

Exaireta spinigera (Wiedemann, 1830) (Diptera: Stratiomyidae) in Belgium

Elias de Bree, Jonas Mortelmans & Steven Vantieghe

Abstract. The soldier fly *Exaireta spinigera* (Wiedemann, 1830) is reported for the Belgian fauna. The native range of the species is Australia (Woodley 2001). Sightings of *E. spinigera* in Belgium since the first records in 2013 have increased markedly and the species has spread from the city of Gent to the coast.

Samenvatting. De wapenvlieg *Exaireta spinigera* (Wiedemann, 1830) wordt hier gemeld voor de Belgische fauna. De soort komt oorspronkelijk uit Australië (Woodley 2001). Sinds de eerste vondst in 2013 wordt de soort veelvuldig waargenomen en heeft ze haar verspreiding verder uitgebreid van de stad Gent tot aan de kust.

Résumé. Le diptère *Exaireta spinigera* (Wiedemann, 1830) est signalé pour la faune belge. L'aire de répartition indigène de l'espèce est l'Australie (Woodley 2001). Les observations d'*E. spinigera* depuis les premiers enregistrements en 2013 ont considérablement augmenté et l'espèce s'est propagée de la ville de Gand vers la côte.

Key words: *Exaireta* — Expansion range — Introduced species.

de Bree E.: Amsterdam, the Netherlands. ectemnius@gmail.com

Mortelmans J.: Gent, Belgium. jonasmortelmans@gmail.com

Vantieghe S.: Gent, Belgium. steven.vantieghe@telenet.be

DOI: 10.6084/m9.figshare.19123277

Introduction

Exaireta spinigera (Wiedemann, 1830) is a large and conspicuous soldier fly (Diptera: Stratiomyidae) that is expanding its range globally, aided by man. Here we report the species new for the fauna of Belgium, as well as a considerable expansion of the range since its first appearance.

Material examined

1 ♂, Wenduine, Verkaveling (51.301, 3.088), 27.viii.2020, leg. S. Stevens, det. col. E. de Bree.

1 ♀, Wenduine, Verkaveling (51.301, 3.088), 9.viii.2020, leg. S. Stevens, det. col. E. de Bree.

Furthermore, all photographs on the citizen science platform www.waarnemingen.be were validated by the first two authors in order to obtain insight in the dispersion of this species.

Identification

Exaireta is readily identified due to the combination of the following characters: four large scutellar spines, bare eyes, a large size (oft exceeding 10mm), the shiny black thorax and the obvious black markings in the wing and long pale hairs on the subscutellum. Researchers using European keys for identification of *Exaireta* will end up with *Actina viridis* (Say, 1824); which is only 5 mm in size (10 mm in *Exaireta*) and has a green/blue metallic thorax (in contrast to the big and blackish thorax in *Exaireta*). *Exaireta* contains only two species (Woodley 2001), being *E. spinigera* and *E. siliacea* White, 1916. *Exaireta siliacea* can be distinguished from *E. spinigera* by the absence of wing markings and longer antennae (Hardy 1960).

Exaireta spinigera is a conspicuous large and black fly (Fig. 1). Despite its striking appearance, *Exaireta* is often identified as a *Xylota* Meigen, 1822 (Diptera: Syrphidae) on citizen science platforms such as iNaturalist or waarnemingen.be. It's elongated body and black femora with tibia pale in basal quarter makes it superficially similar. Also, its hovering behaviour is reminiscent of Syrphidae. *Xylota* have, however, more thickened hind femora with spines ventrally which are lacking in *Exaireta*.

The collected specimens available to us have a couple of remarkable features differentiating the sex. The space between the eyes is equal in both sexes. The male specimen has golden hairs on the scutum, and the abdomen is slightly constricted in the middle. The female has silver hairs on the scutum, and the abdomen is parallel sided.

Distribution

Exaireta spinigera is originally an Australian species but was introduced to New Zealand and Hawaii (Woodley 2001). The species is long established in Hawaii, with the first record being from 1890 and being classified as common by 1900 (Hardy 1960). The first records outside the tropics are from the United States in 1985 (Swann *et al.* 2006). The first specimen in Europe trace back to a record in 2008 from France (Lapeyre & Dauphin 2008). After that the first specimen is a Belgian specimen from 2013. Its expansion seems to accelerate with many records from Italy (Schifani & Paolinelli 2018) and Belgium increasing from 2016 onwards (Fig. 2). In 2018, records from an urban area along the black sea coast in Russia were published (Nartshuk *et al.* 2020).

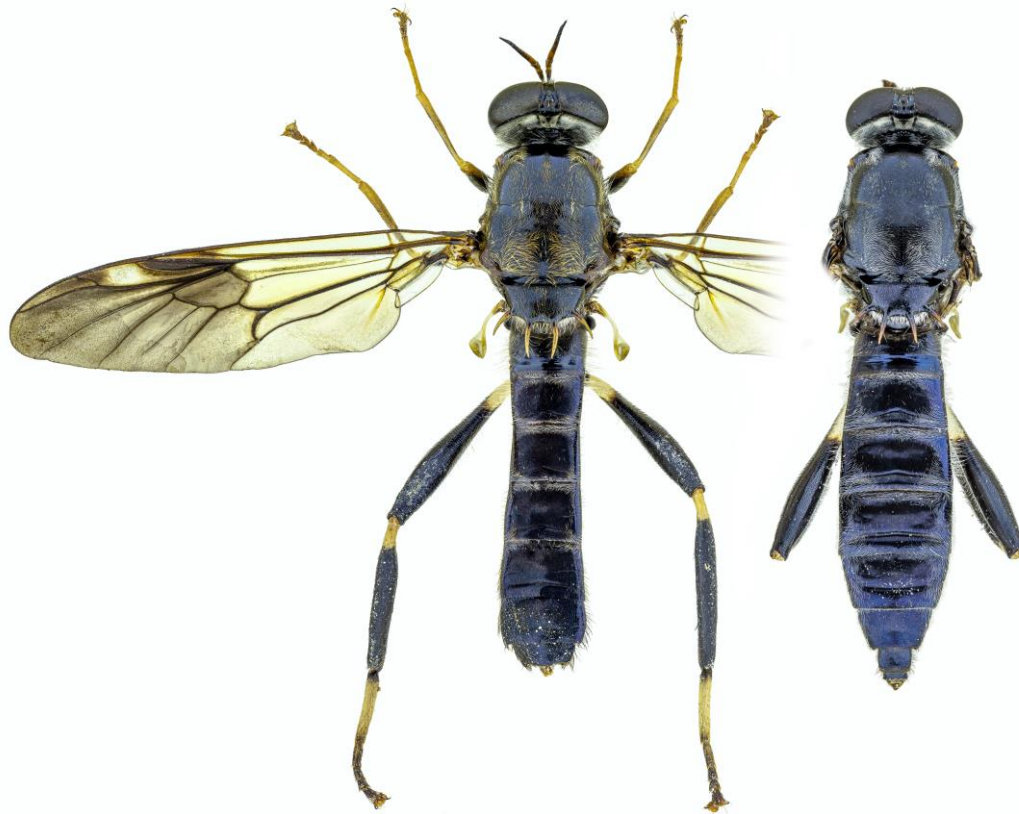


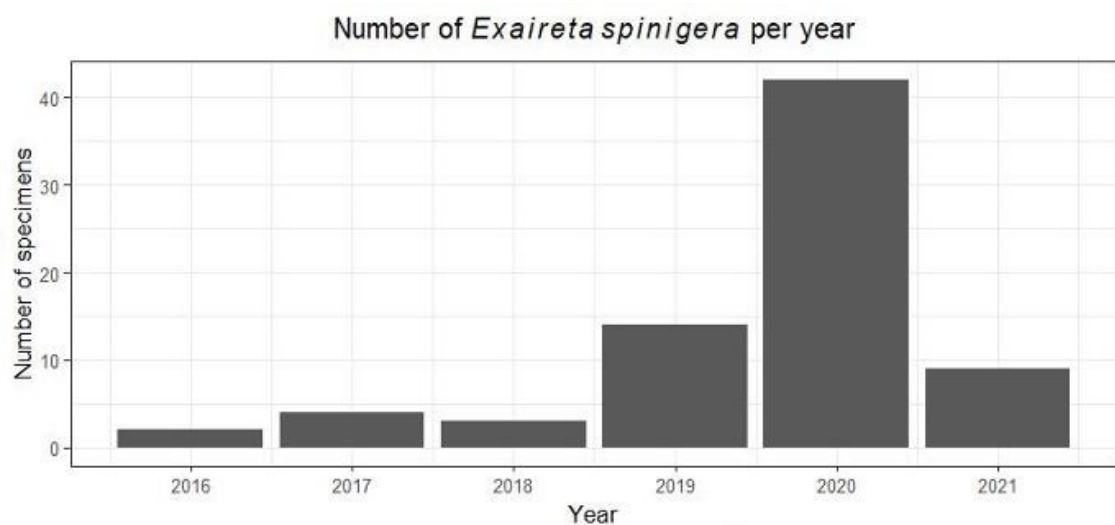
Fig. 1. Habitus of *Exaireta spinigera*, left the male (with wings) right the female from Weduine 27.viii.2020 and 9.VIII.2020 respectively. © Rik Delhem.

Biology

Larvae develop in organic decaying matter (Woodley 1995). Garden compost is probably an excellent breeding medium for the larvae of *Exaireta spinigera*. No larval descriptions are available of *E. spinigera* however, large *Beridinae* larvae found in garden compost in Europe are

worth breeding to confirm its identity as *E. spinigera*. *Exaireta spinigera* is probably polyvoltine as the flight period in Belgium is from April to November.

Adults are able to hover, like *Syrphidae*, and walk across leaves in a manner similar to *Xylota* sp. Noteworthy is the fact that quite a lot of observations are of adults attracted to light at night.



(based on validated data from www.waarnemingen.be)

Fig. 2. Records in time of *Exaireta spinigera* in Belgium, based on validated data from www.waarnemingen.be [the year 2021 was only validated until May and is not representative].

Discussion

Two alien species of Stratiomyidae are rapidly expanding in Europe. *Hermetia illucens* (Linnaeus, 1758) has recently been found in both the Netherlands and Belgium (Smit *et al.* 2019, Limbourg, P. pers. com.) and *Exaireta* is now established and expanding its range in Belgium (Fig. 3). As the larval habitat is garden compost the species seems to be restricted to urban habitats. The species can certainly be expected to be found in the Netherlands in the coming years. The closest find in Belgium is 8 kilometres from the Dutch/Belgian border.

Remarkable to these discoveries, as Schifani & Paolinelli (2018) mention for Italy, is the fact that all observations of both *Exaireta* and *Hermetia* have been published via citizen science platforms and identified by experts afterwards. Online platforms as waarnemingen.be have been, in the case of *Exaireta*, able to track the spread of this species in the country very well. It is to be expected that *Exaireta* will be found in a likewise manner in the Netherlands, most likely on waarneming.nl. Unfortunately, it's unclear what impact yet another alien species has on the indigenous fauna of Europe. For now, the species is restricted to urban habitat.

Acknowledgements

Rik Delhem for making the excellent photo of the two Belgian collected specimens. Part of the specimens in this paper were validated from the website www.waarnemingen.be, a website for nature information from Natuurpunt, Natagora and Stichting Natuurinformatie. These records cannot be duplicated without prior consent of Natuurpunt.

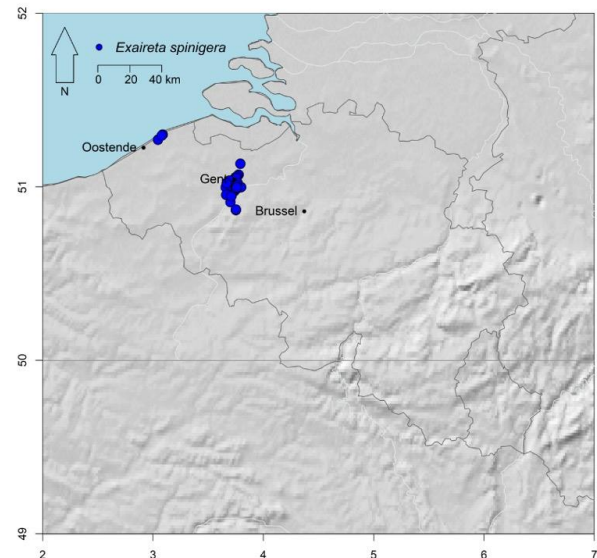


Fig. 3. Distribution map of *Exaireta spinigera* in Belgium.

References

- Hardy G. H. 1920. Australian Stratiomyidae. — *Papers and Proceedings of the Royal Society of Tasmania* **1920**: 33–64.
- Hardy D.E. 1960. *Diptera: Nematocera-Brachycera (except Dolichopodidae)*. *Insects of Hawaii* **10**. — University of Hawaii Press, Honolulu, Hawaii, ix+368 pp.
- Lapeyre R. & Dauphin P. 2008. Présence en France d'*Exaireta spinigera* (Wiedemann) (Diptera Stratiomyidae). — *Bulletin de la Société linnéenne de Bordeaux* **36**: 257–258.
- Nartshuk E. P., Khachikov E. A. & Poushkova S. V. 2020. Two alien species of soldier flies (Diptera: Stratiomyidae) on the Black sea coast of Russia. — *Russian Journal of Biological Invasion* **4**: 114–123 [in Russian].
- Smit J., Zeegers T. & Cramer T. 2019. Exotische zwarte soldatenvlieg *Hermetia illucens* duikt op in Nederland (Diptera: Stratiomyidae). — *Nederlandse Faunistische Mededelingen* **53**: 11–16.
- Schifani E. & Paolinelli R. 2018. Forums and social media help to discover exotic species in Europe and monitor their spread: the case of *Exaireta spinigera* (Wiedemann, 1830) (Diptera, Stratiomyidae) in the Italian peninsula and Sicily. — *Graellsia* **74**(2): 1–4.
- Swann J. E., Kenner R. D., Cannings R. A. & Copely C. R. 2006. *Exaireta spinigera* (Diptera: Stratiomyidae): the first published North American records of an Australian soldier fly. — *Journal of the Entomological Society of British Columbia* **103**: 71–72.
- Woodley N. E. 1995. The Genera of Beridinae (Diptera: Stratiomyidae). — *Memoirs of the Entomological Society of Washington* **16**: 1–231.
- Woodley N. E. 2001. *A world catalog of the Stratiomyidae (Insecta: Diptera)*. — North American Dipterists' Society, Washington D.C., 475 pp.