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ODONATA AND THEIR HABITATS ABOVE 1.000M IN CENTRAL SPAIN

by Anny Anselin

1. Introduction

The knowledge of the distribution of Odonata in Spain is still very incomplete. Although several older data exist, e.g. HAGEN (1866), MAC LACHLAN (1902), NAVAS (1902-1927), PICTET (1965), and more recently the general works of BENITEZ MORERA (1950) and COMPTE SART (1965), it is only since the end of the 70ties that detailed investigations have been carried out and a systematic collection of distribution data has started. The recent studies are however mainly restricted to the southern part of the country, Andalucia, where all known data are now published and form a base for further distribution-studies (FERRERAS ROMERO & PUCHOL CABALLERO 1984). Other recent faunistical studies are those from LOPEZ GONZALEZ (1983) on the Sierra de Gredos and MARTIN (1983) on the province of Madrid. It is clear that the recent Odonata-distribution in central Spain is very poorly known.

Although Spain is a mediterranean country, which is clearly reflected in its Odonatofauna, a great percentage of the surface consist of mountains and plateaus higher than 1000m, and the central Spanish region has a continental climate with strong temperature-fluctuations between Summer and Winter. This is especially the case in the higher mountains as e.g. the Sierra de Gredos and the Sierra de Guadarrama in the west and the Sierra de Albarracín, Serranía de Cuenca and Montes Universales in the east, with altitudes up to resp. 2600 and 2200m. An interesting question is how several mediterranean species will be distributed in these regions, in respect to altitude, exposition of the slope (south/north) and habitat.

As a preliminary study, I investigated the Odonatofauna of the region between Albarracín and Cuenca (eastern part of central Spain)

No recent data existed from this region, therefore, the first aim of the study was to collect faunistical data (ANSELIN & MARTIN in prep.), but attention was also paid to the different habitats where the species occurred. In this article I will describe these habitats and briefly compare and comment their fauna.

2. Material and Methods

The region was visited the second half of July 1984. During these days, 23 different sites were investigated in the Sierra de Albarracín, Montes Universales and Serranía de Cuenca. All were located above 1000 m, with the exception of two (resp. at 960 and 980m), the lowest at 960 m, the highest at 1550 m.

At each site, at least one, but generally several hours of observation were spent. Altitudes could be derived from detailed maps (1:50000) of the Instituto Geográfico Nacional de España. At each site, a description of the habitat was completed by photographs.

3. Localisation and Description

For the exact localisation (province and municipality) we refer to ANSELIN & MARTIN (in prep.). The general situation of the study area and a detailed map of the sites is shown in Fig.1.

The habitats were roughly divided in three main types:

- standing water (10)
- slow running water (4)
- running water (9)

The difference between slow running and running water was made on a qualitative base: slow running waters were very shallow, had always a part without current and were generally narrow (max. 2 m large). The running waters had besides some parts with slow running water, always a part with very fast running water. They generally were larger and deeper.

A review of the different sites is given in Table 1.

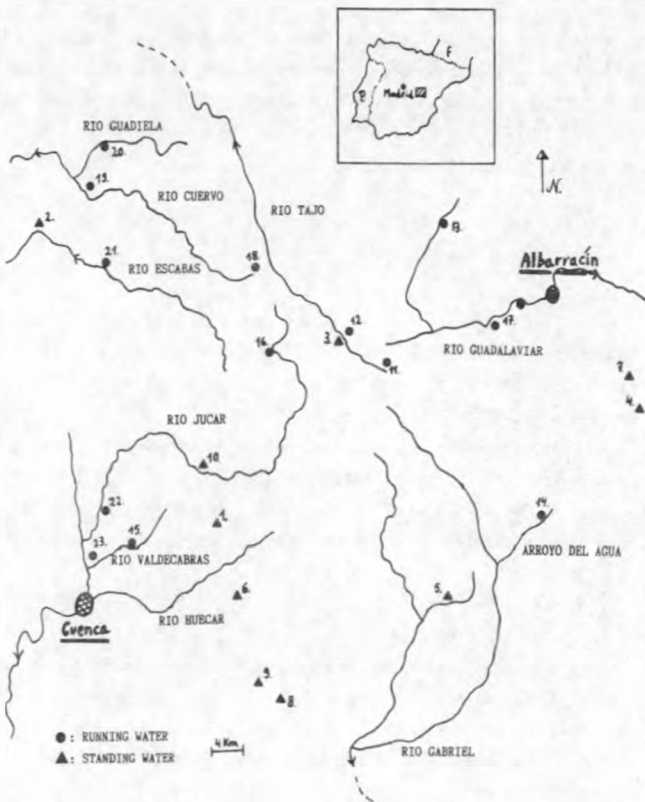


Fig. 1: Situation of the study-area in Spain and detailed map of the localities within the region (numbers refer to the list in text)

Standing water (10 sites)

- | | | |
|-------------------|---|---|
| a. SHALLOW (0-1m) | { | Vegetation cover poor: La Toba, Fuertescusa Vegetation cover dense: Tajo, Rubiales |
| b. DEEPER (> 1m) | { | Small: Salinas del Manzano, Casa Forestal Medium: Laguna, Los Oteros Large: Laguna de Uña |

Slow running water (4 sites)

Nacimiento del Tajo, Tajo El Cubillo, Bronchales, Los Cortijos

Running water (9 sites)

- | | | |
|---|---|---|
| a. 1-3 m LARGE | { | Trees/Shrubs absent: R.Valdecabras, R. Jucar Tr. Trees/Shrubs present: R. Guadalaviar, Nacimiento del R. Cuervo |
| b. 3-10 m LARGE: R. Cuervo, R. Guadiela, R. Escabas, R. Jucar | | |

Table 1: Review of the different sites based on some of their general features.

a) Standing water

1. La Toba-Casa Forestal: Small shallow pond (max. 30 cm deep and 5x15 m wide) with two small surfaces of aquatic Equisetum and some scattered Myriophyllum vegetation. The pond is situated in an open area, some 50 m of the pinewood border. Altitude: 1200 m.
2. Fuertescusa (R.Escabas): Nearly dried out small shallow pond (50 cm deep and 5x5 m wide), with a narrow border of Typha vegetation. Situated some 40 m from the Río Escabas, surrounded by an open deciduous wood. Altitude: 1000 m.
3. Tajo El Cubillo: Small shallow pond (probably former stream-arm of the Tajo). Vegetation cover 70%, with mainly Equisetum and Alisma. The pond is situated in wet hayland, 20 m from the river. Altitude: 1500 m.
4. Rubiales, Balsa del Pinar: Nearly dried out shallow waterbody (30 cm) (surface at winter level probably 40x60 m, during

- our visit 15x10 m). Vegetation of Eleocharis and Ranunculus. Situated in a depression of an open grassland area. Altitude: 1200 m.
5. Salinas del Manzano, Molino y Balsa: Triangular concrete basin of former nearby watermill, 10x10x20 m wide and 2-3 m deep with very clear water. Near bank shallower parts with Phragmites, Typha and Juncus. Scattered Chara vegetation. Near Río Henarrubia. Altitude: 1120 m.
 6. Casa Forestal-Buenache, Costillas: Shallow pond with muddy soil and troubled water, 10x20 m wide and probably 30-150 cm deep. Dense vegetation of Typha and Eleocharis. Altitude: 1250 m.
 7. Rubiales-Bezas, Laguna: Large pond (winterlevel 500x200 m, during our visit $\frac{1}{2}$ smaller (?), ^{open} water surface 10x10 m, dense vegetation of Eleocharis and Polygonum amphibium. Water depth 30-200 cm, peat soil of 40 cm above rocky subsoil. Dense vegetation of Chara and Ranunculus. Situated in a depression of an open grassland area. Altitude: 1220 m.
 8. Torca 1 Los Oteros: Circular waterbody (\pm 110 m diameter) in a depression originated from Karst-collapse, called 'Torca'. Scarce vegetation on borders but a dense floating vegetation of Myriophyllum and Ranunculus. Shallow borders (50 cm), but steepening very suddenly after 1.5 m. Depth unknown but probably more than 3 m. Altitude: 1030 m.
 9. Torca 2 Los Oteros: Very similar to former habitat, but with very scarce floating vegetation and probably deeper. Altitude: 1030 m.
 10. Laguna de Uña: Large lake (\pm 28 ha), formed by the Río Júcar in a depression of the Uña valley. Surface covered for some 50% by Phragmites, especially at the N.E.-side. At the S.W.-side a broad strip (15 m) of Hydrocotyle and Scirpus lacustris and a floating vegetation of Polygonum amphibium. The lake is surrounded by deciduous trees (mostly Populus). Shallow water near the border (up to 1m) but certainly deeper in the center. Altitude: 1140 m.

b) Slow running water

11. Nacimiento del Tajo: Source of the Tajo River, very shallow water (10-30 cm), 1 m large. Sandy soil with gravel and some small stones. Scarce vegetation of Juncus and Eleocharis. Some shrubs nearby. Situated in an open grassland area. Altitude. 1500 m.
12. Tajo El Cubillo: Shallow water (30 cm), 2 m large. Scarce vegetation of Juncus and Eleocharis but some denser parts with Typha. Several willow-trees along the bank. The 'river' is situated in an area of wet hayland. Altitude 1500 m.
13. Fuente de la Rosa, Bronchales: Source of narrow and shallow rivulet in a wet hayland (0.5-1m), surrounded by pinewood at some 20 m distance. Altitude: 1500 m.
14. Arroyo del Agua: Shallow (10-30 cm) rivulet, 1-2 m large with sandy soil and several big stones. Border with scarce vegetation of Juncus and grasses. Aquatic vegetation dense. The 'Arroyo' is situated in a dry grass-shrubland ('matorral') area. Altitude: 1240 m.

c) Running water

15. Río Valdecabras: Small rivulet (2-3 m with some wider parts of 5 m), shallow (up to 50 cm) with scattered stones in the streambed and few vegetation. Situated in a narrow and much eroded valley. Altitude: 1000 m.
16. Río Jucar Tragacete: Small rivulet (30 cm deep, 1m large), without vegetation at the borders, situated in a wet hayland. Altitude: 1550 m.
17. Río Guadalaviar: Rivulet with shallow (20 cm) and some deeper (50 cm) parts. Dense vegetation of Glyceria, Phragmites and Juncus with scattered small willow shrubs. Scarce aquatic vegetation. Surrounded by small fields and open land. Altitude: 1350 m.
18. Nacimiento del Río Cuervo: Fast running water (50 cm), alternating with small waterfalls and parts with slower current

and small pools (30 cm deep), 1-3 m large. Partly surrounded by deciduous trees and shrubs. Vegetation of Juncus and Carex and an aquatic vegetation of Chara. Altitude: 1430 m.

19. Río Cuervo: Solan de Cabrás: Fast running and slower parts, depth variable from 30 cm to 1 m in the middle, big stones in the streambed. Border vegetation with a dense strip (1m) of Glyceria and Carex. Banks with mostly willow shrubs and some trees. Some 7 m large. Altitude: 1200 m.
20. Río Guadiela: Fast running water (shallow parts) and parts with slower current (10-30 cm deep), 3-5 m large. Scattered stones in the streambed. Vegetation at the border with Juncus, Glyceria and willow shrubs. Situated in an open deciduous woodland. Altitude: 1000 m.
21. Río Escabas: General aspect very similar to the Río Cuervo at Solan de Cabrás, slightly larger (10 m). Altitude: 1000 m.
22. Río Júcar: Los Romedales: Parts with slow running and faster running water, depth from some 50 cm (border) to 1.5 m in the deepest parts. Vegetation with Glyceria and Phragmites. Surrounded by open land (fields) with Populus-trees. 10 m large. Altitude: 980 m.
23. Río Júcar: Caserio de Embid: Very similar to former site. Altitude: 960 m.

From this list we can conclude that the study area has a great diversity of different habitat-types suited for Odonata, and is especially rich in clear, unpolluted, permanent running waters.

4. Species composition and habitats

During the study period, a total of 30 species have been observed, 17 Zygoptera and 13 Anisoptera. For data about distri-

bution and abundance at each site, we refer to ANSELIN & MARTIN (in prep.). A review of the species composition in the three different 'habitats' is given in Table 2. (full-line framed: 'typical' species, dotted-line framed: species of more than one habitat).

STANDING WATERSLOW RUNNING WATERRUNNING WATER

Ischnura graellsii
Enallagma cyathigerum
Coenagrion mercuriale
Libellula depressa
Sympetrum fonscolombei

Pyrrosoma nymphula
Calopteryx virgo meridionalis
Calopteryx xanthostoma
Cordulegaster boltoni boltoni
Onychogomphus uncatus

Coenagrion caerulescens
Calopteryx haemorrhoidalis
Orthetrum brunneum

Lestes dryas
Lestes barbarus
Platycnemis acutipennis
Ischnura pumilio
Coenagrion scitulum
Cercion lindenii
Erythronia viridulum
Anax imperator
Anax parthenope
Gomphus pulchellus
Orthetrum cancellatum
Sympetrum flaveolum
Sympetrum meridionale

Platycnemis latipes
Boyeria irene
Orthetrum coerulescens

It is clear that our data represent the situation in the second half of July, and consequently no general conclusions can be drawn based on this partial information. However, some preliminary remarks can be made:

- Several species occur in more than one habitat-type, others are confined to only one. This is especially the case for many species of stagnant water.
- 13 species occur ^{only} at standing waters, 3 only at slow running and 3 only at running water. However, a total of 18 species have been observed at standing water, (10 sites), while 16 at running water (slow and faster: 13 sites).
- Their general habitat choices correspond well with the (although few) available data for Odonata in Spain (FERRERAS 1984, FERRERAS & PUCHOL 1984, LOPEZ 1983, MARTIN 1983). Some species however, e.g. Calopteryx haemorrhoidalis, Coenagrion mercuriale and Cercion lindenii, occur in the study area at much higher altitudes than hitherto stated in literature. More detailed data about microclimatic conditions are necessary before any conclusions can be made about the causes of those differences.

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Summary

Habitat-features of 23 different sites in central Spain (between Albarracín and Cuenca) are described and show that the region is rich in different Odonata-habitats. A total of 30 species have been observed. Some of them occur only at one habitat (standing, running or slow running water), others at two. For some species observations at higher altitudes than known in literature are done. More detailed studies are necessary to give us better information about species-habitat relations in the region.

Zusammenfassung

Eine an vielfältigen Libellen-Lebensräumen reiche Landschaft in Zentral-Spanien (Bereich Albarracin - Cuenca) wird an Hand 23 verschiedener Untersuchungsgebiete beschrieben. Insgesamt wurden 30 Arten beobachtet. Einige der Arten sind auf einen, andere auf zwei der unterschiedenen Habitattypen (stehendes Gewässer, fließendes - und langsam fließendes Gewässer) beschränkt. Einige Arten wurden in größerer Meereshöhe angetroffen als nach der Literatur zu erwarten. Eingehendere odonatologische Studien sollten dieser Region gewidmet werden.

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