

Rhingia nigra and *Eumerus obliquus* (Diptera: Syrphidae): first records in Argentina, and comments on range expansion of *Eumerus strigatus*

TORRETTA, Juan P.^{1,4,*} MAZA, Noelia² & BADO, Silvina G.³

¹ Cátedra de Botánica General, Facultad de Agronomía, Universidad de Buenos Aires. Ciudad Autónoma de Buenos Aires, Argentina.

² Cátedra de Zoología Agrícola, Facultad de Agronomía, Zootecnia y Veterinaria, Universidad Nacional de Tucumán, (FAZyV-UNT). Tucumán, Argentina.

³ EEA Chubut, Instituto Nacional de Tecnología Agropecuaria. Chubut, Argentina.

⁴ Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina.

*E-mail: torretta@agro.uba.ar

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Rhingia nigra* y *Eumerus obliquus* (Diptera: Syrphidae): primeros registros en Argentina y comentarios sobre la expansión del área de distribución de *Eumerus strigatus

RESUMEN. Se reporta por primera vez la presencia de dos especies de sírfidos en Argentina: la especie neotropical *Rhingia nigra* Macquart y la especie exótica *Eumerus obliquus* (Fabricius). Individuos de ambas especies fueron capturados en la provincia de Misiones. Además, otro individuo de *E. obliquus* fue criado a partir de un tallo en descomposición de *Austrocyliodropuntia subulata* (Cactaceae) en la provincia de Tucumán. Finalmente, se reporta la presencia de *Eumerus strigatus* (Fallén), en la provincia de Chubut, a más de 400 km al sudoeste de su registro más austral.

PALABRAS CLAVE. Especie exótica. Merodontini. Rhingiini.

ABSTRACT. Two species of syrphid flies are reported for the first time in Argentina: the neotropical *Rhingia nigra* Macquart and exotic *Eumerus obliquus* (Fabricius). Individuals of both species were captured in the province of Misiones. Moreover, another individual of *E. obliquus* was reared from a decaying stem of *Austrocyliodropuntia subulata* (Cactaceae) in the province of Tucumán. Finally, we report the presence of *Eumerus strigatus* (Fallén) in the province of Chubut, more than 400 km to southwest from its southernmost record.

KEYWORDS. Exotic species. Merodontini. Rhingiini.

Despite the high Neotropical biodiversity of flower flies or hoverflies (Diptera: Syrphidae), the knowledge about these attractive flies is poor compared to other regions of the world (Montoya et al., 2012). This is mainly due to the low number of faunistic studies (Marinoni & Thompson, 2004; Montoya et al., 2012). This state of affairs applies to Argentina as well. Of the few studies carried out on these flies, most are taxonomic studies (López-García et al., 2019a), their role as aphidophagous species (Greco, 1995; López-García & Maza, 2013; Maza, 2018; Díaz-Lucas et al., 2020; Maza et al., 2021), description of their immature stages (Maza 2018; López-García et al., 2019b, 2022) and their presence on Pampean agroecosystems

(Torretta et al., 2021a). Recently, Maza et al. (in press) compiled all the known information about the family in Argentina, citing 244 species represented in 64 genera in its four subfamilies; however, this figure may be higher. On the other hand, Torretta et al. (2021b) reported the presence of the exotic syrphid *Eumerus strigatus* (Fallén) (Eristalinae: Merodontini) and indicated the presence of four exotic, synanthropic species in Argentina: *Eristalinus taeniops* Wiedemann, *Eristalis tenax* (L.), *Syrpitta flaviventris* Macquart, as well as the onion pest *E. strigatus* (Thompson et al., 1990; Thompson, 1997; Mengual & de Soto Molinari, 2020; Torretta et al., 2021a, b). Here, we report the presence of two new records of flower flies in

Argentina: the neotropical species *Rhingia nigra* Macquart (Eristalinae: Rhingiini) and the exotic species *Eumerus obliquus* (Fabricius) (Eristalinae: Merodontini). One individual of the first species was captured near El Soberbio city (27°18' S, 54°12' W, Fig. 1), in the province of Misiones; while one specimen of the second species were captured near El Soberbio city (27°18' S, 54°12' W) and another one in near San Ignacio city (27°15' S, 55°32' W, Fig. 1), both localities in the province of Misiones. Moreover, one third individual was obtained in the locality of El Manantial, in the province of Tucumán (26°50' S, 65°19' W, Fig. 1). The studied specimens are deposited in the Entomological Collections of the following institutions: Cátedra de Botánica General (FAUBA), Facultad de Agronomía, Universidad de Buenos Aires, Argentina; the Museo Argentino de Ciencias Naturales Bernardino Rivadavia (MACN); and Cátedra de Zoología Agrícola, Facultad de Agronomía, Zootecnia y Veterinaria, Universidad Nacional de Tucumán, Argentina (FAZyV, UNT). The specimens were identified as belonging to the genera *Rhingia* Scopoli and *Eumerus* Meigen using the “Key to the genera of the flower flies (Diptera: Syrphidae) of the Neotropical Region” (Thompson, 1999). The map indicating the new and previous records of these species in Argentina was constructed using SimpleMappr (Shorthouse, 2010).

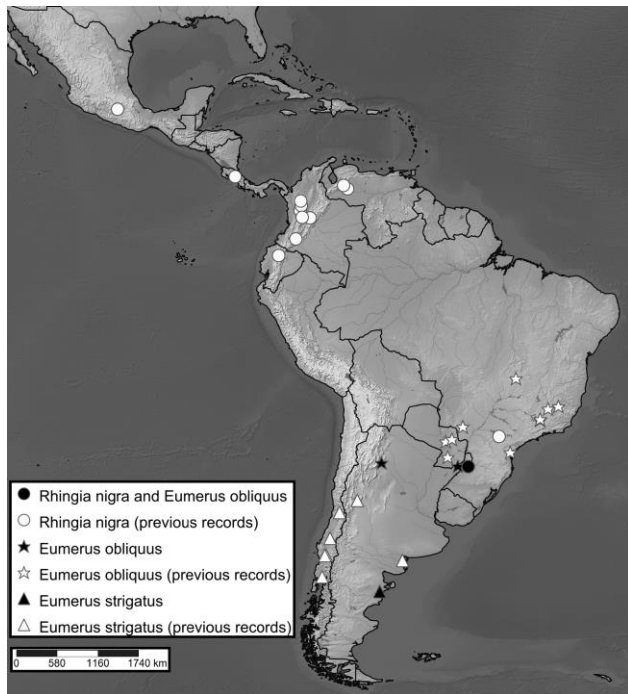


Fig. 1. Distribution of *Rhingia nigra* Macquart, *Eumerus obliquus* (Fabricius) and *E. strigatus* (Fallén) in Neotropics. Black symbols: new records, white symbols: previous records.

The genus *Rhingia* (Eristalinae: Rhingiini) is easily recognized by the face produced into a long porrect snout without tubercle and veins C and R4+5 ending well posterior to the wing apex (Fig. 2). Rhingiini is one of the most important tribes of the subfamily Eristalinae, and is mainly present in the Holarctic, Nearctic, Oriental,



Fig. 2. Lateral habitus of *Rhingia nigra* Macquart. The asterisk indicates long porrect snout and black arrow veins C and R4+5 ending well posterior to wing apex. Scale bar = 2 mm.

Afrotropical and Palearctic Regions (Ståhls et al., 2004), being *Rhingia* the only genus represented in the Neotropical Region with two species (Thompson et al., 2010). *Rhingia nigra* is reported in Mexico, Costa Rica, Colombia, Venezuela, Ecuador and Brazil (Montoya, 2016; Morales et al., 2014; Pape & Thompson, 2022), this being the first record from Argentina. For the determination at the specific level, we used the key for neotropical species of *Rhingia* (Thompson, 2006), and comparative note in Fluke's description of *R. longirostris* (Fluke, 1943).

New record

Rhingia nigra Macquart

Material examined. Argentina. **New record. Misiones:** Guaraní, El Soberbio, 1 female, 2-XI-2021, ex *Cucurbita* sp., J.P. Torretta (FAUBA).

The genus *Eumerus* (Eristalinae: Merodontini) is easily recognized by its M1 vein strongly bi-angulate, with an external spur, the cross vein *rm* apical to middle of the cell *DM*, and the tergites 2-4 with transverse white dusted markings (Fig. 3). In the Neotropic, the tribe Merodontini is represented by four genera. Four species of three of those genera are present in Argentina: *Alipumilio atesphatus* Thompson (Morales et al., 2009), *Nausigaster bonariensis* Lynch Arribálzaga, *N. flukei* Curran (Mengual & López García, 2015) and the exotic *Eumerus strigatus* (Torretta et al., 2021b). Here, we report *Eumerus obliquus* (Fabricius) for the first time for Argentina. This species is reported for Africa, Europe and the Middle East, and it has been introduced in Australia and South America (Garcete-Barrett et al., 2020, Pape & Thompson, 2022).

We used the “Key to the introduced species of *Eumerus* in the Americas and Hawaii” (Garcete-Barrett et al., 2020) to reliably determine the species. *Eumerus obliquus* is easily recognized by its scutellum, which has a narrow margin of short dense white setae, that are not present in all other species in the Neotropical region. Garcete-Barrett et al. (2020) alerted about the expansion of *Eumerus obliquus* (Fabricius) in the last 20 years, from Morretes, State of Paraná to other localities of Brazil and Paraguay.



Fig. 3. *Eumerus obliquus* (Fabricius). M1 indicates M1 vein strongly bi-angulate, black arrow cross vein rm apical to middle of the cell dm and dashed arrows white dusted marks in tergites 2-4. Scale bar = 2 mm.

Our records of this species in Misiones are extremely plausible, while the Tucumán record is far from previous records in the Neotropical Region (Fig. 1). The individual from Tucumán was reared in a wet, decaying stem of *Austrocylindropuntia subulata* (Muehlenpf.) Backeb. (Cactaceae), where it developed along with larvae of one species of *Copestylum* Macquart (Syrphidae: Eristalinae: Volucellini) and *Syrirta flaviventris* (Syrphidae: Eristalinae: Milesiini). Unlike *E. strigatus*, which immature stages feeds on living bulbs (onion [*Allium cepa*] and *Narcissus* spp., both Amaryllidaceae), and tubers (potato [*Solanum tuberosum*; Solanaceae]) (Speight et al., 2013; Ricarte et al., 2017), *Eumerus obliquus* were reared in Mallorca (España) from wet, decaying platyclades of introduced cacti *Opuntia maxima* (Cactaceae) (Ricarte et al., 2008). Our record agrees with this result, being both known host plant species belonging to Cactaceae; *Austrocylindropuntia subulata* is the first report for one host plant in the Neotropical Region, for this exotic and invasive syrphid species.

New record

Eumerus obliquus (Fabricius)

Material examined. Argentina. **New records. Misiones:** Guaraní, El Soberbio, 1 male, 4-XI-2021, J.P. Torretta (FAUBA); San Ignacio, San Ignacio, 1 female, 14-XII-2022, J.P. Torretta (MACN). **Tucumán:** Lules, El Manantial, 1 female, 24-III-2023, reared from *Austrocylindropuntia subulata*, N. Maza (FAZyV, UNT).

Finally, we report new records of *Eumerus strigatus* in the inferior valley of the Chubut river (province of Chubut; 43°21' S, 65°33' W, Fig. 1). In this site, we studied the assemblage of entomophilous insects associated to cultivated flower rows (four species of *Glandularia* [Verbenaceae] and one species of *Nierembergia* [Solanaceae]) in an agroecological orchard. We used colored (blue and yellow) sticky card traps, a technique that is commonly used to study syrphids in agroecosystems (Sutherland et al., 2001). In this agroecological orchard, horticultural crops such as tomatoes (*Solanum lycopersicum* L.), eggplant (*Solanum*

melongena L.), pepper (*Capsicum* sp.), uchuva (*Physalis peruviana* L.; all Solanaceae), sunflower (*Helianthus annuus* L.; Asteraceae), maize (*Zea mays* L.; Poaceae), kale (*Brassica oleracea* var. *sabellica* L., Brassicaceae) and pumpkin (*Cucurbita maxima* Duchesne; Cucurbitaceae) are grown. Note must be taken, however, that onions were not grown at this farm, and we do not know if there were onion being grown close to our sampling site. As a result of this field work, we captured four individuals of *E. strigatus* (three females and one male). Unfortunately, this last individual was destroyed when it was detached from the sticky trap.

Recently, this exotic pest was registered for the first time for Argentina (Torretta et al. 2021b). It was found in two distant sites (Pocito [31°39' S, 68°25' W], province of San Juan and Villalonga [40°03' S, 62°29' W], province of Buenos Aires, Fig. 1) associated with onion crops. In this work, we report this species in a locality more than 400 km southwest from its southernmost recorded site. These three localities, in which the species is now known to occur, belong to the Monte ecoregion of Argentina, and have similar climatic conditions (Roig et al., 2009; Morrone, 2014; Arana et al., 2017). Our finding suggests that the species could be established in other parts of the country and that control should be strengthened, particularly in areas of high productivity with target crops, such as onion and garlic. As proposed by Torretta et al. (2021b), we emphasize the importance of monitoring the presence of *Eumerus strigatus* due to its potential impact on important horticultural crops, and we have informed local authorities (Sistema Nacional de Vigilancia y Monitoreo de Plagas: communication 1235, 5-V-2023) of the need to expand the detection of this species in the country.

In conclusion, here we upgrade to 65 the genera, and to five the exotic species of Syrphidae in Argentina.

New record

Eumerus strigatus (Fallén)

Material examined. Argentina. **New records. Chubut:** Inferior valley of the Chubut river, 1 female, 28-XII-2021, in blue sticky card trap, S.G. Bado (FAZyV, UNT); 2 females and 1 male, 6-IV-2022, in yellow sticky card trap, S.G. Bado (FAZyV, UNT).

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REFERENCES

- Arana, M.D., Martinez, G.A., Oggero, A.J., Natale, E.S., & Morrone, J.J. (2017). Map and shapefile of the biogeographic provinces of Argentina. *Zootaxa*, **4341(3)**, 420-422.

- Díaz-Lucas, M.F., Passarelli, L.M., Aquino, D.A., Maza, N., Greco, N.M., & Rocca, M. (2020). Spatio-temporal variation of predatory hoverflies (Diptera: Syrphidae) and their relationship with aphids in organic horticultural crops in La Plata, Buenos Aires. *Revista de la Sociedad Entomológica Argentina*, **79(4)**, 15-22.
- Fluke, C.L. (1943). A new genus and new species of Syrphidae (Diptera) from Ecuador. *Annals of the Entomological Society of America*, **36(3)**, 425-431.
- Garcete-Barrett, B., Morales M.N., Hauser, M., Smit, J.T., González, L., Ramírez De López, M.B., Arias, O., Adorno, M. Sormanti, G., & Mereles, A. (2020). New geographical records and key to the species of *Eumerus* Meigen, 1823 (Diptera, Syrphidae) introduced into the Americas and Hawaii. *Revista Brasileira de Entomologia*, **64(1)**, e20190016.
- Greco, C.F. (1995) Fenología y selección de hábitat de las especies de sírfidos afidófagos (Dipt.: Syrphidae) más frecuentes en cultivos cerealeros y forrajeros en la provincia de Buenos Aires, Argentina. *Entomophaga*, **40(3-4)**, 317-320.
- López-García, G., Barahona-Segovia, R.M., Maza, N., Domínguez, M.C., & Mengual, X. (2019a). Filling gaps in flower fly distributions: first record of *Aneriophora aureorufa* (Philippi, 1865) (Diptera, Syrphidae) from Argentina. *Check List*, **15(3)**, 249-255.
- López-García, G. & Maza, N. (2013) Lista de sírfidos afidófagos y primeros registros de *Pseudodoros clavatus* y *Eupeodes rojasi* (Diptera: Syrphidae), potenciales agentes de control biológico en la provincia de Mendoza, Argentina. *Revista de la Sociedad Entomológica Argentina*, **72**, 237-240.
- López-García, G.P., Reemer, M., Debandi, G., & Mengual, X. (2019b). New information about the third stage larva and larval habitat of *Microdon (Chymophila) bruchi* Shannon, 1927 (Diptera, Syrphidae) from Argentina. *Journal of Natural History*, **53(45-46)**, 2833-2853.
- López-García, G.P., Roig-Juñet, S.A., Pérez-Bañón, C., Mazzitelli, E., Montoya, A.L., Rojo, S. & Mengual, X. (2022). Description of the third-stage larva and puparium of *Platycheirus (Carposcalis) chalconota* (Philippi) (Diptera: Syrphidae) with new information about the trophic interactions and larval habitats. *Neotropical Entomology*, **51**, 81-98.
- Marinoni, L., & Thompson, F.C. (2004). Flower flies of southeastern Brazil (Diptera: Syrphidae). Part I. Introduction and new species. *Studia dipterologica*, **10**, 565-578.
- Maza, N. (2018) Potencialidad de sírfidos (Diptera: Syrphydae) como agentes de control biológico de plagas en cultivos de pimiento en invernadero. Tesis Doctoral. Facultad de Agronomía y Zootecnia. Universidad Nacional de Tucumán. Argentina.
- Maza, N., López-García, G.P., Mengual, X. (*in press*). Syrphidae. *Biodiversidad de Artrópodos Argentinos, vol. VI* (ed. Claps, L.E., Roig-Juñet, S., & Morrone, J.J.). Editorial INSUE-UNT, San Miguel de Tucumán, Argentina.
- Maza, N., Kirschbaum, D.S., Núñez-Campero, S.R., Reguilón, C., & Jaime, A.P. (2021) Seasonality, richness and abundance of syrphid flies in greenhouse pepper agroecosystem. *International Journal of Tropical Insect Science* **42**, 479-493.
- Mengual, X., & de Soto Molinari, C. (2020) First record of the genus *Syritta* Le Peletier & Audinet-Serville, 1828 (Diptera, Syrphidae) from the West Indies. *Check List*, **16(4)**, 991-995.
- Mengual, X. & López-García, G.P. (2015). First records of *Nausigaster flukei* (Diptera: Syrphidae) from Argentina. *Check List*, **11(6)**, 1816.
- Montoya, A.L., Pérez, S.P., & Wolff, M. (2012). The diversity of flower flies (Diptera: Syrphidae) in Colombia and their Neotropical distribution. *Neotropical Entomology*, **41(1)**, 46-56.
- Montoya, A.L. (2016). Family Syrphidae. *Zootaxa*, **4122**, 457-537. <http://doi.org/10.11646/zootaxa.4122.1.39>
- Morales, J., González, R., & Arcaya, E. (2014). Especies de Eristalinae (Diptera: Syrphidae) presentes en estados del centro-occidente de Venezuela. *Bioagro*, **26(1)**, 63-68.
- Morales, M.N., Massardo, D., Moreira, G.R. & Thompson, F.C. (2009). A new species of *Alipumilio* Shannon (Diptera, Syrphidae) found in association with the exudate resin of *Schinus terebinthifolius* Raddi (Anacardiaceae). *Zootaxa*, **2112(1)**, 53-64.
- Morrone, J.J. (2014) Biogeographical regionalisation of the Neotropical region. *Zootaxa*, **3782(1)**, 1-110. <https://doi.org/10.11646/zootaxa.3782.1.1>
- Pape, T., & Thompson, F.C. (eds) (2022). Systema Dipterorum (version 2.0, Jan 2011). In: Species 2000 & ITIS Catalogue of Life, 2016 Annual Checklist (Roskov Y., Abucay L., Orrell T., Nicolson D., Flann C., Bailly N., Kirk P., Bourgoin T., DeWalt R.E., Decock W., De Wever A., eds). Digital resource at www.catalogueoflife.org/annual-checklist/2016. Species 2000: Naturalis, Leiden, the Netherlands. ISSN 2405-884X.
- Ricarte, A., Marcos-García, M.Á., & Rotheray, G. (2008). The early stages and life histories of three *Eumerus* and two *Merodon* species (Diptera: Syrphidae) from the Mediterranean region. *Entomologica Fennica*, **19(3)**, 129-141.
- Ricarte, A., Souba-Dols, G.J., Hauser, M., & Marcos-García, M.A. (2017). A review of the early stages and host plants of the genera *Eumerus* and *Merodon* (Diptera: Syrphidae), with new data on four species. *PLoS One*, **12**, e0189852.

- Roig, F.A., Roig-Juñent, S. & Corbalán, V. (2009) Biogeography of the Monte desert. *Journal of Arid Environments*, **73**, 164-172.
- Shorthouse, D.P. (2010) SimpleMappr, an online tool to produce publication-quality point maps. Available at: <https://www.simplemappr.net> [accessed Dec 20, 2022].
- Speight, M.C.D., Hauser, M., & Withers, P. (2013). *Eumerus narcissi* Smith (Diptera, Syrphidae), presence in Europe confirmed, with a redescription of the species. *Dipterists Digest*, **20**, 17-23.
- Ståhls, G., Stuke, J. H., Vujic, A., Doczkal, D., & Muona, J. (2004). Phylogenetic relationships of the genus *Cheilosia* and the tribe Rhingiini (Diptera, Syrphidae) based on morphological and molecular characters. *Cladistics*, **20(2)**, 105-122.
- Sutherland, J. P., Sullivan, M. S., & Poppy, G. M. (2001). Distribution and abundance of aphidophagous hoverflies (Diptera: Syrphidae) in wildflower patches and field margin habitats. *Agricultural and forest Entomology*, **3(1)**, 57-64.
- Thompson, F.C. (1997) Revision of the *Eristalis* flower flies (Diptera: Syrphidae) of the Americas South of the United States. *Proceedings of the Entomological Society of Washington*, **99**, 209-237.
- Thompson, F.C. (1999). A key to the genera of the flower flies (Diptera, Syrphidae) of the Neotropical Region including descriptions of new genera and species and a glossary of taxonomic terms used. *Contributions on Entomology International*, **3**, 321-378.
- Thompson, F.C. (2006) Primer taller de identificación de Syrphidae del Neotrópico. Universidad del Valle, Facultad de Ciencias, Cali, Colombia.
- Thompson, F.C., Fee, F.D., & Berzark, L.G. (1990) Two immigrant synanthropic flower flies (Diptera: Syrphidae) new to North America. *Entomological News*, **101(2)**, 69-74.
- Thompson, F.C., Rotheray, G.E. & Zumbado, M.A. (2010). Syrphidae (Flower flies). Manual of Central American Diptera. Vol. 2. (Ed. Brown, B.V., Borkent, A., Cumming, J.M., Wood, D.M., Woodley, N.E., & Zumbado, M.A.), pp. 763-792. NRC Research Press, Ottawa.
- Torretta, J.P., Haedo, J.P., Allasino M.L., & Marrero H.J. (2021a). First records of the phytophagous *Eumerus strigatus* (Fallén) (Diptera: Syrphidae: Syrphinae: Merodontini) in Argentina. *Revista de la Sociedad Entomológica Argentina*, **80(1)**, 93-95.
- Torretta, J.P., López, M.C., & Marrero H.J. (2021b). Las moscas de las flores (Diptera, Syrphidae) en agroecosistemas pampeanos: un caso de estudio. *Revista de la Sociedad Entomológica Argentina*, **80(2)**, 23-34.