov.ar/yuto/info/documentos/entomologia/trips>
- Alejo, G., & Zamar, M. I. (2021). Alfa and beta diversity of thrips (Thysanoptera) and biological control agents in chrysanthemum flowers (*Chrysanthemum* sp.) of two ecoregions in Jujuy province, Argentina. *Revista De La Sociedad Entomológica Argentina*, **80**(4), 1-13. <https://doi.org/10.25085/rsea.800401>
- Alejo, G., Zamar, M. I., & Contreras, E. F. (2019). Diversity and functional groups of arthropods in greenhouse crop of *Chrysanthemum morifolium* Ramat. (Asterales: Asteraceae) from Jujuy, Argentina. *Revista De La Sociedad Entomológica Argentina*, **78**(1), 22-35. <https://doi.org/10.25085/rsea.780103>
- Botton, M., Nondillo, A., Zart, M., Pinent, S., & Genta, W. (2007). Avaliação de inseticidas para o controle de *Frankliniella rodeos* (Moulton, 1933) (Thysanoptera: Thripidae) em uva de mesa no Brasil. *Boletín de Sanidad Vegetal Plagas*, **33**, 575-580.
- Canovas, M., Guay, J., Fournier, V., & Cloutier, C. (2023). Pest thrips do not set field margins aside: preferred wildflowers sustain pest *Frankliniella* spp. (Thysanoptera: Thripidae) and their migration in commercial strawberry. *Arthropod-Plant Interactions*, **17**, 327-340. <https://doi.org/10.1007/s11829-023-09955-y>
- Carreras, M. E., Lovey, R. J., Ruíz, G., Hernández, R., Astegiano, M., Fuentes, E., & Pons, S. M. (2005). *Manual para la identificación de plantas de interés agronómico de Córdoba y sus alrededores: claves*. Brujas.
- Carrizo, P. I. (2002). Establishing a weed host ranking for thrips vectors of tospovirus in La Plata horticultural belt of Buenos Aires, Argentina. In R. Marullo & L. Mound (Eds.), *Thrips and Tospoviruses: Proceedings of the 7th International Symposium on Thysanoptera* (pp. 239-248). Australian National Insect Collection.
- Carrizo, P. I., & Amela García, M. T. (2017). Vegetación espontánea en el cinturón hortícola platense hospedante de Thripidae (Thysanoptera)

- vectores de Tospovirus. *Revista de Investigaciones Agropecuarias*, **43**, 78-91.
- Carrizo, B. N., & Zamar, M. I. (2016). Tisanópteros (Insecta) presentes en flores de la vegetación espontánea frecuente en plantaciones de limón en Famaillá (Tucumán, Argentina). *Revista Agronómica del Noroeste Argentino*, **36**(2), 55-60.
- Carrizo, P. I., Gastelú, C., Longoni, P., & Klasman, R. (2008). Especies de trips (Insecta: Thysanoptera: Thripidae) en las flores de ornamentales. *IDESIA*, **26**(1), 83-86.
- Cavalleri, A., & Mound, L. A. (2012). Toward the identification of *Frankliniella* species in Brazil (Thysanoptera, Thripidae). *Zootaxa*, **3270**(1), 1-30. <https://doi.org/10.11646/zootaxa.3270.1.1>
- Dagatti, C. V., Campón, F. F., González, M. F., Mazzitelli, M. E., Marcucci, B., Solís, S. E., Bonfanti, S., & Uliarte, E. M. (2024). Diversidad de insectos, colémbolos y arañas en viñedos bajo diferentes sistemas de producción, convencional y agroecológico, en Mendoza, Argentina. *Ecología Austral*, **34**, 141-158. <https://doi.org/10.25260/EA.24.34.1.0.2272>
- De Borbón, C. M. (2005). *Los trips del suborden Terebrantia de la provincia de Mendoza*. Ediciones INTA.
- De Borbón, C. M. (2007). Clave para la identificación del segundo estadio larval de algunos trips comunes (Thysanoptera: Thripidae). *Revista de la Facultad de Ciencias Agrarias*, **39**, 69-81.
- De Borbón, C. M. (2013). Especies del género *Frankliniella* (Thysanoptera: Thripidae) registradas en la Argentina, una actualización. *Revista de la Facultad de Ciencias Agrarias*, **45**, 1-22.
- De Borbón, C. M. (2018). *Frankliniella platensis* De Santis (Thysanoptera: Thripidae) sobre *Tulbaghia* sp. y *Allium sativum* en Mendoza, Argentina. *Libro de Resúmenes X Congreso Argentino de Entomología* (p. 232).
- De Borbón, C. M., & Battaglia, M. J. (2022). Is *Taeniothrips inconsequens* (Thysanoptera: Thripidae) a pest of stone and pip fruit trees in Argentina? *Revista de la Facultad de Ciencias Agrarias*, **54**(1), 109-116. <https://doi.org/10.48162/rev.39.070>
- 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**, 59-66.
- De Borbón, C. M., Gracia, O., & Piccolo, R. (2006). Relationships between tospovirus incidence and thrips populations on tomato in Mendoza,

- Argentina. *Journal of Phytopathology*, **154**(2), 93-99. <https://doi.org/10.1111/j.1439-0434.2006.01066.x>
- De Breuil, S., Giudici, A., La Rossa, F. R., Baldessari, J., Bejerman, N., Giolitti, F., & Lenardon, S. L. (2021). Exploring species composition and population dynamics of thrips (Thysanoptera: Thripidae) in peanut crops in Argentina. *Phytoparasitica*, **49**(5), 785-792. <https://doi.org/10.1007/s12600-021-00913-z>
- Dottori, C. A., Zamar, M. I., & de Breuil, S. (2024). Análisis de la composición de trips (Insecta: Thysanoptera) en vegetación espontánea y cultivada asociadas a maní en Argentina. *Acta zoológica lilloana* **68**(2), 525-536. <https://doi.org/10.30550/j.azl/1967>
- Flora Argentina (2018). *Nothoscordum gracile*. Instituto de Botánica Darwinion. ConoSur <http://conosur.floraargentina.edu.ar/species/details/11015>
- Ghersa, C. M., de la Fuente, E., Suarez, S., & Leon, R. J. (2002). Woody species invasion in the Rolling Pampa grasslands, Argentina. *Agriculture, Ecosystems & Environment*, **88**, 271-278. [https://doi.org/10.1016/S0167-8809\(01\)00209-2](https://doi.org/10.1016/S0167-8809(01)00209-2)
- Hanan Alipi, A., & Mondragón Pichardo, J. (2009). *Melia azedarach* L.: *paraíso*. En H. Vibrans, *Malezas de México*. <http://www.conabio.gob.mx/malezasdemexico/meliaceae/melia-azedarach/fichas/ficha.htm>
- Hidalgo Fernández, L., & Hidalgo Togares, J. (2011). *Tratado de Viticultura*. Mundi Prensa.
- Hurrell, J. (2009). *Flora rioplatense: sistemática, ecología y etnobotánica de las plantas vasculares rioplatenses: Parte III. Monocotiledóneas. Vol. 4. Asparagales, Dioscoreales, Liliales*. Literature of Latin America (LOLA).
- Kirk, W. D. J. (1985). Aggregation and mating of thrips in flowers of *Calystegia sepium*. *Ecological Entomology*, **10**(4), 433-440. <https://doi.org/10.1111/j.1365-2311.1985.tb00741.x>
- Lu, Z., Zhu, P., Gurr, G. M., Zheng, X., Read, D., Heong, K. L., Yang, Y., & Xu, H. (2013). Mechanisms for flowering plants to benefit arthropod natural enemies of insect pests: Prospects for enhanced use in agriculture. *Insect Science*, **21**(1), 1-12.
- Marí Herguido, J. M. (2017). *Caracterización polínica de mieles procedentes de la apicultura urbana en los Jardines del Real de la ciudad de Valencia* [Tesis doctoral, Universidad Politécnica de Valencia]. <http://hdl.handle.net/10251/89557>
- Marzocca, A. (1993). *Manual de malezas*. Hemisferio Sur.

- Méndez, E. (2014). Cambios estacionales de las comunidades vegetales de malezas en viñedos de Mendoza. *Boletín de Estudios Geográficos*, **103**, 9-18.
- Monteiro, R. C. (2002). The Thysanoptera fauna of Brazil. In R. Marullo & L. Mound (Eds.), *Thrips and Tospoviruses: Proceedings of the 7th International Symposium on Thysanoptera* (pp. 325-340). Australian National Insect Collection.
- Mound, L. A. (2010). *Thysanoptera (Thrips) of the World – a checklist*. <https://www.ento.csiro.au/thysanoptera/worldthrips.php>
- Mound, L. A., & Marullo, R. (1996). *The Thrips of Central and South America: an introduction (Insecta: Thysanoptera)*. *Memoirs on Entomology International*.
- Mound, L. A., & Ng, Y. F. (2021). Studies on the genus *Lefroyothrips*, with new records from Malaysia, New Caledonia and a new species from Australia (Thysanoptera, Thripidae). *Zootaxa*, **4927**(4), 567-575. <https://doi.org/10.11646/zootaxa.4927.4.7>
- Muruaga de L'Argentier, S., Zamar, M. I., & Gallardo, C. B. (2005). Los Tisanópteros del palto (*Persea americana* Miller) presentes en la provincia de Jujuy (Argentina). *Acta Zoológica Lilloana*, **49**(1-2), 119-122.
- Pizzol, J., Reynaud, P., Bresch, C., Rabasse, J. M., Biondi, A., Desneux, N., Parolin, P., & Poncet, C. (2017). Diversity of Thysanoptera species and associated host plants in Southern France. *Journal of Mediterranean Ecology*, **15**, 13-27.
- Rigamonti, I. (2000). Tisanotteri in un agroecosistema vigneto in Piemonte. *Bollettino di Zoologia Agraria e di Bachicoltura*, **32**(1), 1-23.
- Rodriguez, S. O. (2016). *Diversidad, fluctuaciones y abundancia de las poblaciones de tisanópteros en dos establecimientos tabacaleros de la provincia de Jujuy, Argentina* [Tesis de grado, Universidad Nacional de La Plata].
- Rotenberg, D., Jacobson, A. L., Schneweis, D. J., & Whitfield, A. E. (2015). Thrips transmission of tospoviruses. *Current Opinion in Virology*, **15**, 80-89. <https://doi.org/10.1016/j.coviro.2015.08.003>
- Rovai, L., Viglianco, A. I., Soratti, R., & Cragolini, C. I. (2017). Malezas presentes en viñedos de Colonia Caroya, Córdoba. *VII Jornadas Integradas de Investigación, Extensión y Enseñanza de la Facultad de Ciencias Agropecuarias*.
- Schmidt, K., Teulon, D., & Jaspers, M. V. (2006). Phenology of the New Zealand flower thrips (*Thrips obscuratus*) in two vineyards. *New Zealand Plant Protection*, **59**, 323-329. <http://dx.doi.org/10.30843/nzpp.2006.59.4589>

- Silva, R., Hereward, J., Walter, G. H., Wilson, L., & Furlong, M. J. (2018). Seasonal abundance of cotton thrips (Thysanoptera: Thripidae) across crop and non-crop vegetation in an Australian cotton producing region. *Agriculture, Ecosystems & Environment*, **256**, 226-238. <https://doi.org/10.1016/j.agee.2017.12.024>
- Singh, K., & Varatharajan, R. (2014). Thysanoptera (Insecta) fauna of the Keibul Lamjao National Park, Manipur, northeast India. *Journal of the Bombay Natural History Society*, **111**(1), 19-25. <https://doi.org/10.17087/bnhs/2014/v111i1/56522>
- Tapia, S., Zamar, M. I., Ventura, L., Ochoa, S., & Ortiz, D. (2014). Tisanópteros asociados a plantaciones citrícolas de Jujuy y Salta. *Revista Agronómica del Noroeste Argentino*, **34**, 251-253.
- Terry, L. I. (1997). Host selection, communication and reproductive behaviour. In T. Lewis (Ed.), *Thrips as crop pests* (pp. 65-118). CAB International.
- Varatharajan, R., Maisnam, S., Shimray, C. V., & Rachana, R. R. (2016). Pollination potential of thrips (Insecta: Thysanoptera)–an overview. *Zoo's Print*, **31**(8), 6-12.
- Viglianco, A. I. (2020). *Thysanoptera asociados a la vid (Vitis vinifera L. y Vitis labrusca L.) en la región centro de Argentina: aspectos relacionados con el manejo integrado de especies plaga* [Tesis doctoral, Universidad Nacional de Córdoba].
- Viglianco, A. I., De Borbón, C., Cragolini, C., Brancamonte, E., Novo, R., & Tosutti, L. (2005). Identificación de trips en cultivos de vid en Colonia Caroya, Córdoba. XXVIII Congreso Argentino de Horticultura, p136. Río Negro.
- Viglianco, A., Cragolini, C., Salvo, A., & Ávalos, D. S. (2021). Especies de Thysanoptera asociadas a viñedos en la zona centro norte de la provincia de Córdoba (Argentina). *Agriscientia*, **38**(2), 135-141. <https://doi.org/10.31047/1668.298x.v38.n2.32486>
- Zamar, M. I. (2011). La diversidad de thrips del Cono Sur. El caso de las zonas áridas en Jujuy, Argentina. *Métodos en Ecología y Sistemática*, **6**(2), 71-88.
- Zamar, M. I., & Arce de Hamity, M. G. (1999). Interacción tisanóptero - planta en el modelo de manejo agroecológico. *IDESIA*, **17**, 101-110.
- Zamar, M. I., & De Román, L. E. N. (2012). Asociación Thysanoptera (Insecta)- *Vicia faba* (Fabaceae) en la Prepuna y Puna de Jujuy, Argentina. *Revista De Biología Tropical*, **60**(1), 119-128. <https://doi.org/10.15517/rbt.v60i1.2639>
- Zheng, H., Wu, Y., Ding, J., Binion, D., Fu, W., & Reardon, R. (2005). *Invasive plants established in the United States that are found in Asia*

and their associated natural enemies. USDA Forest Service. <https://www.invasive.org/weeds/asianv2.pdf>

Zuloaga, F. O., Belgrano, M. J., & Zanotti, C. A. (2019). Actualización del catálogo de las plantas vasculares del cono sur. *Darwiniana*, 7(2), 208-278. <https://doi.org/10.14522/darwiniana.2019.72.861>

INV (Instituto Nacional de Vitivinicultura) (2023). *Informe anual de superficie 2023*. https://www.argentina.gob.ar/sites/default/files/2018/10/informe_anual_de_superficie_2023.pdf

Notas de autor

aviglian@agro.unc.edu.ar

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