

## First record of the myrmecophilous silverfish

### *Atelura formicaria* Heyden, 1855 in Belgium

#### (*Zygentoma* : Nicoletiidae)

Thomas PARMENTIER<sup>1,2</sup>, Marc VAN KERCKVOORDE<sup>3</sup> & Wouter DEKONINCK<sup>1</sup>

<sup>1</sup> Royal Belgian Institute of Natural Sciences, Entomology Department, Vautierstraat 29, B-1000 Brussels  
(e-mail : Thomas.Parmentier@bio.kuleuven.be)

<sup>2</sup> Laboratory of Socioecology and Socioevolution, KU Leuven, Naamsestraat 59, B-3000 Leuven

<sup>3</sup> Vennestraat 6, B-9051 Sint-Denijs-Westrem

#### Abstract

*Atelura formicaria* Heyden, 1855 (*Zygentoma*, Nicoletiidae) is a silverfish which lives permanently in ant nests. Despite being recorded and well established in central Europe, it was unknown for Belgium. Here we report the first record of this species in Belgium with some notes on its biology.

**Keywords** : Belgian new species, *Zygentoma*, Nicoletiidae

#### Samenvatting

*Atelura formicaria* Heyden, 1855 (*Zygentoma*, Nicoletiidae) is een zilvervisje dat permanent en obligaat leeft in mierennesten. Niettegenstaande deze soort geregeld wordt waargenomen en wijdverspreid is in Centraal Europa was deze soort nog niet gevonden in België. Hier vermelden we de eerste waarneming van deze soort in België en bespreken we haar biologie.

#### Résumé

*Atelura formicaria* Heyden, 1855 (*Zygentoma*, Nicoletiidae) est un thysanoure qui vit de manière permanente dans des nids de fourmis. Jusqu'à présent il était inconnu de Belgique alors que des données montraient qu'il était bien établi en Europe Centrale. Ici, nous le rapportons pour la première fois de Belgique et renseignons sur sa biologie.

#### Introduction

Many silverfish species throughout the world are associated with ants (RETTENMEYER, 1963 ; MARUYAMA *et al.*, 2009 ; MENDES & SCHMID, 2010 ; MENDES *et al.*, 2011 ; SMITH *et al.*, 2011). They mostly live in ant nests as scavengers feeding on debris, but occasionally steal regurgitated food or prey from their hosts (HÖLLDOBLER & WILSON, 1990). Parasitism on ant brood has never been reported in this group.

*Atelura* is a Palearctic genus comprising three myrmecophilous silverfishes : *Atelura montana* (Stach, 1922) from the Balkans, *Atelura valenciana* (Molero-Baltanás, 1998) restricted to the Valencian region in Spain and *Atelura formicaria*. The latter has a more wide-spread distribution, predominantly in Central Europe, ranging from France to Eastern Europe (MOLERO-BALTANÁS *et al.*, 1998). Despite intensive searching, this species has never been recorded before in the Benelux (LOCK, 2007). *Atelura formicaria* is also the first free-living silverfish in Belgium as the two other *Zygentoma* known for Belgium, *Lepisma saccharina* (Linnaeus, 1758) and *Ctenolepisma longicaudata* (Escherich, 1905) can only be found in antropogenic environments (LOCK, 2007).

## Results

One specimen was hand-collected on 22.IX.2012 by M. Van Kerckvoorde in a *Lasius flavus* (Fabricius, 1782) nest. This nest was hidden under a stone in a calcareous, thermophilic grassland on the slopes along the river Meuse, at the margin of Reserve Naturelle de Devant-Bouvignes, Dinant.

## Discussion

When opening an ant nest, *Atelura formicaria* is very conspicuous by its yellow colour and rapid movement. It can be associated with many ant species and is not restricted to a specific ant taxon as some other silverfishes (MENDES *et al.*, 2011 ; VON BEEREN *et al.*, 2011). This species can integrate in ant nests probably by a combination of chemical camouflage (ant cuticular hydrocarbon adoption) and mechanical defense (by shedding their scales when grasped). As many other myrmecophiles, it has lost its eyes, has an improved sense of touch and a very thin cuticula (POHL, 1958). These are typical adaptations to a permanent underground living in the stable environment of an ant nest.

Hopefully, this record initiates new findings of other myrmecophiles unknown for Belgium. Especially, the ant cricket *Myrmecophilus acervorum* (Panzer, 1799), which is a thermophilic species occurring in central Europe (SCHMIDT & SCHMITT, 2012), might be recorded in the Meuse valley as well.



Fig. 1. Adult *Atelura formicaria* collected in Dinant (Photograph Alain Pauly).

## References

- HÖLLDOBLER B. & WILSON E.O., 1990. - *The Ants*. Harvard University Press, Cambridge, Massachusetts, USA.
- LOCK K., 2007. - Distribution of the Belgian Zygentoma. *Notes fauniques de Gembloux*, 60(1) : 25-27.
- MARUYAMA M., AKINO T., HASHIM R. & KOMATSU T., 2009. - Behavior and cuticular hydrocarbons of myrmecophilous insects (Coleoptera : Staphylinidae ; Diptera : Phoridae ; *Thysanura*) associated with Asian *Aenictus* army ants (Hymenoptera ; Formicidae). *Sociobiology*, 54(1) : 19-35.
- MENDES L.F. & SCHMID V.S., 2010. - Description of *Allograssiella floridana* gen. nov., spec. nov. from the southern United States living with *Pseudomyrmex* ants (Zygentoma, Nicoletiidae). *Spixiana*, 33(1) : 49-54.
- MENDES L.F., VON BEEREN C. & WITTE V., 2011. - *Malayatelura ponerophila* - a new genus and species of silverfish (Zygentoma, Insecta) from Malaysia, living in *Leptogenys* army-ant colonies (Formicidae). *Deutsche Entomologische Zeitschrift*, 58(2) : 193-200.
- MOLERO-BALTANÁS R., GAJU-RICART M., BACH DE ROCA C. & MENDES L.F., 1998. -Description of *Atelura valenciana* n. sp. (Insecta, Zygentoma) and distribution and myrmecophilic relationships of *Proatelurina pseudolepisma* in the Iberian peninsula. *Miscellània Zoològica*, 21 : 101-117.
- POHL L., 1958 - Vergleichende anatomisch - histologische Untersuchungen an *Lepisma Saccharina* Linné und der myrmecophilen *Atelura formicaria* Heyden. *Insectes Sociaux*, 5(1) : 67-76.
- RETTENMEYER C.W., 1963. - The behavior of *Thysanura* found with army ants. *Annals of the Entomological Society of America*, 56(2) : 170-174.
- SCHMIDT C. & SCHMITT T., 2012. - Vorkommen der Ameisengrille (*Myrmecophilus acervorum* [Panzer, 1799]) im Bochumer Raum. *Jahrbuch des Bochumer Botanischen Vereins*, 3(3) : 25-32.
- SMITH G.B., SINGHAM G.V., KUAH M.-K. & LEE C.-Y., 2011. - Two new inquiline silverfish (Zygentoma : Ateluridae, Lepismatidae) from Malaysia. *Sociobiology*, 57(1) : 19-34.
- VON BEEREN C., SCHULZ S., HASHIM R. & WITTE V., 2011. - Acquisition of chemical recognition cues facilitates integration into ant societies. *BMC ecology*, 11(1) : 30.