Invertebrate Species of Conservation Interest of the Meledic Plateau Protected Area (Romania)

Finica-Mariana IVANOV[1],
Giuliano TEVI[2]

Abstract

The Meledic Plateau Protected Area has a double conservation status: protected natural area of national interest (code 2.267) and Natura 2000 site (ROSCI0199). The Protected Natural Area of National Interest Meledic Plateau is a mixed reserve of geological, speleological, zoological and botanical importance. The Natura 2000 Site Meledic Plateau was established for the conservation of a priority habitat and an invertebrate species – the lepidopteran Lycaena dispar. *An inventory of the terrestrial invertebrate species was conducted, within the scientific studies that underlay the elaboration of the Management Plan of this protected area, and three invertebrate species of conservation interest were identified: two species of community interest –* Lycaena dispar *(the Large Copper Butterfly) and* Lucanus cervus *(the Stag Beetle), and one species of national interest -* Euscorpius carpathicus *(the Carpathian Scorpion). The results of the inventory conducted from August 2012 to August 2013 indicate that* Lucanus cervus *and* Euscorpius carpathicus *are resident, quite rare and isolated species in the protected area's perimeter, and* Lycaena dispar *is a resident, quite rare species, with a dynamic distribution in the Natura 2000 Site Meledic Plateau, determined by the availability of hygrophytic vegetation needed by the larva and adult during the entire period of the species seasonal activity.*

Keywords: Lycaena dispar, Lucanus cervus, Euscorpius carpathicus, Natura 2000 sites

[1] Ph.D., Lecturer, Ecological University of Bucharest
[2] Ph.D., Associate Professor, Ecological University of Bucharest

Introduction

The Meledic Plateau Protected Area has a double conservation status: protected natural area of national interest (code 2.267) and Natura 2000 site (ROSCI0199). The Protected Natural Area of National Interest Meledic Plateau is a mixed reserve of geological, speleological, zoological and botanical importance. From a zoological point of view, it is an important area for some thermophilous species from the Romanian fauna (according to the Register Card for the Natural Reserve "Meledic Plateau"), such as *Euscorpius carpathicus* (Drugescu & Geacu 2004). The Natura 2000 Site Meledic Plateau was established for the conservation of a priority habitat and an invertebrate species – the lepidopteran *Lycaena dispar* (the Natura 2000 - Standard Data Form for the site ROSCI1099 Meledic Plateau).

There are no data in the scientific literature regarding the terrestrial invertebrate species from Meledic Plateau. The only references are found in the Register Card for the Natural Reserve "Meledic Plateau" and in the Natura 2000 - Standard Data Form for the site ROSCI1099 Meledic Plateau. Therefore, within the scientific studies that underlay the elaboration of the Management Plan of this protected area, an inventory of the terrestrial invertebrate species was conducted. This was done in order to identify and map the important species, from a conservation point of view, and evaluate the conservation status of the community interest species *Lycaena dispar* (the Large Copper Butterfly). This paper presents the results of the inventory regarding the species of conservation interest.

1. Material and methods

The Meledic Plateau is located in the Curvature sub-Carpathians, in the upper hollow of the Slanic River (a tributary of the Buzau River), between the Slanic River (South), the Jgheab Brook (on the East), the Meledic Brook (North), and the Salty Brook (on the West). The Meledic Plateau Protected Area is located in a hilly zone, at an average elevation of 530 m. The Natura 2000 Site Meledic Plateau covers an area of 151 hectares and it overlaps vastly to the Protected Natural Area of National Interest Meledic Plateau (fig. 1), which covers an area of 156,7 hectares. Characteristic for the Meledic Plateau is a low hilly temperate continental climate, with a tendency of aridity in summer (Sava et al. 2010). In the area of Meledic Plateau are found mesophilic and hygrophilic meadows, shrubberies, and transitory forests.

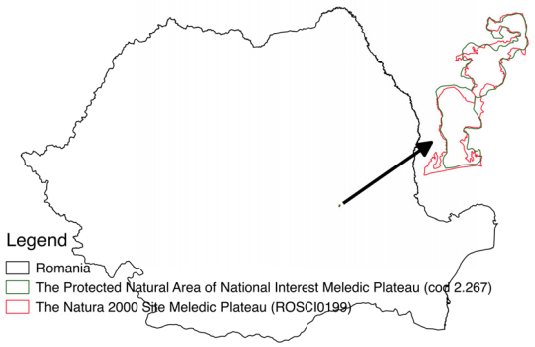

Fig. 1: The Meledic Plateau Protected Area

The inventory of the terrestrial invertebrate species was conducted from August 2012 to August 2013 using active and passive methods: active searching and direct observation, collecting (by hand or with entomological net) or photographing; sweep netting; pitfall trapping. The active methods were used combined, depending on habitat, on line transects of different lengths. The transects were located in open habitats, along the border of shrubberies, in forest habitats, and along the valley of Jgheab, Meledic and Salty Brooks. The pitfall traps were set in meadows, at the edge of shrubberies, and in forest habitats.

The Large Copper Butterfly (*Lycaena dispar*) is a wetland species of butterfly, whose larva feeds on leaves of *Rumex* sp. plants (Bakowski et al. 2010, Rakosy 2008, Strausz et al. 2012). It has a bivoltine life cycle (from May to June and from the end of July to early September), and the larva of the last generation overwinters between withered leaves at the base of the foodplant (Strausz et al. 2012). The inventory of *Lycaena dispar* was performed by actively searching the adults in all types of damp habitats from the plateau and its proximity, during the two flight periods of the species: from May to June, and from August to early September.

2. Results and discussions

In the Meledic Plateau Protected Area were identified 123 terrestrial invertebrate species from the following taxonomic groups: Gasteropoda, Scorpiones, Araneae, Opiliones, Isopoda, Odonata, Homoptera, Heteroptera, Orthoptera, Lepidoptera, Hymenoptera, and Coleoptera. Two of them are listed in the Annex II (Animal and plant species of community interest whose conservation

requires the designation of special areas of conservation) of the Council Directive 92/43/EEC – the lepidopteran *Lycaena dispar* and the coleopteran *Lucanus cervus*, and one is endemic to the Romanian Carpathians - *Euscorpius carpathicus* (Fet et al. 2002, Fet & Soleglad 2002).

Lucanus cervus (the Stag Beetle) is a large beetle (25-80 mm in length), whose larva develops and feeds on decaying wood of stumps and roots from a wide range of broad-leaved trees (Chiari et al. 2014), such as *Quercus spp*., *Fagus spp*., *Salix spp*., *Populus spp*., *Tilia spp*. and *Aesculus spp*. (Tatole et al. 2009). In the Meledic Plateau Protected Area, the community interest species *Lucanus cervus* was detected in the transitory forests from the northern half of the area (fig. 2), where deciduous trees predominate (*Quercus robur*, *Tilia cordata*, *Acer campestre*, *Carpinus betulus*, *Fraxinus ornus* etc.). The favourable habitat characteristics for the saproxylic species *Lucanus cervus*, in the protected area's forests, are the presence of the tree stumps, dead or partially dead trees and old decaying deciduous trees, whose underground woody debris hosts the development stages of the Stag Beetle larva (Thomaes et al. 2008).

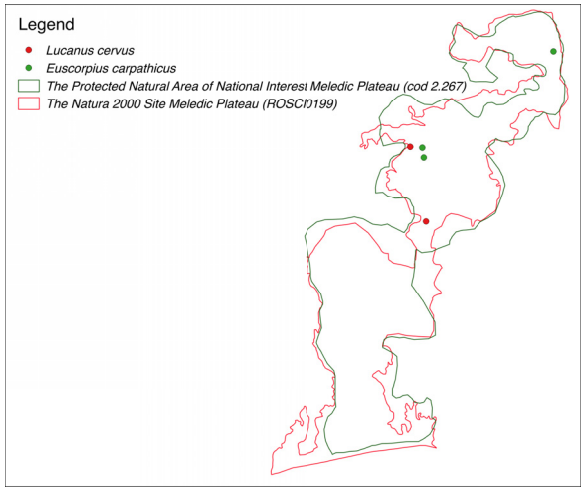

Fig. 2: Distribution of the presence points for *Lucanus cervus* and *Euscorpius carpathicus* in the Meledic Plateau Protected Area

Euscorpius carpathicus (the Carpathian Scorpion) is a small scorpion (1.5-4 cm in length) that lives in the leaf-litter of forests and among cliffs in warm and temperate climate regions. It is active during the night, while during the day it shelters under stones, tree bark or crevices of rocks (Năstăsescu et al. 1998). In the Meledic Plateau Protected Area, the endemic species *Euscorpius carpathicus*

was detected in the transitory forests from the northern half of the area (fig. 2), and during the day it shelters under the stones from the forest floor and under the bark of the dead deciduous trees.

Lycaena dispar (the Large Copper Butterfly) was detected both in the Meledic Plateau Protected Area and in its proximity. In the second flight period of the species from 2012, six males were detected in an area covered by diverse and dense hygrophytic vegetation, with *Mentha longifolia*, *Equisetum sp*. and *Rumex sp*. plants, located near the Castle Lake (fig. 3). In 2013, the referred to perimeter was verified three times during the two flight periods of the specie (in May, June, and August) but no adult was observed. That year, the herbaceous vegetation from the respective perimeter was periodically cut (in May, June, and July), which led to the destruction of the *Rumex sp*. plants and their absence, as well as the absence of the blooming *Mentha longifolia* plants, during the reproductive periods of the species. In 2013, at the end of the first flight period of the species, three males were detected outside of the protected area, on the right bank slope of the Meledic Brook (fig. 3), and in the second flight period of the species, one flying female was detected in the area of a temporary pond covered by diverse and dense hygrophytic vegetation, with *Lythrum salicaria* and *Rumex sp*. plants, located north-west of the Meledic Lake (fig. 3).

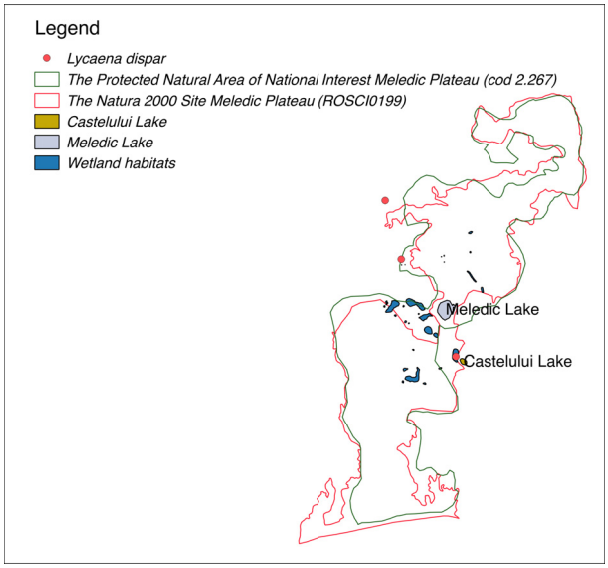

Fig. 3: Distribution of the presence points for *Lycaena dispar* and the wetland habitats in the Meledic Plateau Protected Area

In the Meledic Plateau Protected Area and its proximity, there are many wetland habitats (fig. 3): wet grasslands and meadows, permanent and temporary ponds, wet depressions, etc. These may be potential habitats for *Lycaena dispar*, and particularly those with both *Rumex sp*. plants, the larva foodplant, and *Lythrum salicaria*, *Cirsium palustre* and *Mentha longifolia* plants, the nectar plants for the adult (Mitchell 2009, personal observation). The favourable wetland habitats from the protected area are used by *Lycaena dispar* depending on their availability during the period of the species' seasonal activity (from May to September).

Every year, in the second half of July, the meadows from the Meledic Plateau are entirely mowed (fig. 4), including the herbaceous vegetation located in the close proximity of the permanent ponds, temporary ponds, and wet depressions that can be used by the *Lycaena dispar* adults for feeding, mating and oviposition. This practice makes it difficult to preserve the existence of the adults from the second generation in the protected area. They can make use of the wetland habitats located outside the plateau, being very active fliers with a high dispersal capacity (Strausz 2012). Thus, may be explained the absence of the adults from the first generation of 2013 in the protected area's perimeter.

Fig. 4: Extensive mowing of the meadows from the Meledic Plateau

We consider that the extensive mowing of the meadows from the Meledic Plateau affects the favourable habitat of *Lycaena dispar* in the protected area, which cannot provide the requirements of the larva and adult during the two-generation period of the species, and represents an actual and potential threat to the species.

The results of the *Lycaena dispar* inventory suggest that its distribution in the Natura 2000 Site Meledic Plateau is dynamic: the local distribution of the

species is different from one year to the next and it depends on the presence of the favourable hygrophytic vegetation during the entire period of the species seasonal activity.

Conclusions

In the Meledic Plateau Protected Area there are three terrestrial invertebrate species of conservation interest: two species of community interest – *Lycaena dispar* (the Large Copper Butterfly) and *Lucanus cervus* (the Stag Beetle), and one species of national interest - *Euscorpius carpathicus* (the Carpathian Scorpion). The results of the inventory conducted from August 2012 to August 2013 indicate that *Lucanus cervus* and *Euscorpius carpathicus* are resident, quite rare and isolated species in the protected area's perimeter, and *Lycaena dispar* is a resident, quite rare species, with a dynamic distribution in the Natura 2000 Site Meledic Plateau, determined by the availability of hygrophytic vegetation needed by the larva and adult during the entire period of the species seasonal activity.

Acknowledgement

This study was conducted as part of the project "*Management Plan, public consultation and awareness campaign for the Natura 2000 sites ROSCI0103 Buzău Meadow and ROSCI0199 Meledic Plateau*", implemented by the Ecological University of Bucharest and financed by the Sectoral Operational Environment Programme, Priority Axe 4 - Nature Protection.

References

Bakowski M., Filipiak M., Fric Z., 2010, "Foraging behaviour and nectar use in adult Large Copper, *Lycaena dispar* (Lepidoptera: Lycaenidae)", *Entomologica Fenetica* 21: 49-57.

Chiari S., Zauli A., Audisio P., Campanaro A., Donzelli P.F., Romiti F., Svensson G.P., Tini M., Carpaneto G.M., 2014, "Monitoring presence, abundance and survival probability of the stag beetle, *Lucanus cervus*, using visual and odour-based capture methods: implication for conservation", *Journal of Insect Conservation* 18: 99-109.

Drugescu C., Geacu S., 2004, "Contributions to the knowledge of Sub Mediterranean fauna in Romania", *Scientific Annals of the "Al.I. Cuza" University of Iasi*, Tom L:195-203.