Cixius (Ceratoxicius) pallipes Fieber, 1876  
(Hemiptera: Auchenorrhynca: Fulgoromorpha:  
Cixiidae): first record for Spain

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A preliminary study on the terrestrial fauna from Cova des Coll (Felanitx, Mallorca),  
a cave located at the east of Mallorca (Balearic Islands, Spain), was published in  
2004. In that study some specimens of the planthopper family Cixiidae remained  
unidentified. In this paper we report the first record of the epigean Cixius  
(Ceratoxicius) pallipes Fieber, 1876 for Spain. A diagnosis of the morphological  
characteristics of the species as well as information on its geographical distribution  
and ecology are given.

Keywords: new record, Cixius pallipes, Hemiptera, Cixiidae, Balears.

Introduction

The knowledge of the Cixiidae found in caves from the Balearic Islands is very  
scarce. The only available data are specimens collected in Coves del Drac from  
Mallorca by Racovitza (1907). This author reported the capture of several specimens  
(both larvae and adults) of Cixius, sug-  
gesting that they should be considered as  
true troglobitic species because they  
displayed marked depig-mentation, red eyes  
and they were collected very far from the  
entrance of the cave. No additional data are  
available, and this species obviously was  
never described (Hoch, 1994).
Fig. 1. Location of the sampling sites. Cave survey modified from Gracia et al. (1997).

Subsequently, some more Cixiidae specimens were collected in other caves from Mallorca, such as Cova des Coll (Felanitx) (Vadell & Zaragoza, 2005), which are presented here, as well as from Coves del Pirata (Manacor) (Vadell et al., 2006) and Cova del Pas de Vallgornera (Llucmajor) (Vadell et al., 2007), which are currently under study.

The Cova des Coll is a cave located at the Mallorcan east locality of Portocolom in the municipality of Felanitx. Currently, the cave has a length of 7.020 m of which 5.529 are underwater galleries and is excavated in Miocene limestones and calcarenites. The cave has two natural entrances, one of them contacting the sea and the other one located near the village. The latter is accessible through a collapse doline adjacent to the village. There are also two artificial pits, which connect to the cave (Gracia et al., 1997; 2005).

In 2003 and 2004 a preliminary study was carried out on the terrestrial fauna of the cave in the collapse doline area (Vadell & Zaragoza, 2005) (Fig.1). This doline initially allows the entrance to three halls of the cave: at SE, the Galeria de s’Amagat, at NW the Sala des Porcs and at S the Sala des Pou Negre, all of them mostly dry and of easy access; this first paper reported the occurrence of 7 araneid species, 2 pseudos-
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The Auchenorrhyncha were captured 35 m inside the Galería de s’Amagat on roots and in complete darkness. Several specimens (a male, three females and four nymphs) were submitted to the University of Madeira. Other specimens (a male and two nymphs) are included in the Mateo Vadell collection (CMV) and they are curated at the Museu Balear de Ciències Naturals (MBCN).

**Taxonomy**

*Cixius (Ceratoxicius) pallipes* Fieber, 1876
*Cixius pallipes* Fieber, 1876: 191 [type locality: Italy]
*Cixius pallipes notaticollis* Rey, 1894: 14 [France]
*Cixius pallipes fumipennis* Horváth, 1897: 620 [Croatia]

Cova des Coll (Felanitx) U.T.M 522770 / 4364500-11: 1♂ 2-X-2004, M Vadell leg.,

![Image of Cixius pallipes](image)

Fig. 2. Male of *Cixius pallipes*.

Fig. 2. Masce de Cixius pallipes.
The body size of the collect specimen in male is 5.5 mm (Fig. 2).

**Diagnosis**

Genus *Cixius* Latreille: mesonotum tricarinate; apical margins of tegmen without distinct bases of setae between apical veins, those only on veins themselves; pterostigma without scattered bases of setae.

For a key to the subgenera of *Cixius* see China (1942).

Specific characters in the male genitalia of *C. pallipes*: anal tube distally with two comparatively small processes, aedeagus (male copulatory organ) with one movable spine-like appendage on each side of flagellum base and left dorsal lobe of phallotheca only weakly developed. The male genitalia are figured in Holzinger et al. (2003). The adult specimens display well developed compound eyes as well as tegmina and wings. As no obvious troglomorphies are observed, it is unlikely that the cavernicolous cixiid species reported from Coves del Drach by Racovitza (1907) are identical with *C. pallipes*.

**Distribution**

In the Iberian Peninsula the subgenus *Ceratocixius* are represented by *Cixius simplex* (Herrich-Schäffer, 1835), *Cixius cunicularius* (Linnaeus, 1767), both widely distributed in Europe, and *Cixius trirhacoides* only found in the Spanish provinces of Cádiz and Granada (Remane & Holzinger, 1998).

The species *Cixius pallipes* has been recorded in Afghanistan, Armenia, Azerbaidjan, Bulgaria, Corsica, Cyprus, France, Georgia, Greece, Hungary, Iraq, Israel, Italy (type locality), Moldova, Romania, Sardinia, Serbia, Slovakia, Switzerland, Tadzhikistan, Turkey, former Yugoslavia (Nast, 1972; 1987; Lodos & Kalkandelen, 1980; Kalkandelen, 1987; Dlabola, 1977; Drosopoulos, 1980; Demir, 2008).

Records of *C. pallipes* from the Eastern Mediterranean region, Near- and Middle East are doubtful and probably refer to different species, e.g. those from Eastern Europe are likely to concern *C. wagneri* China (M. Asche, Berlin, pers. comm., used with permission).

**Ecology**

Although the specimens reported here were found inside a cave, *Cixius pallipes* displays no obvious troglomorphies, and thus is an epigean (surface dwelling) species.

Even though the collecting site in Cova des Coll is in complete darkness, the adults were found only 35 m away from the entrance suggesting that the physical conditions comply with those of the entrance/transition zone (Howarth, 1983).

**Evolutionary implications**

Although little is known about their phenology and habitat requirements of *C. pallipes* elsewhere (Holzinger et al., 2003), it is not unusual for adult Cixiidae to seek dark, humid spaces for shelter from hot and dry conditions in surface environments. In doing so, they may incidentally end up in caves or underground galleries, and there may oviposit on penetrating roots of surface vegetation. The nymphs eventually hatch,
as the nymphs of all Cixiidae live in leaflitter or inside the soil– may even occasionally complete their larval development underground. Yet, only if adults manage to locate and recognize potential mating partners under cave conditions (i.e., complete darkness, constant temperature, and constant relative humidity), the evolutionary step from a facultative cavernicolous (troglophilic) to an obligatory cavernicolous (troglobitic) way of life can be realized (Hoch, 1994). Nevertheless, numerous lineages within the Cixiidae and other Fulgoromorpha taxa, have evolved troglobitic and highly troglomorphic species (Hoch, 2002). Therefore, the troglophilic behavior displayed by C. pallipes on Mallorca may represent an early stage of troglobite evolution. As Mallorca is rich in caves and apparently offers adequate subterranean habitat for cavernicolous Cixiidae, further exploration and inventory of the cave fauna should yield exciting discoveries.

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References


Kalkandelen, A. 1987. Türkiye Cixiidae (Homoptera) Türleri Üzerinde Taksonomik


