

New records of the velvet ant *Mutilla europaea* (Linnaeus, 1758) (Hymenoptera, Mutillidae) on Öland, Sweden

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This paper presents all the known records of the velvet ant *Mutilla europaea* (Linnaeus, 1758) on Öland, Sweden. The six new records from 2014 until 2020 might indicate that it is either increasing or has previously been overlooked. Thus, it is not extinct from the island that was previously feared.

Key words: Hymenoptera, Mutillidae, *Mutilla europaea*, records, localities, Öland, Sweden.

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Introduction

Mutilla europaea (Linnaeus, 1758), the velvet ant, can be found in different types of habitats such as moors and dry meadows (Artfakta 2020). The velvet ant is a parasitic hymenopteran that lays eggs in bumblebee nests. The larvae are enclosed in a package (cocoon, puparium, cell, ootheca) and do not actively feed (Brothers et al. 2000) until after they make their way out of the nest as fully-grown adults. In Sweden, most records are from the western parts, from south of Gothenburg up to the Norwegian border, but they have also been found on Gotland in the Baltic Sea (Artfakta 2020). In recent decades, *Mutilla europaea* has declined in number in Sweden and it has also disappeared from many known localities, including Öland where it was thought to be extinct (Gårdenfors 2010). The primary reason for this decline is that many habitats have overgrown, but there may also be an indirect negative effect resulting from the declining populations of bumblebees (Artfakta 2020), which itself can be attributed to anthropogenic effects such as climate change, habitat destruction and pesticides (Andrew-Nielsen 2016). However, there are six new records of *M.*

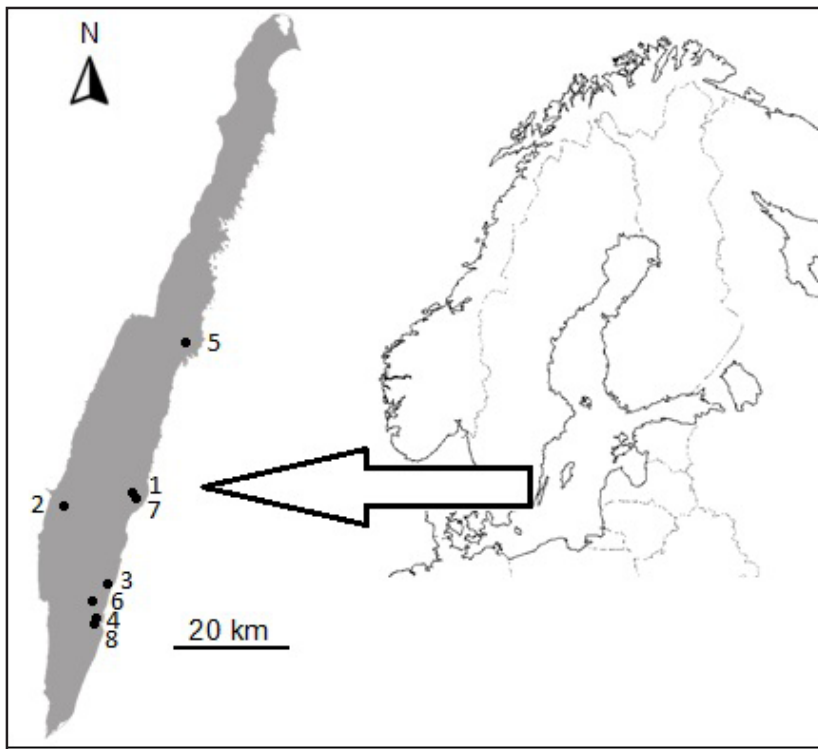
europaea on Öland, which might indicate that its range is increasing or that its presence has been overlooked.

Material and methods

To find locality information for *M. europaea* on Öland, literature searches were performed using the Artportalen database (Artdatabanken 2020). Professional entomologists at museums were also contacted about older records and specimen in their collections. An insect survey was made in Gårdby (on the eastern coast of Öland) on 7 September 2018 with a team of 12 people in total. Insects were collected by hand with hand nets and identified either in the field or back at the laboratory with microscopes. Field surveys were made of all known localities where *M. europaea* had been found on Stora Alvaret (in southern Öland). The localities were investigated three times, once in the early summer on 7–8 June, once in the high summer on 11–13 July and once in the late summer on 8–10 August. The specific aim of finding more individuals of *M. europaea*. A non-fixed transect of 800m ± 100m was used to make

Table 1. Known records of *Mutilla europaea* (Linnaeus, 1758) on Öland, Sweden.

Locality	Date	Coordinates
1. Gårdby, Gårdby	25.VIII.1949	56°36'09.0"N 16°38'28.0"E (±1000m)
2. Vickelby, Vickelby	26.VII.1958	56°35'31.0"N 16°27'55.0"E (±1000m)
3. Hulterstad, Hulterstad	30.V.2014	56°26'35.5"N 16°33'58.6"E (±250m)
4. Kvarnhagen, Mellby	25.VII.2014	56°23'26.0"N 16°32'36.8"E (±100m)
5. Kläppinge Öland, Kläppinge	13.VII.2016	56°50'25.2"N 16°48'52.8"E (±50m)
6. NV rastplatsen, Skärlov	1.VI.2018	56°25'21.8"N 16°31'56.6"E (±25m)
7. S Näsby, Gårdby	7.IX.2018	56°35'09.0"N 16°39'44.2"E (±100m)
8. Mellby, Mellby	7.VI.2020	56°23'23.5"N 16°32'35.9"E (±10m)

**FIGURE 1.** Map of known localities of *Mutilla europaea* (Linnaeus, 1758) on Öland, Sweden. See Table 1 for location names.

the investigations as similar as possible in each of the localities. All individuals of *M. europaea* was identified in the field. The survey included all known localities of *M. europaea* except Kläppinge (Figure 1). This was excluded because the record is from an urban garden on private property furthermore the area is also too small for a proper transect.

Results

Two specimens of *Mutilla europaea* were found in the collections at the Swedish Museum of Natural History in Stockholm: one male from Gårdby (collected on 25 August 1949) and one female from Vickelby (collected on 26 July 1958). The record from Gårdby is the only known record of

a male on Öland. No other known specimen from Öland exists in any other Swedish collections. In addition to the Stockholm specimens, a note was found at the Lund Zoological Museum written by former insect curator Roy Danielsson listing another possible record from Öland. Accordingly, there are eight confirmed records of *M. europaea* from Öland so far (plus an additional sighting by Danielsson), from six different localities (the Danielsson sighting had no further locality data) (Table 1, Figure 1).

Discussion

The number of observations of *M. europaea* in Sweden compared to other hymenopterans indicates a stabile population. Today the species is categorized as LC (Least Concern) in the country for the first time in at least 20 years (Artfakta 2020). In Norway, the velvet ant is still listed as NT (Near Threatened) (Artsdatabanken 2020). Records of this species are usually single and scattered observations, possibly connected to this species' life history. It is difficult for females to find suitable host nests, which are generally scattered and often concealed (Brothers et al. 2000). Furthermore, it is not easy for females to penetrate these enclosures to lay their eggs, and only a few adults successfully reproduce. The female is unable to fly, which easily limits the range to small and isolated populations (Artfakta 2020). It is not known whether the species has lived in small populations on Öland without our knowledge or whether it has recolonized the island. However, this species is only known from two localities on the eastern coast of the mainland (Svartmåla in Småland, 56°42'57.5"N 15°57'50.2"E, 2009 and Torhamn in Blekinge, 56°05'59.5"N 15°47'23.9"E, 1996) (Artdatabanken 2020). It is therefore more likely that *M. europaea* has simply been mostly overlooked on Öland in the last 50 or so years, but more research is needed to confirm this.

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