Bulletin of Insectology ***61*** *(1): 149-150, 2008*
ISSN 1721-8861

Heteroptera study in a Pyrenees valley in Catalonia (Spain)

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Abstract

In the area comprising "Planes de Son" (Son Valley) and "mata de València", of the valleys of Àneu, near the national park of Aigüestortes and the Lake of Sant Maurici (Lleida, Catalonia, Spain), a biennial research on Heteroptera was conducted. Three types of wood (birch, mountain pine, silver fir), a mixed *Genista purgans* L. and *Juniperus communis* L. shrubland, and a subalpine pasture, ranging from 1610 to 1960 m a.s.l., were studied. The vegetation in each biotope was surveyed monthly. From May to October 2006, 618 adults belonging to 92 species and 11 families were collected, distributed as follows: 3 spp. Tingidae (26 specimens); 2 spp. Microphysidae (4 specimens); 55 spp. Miridae (359 specimens); 1 spp. Nabidae (1 specimen); 4 spp. Anthocoridae (27 specimens); 1 spp. Berytidae (1 specimen); 8 spp. Lygaeidae (111 specimens); 5 spp. Rhopalidae (22 specimens); 1 spp. Scutelleridae (1 specimen); 9 spp. Pentatomidae (16 specimens); 3 spp. Acanthosomatidae (50 specimens).

From a faunistic and a taxonomic point of view, the most rewarding biotopes were birch and silver fir forests. Regarding mean and absolute species richness, birch wood and shrubland provided the highest values, while subalpine pasture and mountain pine-wood presented the lowest species richness values.

Key words: Heteroptera, bugs, faunistics, high mountain ecology.

Introduction

The area comprising "Planes de Son" (Son Valley) and "mata de València" is one of the most attractive and well-conserved mountainous areas of the Pyrenees, the valleys of Àneu, near the national park of Aigüestortes and the Lake of Sant Maurici (province of Lleida, Catalonia, Spain). Its area is nearly 3000 ha, and height goes from 1000 to 2700 m a.s.l.. As a result of height gradient, there is a great vegetation variety, from grasslands (pastures of alpine, montane and submontane belts) to shrubland vegetation including *Buxus*, *Juniperus*, *Genista* and *Rhododendron*, to deciduous woods composed by *Fraxinus* (ash), *Betula* (birch), *Alnus* (alder), *Corylus* (hazelnut) and sub-montane, montane and sub-alpine coniferous woods of *Pinus sylvestris* L. (scoots pine), *Pinus mugo* Turra subsp. *uncinata* (mountain pine) and *Abies alba* Miller (silver fir). Mata de Valencia is the most important silver fir wood in Spain. At present, the whole area is owned by the "Fundació Territori i Paisatge", created by the bank entity "Caixa Catalunya Social Work". The main aims of the Foundation is co-operating in the preservation of natural heritage and landscape and creating awareness among the population of the need to protect the environment.

The "Fundació Territori i Paisatge" has promoted the study of geology, flora and fauna in the area for the biennial period 2006-07. An anthropological study has also been launched. In whole, 21 teams of research composed by different number of researchers were contracted. The first author of this work was in charge of the study of Heteroptera, with the purpose of obtaining scientific data on those insects, in view to evaluate the natural history interest of the study area.

Materials and methods

In view of vegetation diversity in the area of research, five representative biotopes were selected: three types of wood (birch, at 1880 m a.s.l.; mountain pine, at 1960 m a.s.l.; and north-faced silver fir, at 1610 m a.s.l.), a mixed *Genista purgans* L. and *Juniperus communis* L. shrubland (at 1650 m a.s.l.), and a subalpine pasture (at 1880 m a.s.l.).

Methods chosen to collect Heteroptera in plants were the result of combining collecting methods from Štepanovičová (1991), Schowalter (1995), Bryja and Kula (2000) and Kula and Bryja (2002). In all biotopes, 4 transects of 25 sweeping net strokes and in 4 soil quadrates of 0.5 m^2 (direct observation) were sampled. In the shrubland and in the woods, 22 more samples were taken on plants, either trees or shrubs. Each plant was sampled using three sweep net strokes. A minimum number of five specimens per plant species were studied. In all, nine different shrub and three species were surveyed.

Every biotope was sampled monthly, from May to October 2006. A total amount of 872 samples was taken.

Results and discussion

In all, about a thousand Heteroptera specimens were collected, of which one third were nymphs. The 618 adults belonged to 92 species and 11 families. Their distribution is as follows (number before a family name states for the number of species of that family; number in brackets states for the number of specimens in that family): infraorder Cimicomorpha: 3 Tingidae (26); 2 Microphysidae (4); 55 Miridae (359); 1 Nabidae (1); 4 Anthocoridae (27); infraorder Pentatomorpha: 1 Berytidae (1); 8 Lygaeidae (111); 5 Rhopalidae (22); 1 Scutelleridae (1); 9 Pentatomidae (16); 3 Acanthosomatidae (50).

Nearly 50% of the species were known only from one or two specimens, while 15 or more specimens were collected only for 11% of the species. 45% of the 20 species known by 10 or more specimens were collected in 6, 7 or 8 samples, but only 15% of species were present in 20 or more samples. Phenology showed that nymphs were most abundant in June, with a deep decline in September. Adults were most abundant in June and August, also declining in September. Species richness was at highest in July and August.

Of the five biotopes surveyed, the most rewarding ones from the point of view of faunistics and taxonomy were birch and silver fir forests. In both biotopes, one mirid species new to the Iberian fauna, a mirid and a tingid new to Spanish Heteroptera catalogue, three mirid species new to the Catalan Heteroptera Catalogue, and three more species reputed as rare for Catalonian fauna were found. The other two rare species were respectively found in the shrub and in the subalpine pasture. Details of all those captures may be found in Ribes *et al*. (in press).

Mean species richness (number of species per sample) and species richness (total number of species) were calculated (figure 1). The pasture was the biotope with the highest mean species richness, followed by birch wood and shrub. The highest species richness was found also in shrub and birch wood, while the lowest species richness occurred in the mountain pinewood and the saubalpine pasture. A classification dendrogram was calculated using Jaccard's coefficient similarity (figure 2) based on presence/absence of species. In it, it is shown that every biotope has a characteristic Heteroptera biocenose, which is clearly different from the other biotope biocenoses.

Conclusion

Main preliminary conclusion is that Heteroptera fauna collected in vegetation in Planes de Son and mata de València area is of the greatest interest. Its research has been very rewarding, and point out the natural history interest of the area. The study of the samples coming from collections of water bugs, from other colleagues sampling with pit-fall traps for soil fauna, and from surveys out of the usual procedure, will complete the present preliminary work.

Acknowledgements

This work was funded by "Fundació Territori i Paisatge" of "Caixa Catalunya Social Work", to whom we are grateful.

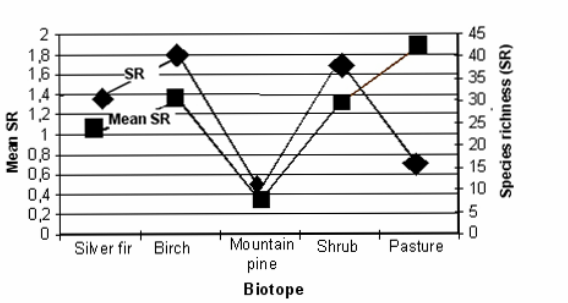

Figure 1. Mean species richness (Mean SR) and species richness (SR) calculated for the five biotopes.

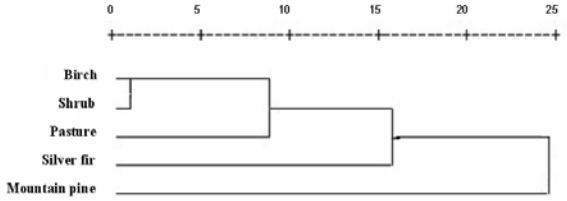

Figure 2. Classification dendrogram according to Jaccard's coefficient of similarity (presence/absence of species in the biotope).

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