

New data to the scale insect (Hemiptera, Coccoomorpha) fauna of Spain

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RESEARCH ARTICLE

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ABSTRACT

New data are provided on the distribution of scale insect species based on the soil sample collection of Museo Nacional de Ciencias Naturales, Madrid, Spain. Six species proved to be new to the scale insect fauna of Spain: 1 species of Ortheziidae (*Ortheziola vej dovskiyi* Sulc), 3 species of Pseudococcidae (*Fonscolombia graminis* Lichtenstein, *Peliococcus mathisi* (Balachowsky), *Rhodania porifera* Goux) and 2 species of Rhizoecidae (*Rhizoecus arabicus* Hambleton, *Ripersiella lelloi* (Mazzeo)).

KEYWORDS

fauna, Iberian Peninsula, mainland Spain, new record, scale insect

INTRODUCTION

The scale insect checklist of Spain currently contains 229 species belonging to 18 families (García Morales et al., 2016). Spain has a long tradition in coccidology from the 19th century by Colvée (1881, 1882), but the most comprehensive base of our current knowledge on scale insects of Spain is related to Juan Gómez-Menor Ortega (1927, 1928, 1935, 1937, 1946, 1948, 1954, 1955, 1956a, b, c,

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1957, 1958a, b, c, d, 1959, 1960, 1965, 1967, 1968). A few other authors' contribution were also important in the 20th century, as Silvestri (1924, 1934), Balachowsky (1931, 1935a, b), Martín Mateo (1983, 1985; Soria et al., 1998), Blay Goicoechea (1993), and more recently, Sánchez-García and Ben-Dov (Sánchez-García and Ben-Dov, 2010; Ben-Dov and Sánchez-García, 2015).

In this study we provide information on the distribution of a few ground living scale insect species based on material housed at the Museo Nacional de Ciencias Naturales, Madrid, Spain.

MATERIAL AND METHODS

The specimens recorded in this study were all collected from the residual soil and litter sample material from the collection of Museo Nacional de Ciencias Naturales, Madrid, Spain (MNCN-CSIC). The soil and litter samples were collected from mainland Spain by different researchers, mainly in the 1960's and 1970's. Name of the collector were often missing from the collection data. The samples were stored in 70% ethanol.

Specimens were prepared for light microscopy using the slide-mounting method discussed by Kosztarab and Kozár (1988). Prepared slide mounted specimens were observed and identified using a phase-contrast light microscope (Olympus BX 41). The scale insects were identified using the following taxonomic keys: Acanthococcidae (Kozár et al., 2013); Ortheziidae (Kozár, 2004); Pseudococcidae (Kosztarab and Kozár, 1988; Williams, 2004; Danzig and Gavrilov-Zimin, 2014; Kaydan, 2015); and Rhizoecidae (Kozár and Konczné Benedicty, 2007).

The slides are deposited in the MNCN and in the Plant Protection Institute, Centre for Agricultural Research, Hungarian Academy of Sciences (PPI), Budapest, Hungary.

Distribution data for each species have been provided, with new country records. However it should be taken into consideration, that these new country records are based on information available in the scale insect database ScaleNet (García Morales et al., 2016). Codes of MNCN and PPI are presented after the locality of specimens.

RESULTS AND DISCUSSION

Among the more than 500 soil samples, 44 contained scale insect specimens, but only 19 sample contained adult females, belonging to 10 species. From these, 1 species belongs to the family Acanthococcidae, 3 species belong to the family Ortheziidae, 4 belong to the family Pseudococcidae and 2 species belong to the family Rhizoecidae. Despite the low number of species found, 6 species proved to be new to the scale insect fauna of Spain.

The large proportion of new fauna elements based on our study can be explained by the fact, that previous authors mostly studied those scale insect families which are associated to the aerial parts of the plants. Our results highlight, that ground living families of scale insects are extremely understudied in Spain, and extended research on these groups may result in several new and interesting data.

List of recorded species:

Acanthococcidae

Rhizococcus thymalaeae (Newstead, 1897): 2♀ – Guadalajara province, Membrillera, litter with lavender and thyme at fishlake, 29-V-1986 (MNCN_Ent 332944/PPI 13213).



Ortheziidae

Arctorthezia cataphracta (Olafsen, 1772): 1♀ – Segovia province, Valsaín, dry oak and pine litter, 17-IX-1967 (MNCN_Ent 332953/PPI 13200).

Newsteadia floccosa (De Geer, 1778): 2 ♀♀ – Segovia province, Pedraza, stony soil under mountain route, 1-V-1975 (MNCN_Ent 332957/PPI 13206); 3 ♀♀ – Huesca province: Jaca, Sta. Isabel, soil and leaf litter below boxwood and holm oak, 21-IX-1969 (MNCN_Ent 332954/MNCN_Ent 332955/MNCN_Ent 332956/PPI 13202, 13202, 13203).

Ortheziola vej dovskiyi Sulc, 1895: 1♀ – Huesca province, Jaca, herbaceous plant where pine begins to predominate replacing the oak, VII-1971 (MNCN_Ent 332967/PPI 13210); 1♀ – Segovia province, Valsaín, *Pinus sylvestris* ferns, grass with snow 29-II-1966, leg. L.R. Muguza (MNCN_Ent 332962/PPI 13207). New to Spain.

Pseudococcidae

Fonscolombia graminis Lichtenstein, 1877: 1♀ – Salamanca province, Comarcal de Barregas, Farm “Cobadilla de Valmuza”, Carrascal de Barregas Town Hall, dry soil by holm oaks with various herbs (*Trifolium*, *Poa*, *Plantago* and moss), IX-1965, leg. F. Simón (MNCN_Ent 332968/PPI 13214). New to Spain.

Peliococcus mathisi (Balachowsky, 1953): 1♀ – Valencia province, El Perellonet, area next to the beach ca. 90 m of the sea shore next to small sand dunes, soil of moist sand with small bushes, 14-II-1987 (MNCN_Ent 332969/PPI 13215). New to Spain.

Phenacoccus madeirensis Green, 1923: 1♀ – Guadalajara province, Membrillera, litter with lavender and thyme at fishlake, 29-V-1986 (MNCN_Ent 332970/PPI 13216).

Rhodania porifera Goux, 1935: 1 ♀ – Salamanca province, Comarcal de Barregas, Farm “Cobadilla de Valmuza”, Carrascal de Barregas Town Hall, dry soil by holm oaks with various herbs (*Trifolium*, *Poa*, *Plantago* and moss), IX-1965, leg. F. Simón (MNCN_Ent 332978/PPI 13223). New to Spain.

Rhizoecidae

Rhizoecus arabicus Hambleton, 1976: 9 ♀♀ – Valencia province, El Perellonet, area next to the beach ca. 90 m of the sea shore next to small sand dunes, soil of moist sand with small bushes, 14-II-1987 (MNCN_Ent 332986 to MNCN_Ent 332991/PPI 13225). New to Spain.

Ripersiella lelloi (Mazzeo, 1995): 8 ♀♀ – Toledo province, Sta. Olalla, Higuera farm, soil under oak decomposition layer, 4-II-1982 (MNCN_Ent 332993 to MNCN_Ent 332996/PPI 13226); 1♀ – unknown locality (MNCN_Ent 332992/PPI 13227). New to Spain.

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