

CONTRIBUTION TO THE KNOWLEDGE OF THE TETRIGIDAE (ORTHOPTERA) IN CONTINENTAL PORTUGAL

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Abstract: A compilation of the Portuguese records of Tetrigidae is presented, together with new distributional data of the six species present in the country. The distribution of the species is mapped and commented upon. Additions are presented for the fauna of three Natural Parks. *Uvarovitettix depressus* (Brisout de Barneville, 1849), previously known from only two localities in the country, is recorded from five new 10 Km UTM squares.

Keywords: Orthoptera, Tetrigidae, new records, distribution, continental Portugal.

Contribución al conocimiento de la fauna de Tetrigidae (Orthoptera) en Portugal continental

Resumen: Se presenta una recopilación de los registros portugueses de Tetrigidae y nuevos datos de distribución de las seis especies presentes en el país. Se incluyen mapas y se comenta la distribución de las especies. Se presentan nuevos registros para la fauna de tres Parques Naturales. *Uvarovitettix depressus* (Brisout de Barneville, 1849), anteriormente conocida de dos localidades en el país, se registra de cinco nuevas cuadrículas UTM 10 Km.

Palabras clave: Orthoptera, Tetrigidae, nuevos registros, distribución, Portugal continental.

Introduction

The Tetrigidae, or groundhoppers, are small-sized Orthopterans easily recognizable by their elongated pronotum, which overlaps at least the abdomen. Most species in this family are more or less hygrophilous, some swimming well on the surface and a few even under water (HARZ, 1975). Their close relationship to water restricts their distribution to habitats with suitable conditions, such as river banks and floodplains.

The European fauna of the family comprises 12 species (Heller *et al.*, 1998), nine of which occur in the Iberian Peninsula (Llorente & Presa, 1981).

Methods

The data presented in this contribution results largely from fieldwork and literature survey. The literature survey was conducted with the purpose of compiling the available information on the Portuguese fauna of Tetrigidae. Fieldwork, which was mainly carried out in the northern half of continental Portugal, was not specifically designed for Tetrigidae but aimed primarily to characterize local insect and spider faunas, namely in some protected areas such as the National and several Natural Parks. In addition, the collection of the Zoological Museum of Coimbra (MZCP) was examined but not all specimens were identified because of their poor condition. Furthermore, data from specimens deposited in the collection of the Agrarian School of Bragança (ESAB), which was provided by Maria José Miranda-Arabolaza, is also included. The identification of the specimens was based on Llorente & Presa (1981) and Llucià Pomares (2002).

The genera and species in the list below are arranged alphabetically. The “Material examined” section includes the collecting data for each record: locality data (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 following acronyms are used for the Parks: ANP (Alvão Natural Park), DINP (Douro International Natural Park), MNP (Montesinho Natural Park), PGNP (Peneda-Gerês National Park) and SENP (Serra da Estrela Natural Park). The altitudinal ranges of the material examined (excepting that in MZCP) are synthesised in the “Altitudinal range” section whereas the adult phenology recorded in this study is presented in the “Phenology in Portugal” section together with a summary of the literature data for the country. It must be emphasized that since fieldwork was not specifically designed for Tetrigidae the data here presented does not represent the phenological patterns of the species. The “References” section presents, for each species, the references that contain data from Portugal. The localities recorded in these references are listed alphabetically in the “Bibliographic localities” section.

Maps 1–6 show the known distributions of the species in continental Portugal, in UTM 10x10 Km squares classified according to the source: bibliographic (○), museum (●) and fieldwork (including ESAB’s collection) (●).

Results

The oldest reference to species of the family Tetrigidae from Portugal found in the literature dates from 1797, when Vandelli recorded “*Gryllus* (Bulla) *bipunctatus*” in his *Floræ, et Faunæ Lusitanicæ Specimen*. The survey conducted so far has yielded 23 references dealing with the Portuguese fauna of the family: one from the 18th century, seven from the 19th century, thirteen from the 20th century

(including the revision by Llorente & Presa in 1981), and one already published in the 21st century (Miranda-Arabolaza & Barranco, 2005).

Overall, seven species have been recorded from Portugal, but only six of them are in fact confirmed from the country, since the records of *Tetrix bipunctata* (Linnaeus, 1758) (only present in the south-east of Spain) were considered misidentifications of *Tetrix undulata* (Sowerby, 1806) (Llorente & Presa, 1981). The remaining two species present in the Iberian Peninsula are also not likely to occur in Portugal as their distributions are restricted to the Pyrenean and Cantabrian areas in the case of *Tetrix tenuicornis* (Sahlberg, 1893), and to the eastern half of Spain in the case of *Tetrix bolivari* (Saulcy, 1901) (Llorente & Presa, 1981).

The present contribution includes data from a total of 109 specimens: 73 collected and identified by the authors, 24 in the collection of MZCP, also identified by the authors, and 12 collected and identified by M. J. Miranda-Arabolaza (ESAB).

The knowledge about the Tetrigidae fauna of five Parks is increased: four species are new to Serra da Estrela Natural Park, three to Montesinho Natural Park and one to Alvão Natural Park. Furthermore, the available distributional data is increased for Peneda-Gerês National Park and Douro International Natural Park.

Species list

Paratetrix meridionalis (Rambur, 1838)

MATERIAL EXAMINED: **Alfândega da Fé:** Sambade (29TPF6888 - 850 m), 12-05-2005 (1 ♀). **Celorico da Beira:** Muxagata (29TPE3796 - 590 m) (SENP), 13-06-2005 (1 ♂); Quinta dos Corgãos (29TPE4297 - 450 m) (SENP), 19-05-2005 (1 ♀). **Freixo de Espada à Cinta:** Poiães (29TPF7649 - 230 m) (DINP), 10-05-2005 (2 ♂♂ and 4 ♀♀). **Fundão:** Meimosa stream (29TPE3249 - 420 m), 27-08-2005 (2 ♂♂ and 2 ♀♀). **Gouveia:** Aldeias stream margin (29TPE1582 - 530 m) (SENP), 06-07-2005 (1 ♀). **Manteigas:** River Zêzere banks (29TPE3372 - 520 m) (SENP), 11-07-2005 (1 ♀). **Mirandela:** Caravelas (29TPF6289 - 650 m), 24-07-1998 (1 ♀, Miranda-Arabolaza *leg. et det.*, ESAB col.). **Torre de Moncorvo:** Urros (29TPF6852 - 380 m), 10-05-2005 (1 ♀). **Vila do Conde:** Vairão (29TNF2775 - 100 m), 30-08-2005 (1 ♀). **Vila Nova de Foz Côa:** Almendra train station (29TPF6744 - 120 m), 11-05-2005 (1 ♂); Piscos stream banks (29TPF5743 - 160 m), 11-05-2005 (1 ♀); Senhora do Campo (29TPF6642 - 180 m), 10-04-2004 (1 ♀, Sónia Ferreira col.) and 11-05-2005 (4 ♂♂ and 2 ♀♀).

ALTITUDINAL RANGE: from 100 to 850 m.

MZCP SPECIMENS EXAMINED: Beja (29SPC00) (1 ♀), Bragança (29TPG83) (2 ♂♂), Buçaco (29TNE56) (1 ♀), Coimbra (29TNE45) (1 ♀), Espinho (29TNF33) (1 ♀), Faro (29SNA99) (1 ♂), Lourical (29TPE23) (1 ♂), Mata do Fundão (29TPE24) (2 ♀♀), Montemor (1 ♂) and Ocreza (29TPE21) (2 ♂♂, Tavares *leg.*, 1907).

REFERENCES: López Seoane (1878), Santos (1883), Nobre (1897, 1900), Bolívar (1898), Aires & Menano (1915), Seabra (1938, 1939a, 1939b, 1942), Ebner (1941), Nobre & Braga (1942), Llorente & Presa (1981), Hochkirch (1999), Lock (1999), Lock & Durwael (1999) and Miranda-Arabolaza & Barranco (2005).

BIBLIOGRAPHIC LOCALITIES: Aldeia Nova de S. Bento, Almada, Almodovar, Amarante, Barca de Alva, Berlenga, Bragança, Buarcos, Castelo Branco, Coimbra, Condeixa, Coruche, Darque, Esmoriz, Estói, Felgar (Rio Sabor), Foz do Douro, Foz do rio Lis, Guarda, Herdade da Mitra, Leça da Palmeira, Lisboa,

Mata da Foja, Mata da Leirosa, Mata da Trafaria, Mata das Virtudes, Mata de Leiria, Mata de Mira, Mata de Quiaios, Mata do Choupal, Mata do Fundão, Mata do Lagar do Seminário, Mata do Urso, Melides, Mogofores, Monchique, Odemira, Parada (Alfândega), Pinelo (Rio Maças), Ponte de Moncorvo (Rio Sabor), Porto Covo, Ria Formosa, Ribeira das Tortulhas (Algozo), Ribeira de Vilar Seco, Ribeira do Angueira (Vale do Algozo), Ribeira do Penacal, road between Batalha and Leiria, Salir, Sanhoane, Serra de Monchique, Serra de Monsanto, Serra de Montesinho, Serra do Gerês, Serra do Marão, Soure, Valdrez, Valongo, Varge, Vilar Chão, Vilar Seco and Vimioso.

PHENOLOGY IN PORTUGAL: April to August (new records); March to November (Santos, 1883; Seabra, 1939b; Ebner, 1941; Llorente & Presa, 1981; Lock, 1999; Miranda-Arabolaza & Barranco, 2005).

COMMENTS: Widely distributed in the country (Map 1), new for Serra da Estrela Natural Park. Montemor and Mata da Foja are not mapped (untraceable UTM coordinates).

Tetrix ceperoi (Bolívar, 1887)

MATERIAL EXAMINED: **Gouveia:** Near Vale do Rossim reservoir (29TPE1973 - 1420 m) (SENP), 12-06-2005 (4 ♀♀). **Meda:** Alto do Vale Redondo (29TPF4929 - 490 m), 17-05-2005 (1 ♀). **Montalegre:** Pegia (Lama Chã stream banks) (29TNG9329 - 940 m) (PGNP), 19-08-2002 (1 ♀, Sónia Ferreira col.). **Seia:** Vidual stream banks (29TPE1872 - 1450 m) (SENP), 12-06-2005 (1 ♀). **Vinhais:** Moimenta (29TPG6746 - 870 m) (MNP), 04-06-2005 (1 ♂).

ALTITUDINAL RANGE: from 490 to 1450 m.

REFERENCES: Aires & Menano (1915), Seabra (1942), Llorente & Presa (1981) and Miranda-Arabolaza & Barranco (2005).

BIBLIOGRAPHIC LOCALITIES: Esmoriz, Ribeira de Vilar Seco and Serra do Gerês.

PHENOLOGY IN PORTUGAL: July and August (Llorente & Presa, 1981; Miranda-Arabolaza & Barranco 2005); May to August (new records).

COMMENTS: New for Montesinho and Serra da Estrela Natural Parks. Despite the fact that it had been scarcely recorded from Portugal, the new data (albeit concentrated in the north, due to a higher sampling effort), suggests that the species is not restricted in the country (Map 2), being probably widely distributed [in Spain it extends southwards to Andalucía (Llorente & Presa, 1981)].

Tetrix subulata (Linnaeus, 1758)

MATERIAL EXAMINED: **Vinhais:** Moimenta (29TPG6746 - 870 m) (MNP), 04-06-2005 (1 ♀).

REFERENCES: Bolívar (1876), López Seoane (1878), Cazurro (1888), Aires & Menano (1915), Seabra (1938, 1939a, 1939b, 1942) and Llorente & Presa (1981).

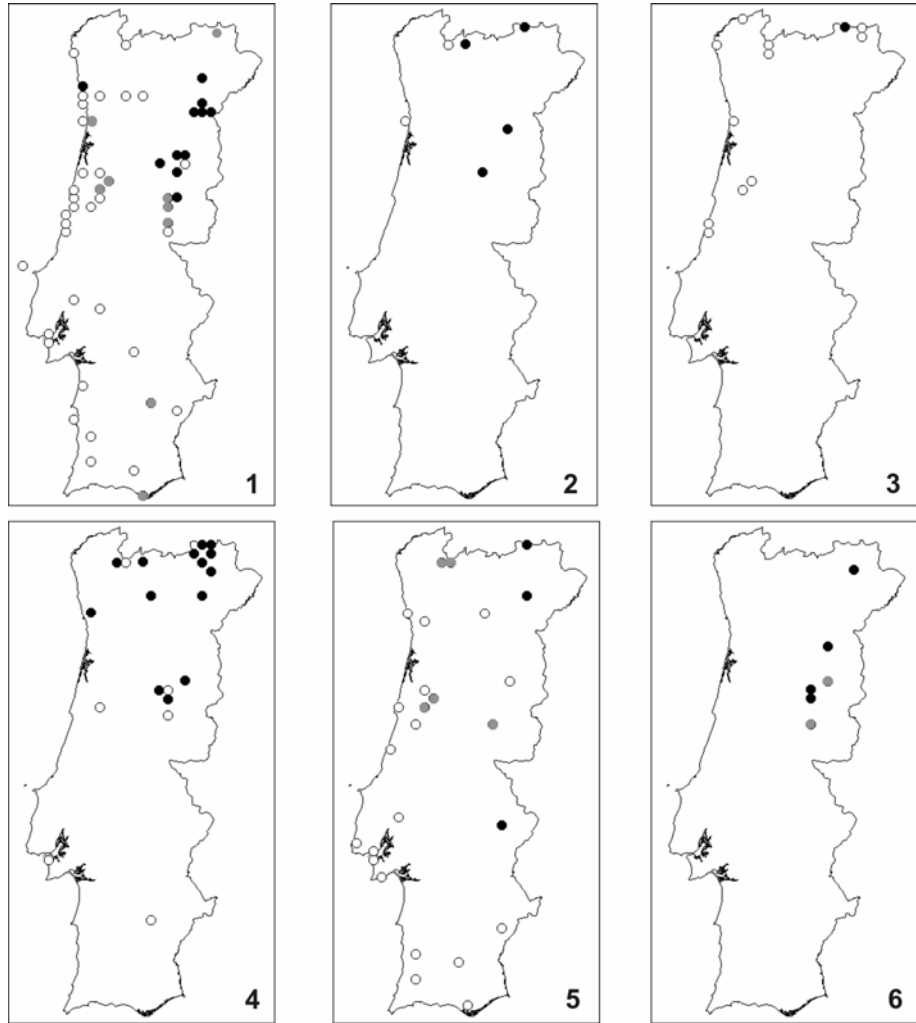
BIBLIOGRAPHIC LOCALITIES: Bragança, Afife, Buçaco, Coimbra, Espinho, Foz do rio Lis, Mata de Leiria, Monção, Serra da Cabreira, Serra de Montesinho, Serra do Gerês, "Villonga" and "Villalonga".

PHENOLOGY IN PORTUGAL: June (new record); no data available in the literature.

COMMENTS: Although the species had been recorded from the north and centre of the country we are only able to confirm its presence in Montesinho Natural Park (Map 3). The species range is probably much wider considering its occurrence from coastal to mountainous areas and in northern, central and southern Spain, namely in Huelva province (Llorente & Presa, 1981). The locality referred in the literature as "Villonga" and "Villalonga" is not mapped (untraceable UTM coordinates).

Tetrix undulata (Sowerby, 1806)

MATERIAL EXAMINED: **Alfândega da Fé:** Sambade (29TPF6687 - 1010 m), 12-05-2005 (1 ♀) and (29TPF6888 - 850 m), 12-05-2005 (1 ♂ and 2 ♀♀). **Bragança:** Near Santo Amaro chapel (29TPG7940 - 780 m) (MNP), 06-06-2005 (1 ♀);



Maps 1-6: Known distribution in continental Portugal of: **1.** *Paratettix meridionalis* (Rambur, 1838). **2.** *Tetrix ceperoi* (Bolivar, 1887). **3.** *Tetrix subulata* (Linnaeus, 1758). **4.** *Tetrix undulata* (Sowerby, 1806). **5.** *Uvarovitettix nodulosus* (Fieber, 1853). **6.** *Uvarovitettix depressus* (Brisout de Barneville, 1849). Records are classified as (○), museum (●) and fieldwork (including ESAB's collection) (●).

Near Vilarinho (29TPG7840 - 770 m) (MNP), 03-06-2005 (1 ♀). **Gouveia:** Salgueiro stream banks (29TPE2175 - 1280 m) (SENP), 13-04-2005 (1 ♀), 12-06-2005 (1 ♀). **Guarda:** Near Quinta da Igreja (29TPE4388 - 830 m) (SENP), 19-05-2005 (2 ♀♀). **Macedo de Cavaleiros:** Vilar de Ouro (29TPG7416 - 900 m), 23-09-1995 (4 ♂♂, Miranda-Arabolaza *leg. et det.*, ESAB col.). **Maia:** Gondim (29TNF3367 - 90 m), 16-03-2003 (1 ♀, Sónia Ferreira col.). **Manteigas:** Malhada Alta (29TPE2367 - 1450 m) (SENP), 09-06-2005 (1 ♂). **Montalegre:** Pegia (Lama Chã stream banks) (29TNG9329 - 940 m) (PGNP), 19-08-2002 (1 ♂, Sónia Ferreira col.). **Ponte da Barca:** Near Germil (29TNG6025 - 650 m) (PGNP), 21-07-2003 (1 ♀, Sónia Ferreira col.); Soutelo (29TNG6535 - 250 m) (PGNP), 15-04-2003 (1 ♀, Sónia Ferreira col.). **Seia:** Near Sabugueiro (29TPE1472 - 1100) (SENP), 03-05-2005 (1 ♂ and 3 ♀♀), 14-06-2005 (1 ♀) and (29TPE1674 - 1190 m) (SENP), 13-04-2005 (1 ♂). **Vila Real:** Lamas d'Olo (29TPF0080 - 1000 m) (ANP), 30-06-1991 (1 ♀, Miranda-Arabolaza *leg. et det.*, ESAB col.). **Vinhais:** Moimenta (29TPG6746 - 870 m) (MNP), 04-06-2005 (1 ♀); Salgueiros (29TPG6340) (MNP), 21-09-1993 (1 ♀, Miranda-Arabolaza *leg. et det.*, ESAB col.); Sandim (River Mente banks) (29TPG5036), 30-09-1993 (2 ♀♀, Miranda-Arabolaza *leg. et det.*, ESAB col.); Soeira (29TPG7335 - 700 m) (MNP), 22-09-1992 (4 ♀♀, Miranda-Arabolaza *leg. et det.*, ESAB col.); Tui-zelo (29TPG6140 - 850 m) (MNP), 05-06-2005 (1 ♀). **Terras de Bouro:** Cruzeiro (29TNG6622 - 630 m) (PGNP), 17-09-2003 (1 ♂ and 1 ♀, Sónia Ferreira col.).

ALTITUDINAL RANGE: from 90 to 1450 m.

REFERENCES: Vandelli (1797), Bolivar (1876, 1898), López Seoane (1878), Cazorro (1888), Aires & Menano (1915), Vargas (1930) Seabra (1942), Llorente & Presa (1981), Lock (1999) and Miranda-Arabolaza & Barranco (2005).

BIBLIOGRAPHIC LOCALITIES: Avelanoso, Barragem de Montesinho, Beja, Bico (Viana do Castelo), Coimbra, Covilhã, França, Mata da Trafaria, Mata do Fundão, Quinta das Quebradas (Mogadouro), Refega, Ribeira do Penacal, Serapicos, Serra da Nogueira, Serra do Gerês, Soeima.

PHENOLOGY IN PORTUGAL: March to September (new records); April to November (Vargas, 1930; Llorente & Presa, 1981; Lock, 1999; Miranda-Arabolaza & Barranco, 2005).

COMMENTS: This was the most frequently encountered species during fieldwork, being new for Alvão, Montesinho and Serra da Estrela Natural Parks (Map 4). Bico is not mapped (untraceable UTM coordinates).

Uvarovitettix nodulosus (Fieber, 1853)

MATERIAL EXAMINED: **Alfândega da Fé:** Sambade (29TPF6888 - 850 m), 12-05-2005 (1 ♀). **Monforte:** Almuro stream banks (29SPD3217 - 230 m), 13-03-2005 (2 ♀♀, Sónia Ferreira col.). **Vinhais:** Ponte do Couço (29TPG6946 - 760 m) (MNP), 02-06-2005 (1 ♀).

ALTITUDINAL RANGE: from 230 to 850 m.

MZCP SPECIMENS EXAMINED: Buçaco (29TNE56) (1 ♀), Coimbra (29TNE45) (1 ♂ and 1 ♀), Gerês (29TNG62) (1 ♂), Lourçal (29TPE23) (1 ♀), S. Fiel (29TPE23) (1 ♂), Serra do Gerês (29TNG72) (1 ♀).

REFERENCES: Bolivar (1876, 1878, 1887, 1898), López Seoane (1878), Cazorro (1888), Aires & Menano (1915), Seabra

(1938, 1939a, 1939b, 1942), Ebner (1941), Llorente & Presa (1981) and Lock (1999).

BIBLIOGRAPHIC LOCALITIES: Mata do Choupal, Mata do Lagar do Seminário, Mogofores, Monchique, Odemira, Pragal, S. Martinho de Antas, Serra da Arrábida, Serra de Monchique, Serra de Sintra, Serra de Valongo, Serra do Buçaco, Serra do Gerês, Serra e Mata do Buçaco, Sintra, Soure and Vale de Coselhas (Coimbra).

PHENOLOGY IN PORTUGAL: March to June (new records); January to December (Seabra, 1939b; Ebner, 1941; Llorente & Presa, 1981; Lock, 1999).

COMMENTS: Widely distributed in the country (Map 5), new for Montesinho Natural Park.

***Uvarovittix depressus* (Brisout de Barneville, 1849)**

MATERIAL EXAMINED: **Bragança:** Rebordainhos (29TPG7715 - 990 m), 12-05-2005 (2 ♀♀). **Gouveia:** Salgueiro stream banks (29TPE2175 - 1280 m) (SENP), 13-04-2005 (2 ♀♀). **Macedo de Cavaleiros:** Espadanedo (29TPG7112 - 780 m), 12-05-2005 (1 ♀). **Manteigas:** Serra de Baixo (29TPE2367 - 1450 m) (SENP), 03-05-2005 (1 ♂ and 1 ♀). **Meda:** Alto do Vale Redondo (29TPF4929 - 490 m), 17-05-2005 (1 ♂). All specimens belong to the brachypterous form.

ALTITUDINAL RANGE: from 490 to 1450 m.

MZCP SPECIMENS EXAMINED: Guarda (29TPE48) (2 ♀♀) (brachypterous form), Lourçal (29TPE23) (1 ♀), S. Fiel (29TPE23) (1 ♂) (macropterous form).

REFERENCES: Cazurro (1888), Bolívar (1898), Aires & Menano (1915), Seabra (1942), Llorente & Presa (1981) and Miranda-Arabolaza & Barranco (2005).

BIBLIOGRAPHIC LOCALITIES: Guarda and Ribeira do Penacal.

PHENOLOGY IN PORTUGAL: April and May (new records); March and April (Miranda-Arabolaza & Barranco, 2005).

COMMENTS: First record for Serra da Estrela Natural Park. The species was previously known from only two localities in the country, and all the previous records except one referred to Guarda specimens kept in MZCP. The species range is enlarged in Portugal (Map 6), which was predictable considering its known range in Spain (Zamora and Cáceres provinces) (Llorente & Presa, 1981). The altitudinal range of the species is in agreement with the preference for mountainous areas already mentioned by some authors (Llorente & Presa, 1981; Lluçia Pomares, 2002).

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