

ON THE GRASSHOPPERS AND CRICKETS OF DOURO INTERNACIONAL NATURAL PARK, PORTUGAL (ORTHOPTERA)

Sónia Ferreira

Departamento de Zoologia e Antropologia, Faculdade de Ciências da Universidade do Porto, 4099-002 Porto, Portugal
CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, Universidade do Porto, Campus Agrário de Vairão,
4485-661 Vairão; Portugal. – hiporame@gmail.com.

Abstract: The knowledge of the composition and distribution of the Orthoptera of Douro Internacional Natural Park (north-eastern Portugal) is increased with data on 20 species. *Mogoplistes brunneus* Serville, 1839 is recorded for the second time from the country, and fifteen species constitute novelties for the Park's fauna.

Key words: Orthoptera, faunistics, new records, Douro Internacional Natural Park, north-eastern Portugal.

Sobre los saltamontes y grillos del Parque Natural do Douro Internacional, Portugal (Orthoptera)

Resumen: En este trabajo se presentan registros de 20 especies de Orthoptera, ampliando los conocimientos sobre la composición y distribución de la fauna del Parque Natural do Douro Internacional (nordeste de Portugal). *Mogoplistes brunneus* Serville, 1839 se registra por segunda vez del país, y quince de las especies son novedades para la fauna del Parque.

Palabras clave: Orthoptera, faunística, nuevos registros, Parque Natural do Douro Internacional, nordeste de Portugal.

Introduction

The Douro Internacional Natural Park (PNDI) is located in the North-east of Portugal in the area where the river Douro is the border between Portugal and Spain (Fig. 1). With an extension of 122 km and an area around 85.150 ha, the Park holds a set of peculiarities that make it unique in the country. The striking sloped valleys of river Douro and Águeda are the most distinguishing landscape features of the Park. Although including areas that range from 125 to 895 meters above sea level (a.s.l.), most of the Park is located between 600 and 800 meters a.s.l.

Douro Internacional Natural Park, which is located in the Mediterranean region, exhibits large temperature variations between summer and winter, especially in the valleys. Furthermore the low level of precipitation, with an annual total of less than 850 mm, produces habitat specificities that enhance the Mediterranean character of the Park's flora and vegetation.

The main woodland type present in the Park is that dominated by *Quercus rotundifolia*. Other tree species represented are *Quercus suber*, *Quercus pyrenaica*, and *Juniperus oxicedrus*, which form scattered patches, and the ripicolous *Alnus glutinosa*, *Salix salvifolia*, *Fraxinus angustifolia* and *Celtis australis*, occurring mainly on the river margins. The main shrubby formation is composed of *Cytisus multiflorus*, followed by that of *Lavandula stoechas ssp. sampaiana* and that of *Cistus ladanifer* among others (Anonymous, 2002).

The insect fauna of PNDI appears to be quite diverse to any visitant of the area. However, its composition is far from well known, the scarce available information hardly exceeding two hundred species (Grosso-Silva pers. comm.). Furthermore, no single order or group has been the subject of a comprehensive study.

Among insects, the grasshoppers and crickets of PNDI are no exception in what concerns the poor state of their

knowledge. Bibliographic data about the Park's fauna is limited to five unrelated references. The eldest of these dates from 1900, when Professor Augusto Nobre published records of 17 Orthoptera species in his *Catálogo do Gabinete de Zoologia*, all of which collected at Barca de Alva. Three decades later, Vargas (1930) mentioned two of Nobre's records and only one century later, a new species (a cricket) was added to the Park's inventory (Grosso-Silva, 2000). Recently two more works have included records of Orthoptera from the Park, Miranda-Arabolaza & Barranco (2005) reporting the presence of nine new species to the area, and Ferreira *et al.* (2006) confirming the presence of *Paratettix meridionalis* (Rambur, 1838), one of the species previously recorded by Nobre (1900). As a result, 27 species are hitherto known from the Park's area.

The main purpose of the present work is to increase the available information on the fauna of the order Orthoptera in Douro Internacional Natural Park, in terms of both Inventory and Distribution.

Methods

The data presented in this contribution results from literature survey and from the study of 1578 specimens collected in 2001 at eleven localities (Fig. 2) in the course of another study, which relied mainly on the use of pitfall traps (Cardoso, 2004).

The identification of the specimens was based on Harz (1969, 1975), Llorente & Pinedo (1990), Lluçà Pomares (2002), Morales Agacino (1943), Ragge (1990). All specimens are deposited in the author's collection.

The classification used below follows mainly the *Fauna Europaea* database (Heller, 2005), in which families are ordered alphabetically inside each suborder, as the species are in each family.

Table I. List of the sampling localities, with locality codes and names, municipalities, altitudes and UTM grid references.

Locality code	Locality name	Municipality	Altitude (m)	UTM 1x1 Km
S-1	Fonte de Aldeia	Miranda do Douro	700	29TQF1789
S-2	Vila Chã de Bracios	Miranda do Douro	710	29TQF2188
S-3	Picote (slopes)	Miranda do Douro	610	29TQF2284
S-4	Bemposta	Mogadouro	450	29TQF1477
S-5	Tó	Mogadouro	690	29TQF0376
S-6	Algozinho	Mogadouro	620	29TQF0475
S-7	Bruçó	Mogadouro	750	29TPF9069
S-8	Picotino	Freixo de Espada à Cinta	740	29TPF8864
S-9	Lagoaça	Freixo de Espada à Cinta	350	29TPF9263
S-10	Mazouco	Freixo de Espada à Cinta	730	29TPF8559
S-11	Palão	Freixo de Espada à Cinta	630	29TPF8355

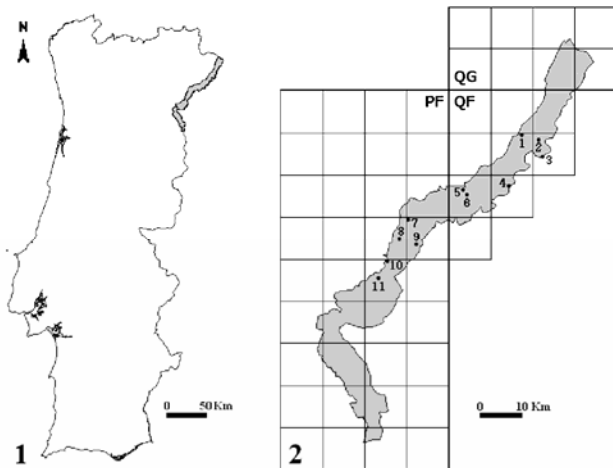


Fig. 1. Location of the Douro Internacional Natural Park in continental Portugal. Fig. 2. Position of the centroids of sampled 1 km UTM squares in Douro Internacional Natural Park (numbers correspond to the site codes in Table I).

The “Material examined” section includes the collecting data for each record: locality code, date and specimen(s) information (“n” indicates nymphs). Information on the localities - code, name, municipality, altitude and 1x1 km UTM coordinates - is presented in Table I.

A list of the 10x10 Km UTM coordinates from which the species are recorded is included as well as the adult phenology observed in the present study. For the species already known from PNDI, the references that contain data to this area are indicated in the “References” section followed by the year of publication, page number and the spelling used in each case.

Results: Species list

Suborder CAELIFERA Family ACRIDIDAE

Calliptamus barbarus (Costa, 1836)

MATERIAL EXAMINED: **S-1**, 04-07-2001 (1 ♂), 25-07-2001 (3 ♂♂ e 1 ♀), 15-08-2001 (1 ♂), 09-09-2001 (1 ♂); **S-2**, 28-06-2001 (1 ♂), 12-07-2001 (2 ♂♂ e 1 ♀); **S-3**, 12-07-2001 (1 ♂), 09-08-2001, (1 ♂); **S-5**, 04-07-2001 (1 ♂), 25-07-2001 (1 ♂); **S-10**, 11-07-2001 (1 ♂), 25-07-2001 (2 ♂♂), 01-08-2001 (1 ♂), 22-08-2001 (1 ♂ e 1 ♀), 19-09-2001 (3 ♂♂); **S-11**, 09-08-2001 (1 ♂).

UTM (10x10): 29TPF85, 29TQF07, 29TQF18, 29TQF28.

PHENOLOGY OBSERVED: July to September.

COMMENTS: New species for the Park.

Pezotettix giornae (Rossi, 1794)

MATERIAL EXAMINED: **S-3**, 05-09-2001 (1 ♂); **S-5**, 25-07-2001 (1 ♂), 01-08-2001 (1 ♂), 15-08-2001 (1 ♂), 22-08-2001 (1 ♀); **S-10**, 25-07-2001 (1 ♂), 01-08-2001 (1 ♂), 29-08-2001 (1 ♀).

UTM (10x10): 29TPF85, 29TQF07, 29TQF28.

PHENOLOGY OBSERVED: July to September.

REFERENCES: Miranda-Arabolaza & Barranco [2005: 182, as “*Pezotettix giornae* (Rossi, 1794)”]: “Quinta de Colmeais (Mogadouro), 1 ♀, 26-IX-2000”. The UTM grid square (29TPF8865) and the altitude of this site (650 m) are mentioned in a table by the authors.

Oedipoda caerulecens (Linnaeus, 1758)

MATERIAL EXAMINED: **S-1**, 19-09-2001 (2 ♀♀); **S-3** 31-05-2001 (1 ♂), 09-08-2001 (1 ♂).

UTM (10x10): 29TQF18, 29TQF28.

PHENOLOGY OBSERVED: May, August and September.

REFERENCES: Nobre [1900: 110, as “*Oedipoda caerulecens* (Lin.)”]; “Barca d’Alva (A. Nobre)”; Vargas [1930: 295-296, as “*Edipoda coerulecens* (Linn.)”]; “A. Nobre cita exemplares (...) Barca d’Alva”.

Suborder ENSIFERA Family GRYLLIDAE

Gryllus campestris Linnaeus, 1758

MATERIAL EXAMINED: **S-1**, July-2001 (1 ♀), 19-09-2001 (1 n ♂), October-2001 (1 n ♂), 03-10-2001 (1 n ♀); **S-2**, April-2001 (2 nn ♀♀), 16-05-2001 (1 ♂ e 4 ♀♀), 26-07-2001 (3 nn), 08-08-2001 (1 n ♂ e 1 n ♀), 23-08-2001 (1 n ♂), 05-09-2001 (1 n ♀), 03-10-2001 (1 n ♀), 31-10-2001 (1 n ♂ e 2 nn ♀♀), 14-11-2001 (1 n ♂); **S-6**, 08-08-2001 (1 n), 22-08-2001 (4 nn), 03-10-2001 (2 nn ♂♂ e 1 n ♀), 17-10-2001 (1 n ♀); **S-10**, 30-05-2001 (2 ♂♂ e 4 ♀♀), 25-07-2001 (2 nn), 08-08-2001 (1 n), 22-08-2001 (4 nn), 19-09-2001 (4 nn ♂♂ e 3 nn ♀♀), 30-10-2001 (1 n ♂), 2001 (1 ♂).

UTM (10x10): 29TPF85, 29TQF07, 29TQF18, 29TQF28.

PHENOLOGY OBSERVED: April to May, July to November.

REFERENCES: Nobre [1900: 112, as “*Liogryllus campestris* L.”]; “Barca d’Alva (L. Alves dos Reis Junior)”.

Nemobius sylvestris (Bosc, 1792)

MATERIAL EXAMINED: **S-1**, 27-06-2001 (1 ♀), 05-09-2001 (1 ♀); **S-4**, 21-10-2001 (1 ♀); **S-5**, 07-02-2001 (6 ♂♂ e 11 ♀♀), 21-03-2001 (4 ♂♂ e 14 ♀♀), 04-04-2001 (1 ♂ e 2 ♀♀), 02-05-2001 (3 ♀♀), 18-05-2001 (1 ♀), 30-05-2001 (8 ♂♂ e 4 ♀♀), 13-06-2001 (7 ♂♂ e 2 ♀♀), 27-06-2001 (45 ex.), 11-07-2001 (37 ex.), 25-07-2001 (65 ex.), 27-07-2001 (43 ex.), 08-08-2001 (82 ex.), 09-08-2001 (1 ♀), 20-08-2001 (56 ex.), 22-08-2001 (98 ex.), 05-09-2001 (9 ♂♂ e 25 ♀♀), 19-09-2001 (190 ex.), 03-10-2001 (4 ♂♂ e 20 ♀♀), 31-10-2001 (2 ♂♂ e 1 ♀), 28-11-2001 (1 ♀), 2001 (5 ♂♂ e 8 ♀♀); **S-6**, 16-05-2001 (1 ♂), 16-06-2001 (1 ♂), 25-07-2001 (3 ♂♂ e 10 ♀♀), 27-07-2001 (3 nn ♂♂ e 2 nn ♀♀), 05-08-2001 (3 ♂♂ e 7 ♀♀), 08-08-2001 (12 ♂♂ e 12 ♀♀), 22-08-2001 (11 ♂♂, 1 n ♂, 10 ♀♀ e 1 n ♀), 25-08-2001 (1 ♂ e 3 ♀♀), 05-09-2001 (1

♂ e 2 ♀♀), 19-09-2001 (6 ♂♂ e 6 ♀♀), 03-10-2001 (1 ♂ e 1 ♀), 15-10-2001 (1 ♀); **S-7**, 07-02-2001 (1 ♀), 17-06-2001 (11 nn), 11-07-2001 (3 ♂♂ e 2 ♀♀), 21-07-2001 (11 nn), 25-07-2001 (49 ex.), 08-08-2001 (38 ♂♂ e 27 ♀♀), 20-08-2001 (5 ♂♂ e 20 ♀♀), 03-09-2001 (39 ex.), September-2001 (1 ♂ e 3 ♀♀), 2001 (34 ex.); **S-8**, 27-06-2001 (1 ♂), 25-07-2001 (1 ♂), 22-08-2001 (1 ♀), 05-09-2001 (1 ♂), 19-09-2001 (2 ♂♂ e 18 ♀♀), 03-10-2001 (1 ♀); **S-9**, 27-05-2001 (4 ♂♂ e 4 ♀♀), 24-06-2001 (1 ♂), July-2001 (1 ♂ e 20 nn); **S-10**, 05-09-2001 (1 ♀); **S-11**, 22-08-2001 (9 ♂♂ e 4 ♀♀).

UTM (10x10): 29TPF85, 29TPF86, 29TPF96, 29TQF07, 29TQF17, 29TQF18.

PHENOLOGY OBSERVED: February to November.

COMMENTS: New species for the Park.

***Oecanthus pellucens* (Scopoli, 1763)**

MATERIAL EXAMINED: **S-1**, 22-08-2001 (3 ♂♂), 05-09-2001 (1 ♀); **S-3**, 25-07-2001 (1 ♂), 12-08-2001 (1 ♂), 05-09-2001 (1 ♀); **S-5**, 29-08-2001 (1 ♀); **S-10**, 25-07-2001 (1 ♀), 09-08-2001 (1 ♀), 15-08-2001 (1 n ♀), 22-08-2001 (1 ♂ e 1 ♀), 29-08-2001 (1 ♂), 05-09-2001 (1 ♂), 12-09-2001 (1 ♀).

UTM (10x10): 29TPF85, 29TQF07, 29TQF18, 29TQF28.

PHENOLOGY OBSERVED: July to September.

COMMENTS: New species for the Park.

***Sciobia lusitanica* (Rambur, 1838)**

MATERIAL EXAMINED: **S-1**, 27-06-2001 (1 ♀), 19-09-2001 (1 ♂); **S-11**, 27-07-2001 (1 ♀), 2001 (1 ♂).

UTM (10x10): 29TPF85, 29TQF18.

PHENOLOGY OBSERVED: June, July and September.

REFERENCES: Grosso-Silva [2000: 88, as “*Sciobia lusitanica* (Serville, 1839)” (*sic*): “Miranda do Douro: Sendim (29TQF18), 22-VI-1995 (1 ex. Higino leg.)”].

Family MOGOPLISTIDAE

***Mogoplistes brunneus* Serville, 1839**

MATERIAL EXAMINED: **S-1**, 27-06-2001 (1 ♂ e 1 ♀), August-2001 (2 ♀♀), 22-08-2001 (1 ♂).

UTM (10x10): 29TQF18.

PHENOLOGY OBSERVED: June and August.

COMMENTS: New species for the Park.

Family BRADYPORIDAE

***Steropleurus dilutus* (Bolivar, 1878)**

MATERIAL EXAMINED: **S-2**, 31-05-2001 (2 ♂♂); **S-10**, 14-06-2001 (1 ♂ e 1 ♀), 25-07-2001 (1 ♂ e 1 ♀), 08-08-2001 (1 ♂), 09-08-2001 (1 ♂), 22-08-2001 (1 ♀).

UTM (10x10): 29TPF85, 29TQF28.

PHENOLOGY OBSERVED: May to August.

COMMENTS: New species for the Park.

Family PHANEROPTERIDAE

***Odontura macphersoni* Morales Agacino, 1943**

MATERIAL EXAMINED: **S-4**, 27-06-2001 (1 ♀); **S-8**, June-2001 (3 ♂♂).

UTM (10x10): 29TPF86, 29TQF17.

PHENOLOGY OBSERVED: June.

COMMENTS: New species for the Park.

***Phanoptera nana* Fieber, 1853**

MATERIAL EXAMINED: **S-1**, 22-08-2001 (1 n ♀); **S-3**, 12-09-2001 (1 ♀); **S-5**, 09-08-2001 (1 n ♀), 15-08-2001 (1 ♂), 19-09-2001 (1 ♂ e 1 ♀).

UTM (10x10): 29TQF07, 29TQF18, 29TQF28.

PHENOLOGY OBSERVED: August to September.

COMMENTS: New species for the Park.

Family TETTIGONIIDAE

***Antaxius spinibrachius* (Fischer, 1853)**

MATERIAL EXAMINED: **S-1**, 31-05-2001 (2 nn ♂♂), 12-09-2001 (1 ♀), 26-09-2001 (1 ♂); **S-3**, 25-07-2001 (1 ♀), 01-08-2001 (2 ♂♂), 09-08-2001 (1 ♀), 05-09-2001 (1 ♀), 12-09-2001 (1 ♂), 19-09-2001 (1 ♀); **S-5**, 11-07-2001 (2 nn ♂♂, 1 ♀ e 1 n ♀), 19-07-2001 (2 ♂♂ e 1 ♀), 01-08-2001 (1 ♂), 09-08-2001 (1 ♀), 15-08-2001 (2 ♀♀), 19-09-2001 (1 ♂ e 1 ♀); **S-7** 08-08-2001 (1 ♀), 20-08-2001 (1 ♀); **S-8**, 12-07-2001 (1 ♂), 25-07-2001 (1 ♂), 22-08-2001 (1 ♂), 05-09-2001 (1 ♂); **S-10**, 31-05-2001 (1 n ♂), 14-06-2001 (1 ♀ e 2 nn ♀♀), 11-07-2001 (2 ♂♂), 12-07-2001 (1 ♂, 2 ♀ e 4 nn ♀♀), 25-07-2001 (2 ♂♂, 2 nn ♂♂, 14 ♀♀ e 3 nn ♀♀), 01-08-2001 (13 ♂♂, 2 nn ♂♂, 8 ♀♀ e 4 nn ♀♀), 08-08-2001 (3 ♂♂ e 1 ♀), 09-08-2001 (7 ♂♂ e 13 ♀♀), 15-08-2001 (29 ♂♂ e 22 ♀♀), 22-08-2001 (11 ♂♂ e 12 ♀♀), 29-08-2001 (7 ♂♂ e 8 ♀♀), August-2001 (4 ♂♂ e 1 ♀), 05-09-2001 (6 ♂♂ e 6 ♀♀), 12-09-2001 (2 ♂♂ e 2 ♀♀), 19-09-2001 (2 ♂♂ e 2 ♀♀); **S-11**, 09-08-2001 (1 ♀), 23-08-2001 (1 ♀), 05-09-2001 (2 ♂♂), 19-09-2001 (1 ♂).

UTM (10x10): 29TPF85, 29TPF86, 29TQF07, 29TQF18, 29TQF28.

PHENOLOGY OBSERVED: May to September.

COMMENTS: New species for the Park.

***Decticus albifrons* (Fabricius, 1775)**

MATERIAL EXAMINED: **S-10**, 08-08-2001 (1 ♂), 19-09-2001 (1 ♂).

UTM (10x10): 29TPF85.

PHENOLOGY OBSERVED: August and September.

COMMENTS: New species for the Park.

***Platycleis (Platycleis) affinis* Fieber, 1853**

MATERIAL EXAMINED: **S-2**, 31-05-2001 (1 ♂), 28-06-2001 (2 ♂♂), 25-07-2001 (1 ♀), 26-07-2001 (1 ♂ e 1 ♀); **S-10**, 12-07-2001 (1 ♀), 2001 (1 ♀), 27-06-2001 (1 ♂), 08-08-2001 (1 ♂), 22-08-2001 (1 ♂).

UTM (10x10): 29TPF85, 29TQF28.

PHENOLOGY OBSERVED: May to August.

COMMENTS: New species for the Park.

***Platycleis (Platycleis) albopunctata* (Goeze, 1778)**

MATERIAL EXAMINED: **S-10**, 12-07-2001 (1 ♀), 01-08-2001 (2 ♀♀), 25-07-2001 (1 ♂), August-2001 (1 ♀), 19-09-2001 (1 ♂).

UTM (10x10): 29TPF85.

PHENOLOGY OBSERVED: July to September.

COMMENTS: New species for the Park.

***Platycleis (Platycleis) intermedia* (Serville, 1839)**

MATERIAL EXAMINED: **S-2**, 26-07-2001 (1 ♀), 05-09-2001 (1 ♀); **S-3**, 09-08-2001 (1 ♀).

UTM (10x10): 29TQF28.

PHENOLOGY OBSERVED: July to September.

REFERENCES: Nobre [1900: 113, as “*Platycleis intermedia* Sew. (*sic*)”]: “Loc. Barca d’Alva (Sr. Alves dos Reis Junior)”.

***Platycleis (Tessellana) tessellata* (Charpentier, 1825)**

MATERIAL EXAMINED: **S-1**, 09-08-2001 (1 ♀); **S-10**, 25-07-2001 (2 ♀♀), August-2001 (1 ♂), 08-08-2001 (1 ♂), 09-08-2001 (1 ♀), 19-09-2001 (1 ♂).

UTM (10x10): 29TPF85, 29TQF18.

PHENOLOGY OBSERVED: July to September.

COMMENTS: New species for the Park.

***Rhacocleis grillata* (Pantel, 1886)**

MATERIAL EXAMINED: **S-11**, 19-09-2001 (1 ♂).

UTM (10x10): 29TPF85.

PHENOLOGY OBSERVED: September.

COMMENTS: The taxonomic status adopted in this paper agrees with the one used by Miranda-Arabolaza & Barranco (2005). New species for the Park.

Tettigonia viridissima (Linnaeus, 1758)

MATERIAL EXAMINED: S-3, 05-09-2001 (1 ♀); S-10, 25-07-2001 (1 ♂), 01-08-2001 (1 ♂), 09-08-2001 (1 ♀), 15-08-2001 (1 ♀).
UTM (10x10): 29TPF85, 29TQF28.
PHENOLOGY OBSERVED: July to September.
COMMENTS: New species for the Park.

Thyreonotus bidens Bolívar, 1887

MATERIAL EXAMINED: S-3, 14-06-2001 (2 ♂♂), 19-07-2001 (1 ♀), 09-08-2001 (1 ♂); S-11, 19-09-2001 (1 ♂).
UTM (10x10): 29TPF85, 29TQF28.
PHENOLOGY OBSERVED: June to September.
COMMENTS: New species for the Park.

Discussion

This paper contains data of twenty species, fifteen of which are new records for PNDI. Among the novelties, the most remarkable record is the presence of the cricket *Mogoplistes brunneus* Serville, 1839, which, in the Iberian Peninsula, was only previously known from Cabeça (Serra da Estrela Natural Park) in Portugal (Grosso-Silva, 2000) and from Barcelona, Córdoba, Málaga, Sevilla and Tarragona provinces in Spain (Barranco *et al.*, 1996; Gorochoy & Llorente 2001; Lluçà Pomares, 2002). It is also worth mentioning that *Rhacocleis grillata* (Pantel, 1886) and *Thyreonotus bidens* Bolívar, 1887, recorded in the present work from PNDI and by Miranda-Arabolaza & Barranco (2005) from the neighbouring basin of river Sabor, have in this area the northernmost populations known in Iberia. The occurrence of these species at this latitude is probably due to the dry climate resulting from the strong Mediterranean influence in the area.

Overall, and despite the advance that the new data represents for the knowledge of the Orthoptera of Douro Internacional Natural Park, it must be emphasized that this new data results from a study whose field surveys were not specifically designed for the Orthoptera. As these relied mainly on pitfall traps the data is noticeably biased towards the suborder Ensifera, whose representatives are mainly epigeaic, rather than towards the Caelifera. However, considering the fact that pitfall results are density-activity related (Topping & Sunderland, 1992; Gardiner *et al.*, 2005), we cannot assume that the sampling of Ensifera was representative and therefore a specifically oriented study is needed for a more comprehensive characterization of the Park's fauna.

Acknowledgments

The author wishes to acknowledge Dr. José Manuel Grosso-Silva for all the constructive and helpful guidance and support. This study was funded by the program POCI 2010, Medida IV.7 – Acção IV.7.1., and was only possible due to Ernestino Maravilhas' help in gaining access to the material studied.

References

- ANONYMOUS 2002. *Plano Zonal Agro-Ambiental do Parque Natural do Douro Internacional*. 67 pp.
- BARRANCO, P., M. BAENA & F. PASCUAL 1996. Los Orthoptera de la provincia de Córdoba (España). *Zool. baetica*, **7**: 61-77.
- CARDOSO, P. M. B. 2004. *The use of Arachnids (Class Arachnida) in biodiversity evaluation and monitoring of natural areas*. PhD Thesis. Universidade de Lisboa. i-viii + 160 pp.
- FERREIRA, S., J. M. GROSSO-SILVA, P. SOARES-VIEIRA & P. SOUSA 2006. Contribution to the knowledge of the Tetrigidae (Orthoptera) in continental Portugal. *Boln. S.E.A.*, **38**: 141-144.
- GARDINER, T., J. HILL & D. CHESMORE 2005. Review of the methods frequently used to estimate the abundance of Orthoptera in grassland ecosystems. *Journal of Insect Conservation*, **9**: 151-173.
- GOROCHOV, A. V. & V. LLORENTE 2001. Estudio taxonómico preliminar de los Grylloidea de España (Insecta, Orthoptera). *Graellsia*, **57** (2): 95-139.
- GROSSO-SILVA, J. M. 2000. Contribuição para o conhecimento dos Grylloidea (Orthoptera, Ensifera) de Portugal. *Boln. S.E.A.*, **27**: 87-89.
- HARZ, K. 1969. *Die Orthopteren Europas I*. Vol 1. Series Entomologica, 5, The Hague: Dr. W. Junk, 749 pp.
- HARZ, K. 1975. *Die Orthopteren Europas II*. Vol. 2. Series Entomologica, 11, The Hague: Dr. W. Junk, 939 pp.
- HELLER, K.-G., 2005. *Fauna Europaea: Orthoptera*. Fauna Europaea version 1.2 (last update: 7 March 2005). Available online at <http://www.faunaeur.org>
- LLORENTE, V. & M^a. C. PINEDO 1990. Los Tettigoniidae de la Península Ibérica, Islas Baleares y norte de Africa. Género *Odontura* Rambur, 1838 (Orthoptera). *Boln. Asoc. esp. Ent.*, **14**: 153-174.
- LLUÇÀ POMARES, D. 2002. *Revisión de los ortópteros (Insecta: Orthoptera) de Cataluña (España)*. Monografías S. E. A., 7. Zaragoza. 226 pp.
- MIRANDA-ARABOLAZA, M. J. & P. BARRANCO 2005. Os ortópteros da bacia do Rio Sabor (Trás-os-Montes e Alto Douro, Portugal) (Insecta, Orthoptera). *Boln. S.E.A.*, **37**(2): 173-200.
- MORALES AGACINO, E. 1943. Estudios sobre Ortópteros del Mediterráneo Occidental. II. Notas críticas sobre las *Odonturas* de la Península Ibérica. *Eos*, **19**: 267-280.
- NOBRE, A. 1900. Catálogo do Gabinete de Zoologia (cont.). *Anuario da Academia Polytechnica do Porto*, **23**: 107-122.
- RAGGE, D. R. 1990. The songs of the western European bush-crickets of the genus *Platycleis* in relation to their taxonomy (Orthoptera, Tettigoniidae). *Bull. Br. Mus. Nat. Hist. (Ent.)*, **59** (1): 1-35.
- TOPPING, C. J. & K. D. SUNDERLAND 1992. Limitations to the use of pitfall traps in ecological studies exemplified by a study of spiders in a field of winter wheat. *Journal of Applied Ecology*, **29**: 485-491.
- VARGAS, D. S. 1930. Observações acerca de algumas espécies de "Dermápteros" e "Ortópteros" existentes nas Coleções do Laboratório de Biologia Florestal. *Arq. Sec. Biol. Paras. Mus. Zool. Univ. Coimbra*, **1**(4): 283-306.