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First records of *Scaeva dignota* Rondani, 1857 (Diptera Syrphidae) in Belgium : a species for the future?

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Summary

The syrphid species *Scaeva dignota* (RONDANI, 1857) can be added to the Belgian fauna list. This species has been observed for the first time in Belgium in 2002, and again in 2003. Also in other West and North West European countries *S. dignota* is a recent newcomer. In Northwestern Europe, many observations originate from anthropogenic environments. Presumably, *S. dignota* is a vagrant from the Mediterranean region, and its occurrence in Northwestern Europe is possibly linked to exceptionally warm summer temperatures. If this is true, we expect that *S. dignota* will probably show up more regularly in the future.

Keywords : Scaeva dignota, Belgian fauna, Syrphidae, Hoverfly, Climate change

Samenvatting

De zweefvliegensoort *Scaeva dignota* (RONDANI, 1857) kan worden toegevoegd aan de Belgische faunalijst. Deze soort werd in 2002 op drie verschillende locaties verzameld en in 2003 is er reeds opnieuw een waarneming. Ook in onze buurlanden werd *S. dignota* de laatste jaren als nieuwkomer voor de fauna vastgesteld. De soort is hoogstwaarschijnlijk een migrant vanuit de Mediterrane regio, en wordt vaak gemeld uit omgevingen met een antropogene invloed. Het voorkomen van deze soort in Noordwest-Europa is mogelijk gelinkt aan warme zomers. Hoogstwaarschijnlijk zal *S. dignota* in de toekomst meer en meer in ons land opduiken.

Résumé

L'espèce *Scaeva dignota* (RONDANI, 1857) peut être ajoutée à la liste des Syrphides de Belgique. En 2002, cette espèce a été attrapée à trois endroits différents en Belgique. Une autre observation est également rapportée en 2003. Récemment, *S. dignota* a aussi été rencontrée pour la première fois dans les pays limitrophes. Cette espèce est probablement un migrateur venu du Sud; elle est souvent rencontrée dans des milieux à forte pression anthropogénique. L'apparition de cette espèce en Europe du Nord-Ouest est éventuellement liée aux étés chauds. Il est probable que dans le futur, *S. dignota* sera de plus en plus fréquente en Belgique.

Introduction

Sometimes the biggest surprises come when and where you expect them the least. On the 24th of June 2002 I noticed a syrphid that had trapped itself inside my house (in the center of Leuven, Province of Vlaams-Brabant) and was flying nervously against the glass roof of our veranda. I caught it to set it free but then was surprised with its unfamiliar appearance. After identification it turned out to be a male of *Scaeva dignota*, a species so far unknown for the Belgian fauna. Only two weeks later, I collected another specimen of *S. dignota* at St. Niklaas (Province of Oost-Vlaanderen, female) on 7 July 2002. However, the first Belgian record of *S. dignota* goes back to 14 June 2002, when a male was captured in Anlier (Province of Luxemburg).

Description of the localities

The observation in Leuven was done inside a house. The door through which the specimen presumably had entered the house is exposed to the West. Just in front of the door, there is a small garden containing flowering plants such as marguerites (*Chrysanthemum parthenium*), Surfinia (*Petunia sp.*) and roses (*Rosa sp.*). The garden is completely surrounded by houses and situated in the eastern part of the agglomeration of Leuven. The observation at St. Niklaas was a *S. dignota* female trapped on 7 July 2002. This specimen was hovering above a glass of orange juice and caught in the air by hand. This locality is situated near the big square of St. Niklaas and is a small herb- and flowerless concrete open area in between houses. The observation from Anlier is from a southerly exposed garden. A male of *S. dignota* was caught here on *Petunia sp.* flowers on 14 June 2002. On 25 June 2003, a male *S. dignota* has been caught in Anlier on *Verbena sp.* on the same spot.

Identification of *S. dignota*

We will describe here morphological features that aid to the identification of *S. dignota*. The description is based on the specimens collected at Leuven (24-VI-2002, male) and St. Niklaas (7-VII-2002, female). Quantitative characteristics are compared to *S. selenitica* of my own collection (*S. selenitica* male: June 1997 Bonheiden, *S. selenitica* female: June 1997 Bonheiden). All measurements are done with an OLYMPUS SZX12 stereomicroscope (20x magnification).

Both specimens show the typical characteristics of the genus *Scaeva* namely the hairy eyes and the swollen dark-haired frons. The size of the ommatidia is distinctively larger on the anterodorsal side of the eyes than on other parts of the eyes (excluding *S. mecogramma*). The hairs on the eyes measure about 0.12 mm in length in the male and 0.07 mm in the female (0.20 mm and 0.09 mm in *S. selenitica* respectively). This is in accordance with REEMER (2000), who states that the hairs on the eyes are typically longer in *S. selenitica*, however, the hair lengths we observed are smaller than indicated by REEMER (0.09 mm for *S. dignota* and 0.12 in *S. selenitica*). The angle between the eyes is about 105° in the male (>135° in *S. selenitica*, see Fig. 1). The frons of the male is only slightly swollen, much less than in *S. selenitica*. In the female, the frons is flat to even slightly concave (convex in *S. selenitica*). The proportion of the facial width to the total head width (both measured at the base of the antennae) equals 0.44 in the male and 0.42 in the female

Fig. 1. Frontal view of the heads of males *Scaeva dignota*, Leuven 24.VI.2002 (up) and *Scaeva selenitica*, Bonheiden, VI.1997 (down).

Fig. 2. Dorsal view of *Scaeva dignota* male, Leuven 24.VI.2002.

(0.48 in male and 0.41-0.46 in female *S. selenitica*). REEMER (2000) reports proportions of less than 0.50 and less than 0.48 in *S. dignota* and proportions of more than 0.50 and more than 0.48 for *S. selenitica* for males and females respectively. These values differ from the ones we obtained, and cannot be used as general thresholds for identification. In general, the proportion of the facial width to the total head width is smaller in *S. dignota*, compared to *S. selenitica*. Tergites 2, 3 and 4 have creamy colored markings that are parallel to the front of the tergites (thus excluding *S. pyrastri*). In accordance to the key of VAN VEEN (2001), the light markings on the abdomen reach the sides of the tergites in both specimens (Fig. 2). However, several authors question the value of this characteristic as a truly specific for *S. dignota* in comparison with the very similar *S. selenitica*. Examination of the collection of the Zoological Museum of Amsterdam in the Netherlands revealed that often in *S. selenitica* the light markings on the abdomen also do reach the sides of the tergites (REEMER 2000).

Discussion

The discovery of *S. dignota* in Belgium was not totally unexpected. During the last decade, *S. dignota* has been found in several West and North West European countries including Denmark (1x; TORP, 1994), North Germany (1x 1992; DUTY, 1995), the Netherlands (3x 1992, 1x 2001; LUCAS, 1992; REEMER, 2000) and France (present in eight departments, autochthonous in southern departments, SARTHOU *et al.*, 2003). Previously, in Europe the species seemed strictly restricted to the Mediterranean area, extending northwards to southern Germany and central France. The increasing list of observations in Western Europe suggests that *S. dignota* is moving northwards. This phenomenon of Mediterranean species that expand their distribution area northwards has been documented for other insects (e.g. Odonata, Lepidoptera, Orthoptera; GOFFART & DE SCHAETZEN, 2001; DE BRUYN *et al*, 2003) and even some spiders (e.g. *Argiope bruennichi*; DE BRUYN *et al*, 2003). It is believed that the recent change in climate allows these species to move northwards by an increase of the ambient temperature.

The frequency of appearance of *S. dignota* in Northwestern Europe fluctuates remarkably between years. The first three Dutch specimens were captured in 1992. The first three Belgian specimens were captured in 2002. REEMER (2000) attributes the coincidence of the Dutch observations in 1992 to exceptionally good weather in the months of June and July 1992. Also in 2002, the weather in Belgium in June and July was warmer than the average, with periods of extremely warm weather occurring at the end of June and at the end of July, which may have aided to the influx of *S. dignota* that year (weather data are from the KMI http://www.meteo.be).

A remarkably high number of observations comes from anthropogenic environments (e.g. observations in the cities of Leuven and St. Niklaas, two observations in a garden in Anlier). Since the search effort of syrphid amateurs for syrphids is at least as high in natural environments as in anthropogenic environments (personal comments of several syrphid amateurs), this suggests a true preference of *S. dignota* for some characteristic(s) related to anthropogenic environments. The nature of these crucial characteristics is yet unknown.

Almost all observations of *S. dignota* in Northwestern Europe come from a rather small time window between the second half of June and the end of July. This is a much shorter adult flight period compared to other Belgian species of the genus *Scaeva* (*S. pyrastri* and *S. selenitica*) which occur from the end of March till the end of September (VERLINDEN, 1991). However, the timing in observations of *S. dignota* accords to the peak in observations of the two other *Scaeva* species. Early observations of *S. pyrastri* and *S. selenitica* are considered to be over wintering individuals, and peak occurrence is presumed to be the result of the hatching of freshly molted adult flies (VERLINDEN, 1991).

We foresee that the occurrence of *S. dignota* in Belgium probably will not be a onetime event. The highest chance on finding *S. dignota* is during periods of exceptionally warm weather in June and July and in anthropogenic environments. In 2003, already a fourth observation of *S. dignota* in Belgium has been reported in Anlier, on exactly the same locality as the first observation, which seems to confirm these expectations.

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