

## NOTA / NOTE

## First records of *Cixidia maroccana* Anufriev, 1969 from the Iberian Peninsula and some additional new records of Achilidae Stål, 1839 (Auchenorrhyncha: Fulgoromorpha)

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**Abstract:** The species *Cixidia maroccana* Anufriev, 1969 is recorded for the first time from Spain and Portugal. *Cixidia sikaniae* D'Urso & Guglielmino, 1995 is newly recorded from Portugal. A female specimen of *Cixidia* cf. *lapponica* (Zetterstedt, 1828) has been collected in Spain, but its identity remains uncertain. The records of *C. maroccana* are the first ones since its description from Morocco. Based on the new observations, *C. maroccana* is an univoltine species, only found in spring.

**Key words:** Auchenorrhyncha, Fulgoromorpha, Achilidae, *Cixidia maroccana*, *Cixidia sikaniae*, faunistics, Iberian Peninsula, Portugal, Spain.

**Resumen:** Primeros registros de *Cixidia maroccana* Anufriev, 1969 de la península ibérica y algunas nuevas citas adicionales de Achilidae Stål, 1839 (Auchenorrhyncha: Fulgoromorpha). La especie *Cixidia maroccana* Anufriev, 1969 se registra por primera vez en España y Portugal. *Cixidia sikaniae* D'Urso & Guglielmino, 1995 se cita por primera vez en Portugal. Se ha recolectado en España un ejemplar hembra de *Cixidia* cf. *lapponica* (Zetterstedt, 1828), pero su identidad sigue siendo incierta. Los registros de *C. maroccana* son los primeros desde su descripción de Marruecos. Según las nuevas observaciones, *C. maroccana* es una especie univoltina que sólo se encuentra en primavera.

**Palabras clave:** Auchenorrhyncha, Fulgoromorpha, Achilidae, *Cixidia maroccana*, *Cixidia sikaniae*, faunística, península ibérica, Portugal, España.

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### Introduction

The family Achilidae Stål, 1839 is a medium sized Auchenorrhyncha family with about 700 species worldwide (Asche, 2015). The West-Palaeartic fauna was recently reviewed by Asche (2015) and is strongly underrepresented compared to tropical areas, with only 16 species, most of which are found in the Mediterranean. Two species, *Cixidia pilatoi* D'Urso & Guglielmino, 1995 and *Cixidia sikaniae* D'Urso & Guglielmino, 1995, are recorded from the Iberian Peninsula, of which the former is known from both Spain and Portugal, and the latter is only recorded from Spain.

A third species, *Cixidia genei* (Spinola, 1839), has been recorded from both Spain and Portugal. However, since its identity is unclear, the distribution of this species should be limited to the type-location, which is the Aosta Valley in Italy. Therefore, the Spanish and Portuguese distribution data are doubtful (Asche, 2015).

Nymphs of Achilidae are mycetophagous, which is unique among Auchenorrhyncha and only shared with nymphs of Derbidae (Gossner & Damken, 2018). Adults feed on the phloem of higher plants (Asche, 2015). Both adults and nymphs can be found in small groups under the bark of (decaying) trees, though adults can also be found flying around and are attracted by light traps. Achilidae are collected only rarely perhaps due to their cryptic life cycle.

## Study area and methods

During the years 2021 and 2023 the second author photographed and collected several Achilidae in southern Portugal which were sent to the first author for identification. Most adults were found while sampling insects with a beating tray, insect net or light traps. After the first identification of *Cixidia maroccana* Anufriev, 1969, the second author searched specifically in humid and damp areas in March and May, which have resulted in the findings of several nymphs and adults. The third author collected some Achilidae during several years of collecting on the Iberian Peninsula. Those specimens have been studied by the first author. When possible, photographed specimens on the citizen scientist platform iNaturalist were identified, these records are added here as well. Records are listed in chronological order per district (Portugal) or province (Spain), the districts/provinces are ordered alphabetically. Records that are not based on iNaturalist are collected by the second author and deposited in the private collection of the first author or collected by the third author and deposited in his private collection. The geographical coordinates are given of each location.

## Results

Three Achilidae species were found in the studied material, all belonging to the genus *Cixidia* Fieber, 1866.

### *Cixidia* cf. *lapponica* (Zetterstedt, 1828) (Fig. 1)

**SPAIN: Tarragona:** 1.5 km northeast of L'Ampolla - barranca Platja del Baconé (40.817, 0.722), 28.IV.2023, 1♀ collected from a pine tree, leg. C.F.M. den Bieman.

**Distribution:** This species has an Eurosiberian distribution (Asche, 2015). The most southwestern records are from southeastern France (La Colle-sur-Loup & Mt. Ventoux). Recently the species was recorded from Slovenia (Seljak, 2023). For a detailed overview of the distribution, see Asche (2015).

**Ecology:** The species is considered boreoalpine or boreomontane, living in montane pine- or coniferous-forests where the nymphs live under the bark of decaying wood; it is a univoltine species, with adults between July and September, while hibernation takes place in the nymphal stage (Asche, 2015; Seljak, 2023).

**Identification:** The species can be identified with Asche (2015).

**Notes:** Even though the single specimen fits the general description of *Cixidia lapponica*, and easily keys out to it with the key in Asche (2015), we refrain from putting a definitive name on the specimen until males of this species are found on the Iberian Peninsula. Distribution and habitat of the Spanish specimen does not correspond with those of *C. lapponica*. Besides this, the Spanish specimen was collected in April, much earlier than records in other parts of Europe.

### *Cixidia maroccana* Anufriev, 1969 (Figs. 2-4)

**PORTUGAL: Évora:** Campinho (38.364, -7.471), 12.IV.2023, 1 adult, photo on iNaturalist, leg. A. Gosseries. **Faro:** Figueira - Vila do Bispo (37.069, -8.836), 3.V.2019, 1♀, leg. C.F.M. den Bieman;

Portimão (37.127, -8.575), 20.III.2021, 1♀, leg. T. Valkenburg; Quinta de Marim - Olhão (37.033, -7.815), 3.IV.2021, 1 adult, photo on iNaturalist, leg. T. Valkenburg; Albufeira (37.089, -8.241), 14.IV.2021, 1 adult, photo on iNaturalist, leg. S. Araújo; Quinta de Marim - Olhão (37.033, -7.815), 27.IV.2021, 2♀♀, leg. T. Valkenburg; Olhão (37.033, -7.817), collected on 26.II.2023 as 3 nymphs and reared till 15.III.2023 too 1♂, 1♀ and 1 nymph put in ethanol, leg. T. Valkenburg; Ameixial - Loulé (37.364, -7.990), 16.IV.2023, 1♂, 1♀, leg. T. Valkenburg; Quinta de Marim - Olhão (37.177, -8.464), 22-23.IV.2023, 1♂, 2♀♀, leg. T. Valkenburg; Quinta de Marim - Olhão (37.033, -7.815), 25.III.2023, 2♂♂, 2♀♀, leg. T. Valkenburg; Fonte da Tareja - São Brás de Alportel (37.180, -7.883), 25.IV.2023, 1♂, leg. T. Valkenburg; Fonte da Tareja - São Brás de Alportel (37.180, -7.883), 26.IV.2023, 1♀, leg. T. Valkenburg. **Santarém:** Samora Correia (38.915, -8.861), 1.IV.2021, 1 adult, photo on iNaturalist, leg. R. Gonçalves. **Setúbal:** Santa Margarida da Serra (38.108, -8.570), 18.IV.2023, 1 adult, photo on iNaturalist, leg. J. Miguel.

**SPAIN:** **Almería:** El Daimuz (37.496, -2.249), 29.V.2022, 1 adult, photo on iNaturalist, leg. photosteve. **Cáceres:** Cáceres - near camping (39.491, -6.140), 440m, 1♀, leg. C.F.M. den Bieman. **Granada:** Órgiva - near río Guadalfeo (36.887, -3.414), 340 m, 9.V.2018, 1♂, leg. C.F.M. den Bieman; Yegen (36.983, -3.118), 15.V.2020, 1 adult, photo on iNaturalist, leg. S. Oliver; Yegen (36.977, -3.121), 16.V.2022, 1 adult, 1 nymph, photo on iNaturalist, leg. S. Oliver. **Málaga:** Antequera (37.014, -4.554), 26.VI.2020, 1 adult, photo on iNaturalist, leg. S. Vogel. **Sevilla:** Molino de Gadea (37.542, -5.396), 16.IV.2021, 1 adult, photo on iNaturalist, leg. A. Manuel.

**Distribution:** The species was described by Anufriev (1969) from a single male, collected in Morocco without a specific location. Asche (2015) only studied the male holotype of this species and no additional material was available. The species appears to be not uncommon along the southern coastline of Portugal and in southern Spain.

**Ecology:** Nothing has been published about the ecology of this species. All records published here were done between the [15th of March (=reared specimens)] 20th of March and the end of May, suggesting that *C. maroccana* is an univoltine species. Nymphs have been found in February, suggesting that the species hibernates in the nymphal stage. Three nymphs were collected by the second author on the 26th of February 2023 and put in a jar till two adults appeared on the 15th of March. During this period, nymphs were kept indoors, which might have resulted in a faster development. The nymphs were found deep in a pile of dead plants and branches which were rotting and covered with mycelium. Adults were usually found in shaded places in a variety of habitats: coastal pine forest, cork oak and holm oak landscape on shale soils and in old carob and olive groves on limestone soils. Based on these findings, habitat preferences seem to be limited as long as (old) trees and rotting material with mycelium are present.

**Identification:** The species can be identified with the original description or the redescription by Asche (2015).

#### *Cixidia sikaniae* D'Urso & Guglielmino, 1995 (Fig. 5)

**PORTUGAL:** **Aveiro:** Mealhada, Grada (40.297, -8.474), 16.VIII.2022, 1 adult, photo on iNaturalist, leg. L. Silva. **Coimbra:** Sanguinheira de Baixo (40.329, -8.719), 2.III.2020, 4 adults, photo on iNaturalist, leg. J. Santos. **Faro:** Castro Marim - Praia Verde (37.180, -7.482), 26.VII.2022, 1♂, leg. T. Valkenburg. **Leiria:** Marinha Grande (39.789, -8.936), 7.VI.2022, 1 adult, photo on iNaturalist, leg. Svduarte; same location as previous record, but date 11.VI.2022.

**SPAIN:** **Barcelona:** Manresa (41.738, 1.881), 14.VII.2023, 1 adult, photo on iNaturalist, leg. Snailman.

**Distribution:** Species described from Sicily (D'Urso & Guglielmino, 1995) and also known from Spain (Asche, 2015). Based on photos on iNaturalist, the species occurs throughout Spain and Portugal.

**Ecology:** Based on Asche (2015): an univoltine species, nymphs and adults have been found under the bark of oak and pine trees, living on the fungus *Trichaptum fuscoviolaceum* (Ehrenb.) Ryvarden. The Portuguese record of four adults in March is strange, considering that this is an univoltine species. Other observations of this species (D'Urso & Guglielmino, 1995; Asche, 2015; this study) are only from June, July and August.

**Identification:** The species can be identified according to the original description or the redescription by Asche (2015). Specimens from Spain are of a lighter coloration than the specimens from Sicily (Asche, 2015), and this is also true for specimens from Portugal.

## Discussion

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The records of two new species of Achilidae for Portugal, and one new species for Spain, reflect the general lack of knowledge on Iberian Auchenorrhyncha. The findings increase the total number of known Achilidae from the Iberian Peninsula to three identified species.

The identity of the single female specimen from L'Ampolla (Spain) remains dubious. Coloration and general morphology fit *C. lapponica*, though female genitalia do not completely match. More material, especially male specimens, from the Iberian Peninsula is needed in order to get a better picture of the Achilidae fauna and species diversity of Portugal and Spain.

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Fig. 1.- Adult female of *Cixidia* cf. *lapponica*, 1.5 km northeast of L'Ampolla (Tarragona, Spain), 28.IV.2023. Photo: M.C. de Haas.



Fig. 2.- Adult of *Cixidia maroccana*, Fonte da Tareja (São Brás de Alportel, Portugal), 25.IV.2023. Photo: T. Valkenburg.

Fig. 3.- Nymph of *Cixidia maroccana*, Quinta de Marim (Olhão, Portugal), 26.II.2023. Photo: T. Valkenburg.

Fig. 4.- Habitat of place where nymphs and adults of *Cixidia maroccana* were found, Quinta de Marim (Olhão, Portugal). Photo: T. Valkenburg.



**Fig. 5.** - Adult specimen of *Cixidia sikaniae*, Praia Verde (Castro Marim, Portugal), 26.VII.2022. Photo: T. Valkenburg.

