

TREMATOCEPHALUS CRISTATUS (WIDER, 1834), A NEW SPIDER FOR THE IBERIAN PENINSULA (LINYPHIIDAE)

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Abstract: *Trematocephalus cristatus* (Wider, 1834) is reported for the first time for Spain and the Iberian Peninsula. Two females were collected from two different fruit orchards in the region of Asturias, northwestern Spain. Specimens were collected by beat sampling of apple trees and blueberry bushes as part of ecological studies aimed at analyzing the diet of spiders inhabiting agroecosystems. Photographs of the preserved specimens and of a cleared epigyne are presented.

Keywords: Araneae, fruit crops, Linyphiidae, Spain, species distribution

***Trematocephalus cristatus* (Wider, 1834), nueva especie para la Península Ibérica (Linyphiidae)**

Resumen: Se cita por primera vez para España y la Península Ibérica la araña *Trematocephalus cristatus* (Wider, 1834). Se recolectaron dos hembras en dos plantaciones frutales diferentes en Asturias, en el noroeste de España. Los especímenes se recolectaron mediante vareo de ramas en manzanos y arandaneras, como parte de un estudio sobre la dieta de arañas en estos agroecosistemas. Se presentan fotografías de los ejemplares conservados y de un epigino.

Palabras clave. Araneae, cultivos frutales, distribución de especies, España, Linyphiidae

Introduction

The spider fauna in Spain and Portugal is rich in species, with the first comprehensive checklist for the spider fauna of the Iberian Peninsula citing 1435 species (Cardoso & Morano 2010). The checklist was subsequently updated in 2019 reporting 1493 species from the peninsula (Branco *et al.*, 2019). Over 300 species of Linyphiidae were listed in the updated checklist. Additional new species (including newly described species) have been reported from the peninsula and these are included in an online catalogue, which was last updated in May 2021 (de Biurrun *et al.*, 2021).

Recent ecological studies have been conducted in the region of Asturias, northwestern Spain, to understand the trophic role of spiders inhabiting fruit orchards (Hambäck *et al.*, 2021). Spiders were collected in apple and blueberry orchards to ascertain if spiders are feeding on fruit pests, through the study of their diet by gut metabarcoding analyses.

As part of this study, a large number of spiders were identified. During the identification process we found two specimens of a linyphiid that was not previously known for the Iberian Peninsula. In this paper we report *Trematocephalus cristatus* (Wider, 1834) as new for Spain and the Iberian Peninsula. We also provide a short description of the specimens collected.

Even though approximately 1500 species of spiders are known in the Iberian Peninsula, new species still wait to be discovered. Seemingly, new species can also be discovered by researchers focusing on agricultural ecology and not necessarily on faunistics or taxonomy.

Material and methods

Spiders were collected in fruit orchards from Asturias, northwestern Spain as part of a trophic study aimed at analyzing spider diet in agroecosystems. Spiders were collected in ten apple orchards in the year 2016 (in late-June and early-July) and in three blueberry plantations in four different dates (May, July, August and September) of 2022. A total of 725

specimens of spiders and harvestmen where collected (346 specimens from apple trees and 379 specimens from blueberry bushes).

Spiders were extracted from vegetation by beating branches (height circa 1.5 m), and individual spiders were collected with forceps from a sampling tray placed under the branches. Spiders were directly transferred to individual tubes with 95% ethanol for subsequent gut content analysis. Collected specimens were identified to species or genus level.

Pictures of habitus were taken with a Canon EOS R digital SLR camera mounted on a motorized rail (Stackshot). A long working distance metallurgic objective from Mitutoyo (10x) was fitted to the camera. Micro photographs of the epigyne were taken with a Nikon DS-Fi1 microscope camera mounted on a Nikon Eclipse 80i microscope. Photographs were stacked using Zerene Stacker software in combination with Canon EOS Utility. Captured stacks of photos were merged using the Pmax algorithm in Zerene Stacker. Photographs were taken at the Swedish Museum of Natural History. Merged photos were prepared for plates in Adobe Photoshop and the GNU Image Manipulation Program (GIMP).

The two specimens of *T. cristatus* collected in Spain are deposited at the Museo Nacional de Ciencias Naturales in Madrid (MNCN). Three additional Swedish specimens of *T. cristatus*, from the first author's personal collection were also studied as comparative material. Systematics and nomenclature follow the World Spider Catalog (2024). Specimens were identified using the interactive Linyphiidae key in araneae – Spiders of Europe (Stäubli, 2013).

Coordinates are expressed in degrees and decimals in WGS 84.

Results

***Trematocephalus cristatus* Wider, 1834** (Figs 1-2)

MATERIAL EXAMINED. SPAIN. Asturias: 1 ♀, Venta de la Salve, Siero (43.379986°N, -5.649100°E, 260 m), handpicked

after beat sampling branches of a *Malus domestica* tree in orchard surrounded by hedgerows and meadows, 28 June 2016, Carlos Guardado & Rodrigo Martínez *leg.*, Raul Vicente *det.* (MNCN 20.02/21594); 1 ♀, Santa Marina, Siero (43.354283°N, -5.733536°E, 280 m), handpicked after beat sampling twigs of *Vaccinium corymbosum*/*V. ashei*. Blueberry plantation surrounded by meadows and natural forests, 16 August 2022, José Javier Jiménez & Manuel Soto *leg.*, Raul Vicente *det.* (MNCN 20.02/21595).

COMPARATIVE MATERIAL EXAMINED. SWEDEN. Gotland: 1 ♀, Othem parish, Filehajdar (57.7163256°N, 18.7103443°E, 40 m), malaisetraps in alvar/forest edge with *Pinus sylvestris* and *Quercus robur*, 16 July - 10 August 2022, Kaj Svahn & Michael Tholin *leg.*, Raul Vicente *det.* (NRM); 1 ♀, Othem parish, Filehajdar (57.711106°N, 18.716698°E, 40 m), sweep netted from low herbs in sandy alvar, 27 June 2023, Raul Vicente, *leg.* (personal collection); 1 ♀, 27.VI.2023, personal collection, Othem parish, Filehajdar (57.713482°N, 18.711088°E, 40 m), sweep netted from *Quercus robur* in open sandy pine forest/wooded alvar, Raul Vicente *leg.* (personal collection).

DIAGNOSIS. For detailed descriptions, diagnosis and illustrations of female genitalia, see for example Merrett (1960), Wiehle (1960), Roberts (1987) and Millidge (1993).

DISTRIBUTION. *Trematocephalus cristatus* is widespread in Europe, and reported from many countries (Nentwig *et al.*, 2024). The southernmost records are from southern France and mainland Italy, whilst the northernmost are from Sweden (SLU Artdatabanken, 2024; MNHN & OFB 2024; Nentwig *et al.*, 2024). Outside Europe it is known as far east as China (Gao & Zhu, 1990).

HABITAT. In Europe *T. cristatus* is known to occur on twigs and on bushes in warm situations. In Spain it was found in an apple orchard and in a blueberry plantation. The 4.9 ha apple orchard was planted partly in 2000 and partly in 2003 with six local cider apple cultivars. It was a low-input orchard with only one pesticide application in the sampling year: mineral oil and copper fungicide at the end of winter. Within a radius of 1 km it was mainly surrounded by grassland (55%), woodland (13%) and hedgerows (10%). The blueberry plantation was 0.6 ha in size and was planted in 2015. It was managed organically, with the sole use of Spinosad against the key pest: spotted wing drosophila, *Drosophila suzukii* (Matsumura, 1931). This plantation was surrounded by forest (26%), grassland (23%) and shrubs (18%). The distance between the apple orchard and the blueberry plantation was 7.4 km.

Discussion

The combination of orange prosoma, orange legs and dark opisthosoma can at a first glance give the resemblance to species from genera such as *Hypomma* and *Hypselistes*. Upon closer inspection the ocular area and the prosoma of females

have a dark pattern (Fig. 1 A-B). The legs also darken towards the apex. This combination of characters could give a good species indication already in the field. Wiehle (1960) and Roberts (1987) noted that there is some individual variation in the dorsal pattern of the opisthosoma, e.g. some individuals being uniformly black, others having an overall pale greyish-black abdomen, whilst some individuals have a paler median pattern on the opisthosoma. This variation was also observed in the two Spanish specimens (Fig. 1A-D), as well as in the comparative material. The variation in opisthosomal pattern is also evident ventrally (Fig. 1C, D). The Spanish specimens fit well with comparative material from Sweden, as well as descriptions made in literature, both as regards habitus and epigyne (Fig. 2) (Merrett, 1960; Wiehle, 1960; Roberts, 1987).

Trematocephalus cristatus is often found on twigs of bushes and trees, preferably in warm situations as noted by Wiehle (1960), Locket *et al.*, (1974) and Roberts (1987). The ecological requirements are consistent with the sites in Asturias, where the two specimens were collected. In Sweden it has been collected by beating twigs of *Quercus robur* in warm and sheltered locations (personal observations; SLU Artdatabanken, 2024). Amongst associated species at both sites there are several typical twig-dwelling species, such as *Araneus pallidus* (Olivier, 1789), *A. triguttatus* (Fabricius, 1775), *Araniella cucurbitina* (Clerck, 1757), *Macaroeis nidicolens* (Walckenaer, 1802), *Parasteatoda simulans* (Thorell, 1875), *Tetragnatha montana* (Simon, 1874), *Theridion pinastri* (L. Koch, 1872), *T. varians* (Hahn, 1833) and *Tmarus* sp.

Trematocephalus cristatus is known to occur in the southernmost parts of France, in the Pyrenées, close to the Spanish border according to MNHN & OFB (2024). The distance from the previously reported sites in France and those cited in this article is approximately 430 km. The occurrence of *Trematocephalus cristatus* in Spain was thus expected. French records suggest that it may also occur in the Spanish Pyrenées. This species should be looked for in other regions in northern Spain, for example by beating or sweep netting bushes.

Acknowledgements

We thank the apple and blueberry growers for allowing us sampling in their properties, the field assistants for their support and BiodivERsA/FACCE JPI joint call (BiodivERsA-FACCE 2014-74) and MinECo/MCIN/AEI/10.13039/501100011033/FEDER (CGL2015-68963-C2-2-R and RTA2017-00051-C02-01) for funding. We thank Begoña Sanchez Chillón for the permission to deposit the material in the collection of the MNCN. We also thank the department of Zoology at the Swedish Museum of Natural History for letting the first author conduct arachnological studies at the museum.

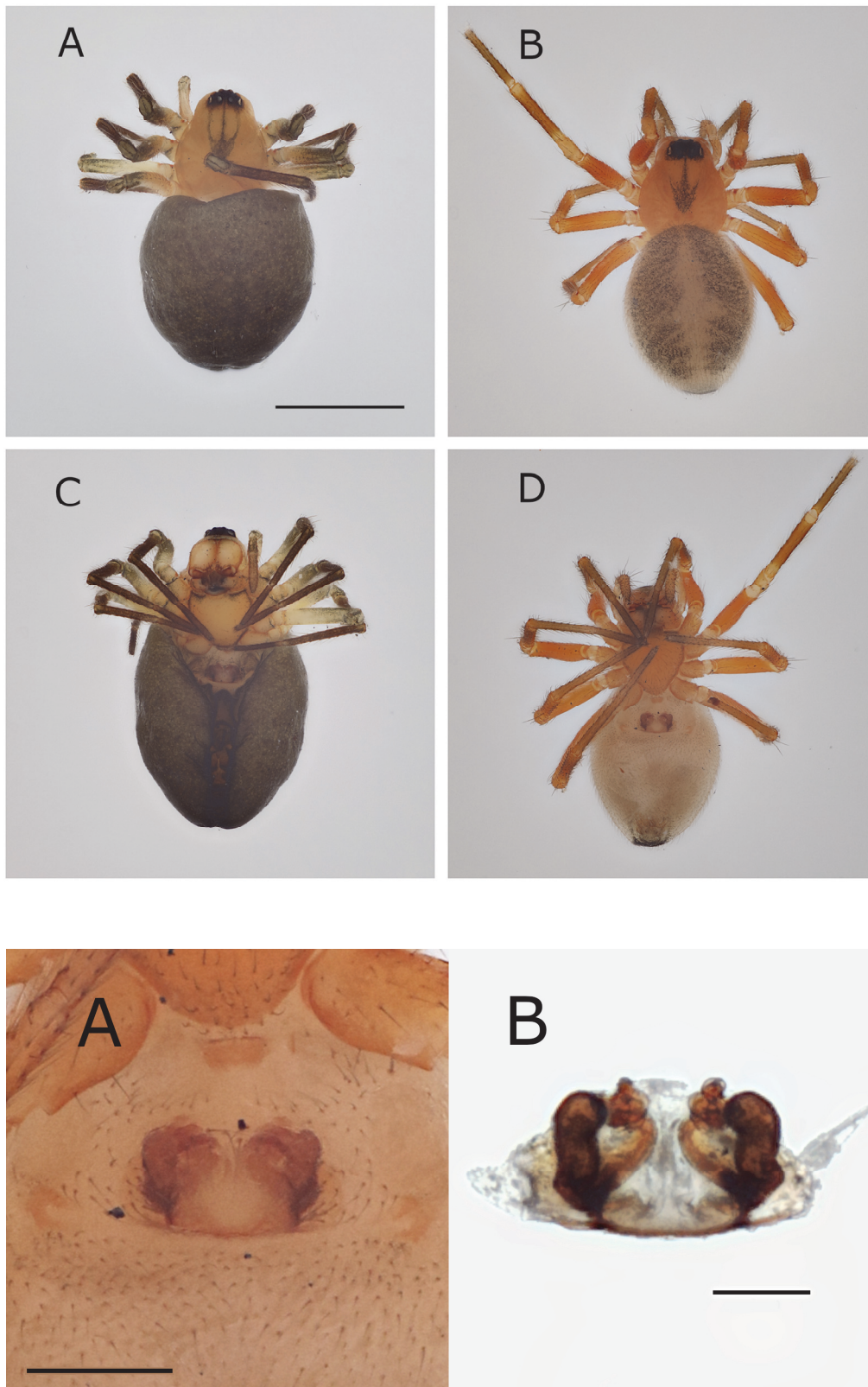


Fig. 1. *Trematocephalus cristatus* Wider 1834, female habitus (A, C = specimen MNCN 20.02/21594; B, D = specimen MNCN 20.02/21595). A, B. Dorsal view. C, D. Ventral view. Scale bar: A-D = 1 mm.

Fig. 2. *Trematocephalus cristatus* Wider 1834, epigyne. A. Epigyne, ventral view (specimen MNCN 20.02/21595). B. Epigyne dorsal view (specimen MNCN 20.02/21594). Scale bars: A = 0,2 mm; B = 0,1 mm.

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