

ON THE FAMILY MECONEMATIDAE IN CONTINENTAL PORTUGAL (ORTHOPTERA)

Sónia Ferreira¹, Amália Espiridião de Oliveira² & Maria Otilia Miralto^{2,3}

¹ CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, Universidade do Porto, Campus Agrário de Vairão, 4485-661 Vairão; Portugal – hiporame@gmail.com

² Centro Ecologia e Ambiente, Universidade de Évora, Colegio Luis Verney, Rua Romão Ramalho, 59; 7000-671 Évora, Portugal – amalia.oliveira@netvisao.pt

³ mos@uevora.pt

Abstract: A compilation of the Portuguese records of Meconematidae is presented, together with new distributional data for the two species present in the country. The distribution of the species is mapped and commented upon. *Cyrtaspis scutata* (Charpentier, 1825), previously known from only one locality in the country, is recorded from five new 10 km UTM squares, including the southernmost record from the Iberian Peninsula.

Key words: Orthoptera, Meconematidae, new records, distribution, Portugal.

Datos sobre la familia Meconematidae en Portugal continental (Orthoptera)

Resumen: Se presenta una recopilación de los registros portugueses de Meconematidae y nuevos datos de distribución de las dos especies presentes en el país. Se incluyen mapas y se comenta la distribución de las especies. *Cyrtaspis scutata* (Charpentier, 1825), anteriormente conocida de sólo una localidad portuguesa, se registra de cinco nuevas cuadrículas UTM 10 km, incluyendo el registro más meridional de la Península Ibérica.

Palabras clave: Orthoptera, Meconematidae, nuevos registros, distribución, Portugal.

Introduction

The family Meconematidae is represented in the Iberian Peninsula by three genera: *Meconema* Serville, 1831, *Cyrtaspis* Fischer, 1853 and *Canariola* Uvarov, 1940. The genus *Meconema* has only one species represented in Iberia, *M. thalassinum* (De Geer, 1773) with a widespread distribution in southern Europe. This species can be easily recognizable as the pronotum is short and both males and females are macropterous. Males have cerci with the rounded apex and females have pointed subgenital plate and ovipositor with smooth edges (Harz, 1969).

Cyrtaspis comprises two species, *Cyrtaspis scutata* (Charpentier, 1825) a widely distributed species in southern Europe and North Africa, and *Cyrtaspis tuberculata* Barranco, 2005 a species from south Spain of which only the type specimen is known. Characters shared by both species include pronotum long and shield-like without humeral incisions, apterous females with processes on seventh sternum and ovipositor distinctly toothed at apex (Barranco-Vega, 2005). The characters that permit species diagnosis are presented in Barranco-Vega (2005), and include: general shape (*C. tuberculata* is more slender and of smaller size); number of ventral spines in fore and mid tibia in each side (*C. tuberculata* has three while *C. scutata* has two); fifth, sixth and seventh abdominal sternites with a central tubercle in *C. tuberculata*, while seventh sternite of *C. scutata* has two spines; subgenital plate of *C. tuberculata* is triangular with two styli overlapping at apex, but in *C. scutata* it is broad and lacks distal styli.

Finally *Canariola* comprises three species, *C. emarginata* Newman, 1964 from south Spain and *C. nubigena* (Krauss, 1892) and *C. willemsei* Morales, 1959 from the Canary Islands. The species of this genus can be distin-

guished from *Cyrtaspis* by the presence of short cerci in males, not reaching beyond the subgenital plate, and absence of processes in seventh sternum in females (Harz 1969).

The Portuguese fauna of the group is much poorer, being represented by only two species: *M. thalassinum* and *C. scutata*. Although their presence in Portugal has been known since the nineteenth century (Charpentier, 1825; Bolívar, 1877), their distribution in the country is almost unknown as very little data was hitherto available. Remarkably, although *C. scutata* was described from the country (referred to as “Lusitania”), no record for a specific locality was published before Pinedo (1983) and this remained the only one until the present work. Regarding Portuguese entomological collections, the record published by Aires & Menano (1916) of *M. thalassinum* from Coimbra refers to specimens kept in Zoological Museum of Coimbra (MZCP). This collection also holds one female of *C. scutata* collected in Gerês, a hitherto unpublished record.

Methods

The data presented in this contribution results from fieldwork, study of collections and literature survey. The literature survey was conducted with the purpose of compiling the available information on the Portuguese fauna of Meconematidae. Fieldwork, which was mainly carried out in the northern half of continental Portugal, was not specifically designed for the group but aimed primarily to characterize local insect and spider faunas, namely in some protected areas such as Serra da Estrela Natural Park. Specimens were found mainly through direct observation but also

by sweeping oak branches. The *C. scutata* specimen from Odemira was captured during fieldwork carried out during a PhD project that aims to improve knowledge about the Carabidae (Coleoptera) of Serra de Monchique (Natura 2000 site). In addition, the collection of the Zoological Museum of Coimbra (MZCP) was studied. The identification of the specimens was based on Pinedo (1983).

For each species, the material examined heading includes the collecting data for each new record: locality data (municipality, site name, UTM coordinate and altitude in metres above sea level), date and number of specimens of each sex. Unless otherwise stated, the specimens were collected by the authors and are included in CIBIO/UP's collection. The heading "MZCP specimens examined" includes data of specimens from the collection of the Zoological Museum of Coimbra (MZCP). "References" outlines, for each species, the references that contain data from Portugal. The localities recorded in these references are listed alphabetically in "Bibliographic localities" heading. Maps 1 and 2 show the known distributions of the species in continental Portugal, in UTM 10x10 Km squares classified according to the source: bibliographic (○), museum (⊙) and fieldwork (●).

Results

The oldest reference to species of the family Meconematidae from Portugal found in the literature is the description of *C. scutata* by Charpentier (1825) as "Barbitistes scutatus". Only nine other references deal with data from Portugal of the family: three from the 19th century, five from the 20th century (including the revision by Pinedo in 1983), and one already published in the 21st century (Ferreira *et al.*, 2007).

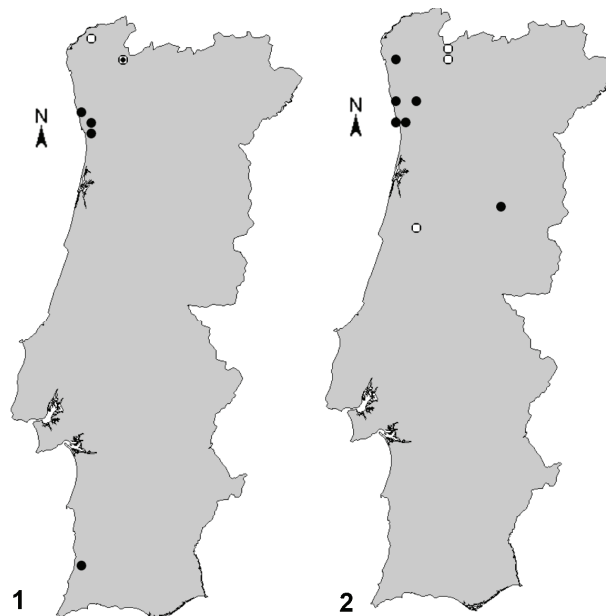
The record of *C. scutata* from Odemira represents a very significant augmentation of the species distribution in the Iberian Peninsula. Although very distant from other localities known in Iberia, its presence in the south was not unexpected as it also occurs in Morocco and Algeria (Pinedo, 1983). Regarding *M. thalassinum*, the species was detected for the first time in Serra da Estrela Natural Park.

The scarce available data regarding the group highlight the necessity of directed searches for these species in order to identify their distributions and understand their conservation status. Additional surveys are required in southern areas of the country, in order to determine if *C. tuberculata* occurs in Portugal, considering the geographic proximity of Doñana, the type locality of the species (Barranco-Vega, 2005). The distribution of *C. scutata* seems to be much wider in Iberia than previously known and its adult phenology, from late summer to winter may have been acting as a barrier to its detection. Other family characteristics, such as the nocturnal activity, arboreal lifestyle and coloration have been recognized as difficulties in their finding and therefore to their study (Rosa-García, 2004).

Species list

Cyrtaspis scutata (Charpentier, 1825)

MATERIAL EXAMINED: **Maia:** Silva Escura (29TNF3467 – 90 m), 11-12-2005 (1 ♂) (Sónia Ferreira's collection); **Odemira:** Seladas (29SNB2949 – 200 m), 11-11-2008 (1



Map 1. Known distribution of *Cyrtaspis scutata* (Charpentier, 1825) in continental Portugal.

Map 2. Known distribution of *Meconema thalassinum* (De Geer, 1773) in continental Portugal.

♀); **Vila do Conde:** Vairão (29TNF2775 – 100 m), Nov-2007 (1 ♂) (Pedro Sousa *leg.*), 14-11-2008 (1 ♀); **Vila Nova de Gaia:** Parque Biológico de Gaia (29TNF35 – 50 m), 06-09-2007 (1 ♂).

MZCP SPECIMENS EXAMINED: **Terras de Bouro:** Gerês (29TNG62) (1 ♀).

REFERENCES: Charpentier (1825), Bolívar (1877), Cazorro (1888), Bolívar (1898), Seabra (1942), Harz (1969), Herrera (1982), Pinedo (1983).

BIBLIOGRAPHIC LOCALITIES: Paredes de Coura.

PHENOLOGY: Adults from September until December, nevertheless Pinedo (1983) presents records from January and states that the adults may survive until April.

COMMENTS: The specimens collected in 2008 showed a brownish coloration.

Meconema thalassinum (De Geer, 1773)

MATERIAL EXAMINED: **Porto:** Serralves (Lordelo do Ouro) (29TNF2856 – 65 m), 01-08-1996 (1 ♂) (J. M. Grosso-Silva obs.); **Manteigas:** Near Senhora dos Verdes (29TPE2371 – 810 m), 13-08-2007 (1 ♀) (J. M. Grosso-Silva & Sónia Ferreira *leg.*); **Santo Tirso:** Carvalho de Valinhas (Monte Córdova) (29TNF4672 – 245 m), 28-07-2006 (1 ♂); **Viana do Castelo:** Vila Franca, S. Simão stream margin (29TNG2115 – 5 m), 15-05-2006 (1 ♂ nymph obs.); **Vila do Conde:** Vairão (29TNF2775 – 100 m), Aug-2008 (1 ♀) (Pedro Sousa *leg.*); **Vila Nova de Gaia:** Parque Biológico de Gaia (29TNF35 – 50 m), 07-07-2008 (1 ♀) (Pedro Sousa & J. M. Grosso-Silva *leg.*), 15-07-2008 (2 ♀♀) (Sónia Ferreira & J. M. Grosso-Silva obs.).

MZCP SPECIMENS EXAMINED: **Coimbra:** Coimbra (2 ♂).

REFERENCES: Bolívar (1877), Cazorro (1888), Bolívar (1898), Aires & Menano (1916), Seabra (1939a, b, 1942), Harz (1969), Pinedo (1983), Ferreira *et al.* (2007).

BIBLIOGRAPHIC LOCALITIES: Coimbra, Mata de Albergaria, Serra da Cabreira, Serra do Gerês.

PHENOLOGY: From the beginning of July until August, nevertheless Pinedo (1983) states that the adults may be found until November.

Acknowledgements

Thanks are due to Pedro Sousa and José Manuel Grosso-Silva who collected some of the specimens and shared their data. To José Reis of Zoological Museum of Coimbra for providing access to the collection. Amália Espiridião Oliveira was funded by FCT (grant no. SFRH/BD/23796/2005). The study conducted at Parque Biológico de Gaia was funded by Parque Biológico de Gaia E. M.

Thanks are also due to Martin Corley for his useful comments and suggestions and Dr. Vicenta Llorente (Museo Nacional de Ciencias Naturales, Madrid, Spain) for her critical review of the manuscript.

References

- AIRES, B. & H. MENANO, 1916. Catálogo sinóptico dos ortópteros de Portugal existentes no Museu Zoológico da Universidade de Coimbra. Fam. Phasgonuridae. *Revista da Universidade de Coimbra*, **5**:160-172.
- BARRANCO-VEGA, P. 2005. Description of *Cyrtaspis tuberculata* sp. nov. (Orthoptera, Tettigoniidae, Meconematinae) from Spain. *Boln. Asoc. esp. Ent.*, **29** (3-4): 35-40.
- BOLÍVAR, I. 1877. Sinópsis de los Ortópteros de España y Portugal, Tercera Parte An. Soc. esp. Hist. nat., **6**: 249-348.
- BOLÍVAR I. 1898. *Catálogo sinóptico de los Ortópteros de la Fauna Ibérica*. Imprensa da Universidade. Coimbra. pp. 168 (Separata dos Annaes de Sciencias Naturaes, Porto, vol. iv e v).
- CAZURRO, M. 1888. Enumeracion de los Ortópteros de España y Portugal. *Bol. R. Soc. Esp. His. Nat.*, **17**: 435-513.
- CHARPENTIER T. DE 1825. *Horae entomologicae, adjectis tabulis novem coloratis*. A. Gosohorsky, Wratislaviae.
- FERREIRA, S., GROSSO-SILVA, J. M. & P. SOARES-VIEIRA 2007. New and interesting grasshopper and cricket (Orthoptera) records for the fauna of Peneda-Gerês National Park (north-western Portugal). *Boln. S.E.A.*, **40**: 309-312.
- HARZ, K. 1969. *Die Orthopteren Europas I*. Vol 1. Series Entomologica, 5, The Hague: Dr. W. Junk, 749 pp.
- HERRERA, L. 1982. *Catalogue of the Orthoptera of Spain*. W. Junk B.V. Publishers. The Hague, 162 págs.
- PINEDO, M. C. 1983. Los Tettigoniidae de la Península Ibérica, España insular y norte de Africa (Orthoptera) I. Subfamilia Meconeminae Kirby, 1906. *EOS*, **59**: 207-222.
- ROSA-GARCÍA, R. 2004. Nuevas citas de la subfamilia Phaneropterinae (Orthoptera: Tettigoniidae) para Asturias (NO Península Ibérica). *Boln. Asoc. esp. Ent.*, **28** (3-4): 185-187.
- SEABRA, A. F. 1939a. Contribuição para a História da Entomologia em Portugal. A Secção Entomológica do Laboratório de Biologia Florestal. *Publicações da Direcção Geral dos Serviços Florestais e Aqüícolas*, **6**(1): 1-146.
- SEABRA, A. F. 1939b. Contribuição para a História da Entomologia em Portugal. Catálogo das Coleções Entomológicas do Laboratório de Biologia Florestal em 1937. *Publicações da Direcção Geral dos Serviços Florestais e Aqüícolas*, **6**(2): 155-301. (159-165).
- SEABRA, A. F. 1942. Contribuições para o inventário da fauna lusitânica. Insecta. Orthoptera (Saltatoria, Phasmida, Dermaptera, Blattariae e Mantodea). *Mems. Est. Mus. Zool. Univ. Coimbra*, **127**: 1-26.