Revista Ibérica de Aracnología, nº **28** (30/06/2016): 155–157.
Grupo Ibérico de Aracnología (S.E.A.). ISSN: 1576 - 9518.

First male record of *Sintula retroversus* (O. Pickard-Cambridge, 1875) and confirmation of a *Hypomma cornutum* (Blackwall, 1833) population in the north east of the Iberian Peninsula (Araneae: Linyphiidae)

Adrià Bellvert Bantí

C/Amadeu, nº: 2, SobreAtic 4º, 08370. Calella, Barcelona (España)
theadriBiB@hotmail.com

Abstract: First record for the Iberian Peninsula of an adult male of *Sintula retroversus*, and a second record of the spider *Hypomma cornutum* for the Spanish fauna. No males of the latter had ever been recorded from the country.
Keywords: Araneae, Linyphiidae, *Hypomma cornutum*, *Sintula retroversus*, Spain, Catalonia, Girona.

Primera cita de un macho de *Sintula retroversus* (O. Pickard-Cambridge, 1875) y confirmación de una población de *Hypomma cornutum* (Blackwall, 1833) en el noreste de la Península Ibérica (Araneae: Linyphiidae)
Resumen: Se cita por primera vez de la Península Ibérica un macho adulto de *Sintula retroversus*, y se presenta una segunda cita de la araña *Hypomma cornutum* para la fauna española. De esta última aún no se habían citado machos del país.
Palabras clave: Araneae, Linyphiidae, *Hypomma cornutum*, *Sintula retroversus*, España, Cataluña, Girona.

Introduction

Sheet web spiders are one of the richest families of spiders, with a total of 4544 valid species until today (World Spider Catalog, 2015), which represents a 10% of the total of the species for this order, and with a worldwide distribution. Many of their European representatives have a reduced size, between one and three millimetres and there are many species with a marked resemblance between them where a positive identification can only be made from the individual's genitalia.

The "Deveses de Salt" park is bordered by the town of Salt by its southern side and the Ter River in the north west of the Girona city. This park already has shown to be of some interest regarding their spider richness, ever since in 2012 the first record of *Dolomedes plantarius* (Clerck, 1757) for the Iberian Peninsula was found in a pond of this park (Bellvert *et al.,* 2013).

Methodology

Fortnightly sample was conducted for a year in the "Deveses de Salt" park, in Girona, in the north east of Catalonia. The capture methods chosen to execute the sample were the beating tray and the pitfall traps. The beating method remained all over the sampling year, however, due to technical problems, the pitfall trap could not be maintained throughout the year. The individuals captured were preserved in 70% alcohol for their posterior identification.

The pictures of the specimens were made with a Zeiss Stereo Discovery V12 stereomicroscope equipped with an Infinity X DeltaPix digital camera.

Results

During the species identification captured over the course of the sampling, two species were found which, one of them had never been cited before in the Iberian fauna, and the other one is the second record cited in the Spanish fauna. In the first case, the individual was identified as an adult male of *Sintula retroversus* (O. Pickard-Cambridge, 1875) by José Antonio Barrientos. In the second case, the specimens were identified as *Hypomma cornutum* (Blackwall, 1833), confirming the presence of populations of this spider in Spain.

Hypomma cornutum

The *Hypomma* genus (Dhal, 1886) is represented in the Iberian Peninsula by 3 species, *H. bituberculatum* (Wider, 1834), *H. fluvum* (Bösenberg, 1902) and *H. cornutum* (Blackwall, 1833) (Cardoso, 2000; Cardoso & Morano, 2010). The latter, although it has been cited in Navarra, only had been found female individuals until now in the Ultzama valley (Castro & Barriuso, 2004). In Europe, *H. cornutum* it appears in almost all of their countries, with the exceptions of Bosnia and Herzegovina, Albania, Kosovo, Macedonia, Greece and Turkey (Nentwig *et al*., 2015).

In the sample carried out by the author, several adult individuals of the specie *Hypomma cornutum* were found, both males and females. The species were recollected between March and May 2013 and preserved in 70% alcohol for their posterior identification.

Hypomma cornutum has a corporal length of about two millimetres. The prosoma adopts a reddish brown coloration with a darker colour in the opistosoma. The identification was made possible thanks to the genitalia of specimens. In the male case the elongated tibial apophysis can be observed, which in the case of *H. bituberculatum* stretches to two thirds of the matting bulb, while in *H. cornutum* it is smaller without this reaches half of the bulb (Figure 1). This was the case of the captured specimens. Adjacent to this tibial aphophysis we can observe a second one of about one tenth the size of the above which is slightly curved (Figure 2), unlike *H. bituberculatum* where it adopts a labeled form resembling a hook. For females, the epigynum of the *Hypomma* genus may have variability, although it is easy to identify the different species (Roberts, 1987). In the captured females we can observe a bulge in the middle of epigynum only present in *H. cornutum* (Figure 3).

Throughout the year of sampling 60 adult individuals were found, 27 males and 33 females, most of them between the months of March and May of 2013 (Figure 4). The appearance of adult individuals in the year matches the one described by Harvey *et al.* (2002) in the provisional atlas of British spiders, but with an anticipated start of the period as adults begin to appear, probably due to the fact of the warmer climate of the Mediterranean region compared to the British Isles.

The presence of *Hypomma cornutum* in Catalonia is not surprising, since it was cited in Navarra (Castro & Barriuso, 2004), France (Nentwig *et al*., 2015) and Portugal (Cardoso & Morano, 2010). If the spider migrated from France or Navarra in a nearby past or if has been here for some time remains unknown and with the data shown here could not be tested. However, this is one of the many species that perform an aerial dispersion using silk ("ballooning") (Bell *et al*., 2005), so none of this possibilities have to be discarded. What can be assured, is that the presence of *H. cornutum* in Salt is not due to a case of erratic dispersion, since was found an elevated number of adult individuals during all their maturity period indicated by Harvey *et al.* (2002).

Sintula retroversus

The *Sintula* genus (Simon, 1884) in the Iberian Peninsula is represented by two species, *S. furcifer* (Simon, 1911) and *S. iberica* (Bosmans, 2010) (Bosmans *et al.*, 2010). *S. retroversus* was cited until France (Nentwig *et al.*, 2015) and its distribution goes from Europe to Azerbaijan (World Spider Catalog, 2015), but had never been cited in the Iberian fauna, until in 2015 Barrientos *et al.* cited the first female of this spider in Montseny (Catalunya, España), at 70km from Girona. This spider of mainly epigean customs can be found in pine woods or deciduous forests of the genus *Populus* and *Quercus* and the adults appear from October to late May (Gnelitsa, 2012).

In October 2012 an adult male of *Sintula retroversus* captured with pitfall trap was found. This was placed in an area dominated by poplars, which is consistent with that described by Gnelitsa (2012). *S. retroversus* is a small spider (approximately two millimetres) with a light brown colour in the prosoma and a darker one in the opisthosoma. The cymbium of the male has an elongated shape that allows clearly differentiated from *S. iberica*. This character is similar to *S. furcifer* as well. However, the latter has thorns on the terminal part of cymbium, while in *S. retroversus* these are located in the subterminal part (Figure 5).

These finding represents the first record of a male of this species for the Iberian Peninsula, however, with the current data it can not be assured that it is a stable population.

Conclusion

The number of individuals found indicates that there is an established population of the *Hypomma cornutum* species, since a good number of these animals in their adult stage were found. The time and percentage of appearance between males and females observed corresponds to that described by Harvey *et al.* (2002), reinforcing the belief that we are faced with a population entrenched in the area. These findings show that the presence of this spider is not an isolated case in Navarra and could be more widespread among the Iberian Peninsula

For *Sintula retroversus*, the fact that the setting of pitfall traps did not continue prevented from checking whether it was erratic individual or a population of these species exists in the area, for which more samples of the epigean fauna would be required to check their status.

Acknowledgments

First of all, I want to thank José Antonio Barrientos from the "Universitat Autònoma de Barcelona" for identifying the *Sintula retroversus* specimen and the confirmation of *Hypomma cornutum*. Thanks to Núria Roura and the University of Girona for the transfer of the material used for the sampling. To Alba Casals and Gerard Dalmau for their help in the sampling conducted in Salt. To Carles Ribera and Marcos Roca-Cusachs for help in the shooting and the University of Barcelona for the material provided for this purpose. And finally thanks to Pol Bantí for reviewing the translation of this text.

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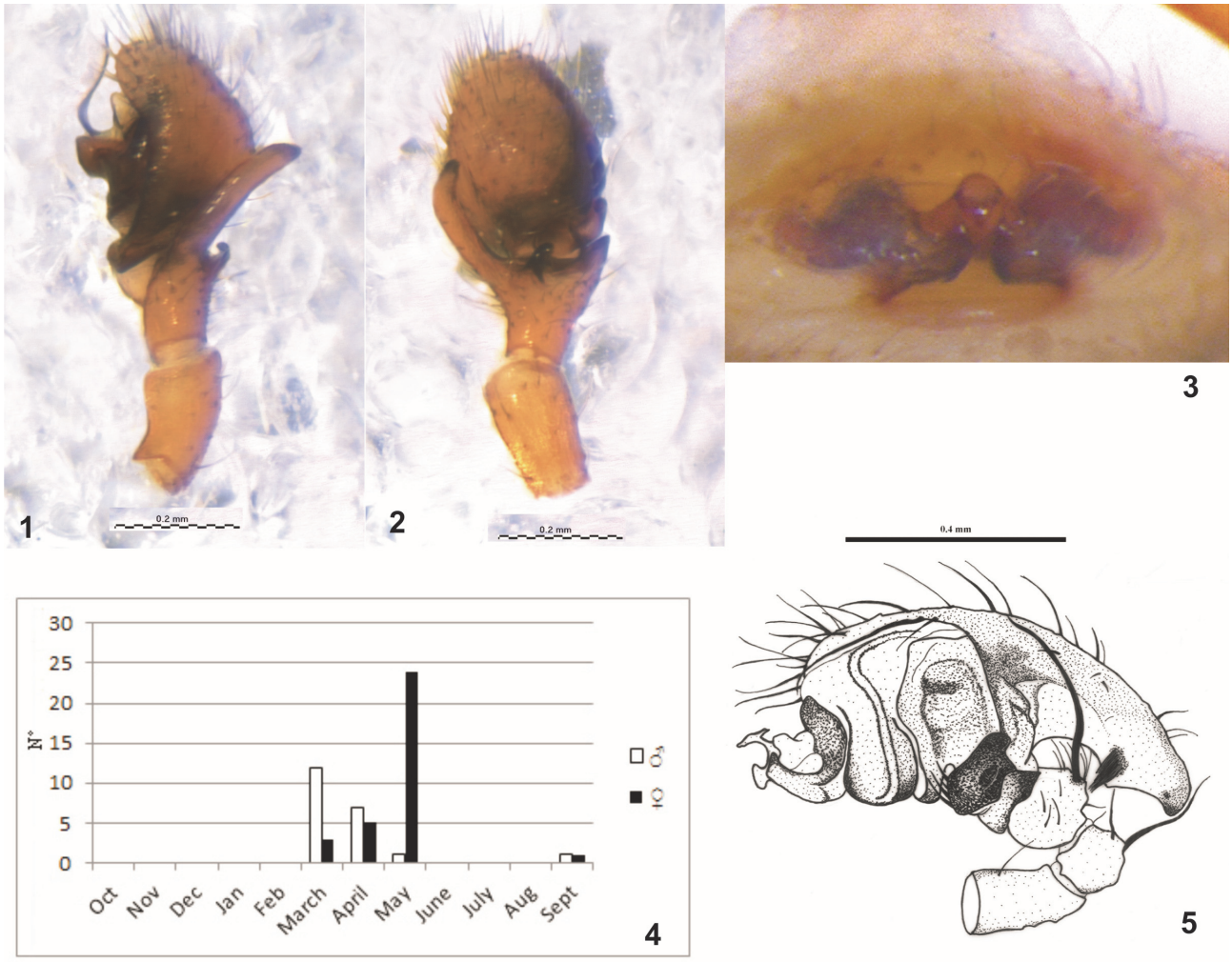


Fig. 1-4. *Hypomma cornutum* (Blackwall, 1833). **1-2**. Male palp and tibial aphophysis. **3**. Female epigynum. **4**. Phenology of the species in "Deveses de Salt" park, in Girona. **Fig. 5.** *Sintula retroversus* (O. Pickard-Cambridge, 1875). Male palp.