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Inventory of some families of Hemiptera, Coleoptera (Curculionidae) and Hymenoptera associated with horticultural production of the Alto Valle de Río Negro and Neuquén provinces (Argentina)

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Inventory of some families of Hemiptera, Coleoptera (Curculionidae) and Hymenoptera associated with horticultural production of the Alto Valle de Río Negro and Neuquén provinces (Argentina)

Inventario de Hemiptera, Coleoptera (Curculionidae) e Hymenoptera asociados a la producción hortícola del Alto Valle de Río Negro y Neuquén (Argentina)

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Abstract: The knowledge of the entomological fauna in productive systems is important for the agroecological management since beneficial insects are a key resource for pest management in horticultural systems. Scientific information on the biodiversity present in a given area is essential as well as the ecological function and/or feeding habits of the insects. In Alto Valle de Río Negro and Neuquén, horticultural production systems can be described as highly dependent on chemical inputs for pest management and

fertilization. The aim of this study is to carry out an inventory of the biodiversity of some families of Hemiptera, Coleoptera (Curculionidae) and Hymenoptera present in peri-urban and rural farms located in Neuquén and Río Negro, respectively. Insects were collected through pitfall and sweeping net on tomato and pepper crops and the surrounding non-cultivated areas. *Idiosystatus* Berg (Auchenorrhyncha) was cited for the first time from Argentina. Species cited for the first time from Neuquén: Hemiptera: Auchenorrhyncha: *Acanalonia chloris* (Berg), *Syncharina punctatissima* (Signoret), *Amplicephalus dubius* Linnavuori, *Exitianus obscurinervis* (Stål), *Agalliana ensigera* Oman and *Bergallia signata* (Stål); Hemiptera: Heteroptera: *Harmostes* (*Harmostes*) *prolixus* Stål and *Atrachelus* (*Atrachelus*) *cinereus* (Fabricius); Coleoptera: Curculionidae: *Hypurus bertrandi* (Perris), *Naupactus leucoma* Boheman, *Otiorynchus rugosostriatus* (Goeze) and *Sitona discoideus* Gyllenhal and Hymenoptera: *Xylocopa* (*Neoxylocopa*) *augusti* Lepeletier and *Pseudagapostemon* (*Neagapostemon*) *singularis* Jörgensen. Species cited for the first time from Río Negro: Hemiptera: Auchenorrhyncha: *Amplicephalus dubius* Linnavuori, *Amplicephalus marginellanus* Linnavuori, *Circulifer tenellus* (Baker) and *Xerophloea viridis* (Fabricius); Hemiptera: Heteroptera: *Tupiocoris cucurbitaceus* (Spinola), *Atrachelus* (*Atrachelus*) *cinereus* (Fabricius), *Dichelops furcatus* (Fabricius) and *Harmostes* (*Harmostes*) *prolixus* Stål; Coleoptera: Curculionidae: *Naupactus xanthographus* (Germar) and Hymenoptera: *Diadasia pereyae* (Holmberg) and *Dialictus autranellus* (Vachal).

Keywords: Beneficial insects, Pests, Surrounding vegetation, Tomato and pepper crops.

Resumen: El conocimiento de la fauna entomológica presente en los sistemas productivos es importante para el manejo agroecológico ya que los insectos beneficiosos son un recurso clave para el manejo de plagas en los sistemas hortícolas. Es esencial contar con información científica sobre la biodiversidad presente en un área determinada y la función ecológica y/o los hábitos alimenticios de los insectos. En el Alto Valle de Río Negro y Neuquén, los sistemas de producción hortícola pueden describirse como altamente dependientes de los insumos químicos para el manejo de plagas y fertilización. El objetivo de este estudio es realizar un inventario de la biodiversidad de algunas familias de Hemiptera, Coleoptera (Curculionidae) e Hymenoptera presentes en las chacras periurbanas y rurales ubicadas en Neuquén y Río Negro, respectivamente. Los insectos fueron recolectados a través de trampas de caída y red entomológica en cultivos de tomate y pimiento, y áreas circundantes no cultivadas. *Idiosystatus* Berg (Auchenorrhyncha) fue citado por primera vez en Argentina. Especies citadas por primera vez en Neuquén: Hemiptera: Auchenorrhyncha: *Acanalonia chloris* (Berg), *Syncharina punctatissima* (Signoret), *Amplicephalus dubius* Linnavuori, *Exitianus obscurinervis* (Stål), *Agalliana ensigera* Oman y *Bergallia signata* (Stål); Hemiptera: Heteroptera: *Harmostes* (*Harmostes*) *prolixus* Stål y *Atrachelus* (*Atrachelus*) *cinereus* (Fabricius); Coleoptera: (Curculionidae): *Hypurus bertrandi* (Perris), *Naupactus leucoma* Boheman, *Otiorynchus rugosostriatus* (Goeze) y *Sitona discoideus* Gyllenhal e Hymenoptera: *Xylocopa* (*Neoxylocopa*) *augusti* Lepeletier and *Pseudagapostemon* (*Neagapostemon*) *singularis* Jörgensen. Especies citadas por primera vez en Río Negro: Hemiptera: Auchenorrhyncha: *Amplicephalus dubius* Linnavuori, *Amplicephalus marginellanus* Linnavuori, *Circulifer tenellus* (Baker) y *Xerophloea viridis* (Fabricius); Hemiptera: Heteroptera: *Tupiocoris cucurbitaceus* (Spinola), *Atrachelus* (*Atrachelus*) *cinereus* (Fabricius), *Dichelops furcatus* (Fabricius) y *Harmostes* (*Harmostes*) *prolixus* Stål; Coleoptera: Curculionidae: *Naupactus xanthographus* (Germar) e Hymenoptera: *Diadasia pereyae* (Holmberg) y *Dialictus autranellus* (Vachal).

Palabras clave: Cultivos de tomate y morrón, Insectos benéficos, Plagas, Vegetación circundante.

INTRODUCTION

Insects make up a large part of the overall diversity in agricultural landscapes and encompass a broad range of functional groups (Kremen et al., 1993). They do not only represent agricultural pest species, insects

also serve as biological control agents, provide pollination services, and form an important food resource for many vertebrates in agricultural landscapes (Diekötter et al., 2008).

An increasing number of studies show that the intensification of land uses and homogenization in agricultural landscapes, with the aim of increasing food supply, decreases biodiversity. At the local field scale, increased uses of crop monocultures, greater inputs of fertilizers and pesticides, and decreased within-field heterogeneity may affect species diversity and composition and the provision of ecosystem services to agricultural productivity (Tscharntke et al., 2005).

In the Alto Valle de Río Negro and Neuquén provinces, in the north of the Argentinian Patagonia, the main economic-productive development is linked to fruit production of pears and apples. The second most important activity, in terms of arable land area and impact on the rural economy, is horticultural production (Fernández Lozano, 2012). In this region, both the fruit and vegetable production models can be described as systems highly dependent on chemical inputs for pest management and fertilization (FAO, 2015a, 2015b). Besides, the progress of the real estate market and subsequent urbanization on former production areas is affecting the region's biodiversity due to habitat fragmentation.

These productive activities take place within a dynamic and heterogeneous landscape. Horticulture farms are surrounded by fruit productive orchards, abandoned orchards, patches and corridors of spontaneous vegetation and poplar "shelterbelts" (e.g., Buck et al., 1999). This landscape heterogeneity provides resources such as nectar and pollen from a diversity of flowering plants, a variety of preys or hosts, and overwintering and nesting habitat for pollinators and predatory insects, which may regulate the incidence of pests and promote the presence of beneficial insects in crops.

Agroecological management has been proposed as an alternative to conventional agricultural management due to its alleged ability to rehabilitate degraded ecosystem services (De Leijster et al., 2019).

The knowledge of the entomological fauna present in productive systems is important for the agroecological approach, since beneficial insects are a key resource for pest management in horticultural systems, allowing a decrease in the use of agrochemicals, and providing other services such as pollination. The maintenance and management of agrobiodiversity is one of the most promising strategies in the search for sustainable agroecosystems. There is a growing consensus that a greater agrobiodiversity in its different dimensions (spatial, temporal, and structural) provides essential ecological services in agroecosystems (Stupino et al., 2014). The growing demand for productive systems with less dependence on chemical inputs promotes the search for management strategies to strengthen ecological processes weakened by a decrease in diversity.

In order to design productive systems with an agroecological approach, it is essential to have scientific information on the biodiversity present in a given area and the ecological function and/or feeding habits of the

insects. For example, the order Hymenoptera includes families with a broad heterogeneity of functions: predators (*e.g.*, Vespidae), pollinators (*e.g.*, Apidae), and parasitoids (*e.g.*, Braconidae).

The scientific knowledge of the insect fauna of the Alto Valle de Río Negro and Neuquén is scarce and strongly associated with pome fruit production for export markets, as illustrated by the following contributions: Hymenoptera (Dapoto & Giganti, 1994; Aquino et al., 2013; Garrido et al., 2017), Hemiptera: Sternorrhyncha (Giganti et al., 2004; Vera et al., 2012), Hemiptera: Auchenorrhyncha (Catalano et al., 2009; Paradell & Dellapé, 2015; D'Hervé et al., 2017); Lepidoptera (Garrido et al., 2007; Dapoto et al., 2010); Neuroptera (Gonzalez et al., 2011), Diptera (Santadino et al., 2015) and Coleoptera (Curculionidae) (del Río et al., 2019).

The aim of this study is to carry out an inventory of the biodiversity of some families of Hemiptera, Coleoptera (Curculionidae) and Hymenoptera present in rural and peri-urban horticultural farms, taking into account tomato and pepper crops and the surrounding non-cultivated areas (as spontaneous vegetation, abandoned fruit orchards, and poplar shelterbelts).

MATERIAL AND METHODS

Study area

Alto Valle de Río Negro and Neuquén is situated in the north of the Argentinian Patagonia, along parallel 39° S and meridians 68° to 66° W (Gili et al., 2004). It develops along the lower basin of Limay and Neuquén rivers and the upper basin of Río Negro river, as seen in Figure 1. Natural and semi-natural habitats, urban centers, peripheries and rural areas are alternated along almost 130 km. The Alto Valle is a long strip about 6 to 20 km wide. The arable land with the highest quality is located near the river terraces of Limay, Negro and Neuquén rivers.

The climate is temperate and semiarid, with an average annual temperature between 13.6 °C and 14.5 °C and thermal amplitude between 16.1 °C and 17.7 °C. The rainfall varies between 130 and 170 mm *per* year, depending on the locality, with a slightly progressive increase from west to east.

It is an area of strong winds higher than 4 m/s on average, with predominant direction southwest-west. The typical vegetation is composed of shrubs of the genera *Larrea* ("jarillas") (*L. divaricata* Cav., *L. cuneifolia* Cav. and exceptionally *L. nitida* Cav.) and some *Prosopis* L. such as *P. alpataco* Phil. ("alpataco"), or *Schinus* (*S. johnstonii* F.A. Barkley ("molle"). Permanent and ephemeral grasses grow under these shrubs, although in some areas this vegetation has changed due to the implementation of gravity irrigation system. The usual summer water deficit is mainly supplied by a channel network derived from the Limay, Neuquén and Negro rivers.

In the Alto Valle region, horticultural activities are mostly performed by small and medium farmers. The most important crops are tomatoes, peppers, carrots, pumpkins, lettuce, and other vegetables. The farm activities show strong seasonality depending on the climate (*e.g.*, summer water stress, frost, strong winds, hail) (FAO, 2015a, 2015b).

Localities studied. The coexistence of peri-urban and rural farms is frequent in the Alto Valle, for that reason we selected one peri-urban farm located on the eastern side of Plottier city ($38^{\circ}57'02.5''$ S; $68^{\circ}12'29.5''$ W), Neuquén province and a rural one located in Campo Grande ($38^{\circ}41'11.5''$ S; $68^{\circ}11'25.6''$ W), Río Negro province. The first one is about 6 hectares in size and belongs to a larger pear orchard (25 hectares in size), abandoned 10 years ago. Currently, this orchard is surrounded by real estate projects with different levels of development (Fig. 1a). The rural farm is about 3 hectares, located in a fruit production area of the Alto Valle. About 20 years ago this area was a pome orchard surrounded by other fruit and vegetable farms. The plot for cultivation is adjacent to the abandoned pear orchard (Fig. 1b).

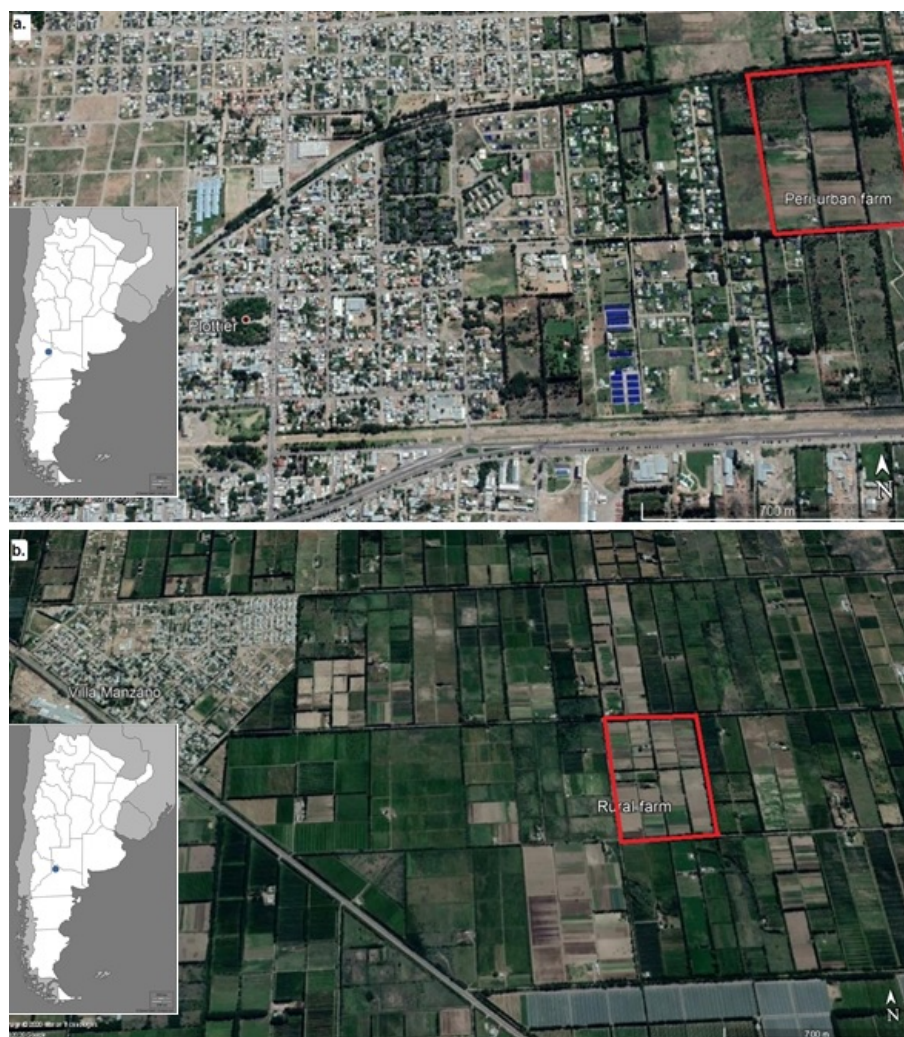


Fig. 1. Location of the horticultural farms studied. a. Peri-urban farm (Plottier, Neuquén). b. Rural farm (Campo Grande, Río Negro).

Sampling methods

Collecting insects

For collecting insects in the horticultural systems (peri-urban and rural), we used different sampling techniques, carried out every 30 days, from January to April 2017 (January 6th, February 3rd, March 3rd and 31th), during the period of tomatoes and pepper harvest. The sampling methods were as follows:

Sweeping net: Sequential sampling by net blows was carried out to capture the insects that inhabit the aerial part of the vegetation, walking through the field and passing the net over the vegetation. The movement with the net was performed with an angle of approximately 90°. Twenty net strokes were made at each sampling site. The captured insects were placed in transparent jars with 70% ethanol.

Pitfall trap: These traps were used to capture epigeous walking insects. They consisted of 220 ml white plastic containers (diameter: 10 cm; depth, 12 cm), buried and placed at ground level, with 100 ml of a solution of 70% ethanol, 20% water and 10% liquid petroleum jelly. The material obtained by each sampling method was separated for subsequent determination by the authors: Hemiptera: Auchenorrhyncha: Fulgoroidea and Membracidae by A.M. Marino de Remes Lenicov; Hemiptera: Auchenorrhyncha: Cicadellidae by S.L. Paradell and B.S. Defea; Heteroptera by P. M. Dellapé and E. Minghetti; Coleoptera: Curculionidae by M.G. del Río and A.A. Lanteri, and Hymenoptera by L.J. Álvarez. The specimens were identified through the use of keys, specialized bibliography and by comparison of primary types and reference specimens from the Museo de La Plata. The material examined was deposited in the entomological collection of the Museo de La Plata, Buenos Aires, Argentina (MLP).

Sampling design

The agricultural landscape was defined as a heterogeneous land area made up of a group of ecosystems, repeated across length and width in similar ways (Forman & Godron, 1986). The landscape represents a mosaic of farms, semi-natural habitats, human infrastructure and, occasionally, natural habitats (Marshall & Moonen, 2002). For this reason, the selected sites included not only tomatoes and pepper crops, but also feral plant communities located on the margins of these crops: abandoned pear orchards, spontaneous vegetation and poplar shelterbelts. Sampling stations were established within each sampling site. The number of stations was based on the site's surface. Each station consisted of the locations where each pitfall trap was placed.

Vegetation sampling

For vegetation sampling we applied quadrat method (Goodall, 1952). At each sampling station a 1 m x 1 m quadrat was randomly placed and all plants within the quadrat were recorded and identified at species level (Kennedy & Addison, 1987), when possible.

RESULTS

Characterization of sites

Peri-urban farm. Tomato and pepper crop. Accompanied by low coverage of herbaceous species (Table I).

Rural farm. Tomato and pepper crop. These crops are accompanied by a low coverage of herbaceous species (Table I).

Abandoned pear orchard. It contains pear, rosehip and wild vine plants within a plantation frame of 6 m x 4 m. Accompanied by an herbaceous stratum where grasses predominate (Table II).

Species	Growth habit	Tomato		Pepper	
		Neuquén	Río Negro	Neuquén	Río Negro
		Plottier	Campo Grande	Plottier	Campo Grande
		Periurban	Rural	Periurban	Rural
<i>Cynodon dactylon</i> (L.) Pers.	Graminoid	X	X	X	X
<i>Panicum capillare</i> L.	Graminoid			X	
<i>Setaria verticillata</i> (L.) P. Beauv.	Graminoid	X	X		
<i>Carduus acanthoides</i> L.*	Forb/Herb			X	
<i>Galinsoga parviflora</i> Cav.*	Forb/Herb			X	
<i>Polygonum aviculare</i> L.	Forb/Herb			X	X
<i>Portulaca oleracea</i> L.	Forb/Herb	X			X
<i>Melilotus albus</i> Medik.*	Subshrub			X	
<i>Plantago lanceolata</i> L.**	Forb/Herb		X	X	X

Table I. Plant species associated to tomato and pepper crop.

* = Species pollen and nectar source. ** = Species pollen source.

Spontaneous vegetation. It shows the greatest complexity in vegetation structure, with herbaceous, shrub and tree layers (Table II).

Poplar shelterbelt. It is characterized by dominant arboreal species and a medium coverage of herbaceous layer (Table II).

Abandoned pear orchard. It is characterized by a herbaceous layer (Table II).

Spontaneous vegetation. It is characterized by a predominant shrub and herbaceous layers (Table II).

Poplar shelterbelt. The arboreal layer of *Populus* L. "Poplar" is accompanied by a herbaceous shrub layer of medium to low coverage (Table II).

Genus/Species	Growth habit	Abandoned pear orchard		Spontaneous vegetation		Poplar shelterbelt	
		Neuquén	Río Negro	Neuquén	Río Negro	Neuquén	Río Negro
		Plottier	Campo Grande	Plottier	Campo Grande	Plottier	Campo Grande
		Periurban	Rural	Periurban	Rural	Periurban	Rural
<i>Bromus catharticus</i> Vahl.	Graminoid	X					
<i>Cynodon dactylon</i> (L.) Pers.	Graminoid	X	X	X	X		X
<i>Distichlis spicata</i> (L.) Greene	Graminoid			X			
<i>Lolium</i> L.	Graminoid		X	X			
<i>Macrochloa tenacissima</i> (L.) Kunth	Graminoid	X		X			
<i>Panicum capillare</i> L.	Graminoid					X	
<i>Setaria verticillata</i> (L.) P. Beauv.	Graminoid						
<i>Sorghum halepense</i> (L.) Pers.	Graminoid	X	X				X
<i>Baccharis salicifolia</i> (Ruiz & Pav.) Pers.*	Shrub						X
<i>Carduus acanthoides</i> L.*	Forb/Herb						
<i>Cichorium intybus</i> L.*	Subshrub		X	X	X	X	
<i>Cirsium vulgare</i> (Savi) Ten.*	Forb/Herb	X					
<i>Galinsoga parviflora</i> Cav.*	Forb/Herb					X	
<i>Sonchus oleraceus</i> L. non Schur*	Forb/Herb	X		X			
<i>Tagetes minima</i> L.*	Subshrub					X	
<i>Taraxacum officinale</i> G.H. Weber ex Wiggers*	Forb/Herb		X				
<i>Tessaria absinthioides</i> D.C.*	Subshrub				X		
<i>Aetoxicon punctatum</i> Ruiz & Pav**	Tree						X
<i>Cardaria draba</i> Desv.*	Forb/Herb				X		
<i>Rapistrum rugosum</i> (L.) All.*	Forb/Herb	X					
<i>Chenopodium quinoa</i> Willd.	Forb/Herb			X			
<i>Kochia scoparia</i> (L.) Schrad.	Subshrub			X	X		
<i>Tamarix</i> L.*	Tree				X		
<i>Polygonum aviculare</i> L.	Forb/Herb					X	
<i>Rumex crispus</i> L. **	Forb/Herb	X	X				
<i>Portulaca oleracea</i> L.	Forb/Herb						
<i>Melilotus albus</i> Medik.*	Subshrub	X	X	X	X	X	X
<i>Robinia pseudoacacia</i> L.*	Tree					X	
<i>Trifolium pratense</i> L.*	Forb/Herb		X				
<i>Trifolium repens</i> L.*	Forb/Herb		X				
<i>Plantago lanceolata</i> L.**	Forb/Herb		X			X	X
<i>Plantago major</i> L.**	Forb/Herb		X				X
<i>Populus</i> L.*	Tree		X	X	X	X	X
<i>Populus alba</i> L.	Tree				X		
<i>Ulmus</i> L.*	Tree			X			
<i>Allantherus altissima</i> (Mill.) Swingle*	Tree			X			
<i>Convolvulus arvensis</i> L.*	Subshrub		X				
<i>Vitis vinifera</i> L.**	Vine						X

Table II. Plant genus/species associated to abandoned pear orchard, spontaneous vegetation and poplar shelterbelt

* = Genus and species pollen and nectar source. ** = Species pollen source.

Inventory of insects

Order Hemiptera

Suborder Auchenorrhyncha

Superfamily Fulgoroidea

Family Delphacidae

Subfamily Asiracinae

Tribe Idiosystanini

Idiosystatus Berg

Geographic distribution. Native to Chile, Argentina: Río Negro and Santa Cruz (Patagonia) (Bourgoin, 2019). Río Negro is a new province record.

Feeding habits. Phytophagous.

Plant associations. *Schoenoplectus californicus* (C.A. Mey.) Soják (Cyperaceae) in the Metropolitan Region of Chile (Campodonico, 2017). The traps were placed under the tomato plants on the ridges, in addition, feral vegetation cover was very low, so we consider that tomato is a new crop association.

Economic importance. Unknown.

Material studied: **Río Negro**. Campo Grande. Tomato (pitfall), 06-I-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Table III).

Subfamily Delphacinae

Tribe Delphacini

Metadelphax propinqua (Fieber)

Geographic distribution. Pantropical. In Argentina it is widely distributed north of 33° S (Remes Lenicov & Tesón, 1989; Remes Lenicov & Paradell, 2012).

Feeding habits. Phytophagous.

Plant associations. Mostly cultivated and wild Poaceae, including "barley", "maize", "oat", "rice", "sorghum", and "sugarcane" (Remes Lenicov & Virla, 1999). New crop associations with tomato and pepper. It also occurs in abandoned pear orchard.

Economic importance. It is a vector of viruses that affects various crops: Cynodon Chlorotic Streak Nucleorhabdovirus (CCSV), Maize Rough Dwarf Virus (MRDV), and Barley Yellow Striate Mosaic Cytorhabdovirus (BYSMV) (Harpaz, 1972). In Argentina it is the vector of the Mal de Río Cuarto Virus (MRCV), affecting "maize" and "wheat" (Remes Lenicov et al., 1985; Velazquez et al., 2017).

Material studied. **Neuquén**. Plottier. Pepper (pitfall), 3-III-2017, (1 male, 1 nymph). **Río Negro**. Campo Grande. Tomato (pitfall), 03-III-2017, (2 males, 4 females, 1 nymph). Pepper (pitfall), 03-II-2017, (1 male, 1 female); 31-III-2017 (2 females). Abandoned pear orchard (sweeping net), 31-III-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Table III and IV).

Delphacodes kuscheli Fennah

Geographic distribution. Native to Chile, Argentina and Uruguay. Widespread in Argentina (32° to 39° S). Its northern expansion occurred with gramineae such as "oat", "barley", "wheat" and "maize" (Remes Lenicov & Tesón, 1978; Remes Lenicov & Paradell, 2012).

Feeding habits. Phytophagous.

Plant associations. "Maize", outbreak populations of "oat", breeds of "wheat", "barley" and several wild grasses, most of them reservoirs of MRCV (Remes Lenicov & Virla, 1999).

Economic importance. It is a major pest of "maize" in Argentina as vector of MRCV (Remes Lenicov & Paradell, 2012).

Material studied. **Río Negro**. Campo Grande. Tomato (pitfall), 06-I-2017, (1 female); 03-II-2017, (1 female). Pepper (pitfall), 03-II-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Table III).

Neodelphax fuscoterminalata (Berg)

Geographic distribution. Native to Argentina, where it is widely distributed in the humid Pampean region (Remes Lenicov & Virla, 1999).

Feeding habits. Phytophagous.

Plant associations. It is common and abundant in maize and "rice" agrosystems, and several grasses: "johnson grass", "bermuda grass", *Bromus* sp., *Setaria* sp., "dandelion" and "ribwort" plantain (Remes Lenicov, 1996). Associated with "apple" in the main cultivated area of Río Negro province (D'Hervé et al., 2017). Tomato and pepper are new crop associations. It also occurs on poplar shelterbelt.

Economic importance. It is probably another vector of MRCV in central Argentina (Remes Lenicov & Brentassi, 2017).

Material studied. **Neuquén**. Plottier. Poplar shelterbelt (pitfall), 03-III-2017, (1 female). Pepper (sweeping net), 03-III-2017, (1 nymph). **Río Negro**. Campo Grande. Tomato (pitfall), 03-II-2017, (1 male). Pepper (sweeping net), 31-III-2017, (1 nymph). Abandoned pear orchard (pitfall), 03-II-2017, (1 female); (sweeping net), 03-II-2017, (2 females); (sweeping net), 03-III-2017, (1 female). Spontaneous vegetation (pitfall), 06-I-2017 (1 nymph). Bernardis-Gittins-López Armengol, cols. (Table III and IV).

Family Acanaloniidae

Acanalonia chloris (Berg)

Geographic distribution. Native to Uruguay and Argentina: Misiones, Corrientes, Córdoba, Mendoza and Buenos Aires (Berg, 1879). Neuquén is a new province record.

Feeding habits. Phytophagous.

Plant association. It is associated with spontaneous vegetation.

Material studied. **Neuquén**. Plottier. Spontaneous vegetation (sweeping net), 03-II-2017, (2 males, 3 females); spontaneous vegetation (pitfall), 31-III-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Table IV).

Superfamily Membracoidea

Family Membracidae

Subfamily Smilinae

Tribe Ceresini

Ceresa brunnicornis (Germar)

Geographic distribution. Native to South America between 15° and 39° S. It occurs in Northern and Central Argentina, and in Brazil (Remes Lenicov, 1973).

Feeding habits. Phytophagous.

Plant associations. *Acacia* sp., "vine", "wheat", "alfalfa" and "potatoes" (Remes Lenicov, 1973). It is associated with abandoned pear orchards and spontaneous vegetation.

Economic importance. Mechanical damage caused by feeding on *Acacia* spp. and "vine" canes (Torres, 1946; Remes Lenicov, 1973).

Material studied. **Río Negro**. Campo Grande. Abandoned pear orchard (sweeping net), 03-III-2017, (3 females); spontaneous vegetation

(pitfall), 03-III-2017, (1 female). Bernardis-Gittins-López Armengol, cols. (Table IV).

Family Cicadellidae

Subfamily Cicadellinae

Syncharina punctatissima (Signoret)

Geographic distribution. It occurs in Argentina, Bolivia, Brazil and Uruguay. In Argentina, it is widespread: Salta, Jujuy, Corrientes, Entre Ríos, Santa Fe, Buenos Aires, Mendoza, Córdoba, Catamarca, Tucumán, and San Juan (Defea, 2018). Neuquén is a new province record.

Feeding habits. Phytophagous.

Plant associations. "Pangola grass", "maize", "wheat", "oat", "barley", *Trifolium* sp., "alfalfa", "rice", "rye", "sorghum", "winter vetch" (Young, 1977; Remes Lenicov & Tesón, 1985; Remes Lenicov et al., 2006; Paradell et al., 2014), *Citrus* sp., "parsley and "radish root" (Defea, 2018). It was only associated with spontaneous vegetation.

Phytosanitary importance. Unknown.

Material studied. **Neuquén**. Plottier. Spontaneous vegetation (sweeping net), 3-II-2017, (1 female). Bernardis-Gittins-López Armengol, cols. (Table IV).

Tapajosa rubromarginata (Signoret)

Geographic distribution. Native to Argentina (Young, 1968), Brazil (Azevedo-Filho & Carvalho, 2004, 2006) and Paraguay (Dellapé et al., 2011). In Argentina, it is widespread in Salta, Catamarca, Tucumán, Santa Fe, Córdoba, Mendoza, San Luis, San Juan, Santiago del Estero, Formosa, Chaco, Misiones, Corrientes, Entre Ríos, Buenos Aires, Neuquén and Río Negro (Dellapé et al., 2011; Paradell et al., 2012).

Feeding habits. Phytophagous.

Plant associations. "Onion", *Eryngium* sp., *Baccharis* sp., "garden dahlia", *Conyza* sp., "lapacho", "whitemouth day flower", *Ipomea* sp., "soybean", "alfalfa", "burclover", "cowpea", "mint", *Chorisia* sp., "arrowleave sida", "black mulberry", *Plantago* sp., "oat", *Paspalum* sp., "sugarcane", *Setaria* sp., "bermuda grass", "johnson grass", "sorghum", "maize", "wheat", "rescue grass", *Populus* sp., *Cardiospermum* sp., "black nightshade", "common lantana", "chinese ibiscus", "sweet orange" and "vine" (Costilla et al., 1972; Paradell, 1995; Remes Lenicov et al., 1998, 2006; Azevedo-Filho & Carvalho, 2004, 2006; Virla et al., 2007; Azevedo-Filho et al., 2008; Paradell et al., 2012), "blueberry" (Dellapé, 2013). It is associated with abandoned pear orchards.

Phytosanitary importance. Species positive for *Xylella fastidiosa* Wells et al. (Xanthomonadales: Xanthomonadaceae) in Argentina (Dellapé et al., 2016).

Material studied. **Río Negro**. Campo Grande. Abandoned pear orchard (sweeping net), 31-III-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Table IV).

Subfamily Deltocephalinae

Amplipcephalus dubius Linnavuori

Geographic distribution. Native to Argentina: Salta, San Juan, Mendoza, Córdoba, Santa Fe and Buenos Aires (Paradell, 1995). Neuquén and Río Negro are new provinces records.

Feeding habits. Phytophagous.

Plant associations. "Maize", "wheat", "rice", "barley", "oat", *Cynodon* sp., *Digitaria* sp. and "cebadilla" (Paradell et al., 2001). New crop association with tomato. It also occurs in abandoned pear orchards and spontaneous vegetation.

Phytosanitary importance. Unknown.

Material studied. **Neuquén**. Plottier. Spontaneous vegetation (sweeping net), 3-II-2017, (1 male). **Río Negro**. Campo Grande. Tomato (pitfall), 3-II-2017, (2 females). Abandoned pear orchard (sweeping net), 3-II-2017, (1 nymph). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Amplipcephalus marginellanus Linnavuori

Geographic distribution. Native to Brazil, Bolivia, Paraguay and Argentina: Jujuy, Chaco, Misiones, Corrientes, Entre Ríos, Santa Fe, Tucumán, San Luis, Córdoba and Buenos Aires (Paradell, 1995). Río Negro is a new province record.

Feeding habits. Phytophagous.

Plant associations. Spontaneous vegetation with "pangola grass" and "bahia grass" (Zanol & Menezes, 1982); "maize", "wheat", "gramon", "cebadilla" and "oat" (Paradell, 1995). New crop association with tomato. It is also in abandoned pear orchard.

Phytosanitary importance. Unknown.

Material studied. **Río Negro**. Campo Grande. Tomato (pitfall), 6-I-2017, (1 female). Abandoned pear orchard (pitfall), 6-I-2017, (1 female). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Circulifer tenellus (Baker)

Geographic distribution. Almost cosmopolitan (Nearctic, Palearctic, Oriental and Neotropical regions). In America it is present in Canada, USA, Central American and Caribbean countries, Brazil, Peru, Suriname, Colombia, Venezuela and Argentina (Zanol, 2006). Río Negro is a new province record.

Feeding habits. Phytophagous.

Plant associations. "Potato" and "carrot" (Creamer et al., 2003; Munyaneza et al., 2010). New crop association with pepper. It also occurs in abandoned pear orchard, spontaneous vegetation and poplar shelterbelt.

Phytosanitary importance. It is a vector of phytoplasma in Mexico, especially on horticultural plants such as "radish root" and "pepper". It is also vector of Beet curly top virus (BCTV) that produces the Carrot purple leaf (Weintraub & Beanland, 2006; Lee et al., 2006).

Material studied. **Río Negro**. Campo Grande. Pepper (pitfall), 3-III-2017, (4 males, 9 nymphs). Abandoned pear orchard (pitfall), 3-II-2017, (1 female). Spontaneous vegetation (pitfall), 6-I-2017, (4 males, 7 females); 3-II-2017, (2 males, 2 females, 14 nymphs); 3-III-2017, (3 nymphs); 31-III-2017, (1 male, 2 females, 5 nymphs). Spontaneous vegetation (sweeping net), 3-III-2017, (1 female, 1 nymphs); 31-III-2017, (1 male, 2 females, 5 nymphs). Poplar shelterbelt (pitfall), 3-III-2017, (2 males). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Exitianus obscurinervis (Stål)

Geographic distribution. Peru, Brazil, Paraguay, Uruguay and Argentina, where it is widespread in several provinces: Jujuy, Salta, Catamarca, Formosa, Chaco, Tucumán, Santiago del Estero, Misiones, Corrientes, Entre Ríos, Santa Fe, Córdoba, Mendoza, Buenos Aires and Río Negro (Paradell, 1995). Neuquén is a new province record.

Feeding habits. Phytophagous.

Plant associations. Cereals, mainly "maize", "wheat" and "rice", "cotton", "castor bean", "oat", "rescue grass", "bermuda grass", "hairly crabgrass", "pangola grass", "barnyard grass", "bahia grass", "sugarcane", "big blue stem" and "creeping vegetation", "barley", "bean", "sorghum" and "citrus" (Cordo et al., 2004). Tomato and pepper and new crop associations. It is also in abandoned pear orchards and spontaneous vegetation.

Phytosanitary importance. This species transmits the bacteria *Spiroplasma kunkelii* (Entomoplasmatales: Spiroplasmataceae) under experimental conditions, suggesting that may be a vector of the disease called "Corn Stunt Spiroplasma" in Argentina (Carlóni et al., 2011).

Material studied. **Neuquén**. Plottier. Tomato (pitfall), 3-II-2017, (1 female); 3-III-2017 (2 males, 1 nymph); 31-III-2017, (4 nymphs). Pepper (pitfall), 3-III-2017, (1 male, 1 female, 1 nymph). **Río Negro**. Campo Grande. Tomato (pitfall), 6-I-2017, (1 male); 3-II-2017, (4 males); 3-III-2017, (1 male); 31-III-2017, (5 males, 1 female, 2 nymphs). Pepper (pitfall) 6-I-2017, (1 male); 3-III-2017, (5 males, 1 nymph); 31-III-2017, (6 males, 1 nymph). Abandoned pear orchard (pitfall), 6-I-2017, (1 female); 3-II-2017, (4 males, 1 female, 1 nymph); 3-III-2017, (2 males); 31-III-2017, (1 male). Spontaneous vegetation (pitfall), 31-III-2017, (1 nymph). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Paratanus exitiosus (Beamer)

Geographic distribution. Native to Chile and Argentina: Jujuy, Chaco, San Luis, Córdoba, Buenos Aires, San Juan, Mendoza and Río Negro (Paradell et al., 2014).

Feeding habits. Phytophagous.

Plant associations. "Maize", "rice", "wheat", "sugar beet", "sorghum", "garlic", "alfalfa" and "hairy vetch" (Paradell et al., 2014). Tomato is a new crop record. It occurs in abandoned pear orchard and spontaneous vegetation.

Phytosanitary importance. It is a vector of "Virus Sugar Beet Yellow-Wilt" causing the disease "Yellow Wilt" of "sugar beet". This is also a potential vector of fitoplasma 16SrIII X-disease, that causes "Garlic decline" disease (Paradell et al., 2014).

Material studied. **Río Negro**. Campo Grande. Tomato (pitfall), 6-I-2017, (2 males); 31-III-2017, (1 male). Abandoned pear orchard (pitfall), 3-III-2017, (1 male); 31-III-2017 (2 males). Spontaneous vegetation (pitfall), 6-I-2017, (1 female); 3-II-2017 (1 female, 1 nymph); 3-III-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Subfamily Idiocerinae

Rhytidodus decimusquartus (Schrank)

Geographic distribution. Australian, Palearctic, Nearctic and Neotropical regions. In Argentina occurs in Mendoza, Neuquén, Río Negro and Chubut (Paradell & Dellapé, 2015).

Feeding habits. Phytophagous.

Plant associations. Poplar used as wind curtain and porrum (Paradell & Dellapé, 2015).

Material studied. **Neuquén**. Plottier. Poplar shelterbelt (pitfall), 6-I-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Table IV).

Subfamily Ledorinae

Tribe Xerophloeini

Xerophloea viridis (Fabricius)

Geographic distribution. Nearctic and Neotropical regions (Jones & Deitz, 2009). USA, Mexico, Peru Venezuela, Brazil, Bolivia, Chile, Argentina: Salta, Tucumán, Catamarca, La Rioja, Misiones, Entre Ríos, Córdoba, Mendoza, San Juan, Santa Fe, Buenos Aires and Neuquén (Paradell et al., 2014). Río Negro is a new province record.

Feeding habits. Phytophagous.

Plant associations. "Weeds", "wheat", "maize", "barley", "sweet potato", *Ipomoea* sp., "yams", "tomato", "lettuce", "San Jose weed", "broom jute", "pangola grass", "citrus", "alfalfa", Poaceae (Jones & Deitz, 2009), "garlic",

"hairy vetch" (Paradell et al., 2014). New records for pepper crop, abandoned pear orchard, spontaneous vegetation and poplar shelterbelt.

Phytosanitary importance. Vector of "Virus Sugar Beet Yellow- Wilt" to sugarcane in Argentina (Bennet & Munck, 1946).

Material studied. **Neuquén**. Plottier. Tomato (pitfall), 6-I-2017, (2 females); 3-II-2017, (1 male); 3-III-2017, (3 males). Pepper (pitfall), 3-II-2017, (1 male, 1 nymph); 3-III-2017, (1 nymph). Spontaneous vegetation (pitfall), 6-I-2017, (1 female); 3-III-2017, (1 male, 2 nymphs). Spontaneous vegetation (sweeping net), 31-III-2017 (1 male). Poplar shelterbelt (sweeping net), 6-I-2017, (1 male, 1 nymph); 3-II-2017, (1 male, 1 female). **Río Negro**. Campo Grande. Tomato (pitfall), 6-I-2017, (1 male); 3-III-2017, (1 female). Pepper (pitfall), 3-II-2017 (1 female); 3-III-2017, (1 female). Abandoned pear orchard (pitfall), 6-I-2017, (1 male, 1 female); 3-III-2017, (1 male). Spontaneous vegetation (pitfall), 6-I-2017, (2 males, 1 female); 3-II-2017 (3 males); 3-III-2017, (1 male); 31-III-2017 (1 male, 1 nymph). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Subfamily Megophthalminae

Tribe Agallini

Agalliana ensigera Oman

Geographic distribution. Neotropical. Argentina: Jujuy, Salta, Tucumán, La Rioja, Catamarca, Santiago del Estero, Chaco, Misiones, Entre Ríos, San Juan, Mendoza, Santa Fe, La Pampa, Buenos Aires and Río Negro (Paradell et al., 2014). Neuquén is a new province record.

Feeding habits. Phytophagous.

Plant associations. "Pumpkin", "potato", "pepper", "tomato", "fababeen", "zucchini", "berrie", "cotton", "wheat", "maize", "alfalfa", "soybean", "sugarbeet", "sorghum", "tobacco", "sunflower", "oat", "prairie grass" and "weeds", "garlic", "citrus", "carrot", "hairy vetch" (Paradell et al., 2014). New records for abandoned pear orchard and spontaneous vegetation.

Phytosanitary importance. Vector "Argentine Curly Top Virus" on sugar cane and "Brazilian Curly Top Virus" tomato. Possible vector of "Witches-Broom Disease" alfalfa. Potential vector of phytoplasma 16SrIII X-disease "Garlic decline" (Paradell et al., 2014).

Material studied. **Neuquén**. Plottier. Tomato (pitfall), 31-III-2017, (1 male). Pepper (pitfall), 31-III-2017, (1 female). Pepper (sweeping net), 31-III-2017, (1 male, 1 female). **Río Negro**. Campo Grande. Pepper (pitfall), 6-I-2017, (1 female); 31-III-2017, (1 male). Abandoned pear orchard (pitfall), 6-I-2017, (5 males, 3 females); 3-II-2017 (2 males, 1 female); 3-III-2017, (5 males). Spontaneous vegetation (pitfall), 6-I-2017, (1 male, 1 nymph). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Bergallia signata (Stål)

Geographic distribution. Argentina: Jujuy, Tucumán, Chaco, Misiones, San Juan, Mendoza, Buenos Aires and Río Negro (Paradell et al., 2014). Neuquén is a new province record.

Feeding habits. Phytophagous.

Plant associations. "Maize", "wheat", "prairie grass", "potato", "beet", "radish root", "turnip", "purslane", "pepper", "tomato", "carrot", "hairy vetch" (Paradell et al., 2014). It is also in abandoned pear orchards and spontaneous vegetation.

Phytosanitary importance. Unknown

Material studied. **Neuquén**. Plottier. Tomato (pitfall), 31-III-2017, (1 male). Pepper (sweeping net), 31-III-2017, (1 male, 3 females). **Río Negro**. Campo Grande. Tomato (pitfall), 6-I-2017, (1 male); 3-II-2017, (1 female). Pepper (pitfall), 6-I-2017, (1 female); 3-II-2017, (1 male); 31-III-2017, (4 males, 1 female). Abandoned pear orchard (pitfall) 6-I-2017, (3 males, 3 females); 3-III-2017, (1 female); 3-III-2017 (4 males). Spontaneous vegetation (pitfall), 6-I-2017, (1 male, 1 nymph). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Order/Family/Species	Tomato		Pepper	
	Neuquén	Río Negro	Neuquén	Río Negro
	Plottier	Campo Grande	Plottier	Campo Grande
	Periurban	Rural	Periurban	Rural
HEMIPTERA				
Fam. Delphacidae				
<i>Idiosystatus</i> sp. *		X		
<i>Metadelphax propinqua</i>		X	X	X
<i>Delphacodes kuscheli</i>		X		X
<i>Neodelphax fuscoterminalata</i>		X	X	X
Fam. Cicadellidae				
<i>Amplipcephalus dubius</i> *		X		
<i>Amplipcephalus marginellanus</i> *		X		
<i>Circulifer tenellus</i> *				X
<i>Exitianus obscurinervis</i> *	X	X	X	X
<i>Paratanus exitiosus</i>		X		
<i>Xerophloea viridis</i> *	X	X	X	X
<i>Agalliana ensigera</i> *	X		X	X
<i>Bergallia signata</i> *	X	X	X	X
Fam. Miridae				
<i>Tupiocoris cucurbitaceus</i> *		X		
Fam. Reduviidae				
<i>Atrachelus cinereus</i> *			X	
Fam. Pentatomidae				
<i>Dichelops furcatus</i> *		X		
Fam. Geocoridae				
<i>Geocoris</i> sp.	X			
Fam. Lygaeidae				
<i>Nysius simulans</i>	X	X	X	X
COLEOPTERA				
Fam. Curculionidae				
<i>Hypurus bertrandi</i> *	X		X	
<i>Listroderes costirostris</i> species complex				
<i>Naupactus xanthographus</i> *	X	X		
HYMENOPTERA				
Fam. Apidae				
<i>Xylocopa augusti</i> *	X			
Fam. Halictidae				
<i>Dialictus autranellus</i> *		X		X
<i>Pseudagapostemon singularis</i> *			X	
<i>Pseudagapostemon pampeanus</i>	X	X		X
Fam. Vespidae				
<i>Vespula germanica</i>	X		X	

Table III. Order, Family, and species collected in tomato and pepper crops in peri-urban and rural farms.

* = new records.

Suborder Heteroptera

Infraorden Cimicomorpha

Superfamily Cimicoidea

Family Anthracoridae

Orius sp.

Feeding habits. Predator.

Comments: Various species of *Orius* Wolff are important predators of Thysanoptera, mites, and eggs of Lepidoptera, both in greenhouse and field crops situations (Schuh & Weirauch, 2020).

Material studied. Neuquén. Plottier. Abandoned pear orchard (sweeping net), 03-II-2017, (2 males). Bernardis-Gittins-López Armengol cols. (Table IV).

Superfamily Naboidea

Family Nabidae

Subfamily Prostematinae

Tribe Prostematini

Pagasa (Lampropagasa) fuscipennis Reuter & Poppius

Geographic distribution. Argentina: Buenos Aires, Chaco, Chubut, Córdoba, La Pampa, Misiones, Río Negro, Salta, San Luis, Santa Fe and Santiago del Estero. This species is also known from Brazil, Paraguay and Uruguay (Cornelis & Coscarón, 2013; Melo et al., 2020).

Feeding habits: Predator. Species in the genus are known predators of other Heteroptera, particularly Blissidae, Geocoridae, and Rhyparochromidae (Lattin, 1989). Economic importance. Although the members of Nabidae are generalist predatory species, and some species are frequently present in agroecosystems, the role of nabids in regulation of pest populations of importance to urban agriculture remains largely unknown (Braman, 2000).

Material studied. **Río Negro**. Campo Grande: abandoned pear orchard (pitfall), 03-II-2017, (2 males). Bernardis-Gittins-López Armengol, cols. (Table IV).

Superfamily Miroidea

Family Miridae

Subfamily Bryocorinae

Tribe Dicyphini

Tupiocoris cucurbitaceus (Spinola)

Geographic distribution. Buenos Aires, Catamarca, Corrientes, Entre Ríos, Jujuy, Mendoza, Salta and Tucumán (Carpintero & Carvalho, 1992; Carpintero & De Biase, 2011; Carpintero et al., 2014, 2016; Melo et al., 2020). Río Negro is a new province record.

The North American records of this species are misidentifications as was shown by Kelton (1980), so its distribution has been restricted to the Neotropical Region (Fiúza Ferreira & Henry, 2011). These records include Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru and Uruguay (Spinola, 1852; Carvalho, 1958; Carvalho & Fiúza Ferreira, 1972; Carvalho & Afonso, 1977; Melo et al., 2020).

Feeding habits. Although *T. cucurbitaceus* is a zoophytophagous insect, it has a limited phytophagy, which is restricted to its nymphal instars (Orozco-Muñoz et al., 2012). Until now, no crop damage has been observed due to this mirid species, however, these observations need verification (Polack et al., 2017).

Plant associations. "Tobacco", "bean", "potato", *Cucurbita* sp., "geranium" (Carpintero & Carvalho, 1992), *Rubus* sp., "eupatoire", *Adesmia* sp. (Carpintero & De Biase, 2011), "tomato" (Fiúza Ferreira et al., 2001).

Economic importance. This species has been used as a biological control agent of *Tuta absoluta* Meyrick (Lepidoptera; Gelichiidae) in

South America (Salas Gervasio et al., 2019). In Argentina the *Instituto Nacional de Tecnología Agropecuaria* (INTA) has raised and tested this mirid species as a predator of *Trialeurodes vaporariorum* Westwood and *Bemisia tabaci* (Gennadius) (Hemiptera: Aleyrodidae) and *Mysus persicae* (Sulzer) (Hemiptera: Aphididae) in "tomato" crops (Polack et al., 2017). A recent study indicated that *T. cucurbitaceus* can successfully prey on different tomato pests, such as *B. tabaci*, *T. vaporariorum*, *Sitotroga cerealella* Olivier (Lepidoptera: Gelichiidae), *T. absoluta*, *M. persicae* and *Tetranychus urticae* Koch (Acari: Tetranychidae) (López et al., 2019).

Material studied. **Río Negro**. Campo Grande. Tomato (sweeping net), 31-III-2017, (1 female). Bernardis-Gittins-López Armengol, cols. (Table III).

Superfamily Reduvioidea

Family Reduviidae

Subfamily Harpactorinae

Tribe Harpactorini

Atrachelus (*Atrachelus*) *cinereus* (Fabricius)

Geographic distribution. Argentina: Buenos Aires, Catamarca, Chaco, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, La Pampa, La Rioja, Mendoza, Misiones, Salta, San Juan, San Luis, Santa Fe, Santiago del Estero and Tucumán (Dellapé et al., 2015, 2020; Melo et al., 2017, 2020). Río Negro and Neuquén are new provinces records. This species has been also recorded for Chile, Cuba, Guatemala and Uruguay (Maldonado Capriles, 1990).

Feeding habits. Predator.

Economic importance. No economic damages registered.

Material studied. **Neuquén**. Plottier. Spontaneous vegetation (pitfall), 06-I-2017, (1 nymph). Poplar shelterbelt (sweeping net), 03-III-2017, (1 nymph). Pepper (sweeping net), 31-III-2017 (2 males). **Río Negro**. Campo Grande. Spontaneous vegetation (sweeping net), 06-I-2017 (1 nymph). Abandoned pear orchard (pitfall), 31-III-2017, (3 nymphs). Poplar shelterbelt (sweeping net), 31-III-2017, (1 male, 1 female). Bernardis-Gittins-López Armengol cols. (Tables III and IV).

Infraorden Pentatomomorpha

Superfamily Pentatomoidea

Family Pentatomidae

Tribe Carpocorini

Dichelops furcatus (Fabricius)

Geographic distribution. Argentina: Buenos Aires, Chaco, Córdoba, Jujuy, Mendoza, Misiones, Salta, San Juan, Santa Fe, Santiago del Estero and Tucumán (Grazia & Schwertner, 2008). This species is widely distributed in the Neotropical region (Pannizi et al., 2016, 2018). Río Negro is a new province record.

Feeding habits. Polyphagous.

Plant associations. This species feeds on 27 host plants including cultivated and wild species, such as "soybean", "sunflower", "maize", "oat", "wheat" (Pannizi et al., 2016, 2018).

Economic importance. This species can cause an important damage in "soybean" and "maize" (Chocorosqui & Pannizi, 2004; Roza-Gomes et al., 2011).

Material studied. **Río Negro.** Campo Grande. Abandoned pear orchard (pitfall), 03-III-2017, (3 nymphs). Abandoned pear orchard (sweeping net), 03-III-2017, (2 nymphs). Tomato (sweeping net), 31-III-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Table III and IV).

Superfamily Coreoidea

Family Rhopalidae

Subfamily Rhopalinae

Tribe Harmostini

Harmostes (*Harmostes*) *prolixus* Stål

Geographic distribution. Argentina: Buenos Aires, Catamarca, Chaco, Córdoba, Corrientes, Entre Ríos, Jujuy, La Pampa, La Rioja, Mendoza, Misiones, Salta, San Luis, Santa Fe, Santiago del Estero and Tucumán (Melo & Montemayor, 2015; Dellapé et al., 2020). Río Negro and Neuquén are new province records. This species is also known from Bolivia, Brazil, Paraguay, Peru and Uruguay (Göllner-Scheiding, 1978, 1983; Melo & Montemayor, 2015; Dellapé et al., 2020).

Feeding habits. Phytophagous.

No plants association recorded.

Economic importance. No economic damages registered.

Material studied. **Neuquén.** Plottier. Spontaneous vegetation (sweeping net), 03-II-2017, (1 female). **Río Negro.** Campo Grande. Abandoned pear orchard (sweeping net), 03-III-2017, (1 female). Bernardis-Gittins-López Armengol, cols. (Table IV).

Harmostes (*Neoharmostes*) *procerus* Berg

Geographic distribution. Argentina: known from all provinces (Melo & Montemayor, 2015; Dellapé et al., 2020). It has been also recorded for Brazil, Peru, and Uruguay (Melo & Montemayor, 2015).

Feeding habits. Phytophagous.

Plant associations. Seepwillow, "romerillo", "pichana" (Melo & Montemayor, 2015).

Economic importance. No economic damages registered.

Material studied. **Río Negro.** Campo Grande. Spontaneous vegetation (pitfall), 03-II-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Table IV).

Superfamily Lygaeoidea

Family Geocoridae

Subfamily Geocorinae

Geocoris sp.

Feeding habits. Predator.

Comments: All species in this genus are predators, and can be abundant in agroecosystems. Some species in the genus are considered to be of value in biological control of crop pests.

Material studied. **Neuquén**. Plottier. Tomato (sweeping net), 06-I-2017, (1 nymph). Pepper (pitfall), 03-III-2017, (1 male). **Río Negro**. Campo Grande. Abandoned pear orchard (pitfall), 3-II-2017, (1 male, 1 female). Bernardis-Gittins-López Armengol, cols. (Table III and IV).

Family Lygaeidae

Subfamily Orsillinae

Tribe Nysiini

Nysius simulans Stål

Geographic distribution. Argentina: Buenos Aires, Catamarca, Chaco, Chubut, Córdoba, Corrientes, Entre Ríos, La Pampa, La Rioja, Mendoza, Misiones, Neuquén, Río Negro, Salta, San Juan, San Luis, Santa Fe, Santiago del Estero and Tucumán (Dellapé, 2014; Pall et al., 2016; Dellapé et al., 2020).

This species has been also recorded for Brazil, Paraguay, and Uruguay (Dellapé & Henry, 2020).

Feeding habits. Phytophagous.

Plant associations. According to Pall et al. (2016) the following list of plants are associated with the attack by *N. simulans* in Argentina: Gramineae: "maize", Linaceae: "flax", Poaceae: "wheat", Malvaceae: "cotton", Asteraceae: "lettuce", Solanaceae: "tobacco" and "potato", Rosaceae: "plum", Vitaceae: "vine", Fabaceae: "soybean" (Di Iorio, 2004). Also, other plants, Asteraceae: *Gamochaeta* sp., Brassicaceae: "capsella", "field mustard", "rapeseed" and "giant mustard" (Aragón & Flores, 2006); more recently, it has been found in "sunflower", and exotic plants as "wild rocket" and "barnaby thistle" all Asteraceae (Carmona et al., 2015).

Economic importance. *Nysius simulans* is abundant in most of the country and frequently present on many cultivated plants. This species has been recently a problem to "soybean" (Aragón & Flores, 2006; Igarzábal et al., 2009; Molinari & Gamundi, 2010), "quinua" (Dughetti et al., 2015; Rivas & Dughetti, 2015) and "sunflower" (Carmona et al., 2015; Renzi Pugni et al., 2015).

Comments: Although *N. simulans* is an almost ubiquitous species in Argentina, it is commonly confounded or mixed with populations of other species in the genus, and with species of the closely relative genus *Xyonysius*.

Material studied. **Neuquén**. Plottier. Spontaneous vegetation (pitfall), 06-I-2017, (20 males, 19 females); 03-II-2017, (1 male, 1 female).

Spontaneous vegetation (sweeping net), 06-I-2017, (5 males, 3 females); 03-II-2017, (17 males, 10 females); 31-III-2017, (2 males). Pepper (pitfall), 06-I-2017 (1 females); 31-III-2017, (1 female). Tomato (pitfall), 06-I-2017, (1 males), (sweeping net), (1 male, 2 females); 03-II-2017, (2 females); 03-III-2017, (1 male); 31-3-2017 (1 male). Poplar shelterbelt, 06-I-2017, (sweeping net) (2 females). Poplar shelterbelt (pitfall), 03-II-2017, (1 specimen). **Río Negro.** Campo Grande. Spontaneous vegetation (pitfall), 06-I-2017, (43 males, 44 females); 3-II-2017, (1 male, 2 females); 31-III-2017, (1 female). Spontaneous vegetation (sweeping net), 06-I-2017, (1 male); 3-II-2017, (1 female); 31-III-2017, (2 males, 3 females). Abandoned pear orchard (pitfall), 06-I-2017, (6 males, 6 females); 3-II-2017, (1 female). Pepper (pitfall), 06-I-2017, (3 males, 4 females); 3-II-2017, (1 males). Tomato (pitfall), 06-I-2017, (4 males, 4 females). Tomato (sweeping net), 06-I-2017, (2 males). Poplar shelterbelt (pitfall), 06-I-2017, (1 female). Abandoned pear orchard (sweeping net), 31-III-2017, (2 females). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Order/Family/Species	Abandoned pear orchard		Spontaneous vegetation		Poplar shelterbelt	
	Neuquén	Río Negro	Neuquén	Río Negro	Neuquén	Río Negro
	Plottier	Campo Grande	Plottier	Campo Grande	Plottier	Campo Grande
	Periurban	Rural	Periurban	Rural	Periurban	Rural
HEMIPTERA						
Fam. Delphacidae						
<i>Metadelphax propinqua</i>		X				
<i>Neodelphax fuscoterminata</i>		X		X	X	
Fam. Acanaloniidae						
<i>Acanalonia chloris</i> *			X			
Fam. Membracidae						
<i>Ceresa brunnicornis</i>		X		X		
Fam. Cicadellidae						
<i>Syncharina punctatissima</i> *			X			
<i>Tapajosa rubromarginata</i>		X				
<i>Ampliphephalus dubius</i> *		X	X			
<i>Ampliphephalus marginellanus</i> *		X				
<i>Circulifer tenellus</i> *		X		X		X
<i>Exitianus obscurinervis</i> *		X		X		
<i>Paratanus exitiosus</i>		X		X		
<i>Rhytidodus decimusquartus</i>					X	
<i>Xerophloea viridis</i> *		X	X	X	X	
<i>Agalliana ensigera</i> *		X		X		
<i>Bergallia signata</i> *		X		X		
Fam. Anthracoridae						
<i>Ortus</i> sp.	X					
Fam. Nabidae						
<i>Pagasa fuscipennis</i>		X				
Fam. Reduviidae						
<i>Atrachelus cinereus</i> *			X	X	X	
Fam. Pentatomidae						
<i>Dichelops furcatus</i> *		X				
Fam. Rhopalidae						
<i>Harmostes prolixus</i> *		X	X			
<i>Harmostes procerus</i>				X		
Fam. Geocoridae						
<i>Geocoris</i> sp.		X				
Fam. Lygaeidae						
<i>Nysius simulans</i>		X	X	X	X	
COLEOPTERA						
Fam. Curculionidae						
<i>Hypurus bertrandi</i> *			X			
<i>Listroderes costirostris</i> species complex		X				
<i>Aramigus tessellatus</i>			X			
<i>Naupactus cervinus</i>	X					
<i>Naupactus leucoloma</i> *	X		X		X	
<i>Naupactus xanthographus</i> *	X	X			X	
<i>Otiorynchus ovatus</i>	X					
<i>Otiorynchus rugosostriatus</i> *	X					X
<i>Otiorynchus sulcatus</i>	X					
<i>Sitona discoideus</i> *			X			
HYMENOPTERA						
Fam. Apidae						
<i>Diadasia pereyae</i> *				X		X
Fam. Halictidae						
<i>Pseudagapostemon singularis</i> *	X					
Fam. Vespidae						
<i>Vespula germanica</i>		X	X		X	X

Table IV. Order, Family, and species collected in fruit abandoned orchard, spontaneous vegetation and poplar shelterbelt in peri-urban and rural farms.

* = new records.

Order Coleoptera

Family Curculionidae

Subfamily Ceutorhynchinae

Hypurus bertrandi (Perris)

Common name. Portulaca leaf mining weevil.

Geographic distribution. Native to the Mediterranean region of Europe and Africa, and introduced in North America and South America (Chile and Argentina). In Chile was reported for the Maule region. Neuquén is a new province record.

Feeding habits. Phytophagous.

Plant associations. It shows preference for "portulaca". The larvae mine in *Portulaca* sp. leaves and adults also feed on leaves. Considered a pest in several countries, it is a potential pest in Argentina.

Material studied. **Neuquén:** Plottier. Spontaneous vegetation (pitfall), 06-I-2017, (2 specimens). Tomato (pitfall), 03-II-2017, (3 specimen); 03-III-2017, (11 specimens). Pepper (pitfall), 06-I-2017, (4 specimens); 03-II-2017, (12 specimens); 03-III-2017, (12 specimens); 31-III-2017, (1 specimen). Bernardis-Gittins-López Armengol cols. (Tables III and IV).

Subfamily Cyclominae

Listroderes costirostris Schoenherr species complex

Common name. Vegetable weevil.

Geographic distribution. Native to South America, where it was recorded in Argentina, Bolivia, Brazil, Chile (including Easter Island and Juan Fernández Islands). In Argentina it is widespread in several provinces: Buenos Aires, Catamarca, Chaco, Chubut, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, La Pampa, La Rioja, Mendoza, Misiones, Neuquén, Río Negro, Salta, San Juan, San Luis, Santa Fe, Santiago del Estero and Tucumán. It has been introduced into Australia, France, New Zealand, Portugal, Spain, South Africa, USA and Japan (Lanteri et al., 2002).

Feeding habits. Phytophagous.

Plant associations. It is a primary pest of vegetables, found in many wild and cultivated hosts (more than 80).

It is frequent especially on cruciferous. In Argentina it was reported on "pale dock" (Polygonaceae), *Senecio* sp. (Asteraceae), *Stellaria* sp. (Caryophyllaceae) and several legumes (Fabaceae), "field mustard", "rapeseed", "cabbage", "radish" and *Nasturtium* sp. (Brassicaceae); "sunflower", "camomile" (Asteraceae); "soybean" (Fabaceae); "tobacco", "potato" (Solanaceae); "celery" and "carrots" (Apiaceae) (Lanteri et al., 2002).

Larvae destroy the tender young crown leaves of carrots and turnips. Adults often cause extensive damage by feeding on the leaves of small "tomato" and "potato" plants (Solanaceae), by cutting off the stems of plants at ground level. Females reproduce by parthenogenesis.

Material studied. **Río Negro.** Campo Grande. Abandoned pear orchard (pitfall), 31-III-2017, (1 female). Bernardis-Gittins-López Armengol cols. (Table IV).

Subfamily Entiminae

Tribe Naupactini

Aramigus tessellatus (Say)

Geographic distribution. Native to South America (Argentina, southern Brazil and Uruguay). In Argentina it is widespread in several provinces: Buenos Aires, Chaco, Córdoba, Corrientes, Entre Ríos, Jujuy, La Pampa, Misiones, Neuquén, Río Negro, Santa Fe, Santiago del Estero and Tucumán. Introduced in Chile, Mexico and USA (Lanteri & del Río, 2020).

Feeding habits. Phytophagous.

Plant associations. Harmful for roots of cereals as "wheat", "oat" and "barley". It causes damage on "alfalfa" (Fabaceae), "sunflower" (Asteraceae), "potato" (Solanaceae), "weat", "oat" and "barley" (Poaceae) (Lanteri et al., 2002). In Chile it affects "raspberry", "sweet cherry", "apple" (Rosaceae), and *Lupinus* sp. (Fabaceae) (Elgueta, 1993).

Lifecycle. Males are unknown or scarce and the species reproduces by parthenogenesis in most of its range. It is common in pastures, shrubs and crops of the Pampean biogeographic province.

Material studied. Neuquén. Plottier. Spontaneous vegetation (sweeping net), 06-I-2017, (2 females); 02-III-2017, (1 female). Bernardis-Gittins-López Armengol cols. (Table IV).

Naupactus cervinus Boheman

Common names. Fuller's rose weevil, Fuller's rose beetle.

Geographic distribution. Native to Argentina, southern Brazil, Paraguay and Uruguay. Introduced in Chile, Australia, New Zealand, Japan and several Pacific Islands, as well as other countries of Central America, North America, Europe, and South Africa. In Argentina it is widespread in several provinces: Buenos Aires, Catamarca, Chaco, Chubut, Córdoba, Corrientes, Chubut, Entre Ríos, Jujuy, Mendoza, Misiones, Salta, Santa Fe and Tucumán (Lanteri & del Río, 2020).

Feeding habits. Phytophagous.

Plant associations. It is a major pest of *Citrus* spp. (Rutaceae), other fruit plants and ornamental plants. Examples of fruit plants are *Musa* sp. (Musaceae), "avocado" (Lauraceae), "walnut" (Juglandaceae), "strawberry", "apple", "plum" (Rosaceae). Among ornamentals there are *Rosa* sp. (Rosaceae), *Begonia* sp. (Begoniaceae), *Gardenia* sp. (Rubiaceae), *Hibiscus* sp. (Malvaceae), *Hydrangea* sp. (Hydrangeaceae), *Lilium* sp. (Liliaceae) and others. Other crops are "potato" (Solanaceae), "alfalfa", *Phaseolus* sp. (Fabaceae), and *Cucurbita* sp. (Cucurbitaceae) (Lanteri et al., 2002).

Lifecycle. Adults of *N. cervinus* feed on foliage and larvae feed on roots. Under severe infestations, these weevils can consume the entire leaf, leaving only the midrib. Plants with severe root damage are more vulnerable to other biotic and abiotic factors (e.g., fungal infections with *Phytophthora* spp.) and may die during periods of drought. Larval damage can be serious on vegetable crops but relatively minor in citrus. Reproduction occurs without fertilization, a phenomenon known as parthenogenesis, except in small native areas of Argentina and Brazil.

Material studied. Neuquén. Plottier. Abandoned pear orchard (pitfall), 31-III-2017, (1 female). Bernardis-Gittins-López Armengol cols. (Table IV).

Naupactus leucoloma Boheman

Common names. White-fringed weevil, white-fringed beetle.

Geographic distribution. Native to South America: Argentina, southern Brazil and Uruguay. Introduced in Chile (including Easter Island and Juan Fernández Islands), Peru, Mexico, USA, Australia, New Zealand and South Africa. In Argentina it is widespread in several provinces: Buenos Aires, Catamarca, Chaco, Chubut, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, La Pampa, La Rioja, Mendoza, Río Negro, Salta, San Juan, San Luis, Santa Fe, Santiago del Estero and Tucumán (Lanteri & del Río, 2020). Neuquén is a new province record.

Feeding habits. Phytophagous.

Plant associations. It shows a broad host range, of about 385 plant species worldwide, including ornamentals, fruit trees, horticultural and industrial crops and forage. The major crop species are: *Brassica* sp. (Brassicaceae), "carrots" (Apiaceae), "strawberry", *Rubus* sp. and *Prunus* sp. (Rosaceae), "peanut", "soybean", "alfalfa", "beans", "pea", "cowpea" and *Trifolium* spp. (Fabaceae), "onion" (Amarydillaceae), "potato" and "pepper" (Solanaceae), "maize" (Poaceae), "sweet potato" (Convolvulaceae). Fabaceae are major hosts in Argentina, Brazil, Chile and Uruguay (Lanteri et al., 2002). Pastures can be seriously damaged in Australia and New Zealand.

Lifecycle. Adults feed at the bases of leaf margins, leaving characteristic "notching". This feeding behavior injures plants seriously only if adults are very numerous. Larvae gnaw at tap roots, the basal parts of stems and the small lateral roots. When feeding is severe, plants turn yellow, wilt and die. Plants on which only a small amount of the cambium layer is eaten usually survive, but produce little or no crop. In lucerne, the larvae usually chew into the taproot, make a furrow along it and these results in the death of young plants. In "potatoes" damage is more spectacular, as larvae tunnel inside the tubers. The nitrogen fixation rate of *Trifolium repens* L. is reduced by 92% by *N. leucoloma* in New Zealand.

Except in some small areas of Argentina, populations of *N. leucoloma* include only parthenogenetic females.

Material studied. Neuquén. Plottier. Poplar shelterbelt (pitfall), 06-I-2017, (1 female). Spontaneous vegetation (pitfall), 03-III-2017, (1 female). Abandoned pear orchard (pitfall); 03-III-2017, (1 female). Bernardis-Gittins-López Armengol cols. (Table IV).

Naupactus xanthographus (Germar)

Common names. Grapefruit weevil, peach-tree weevil, fruit weevil, grape snout beetle.

Geographic distribution. Native to South America (Argentina, southern Brazil, Paraguay and Uruguay). Introduced in Chile, being prevalent in the central zone. The current distribution in Argentina includes several provinces: Buenos Aires, Catamarca, Chaco, Chubut, Córdoba, Corrientes, Entre Ríos, Jujuy, La Pampa, La Rioja, Mendoza,

Misiones, Salta, San Juan, San Luis, Santa Fe, Santiago del Estero, Neuquén and Tucumán (Lanteri & del Río, 2020). Río Negro is a new province record.

Feeding habits. Phytophagous. The adults feed on shoots and leaves, being particularly injurious to young plants. The larvae live in soil during the whole year, eating the plant's roots.

Plant associations. The major crop species include "vine" (Vitaceae), other fruit plants, mainly "pear", "apple", *Rubus* sp., *Prunus* sp., (Rosaceae), *Ribes* sp. (Grossulariaceae), "cherries" and "berries" (del Río et al., 2010); "kiwifruit" (Actinidiaceae), "tangerine" (Rutaceae), "avocado" (Lauraceae) and "walnut" (Juglandaceae). It also causes damage in "alfalfa", *Trifolium* spp. and "bean" (Fabaceae), "maize" (Poaceae), horticultural plants such as "potato", "tomato" (Solanaceae), "asparagus" (Liliaceae) and "beet" (Chenopodiaceae); and garden plants as *Ligustrum* sp. (Oleaceae) and *Rosa* sp. (Rosaceae) (Lanteri et al., 2002).

Material studied. **Neuquén.** Plottier. Abandoned pear orchard (pitfall), 03-III-2017, (1 male). Poplar shelterbelt (sweeping net), 06-I-2017, (1 female); (pitfall), 03-III-2017, (1 female). Tomato (pitfall), 06-I-2017, (1 male); 03-II-2017, (1 female). **Río Negro.** Campo Grande. Tomate (pitfall), 03-II-2017, (1 male). Abandoned pear orchard (pitfall), 03-II-2017, (1 male). Bernardis-Gittins-López Armengol cols. (Tables III and IV).

Tribe Otiorhynchini

Otiorhynchus ovatus (L.)

Common names. Strawberry Root Weevil

Geographic distribution. It is native to Europe and has been introduced in Canada, USA, Australia, New Zealand, Chile and Argentina: Chubut, Neuquén, Río Negro and Santa Cruz. It is considered invasive due to its parthenogenetic reproduction and associations with many plant species.

Feeding habits. Phytophagous.

Plant associations. It was found associated with "strawberry", *Fragaria* sp. (Rosaceae) and "blueberry" (Ericaceae) (del Río et al., 2010). In other countries, it causes damage to various ornamental, fruit and forest species.

Material studied. **Neuquén.** Plottier. Abandoned pear orchard (pitfall), 06-I-2017, (7 female). Bernardis-Gittins-López Armengol cols. (Table IV).

Otiorhynchus rugosostriatus (Goeze)

Common names. Rough Strawberry Root Weevil, "Otiorrinco de la frutilla".

Geographic distribution. It is native to Europe and North Africa (Palearctic region), and introduced in New Zealand, Australia, Tasmania, Canada, USA, Chile and Argentina. In Argentina, it was first

cited in Río Negro province associated with red fruits (del Río et al., 2010). Neuquén is a new province record. It is considered invasive due to its parthenogenetic reproduction and associations with many plant species.

Feeding habits. Phytophagous.

Plant associations. Mainly, fruits, ornamentals and "berries". In Argentina, it was found associated with "strawberry" and in Chile, it causes damage to "blueberries", "raspberries", "strawberries" *Fragaria* sp., "apples", "redcurrant" and "vine" (del Río et al., 2010).

Material studied. **Neuquén**. Plottier. Abandoned pear orchard (pitfall), 06-I-2017, (1 female). **Río Negro**. Campo Grande. Poplar shelterbelt (pitfall), 31-III-2017, (1 female). Bernardis-Gittins-López Armengol cols. (Table IV).

Otiorhynchus sulcatus (Fabricius)

Common names. Black Vine Weevil, Greenhouse weevil.

Geographic distribution. It is native to Europe (Palearctic region) and introduced in several places around the world, North America (broadly distributed), Hawaii, Australia, New Zealand, Japan, Malaysia and Russia. In South America it is present in Chile and Argentina: Chubut, Neuquén and Río Negro provinces. In Argentina it was registered for the first time in 2000 (Lanteri et al., 2002). It is considered invasive due to its parthenogenetic reproduction and associations with many plant species.

Feeding habits. Phytophagous.

Plant associations. Numerous host plants of economic importance have been cited in Europe and North America, mainly ornamental, forest, horticultural and fine fruit plants. In Argentina, it causes damage to "strawberry" and "raspberry" (Lanteri et al., 2002; del Río et al., 2010). In Chile, it causes damage in fruit trees (Elgueta, 1993) such as "strawberry", "raspberry", "vine" and "blackberry" (Rosaceae).

Material studied. **Neuquén**. Plottier. Abandoned pear orchard (pitfall), 06-I-2017, (3 females); 03-II-2017, (1 female); 31-III-2017, (1 female). Bernardis-Gittins-López Armengol cols. (Table IV).

Tribe Sitonini

Sitona discoideus Gyllenhal

Common names. Alfalfa root weevil.

Geographic distribution. Native to southern Europe and northern Africa, introduced in North America, Australia, New Zealand, Tasmania, South Africa, Chile and Argentina: Río Negro. Neuquén is a new province record.

Feeding habits. Phytophagous.

Plant associations. It prefers legumes such as "alfalfa", other *Medicago* sp. and *Trifolium* sp. It is a pest of pastures in Australia and New Zealand.

Lifecycle. Larvae feed on roots and root nodules, resulting in stunting and yellowing of the plants due to nitrogen deficiency, adults feed on leaves, usually of the same plant species (del Río et al., 2019).

Material studied. **Neuquén**. Plottier. Spontaneous vegetation (pitfall), 06-I-2017, (1 female). Bernardis-Gittins-López Armengol cols. (Table IV).

Order Hymenoptera

Family Apidae

Subfamily Eucerinae

Tribe Emphorini

Diadasia pereyrae (Holmberg)

Geographic distribution. Neotropical. Uruguay and Argentina: Buenos Aires, Catamarca, Córdoba, Mendoza, Salta, San Juan, San Luis, Santiago del Estero and Tucumán (Moure, 2007). Río Negro is a new province record.

Biological comments. Pollinator. *Diadasia pereyrae* nests in the soil and has a solitary life behavior (Jørgensen, 1909). In Mendoza, Jørgensen (1909, 1912) reported that this species visited 32 plant species belonging to 11 families, including Asteraceae, Malvaceae, Convolvulaceae and Solanaceae.

Material studied. **Río Negro**. Campo Grande. Poplar shelterbelt (pitfall), 03-III-2017, (2 males). Abandoned pear orchard (pitfall), 03-III-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Table IV).

Subfamily Xylcopinae

Tribe Xylcopini

Xylcopa (Neoxylcopa) augusti Lepeletier

Geographic distribution. Neotropical. Southeastern Brazil, Chile, Paraguay, Uruguay and Argentina: Buenos Aires, Chaco, Corrientes, Córdoba, Entre Ríos, Formosa, Jujuy, La Pampa, Mendoza, Misiones, Río Negro, San Luis, Santa Fe and Tucumán (Lucia et al., 2014). Neuquén is a new province record.

Biological comments. Pollinator. This species nests in solid wood and has a parasocial life behavior (Lucia et al., 2017). *Xylcopa augusti* is a polilectic species, the presence of 18 pollen types from 11 families of brood cells of several artificial nests was recorded (Lucia et al., 2017). This species presents buzzing behavior to collect pollen and was recorded visiting eggplant crops (Álvarez et al., 2014).

Material studied. **Neuquén**. Plottier. Tomato (sweeping net), 03-II-2017, (1 female). Bernardis-Gittins-López Armengol, cols. (Table III).

Family Halictidae

Subfamily Halictinae

Tribe Halictini

Dialictus autranellus (Vachal)

Geographic distribution. Neotropical. Paraguay and Argentina: Buenos Aires (Dalmazzo et al., 2014). Río Negro is a new province record.

Biological comments. Pollinator. Species of *Dialictus* nest in the soil and present life habits from solitary to eusocial (Michener, 2007; Dalmazzo et al., 2014).

Material studied. **Río Negro**. Campo Grande. Tomato (pitfall), 03-III-2017, (1 female). Pepper (pitfall), 31-III-2017, (1 female). Bernardis-Gittins-López Armengol, cols. (Table III).

Tribe Caenohalictini

Pseudagapostemon (*Neagapostemon*) *singularis* Jörgensen

Geographic distribution. Neotropical. Argentina: Buenos Aires, La Rioja, Mendoza, Río Negro and San Luis (Dalmazzo et al., 2014). Neuquén is a new province record.

Biological comments. Pollinator. Species of *Pseudagapostemon* nest in the soil (Michener, 2007). Jörgensen (1912) reported this species on *P. alpataco* Phil.

Material studied. **Neuquén**. Plottier. Abandoned pear orchard (pitfall), 03-III-2017, (1 female). Pepper (pitfall), 31-III-2017, (2 females). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

Pseudagapostemon (*Pseudagapostemon*) *pampeanus* (Holmberg)

Geographic distribution. Neotropical. Brazil, Uruguay and Argentina: Buenos Aires, La Rioja, Neuquén, Río Negro, Salta and Santa Fe (Dalmazzo et al., 2014).

Biological comments. Pollinator. Species of *Pseudagapostemon* nest in the soil (Michener, 2007).

Material studied. **Neuquén**. Plottier. Tomato (pitfall), 03-III-2017, (1 female). **Río Negro**. Campo Grande. Tomato (pitfall), 06-I-2017, (1 female). Pepper (pitfall) (1 female). Bernardis-Gittins-López Armengol, cols. (Table III).

Family Vespidae

Subfamily Vespinae

Vespula germanica (Fabricius)

Geographic distribution. Native to the Palaearctic, and introduced in Australia, New Zealand, North America, South America, South Africa, Ascension Island, Madeira, Canary Islands and Iceland (Beggs et al., 2011). In Argentina it was registered by Willink (1980), and it is distributed from the north of the province of Mendoza to the south of the province of Tierra del Fuego and from the Andes to the Atlantic Ocean (Masciocchi & Corley, 2013; Sola et al., 2015).

Biological comments. Eusocial and with generalist predator behavior, it can negatively affect natural ecosystems and economic activities, including beekeeping, horticulture and tourism (Masciocchi & Corley, 2013).

Material studied. **Neuquén.** Plottier. Spontaneous vegetation (pitfall), 06-0I-2017, (3 males); 03-II-2017, (1 male); 31-III-2017 (1 male). Pepper (pitfall), 03-II-2017, (1 male); 03-III-2017, (1 male). Tomato (sweeping net), 03-III-2017; 31-III-2017 (1 male); (pitfall), 31-III-2017, (1 male). Poplar shelterbelt (sweeping net), 03-II-2017, (1 male); (pitfall), 31-III-2017 (1 male). **Río Negro.** Campo Grande. Poplar shelterbelt (pitfall), 31-III-2017, (1 male). Abandoned pear orchard (pitfall), 31-III-2017, (1 male). Bernardis-Gittins-López Armengol, cols. (Tables III and IV).

DISCUSSION

Among the species listed in the present work, 74% are herbivorous, of which 55% are pests, but within this percentage only 35% correspond to horticultural species and the rest to cereals and fruit trees. The remaining 45% of herbivorous species are not pests and can act as alternative prey for predator populations with interest for biological control. Among the non-herbivores (26%) three species are of interest for biological control and five for pollination. It is worth mentioning that only some of the insect families captured in the study are published in the present work. Even so, the species listed herein show the importance of the vegetation areas surrounding the crops. The predatory species were found mainly in the patches of vegetation with greater complexity in their structure since there are herbaceous, shrub and arboreal species (abandoned fruit orchard in the rural area and spontaneous vegetation patch in the peri-urban area), and which also present a greater number of species that represent a source of pollen and / or nectar for insects. Other studies analysing bees, true bugs, and carabids separately in each landscape confirmed that diversity patterns in mosaic agricultural landscapes are strongly determined by the interplay of species' dispersal abilities and landscape structure (Steffan-Dewenter & Tscharntke, 2002; Thomas, 2000). Something similar is observed with species that are pollinators. Floral resource availability is considered a major driving force that directly regulates the abundance and diversity of wild bees' communities (Potts et al., 2003; Roulston & Goodell, 2011).

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