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Research Paper

Data on biogeography of gastropod species *Chondrula tridens* in Southern Dobrogea, Romania

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Abstract: Cobadin Plateau (subunit of Negru Vodă Plateau, South Dobrogea) is located in the extreme south-eastern part of Romania. Its landscape consists of large and almost flat interfluves. There start a series of short valleys discharging into the Danube River. To the west, it is bordered by Oltina Plateau, taller and stronger fragmented by valleys of canyon type. To the east, the plateau is bordered by Black Sea. Karst phenomena (sinkholes and poles) are present below. The paper examines biogeographic point of view two populations of *Chondrula tridens* (Tree Tooth Bulin Snail) identified in Cobadin Plateau (South-East Dobrogea), in period 2009-2012. Specimens were taken from two areas geographically close (10 km distance between them), but ecologically different.

Keywords: *Chondrula* sp. diversity, Oak forests, Conacu-Negreşti Valley, Cobadin Plateau, Dobrogea - Romania

INTRODUCTION

Cobadin Plateau is located in the extreme south-eastern part of Romania (Figure 1 A, B). Along with the Oltina Plateau, form the southern Dobrogea, with average altitudes of 100 m (Al-Azki, 2003, 2006; Peahă, 1982).

The studied region has an old Proterozoic foundation, composed of crystalline and one sedimentary supra-structure that is characterized by the existence of two types of Palaeozoic-Mesozoic and Neozoic formations (Axini, 2012a, b; Al-Azki, 2007, 2010-2011a, b; Brezeanu, 1997; Coteț, 1969).

By Axini (2006, 2009) and Iana (1970), geographic positioning on the globe of this region (the parallel $43^0$58`48,93`` north latitude and the meridian $28^0$10`05,12`` east longitude) explains the continental climate characteristics of its, which influences all environmental characteristics

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Here develops a temperate-continental climate, with hot, dry summers and cold winters with strong blizzards because of the movement of cold continental air from north-eastern and eastern parts Europe or the Arctic air.

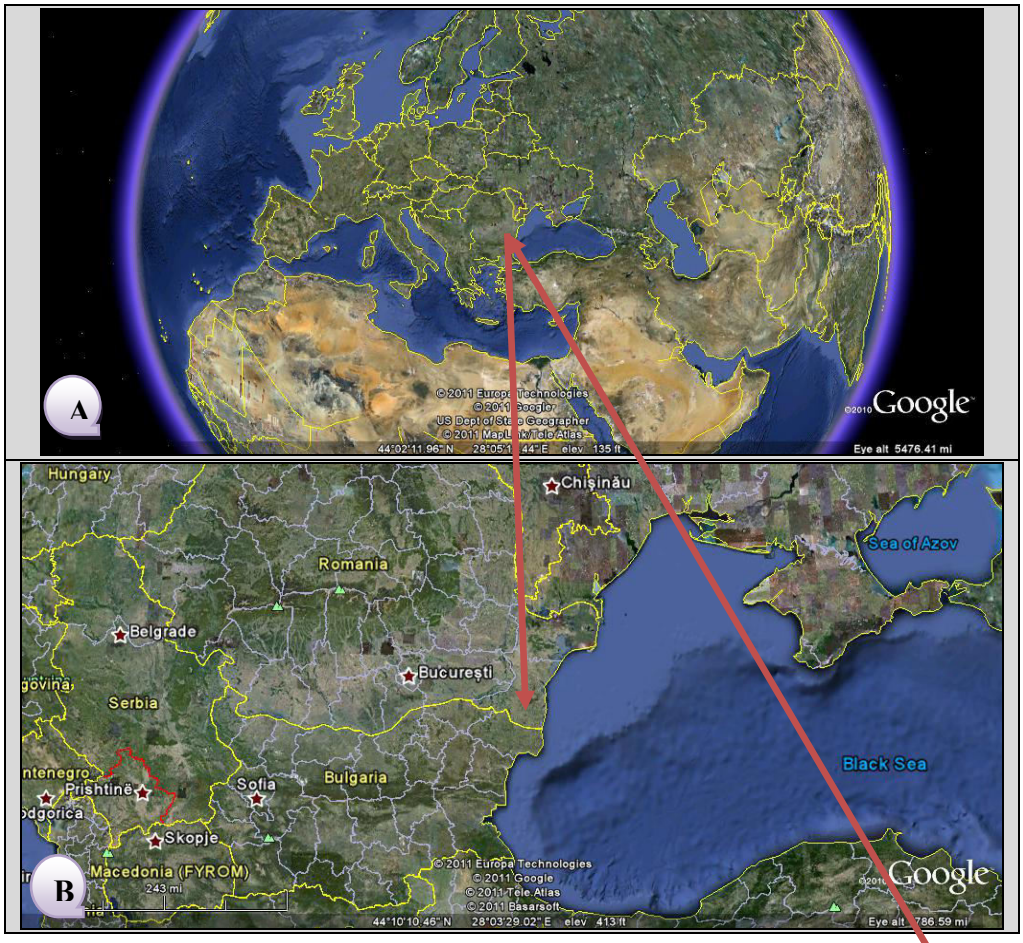

Figure 1: A, B - Map of Europe emphasizing the geographical position of Dobrogea Region, with Conacu - Negreşti Valley and Cobadin Village in Europe (processing after Google Earth, accessed September 1, 2017)

This region is characterized by an extremely rich and diverse geo-biodiversity with rare and endemic species of wildlife Dobrogea and Romania, too, many of them within the boundary area.

The two biogeographical micro-areas analyzed in the paper (Conacu-Negreşti and Cobadin), are located in the Cobadin Plateau and geographically positioned very close to each other (only 10 km away).

MATERIAL AND METHODS

The analyzed samples were taken in 2009-2012. The sampling stations differed from the ecological point of view through the geological structure of the land, the nature of the substrate, slope inclination, the type of existing habitat, the existence of vegetation. It was widely used field observations and photographs. The biological material was analyzed both on the field and in the laboratory.

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The nomenclature of taxa and data processing is according to data from literature as well as national and international legislation.

RESULTS AND DISCUSSIONS

Chondrula genus is represented by 20 species, with a geographical spread from Europe and northern Africa and to Iran. This genus is of West Asian origin. Of these, in Dobrogea, two species were identified: *Chondrula tridens* O.F. Müller, 1774 and *Ch. microtragus* Rossmässler, 1839 – Euthyneura-Pulmonata, Stylomatophora Order, Enidae Family (Axini, 2012c; Axini and Al-Azki, 2012; Beck, 1837, 1838; Grossu, 1986, 1987).

Chondrula (Helix) tridens (Tree Tooth Bulin Snail) is European (North Mediterranean)-Turanian and Pontic species, with a geographical spread that encompasses SW France and Italy to central Europe, Lithuania, central Russia, SE Europe (Bulgarian and Romanian Dobrogea), Turkey, S Ural and N Iran. Not in Sardinia (Dedov, 1998; Dedov and Antonova, 2015; Hubenov, 2007; IUCN, 1996; Komarova *et al*., 2015; Welter-Schultes, 2012).

It is a air-breathing land snail, pulmonate gasteropod mollusk, terrestrial and xerophilous-mesophilous species. It is a small, brown snail, with aperture provided with three characteristic teeth, with importance in its identification (Axini, 2012d, e; Balashov and Gural-Sverlova, 2012; Lisický, 1991; Müller, 1774; Skolka, 2008; Skolka and Paraschiv, 2005).

This gastropod species lives in meadows of sunny and dry slopes, usually in the soil, near rocks, appearing at the surface only at warm and humid weather. Also, it is relatively common species in the foliage of oak forests (Axini and Al-Azki, 2016a). In the Conacu-Negrești zone, it was found on the limestone walls with "rocks to day", in a small number of copies. In Cobadin zone, it was found on a limestone plateau with some grassy, ruderal vegetation, in a few copies (Table 1; Figure 2).

Table 1. The some ecological characteristics of the sampling stations (original)

SAMPLING STATIONS	THE ECOLOGICAL CHARACTERISTICS OF ITS		
	Substrate	**Vegetation**	**Cohabiting gastropod species**
Conacu-Negrești	limestone-sandy, 45 degree slope, southern exposure	almost nonexistent	*Zebrina detrita* (syn. *Helix detrita*) (Müller 1774) *Zebrina varnensis* (L. Pfeiffer 1847) *Helicella obvia dobroudschae* (Clessin 1886)
Cobadin	limestone	grassy, ruderal	*Helicella obvia dobroudschae* (Clessin 1886)

According to Axini and Al-Azki (2017), in the past, Cobadin Plateau had extensive forests of oaks, part of famous Secular Forests of Deliorman (Iana S., 1965). Today, mainly due anthropogenic factors, but also of the natural (eg. catastrophic floods that led to geo-morphological and geographical changes), area is completely deforested. The proof that this biogeographical zone was dominated by an oak forest is the presence of herbaceous and shrub plant and invertebrates (gastropod and insect) species,

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which normally live together in a oak forest (Arcuș and Lupașcu, 2004; Axini and Al-Azki, 2016b, 2017b; Parincu *et al*., 1998).

The presence of *Ch. tridens* confirm the previously existence of the vast pubescent oak forest in Cobadin Plateau, now extinct in this zone.

According to IUCN and EU Habitat Directive, the species is classified as vulnerable (in some European countries, endangered species) and in Annex IV of the Directive. The disappearance of the deciduous forest in the Cobadin Plateau, as well as the limestone excavations made in some parts of the analyzed area, determine that this species becomes endangered in Dobrogea.

The disappearance of many oak forests and the industrial and domestic exploitation of limestone areas (habitats of this gastropod species) in many areas of its spreading area make the scientific and practical importance of this mollusc becoming ever larger.

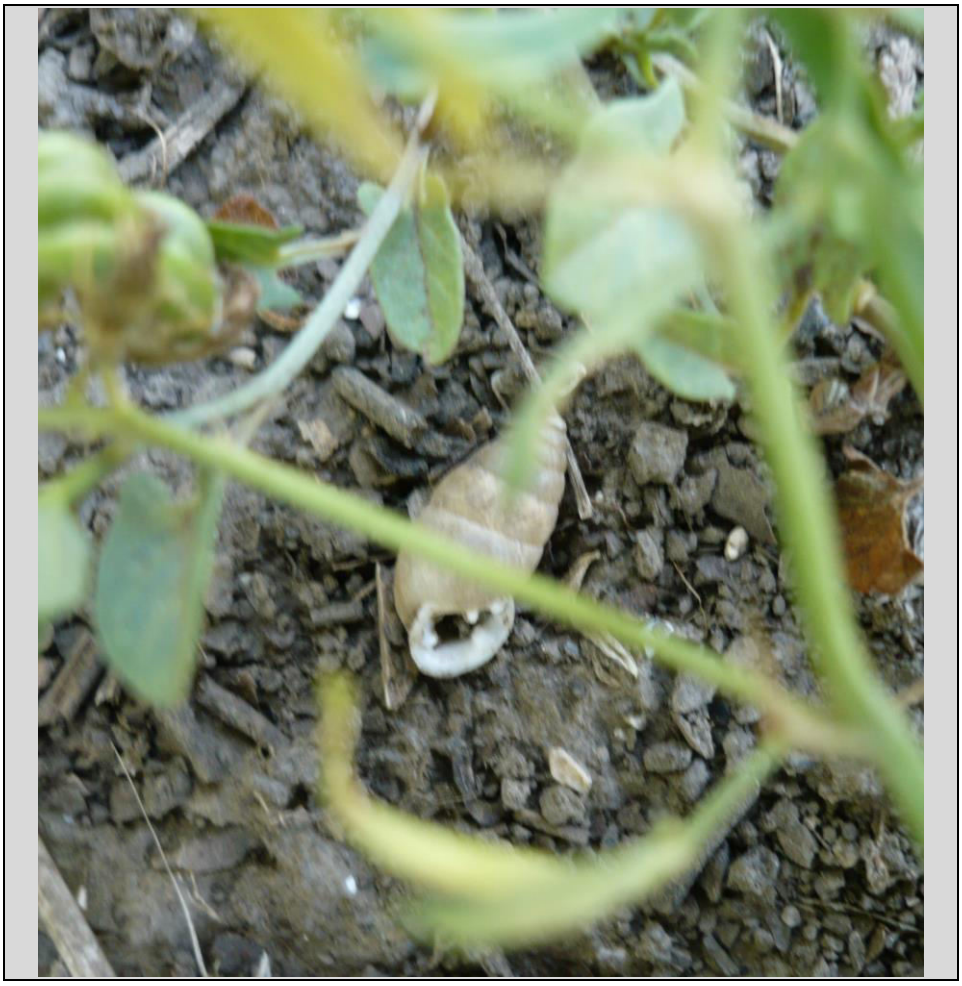

Figure 2: *Chondula tridens* on Cobadin Village plateau (original photo., 2012)

Conclusions: Research in the Cobadin area has been running since 2003 until now. There are pioneering researches because until 2003 there were only geographic studies of the Negru Vodă Plateau, which includes the Cobadin Plateau. Our research

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will continue because South Dobrogea presents a unique geo-biodiversity, but very little studied and thus very little known. This comes on a unique geological and paleontological background.

Current and future data will enable us to reconstruct the natural history of Dobrogea, in conjunction with the current geo-biological environment.

The area requires intensification of research, due to the fact that the anthropic and natural factors have made their strong mark on the area with changes in the geo-bio-diversity components, and thus with their strong danger.

With regard to the data presented in this paper, these require further field studies and laboratory research that will complement the scientific basis currently existing for the *Chondrila* genus.

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