THE CONSERVATION OF SOME PROTECTED SPECIES IN RUDARIA CANYON AREA

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Abstract. *The Eftimie Murgu village, known by its old slave name Rudăria is famous due to his biggest Mulinologic Complex from South-Eastern Europe and the presence of the Rudăria Canyon. The value of the area increased in 2007 when the first Romanian Sites of Community Importance (SCI) were declared, as part of the Natura 2000 network, near Eftimie Murgu village being established ROSCI 0032 Cheile Rudăriei. The study was carried out in 2013 in the protected area ROSCI 0032 Cheile Rudăriei on invertebrates, amphibians and reptiles. Although the protected area covers only 300 hectares, the observations showed that the national or community interest species are more than those for which the protected area was declared. The area stretches along the Rudăria Valley, the meadow being flanked either by sunny slopes with shrubs and barren areas which form the canyon in their lower part, either by forests with narrow and shaded valleys. This geographical diversity favours the presence of various habitats despite the restricted surface of the area. Besides the two species mentioned in the site (Austropotamobius torrentium Schrank, 1803 -priority species and Cerambyx cerdo Linnaeus, 1758- IUCN vulnerable status in Word and near threatened in Europe) other six species were identified: three beetles (Cucujus cinnaberinus Scopoli, 1763, Morimus funereus Mulsant, 1863 and Carabus variolosus Fabricius, 1787), two butterflies (Nymphalis vaualbum Denis & Schiffermüller, 1775 and Euplagia (Callimorpha) quadripunctaria Poda, 1761) and one dragonfly (Cordulegaster heros Theischinger, 1979). As protected herpetofauna in the Rudaria SCI was considered Testudo hermanni and Vipera ammodytes. After the observations and information collected, the presence of the Testudo hermanni in this area is doubtful. As new herpetological protected species can be mentioned Bombina variegata and among the species mentioned to the IV Annex of the Council Habitat Directive 92/43/EEC are present here Coronella austriaca, Lacerta viridis and Podarcis muralis. The conservation status and the major threats for the protected species were also as assessed. The major problem for the population conservation is the small size of the protected area and the reduced number of areas with favourable habitats which might prevent the conservation efforts for the protected populations.*

Keywords: *ROSCI 0032 Cheile Rudăriei, Natura 2000 species, conservation assessment*

INTRODUCTION

The ROSCI0032 Cheile Rudăriei protected area was adopted in the first list of sites declared in Romania by the Order of Minister of Environment and Sustainable Development no. 1.964/2007 regarding the declaration of the sites of Community importance as part of the European ecological network Natura 2000. The protected area is situated in Caraș-Severin County at the border between the northern part of the Almăj Mountains and the Almăj Depression. Though the highest top of Almăj Mountains is Svinecea Mare-alt. 1224 m., located 6,5 km. south, the site reached only 874 m. and is formed only by hills streaked by the Rudăria Valey which dug into cliff a short pseudocanyon (1,5 km. long). From the 300 hectares of the site, only approx. 2 hectares from the Cioaca Mare (Rudina) slope are bared, while the rest of the site is covered by forests or scree with shrubs.

The protected area has the disadvantage of being geographically isolated from the other neighbouring protected areas, the nearest one being also a small and isolated area (ROSCI0375 Râul Nera între Bozovici şi Moceriș). However, excepting the northern part, all

the rest are surrounded by National Parks: Cheile Nerei-Beușnița to the west, Domogled-Valea Cernei to the east, respectively the Natural Park Porțile de Fier to the south, all located at a distance of 15-20 km away. The proximity with these huge protected areas represent a great advantage, due to the presence of some natural corridors through forest habitats.

Older than the ROSCI0032 Cheile Rudăriei is the Nature Reserve Cheile Rudăriei (IUCN category IV, mixed nature reserve), protected area declared in 1994, the boundaries of these two protected areas overlapping to a large extent, the natural reserve being smaller with 50 ha. This Nature Reserve was declared for freshwater habitats, shrubs, natural and semi-natural grasslands, rocky habitats, forests, diversity of flora and fauna and geodiversity.

The ROSCI0032 Cheile Rudăriei was declared in 2008 for two invertebrates species (*Austropotamobius torrentium* and *Cerambyx cerdo*), one fish species (*Barbus meridionalis*), one reptile species (*Testudo hermanni*), one plant species (*Asplenium adulterinum*) and four habitats including two priorities (6110 and 9180). Being a small area, which is part of a large forest habitat, the studies so far are insignificant especially for the fauna aspects, the existing studies, especially on flora and vegetation, being anyway sporadic. (GRIGORIU A.L, *et al.* 2005, IMBREA I. *et al*. 2006, NICOLIN A.L. *et al* 2007).

The present study is based on observations made in 2013, an analysis of the invertebrates and the herpetofauna species of national or community interest from Cheile Rudăriei protected area being performed.

MATERIAL AND METHODS

The observations were made in seven campaigns (one in March, two in April, one in June, two in August and one in September) including two nights observations. Different observation and capture methods were used in order to obtain as many entomological and herpetological taxa as possible. In addition to the direct observations made in transects, traps soil, crayfish traps, hung traps with sweet juices, light sources were used and the refuge places or hibernation and specimens crushed by cars or voluntarily killed by humans were also inspected . For the saproxylic beetles, all the decaying trunks from on the transect line were inspected. (BUSE J. *et al.* 2007, ALBERT J. *et al* 2012, CHIARI S., *et al.* 2004). Transects were conducted mainly in valleys and level curves. Animals found by direct searches were captured directly by hand or net. All specimens found alive were released in the same place where they were found.

RESULTS AND DISCUTIONS

I. The populations protected species

Among the species listed on Annex II of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, the field observations identified six invertebrate species not mentioned in ROSCI0032 Cheile Rudăriei Standard Data Form or in previous studies and one amphibian species (table 1).

Table 1.

Species requiring designation as Special Areas of Conservation in Rudăria Gorges

	Code	Scientific name	Directive (92/43/CEE)			Bern Convention		IUCN Europe	OUG[1] 57/2007			
			II	IV	V	II	III	Red List	3	4A	4B	5A
1	1217	***Testudo hermanni***	x	x		x		NT	x	x		
2	1088	***Cerambyx cerdo***	x	x		x		NT	x			
3	1093	***Austropotamobius torrentium****	x		x		x	DD	x	x		
4	1086	***Cucujus cinnaberinus***	**x**	x		x		NT	x	x		
5	1089	***Morimus funereus***	**x**	x				VU	x	x		
6	4014	***Carabus variolosus***	**x**	x				-	x	x		

	Code	Scientific name	Directive (92/43/CEE)			Bern Convention		IUCN Europe	OUG[1] 57/2007			
			II	IV	V	II	III	Red List	3	4A	4B	5A
7	4039	***Nymphalis vaualbum****	**x**	x				LC	x	x		
8	1078	***Callimorpha quadripunctaria***	**x**					-	x			
9	4046	***Cordulegaster heros***	**x**	x				NT	x	x		
10	1193	***Bombina variegata***	**x**	x		x		LC	x	x		

[1] OUG- Romanian Government Emergency Ordinance

Among those listed in the standard data form, the sporadic presence of the *Austropotamobius torentium* priority species can be confirmed so far.

1. Testudo hermanni Gmelin, 1789

In Romania is present in the southwestern part of the country, the subspecies *Testudo hermanni boettgeri* Mojsisovics 1889. The distribution studies (FUHN & VANCEA 1961, IANA & PETCU 1976, COVACIU-MARCOV *et al.* 2005, IFTIME 2005, COVACIU-MARCOV *et al.* 2005, 2009, ROZYLOWICZ L. *et all.* 2003, ROZYLOWICZ L. &MARIANA DOBRE 2010) show the presence of the species from Baziaş until Orşova only along the Danube, on the southern side of the Locva and Almăj mountains. Downstream of Orşova city, this species penetrates north on the corridor Timis-Cerna, eastwards this corridor being present in Cerna Mountains, Mehedinți Mountains and Plateau, Oltenia Subcarpathians. Some isolated populations have been found even in Dobrogea (IFTIME, A. 2002, SOS, T., *et al.* 2008).

In the absence of clear bibliographic citations of the presence of the *Testudo hermanni* species in the protected area and following this research, we believe that the presence in the standard form is doubtful. Native people confirmed that they have never seen this species nearby their village.

This alleged error could have appeared either by artificial extending of the distribution in the surrounding areas given the geographic proximity to some stations well known for the presence of the species, either because of a similarity of the environmental conditions with those of other areas of distribution, or because of the existing natural corridors . Among the mentioned localities that might host this species, Fuhn&Vancea names the Rudina village in Mehedinți County, thusthe same name as the western summit (Rudina Mare 825 m. alt.) in the Rudăria Canyon.

2. Cerambyx cerdo **Linnaeus, 1758**

In Romania the species is mentioned in 35 sites including ones from south (Porțile de Fier) and east (Domogled Valea Cernei) the focused area. This saproxylic beetle is associated with old and decaying oaks selecting those that are over 100 year old and have a diameter larger than 40 cm (EU Wildlife and Sustainable Farming project 2009) the preffered host plants being *Fraxinus sp., Juglans sp., Castanea sp., Ulmus sp* and *Salix sp.* (BÍLÝ S.&MEHL O. 1989). It prefers the sun exposed lower parts of the trunks (ALBERT J. *et al.* 2012). Other important factors contributing to the increasing of species presence in oak habitats are the presence of oak sap on the trunks, the depth of the bark and the distance between trees (BUSE J. *et all.* 2007).

In ROSCI0032, the presence of *Cerambyx cerdo* adults could not be confirmed. In the northeastern part of the site, oaks in a sunny zone and with many dead trunks or old trees were identified, both on the ground and standing. Here, old traces of the saproxylic species activity were found, but there is nocertainty that these belong to the *Cerambyx cerdo* species. Instead, *Cerambyx scopolii* was observed, which has a wider range of host plants and whose adults visit the flowers of *Filipendula, Cornus, Crataegus, Apiaceae* (BÍLÝ S.&MEHL O. 1989).

3. *Austropotamobius torrentium* **Schrank, 1803**

Austropotamobius torrentium originates in the northern part of Balkan Peninsula and now is widespread throughout all Danube Basin and even in the European part of Turkey. In Romania, two separately distribution areas are mentioned, one in south–west (from Danube River until Retezat Mountain) and another in north-west (Apuseni Mountains) (PÂRVULESCU L. 2010, 2012, PÂRVULESCU L.,&PETRESCU I. 2010). The older data from Antipa Museum (PETRESCU I.,&PETRESCU A.,M., 2010) also name other regions (stations from the counties: Maramureș, Satu Mare, Bistrița Năsăud, Mureș, Alba, Brașov).

In ROSCI0032 Cheile Rudăriei, Pârvulescu L&Petrescu 2010 highlight the presence of the *Austropotamobius torrentium* species in the Rudăria Valley 3 km. (straight line) upstream the site boundary. They captured here six exemplars, which is much above the average of all other observation points from Nera river tributaries.

The species was identified in the Rudăria River (fig. 1) and in the torrent from the right side of the river at the eastern boundary of the site. Crayfishes were caught in the river using baited traps with fish and in torrent only by direct searches. Using 3 traps, maximum 2 individuals/night were captured while in the torrent only one individual was found.

We assume that the presence of this species in site is due to the populations from the upper river sector and to his tributaries.

***4. Cucujus cinnaberinus* Scopoli, 1763**

Considered a very rare species in Europe (JIŘÍ S., *et al.* 2008) *Cucujus cinnaberius* is well spread in central Europe and absent in south and west (Horák J. 2010). Romanian Carpathians form the southern border of the species distribution area (HELSDINGEN, P.J. *et al.* 2006). In Romania, it is reported in only 5 Natura 2000 sites quite distant geographically. In ROSCI0032 Cheile Rudăriei, *Cucujus cinnaberinus* was found in a decaying trunk standing, at a height of about 2 m above the ground, in the habitat of meadow valley.

5. *Morimus funereus* Mulsant, 1863

Morimus funereus is widespread in south-eastern Europe and in the Middle East. In Romania, it has a large spreading area, being listed in 26 Natura 2000 sites and their surroundings. In ROSCI0032 Cheile Rudăriei two individuals were identified, one through direct observation and another one found in a trap placed in a rotten trunk fell to the ground. The two points identified in south of the Valley Rudăria are remote from each other.

6. *Carabus variolosus* Fabricius, 1787

Geographical range of distribution is the Eastearn part of Europe, along the Carpathians, but also down in the hilly areas, Balkan Mountains being the southern edge of the spreading area . (TURIN H. *et al.* 2003). *C. variolosus* disappeared or is extremely rare in several European countries, but in Romania it meets on all the territory except Dobrogea. (BARLOY, J.&PRUNAR, F. 2012). So far, it has been reported in the records of 16 Romanian sites. In ROSCI0032 Cheile Rudăriei four individuals were found, in the wintering lodges in the torrent with dead wood logs from the north-eastern border of the site (fig. 1). Along the Rudăria valley, the species was not identified using Barber pitfall traps.

***7. Nymphalis vaualbum* Denis & Schiffermüller, 1775**

Prioriy butterfly present in Eastern Europe, Turkey, Central Asia, NE China, Korea, Japan, southern Canada and northern United States. (TOLMAN T.&LEVINGTON R 1999). In Romania, some recently confirmed stations are located in the west and southwest **(**SZÉKELY L., 2008) but in the Natura 2000 files, it is listed in 12 sites some of them from Wallachia and Transylvania. In ROSCI0032 the imagos were identified (fig. 1) in the last decade of April in several points between the valley and the rocky walls upstream the canyon.

***8. Euplagia (Callimorpha) quadripunctaria* Poda, 1761**

Palearctic species present throughout all Europe, excepting Nordic countries. Listed in 35 Natura 2000 sites from Romania, it is a widespread species being reported in all neighbouring sites.

In the ROSCI0032 Cheile Rudăriei, the imagos is present in August throughout all the investigated protected area, but abundance is higher to the edge of the roads or to the forest where the host plant (*Eupatoria cannabium*) is present.

***9. Cordulegaster heros* Theischinger, 1979**

Cordulegaster heros is a species from central and south-eastern Europe with the distribution centre in the Balkan Peninsula. Between the five species of *Cordulegaster* genre mentioned in Romania, two are not confirmed by recent studies and one has a restricted distribution area. (MANCI O. 2012) This two (*Cordulegaster heros* and *Cordulegaster bidentata*) remaining species in question, are difficult to be distinguished in flight, they are both reported in the southwestern Romania. *Cordulegaster heros* is mentioned in only 7 Natura 2000 sites, two of them being located around the studied area. In ROSCI0032 Cheile Rudăriei area, this species is flying over the valley and the road that crosses Rudăria site, but also in the forest along the torrent from in the north-east.

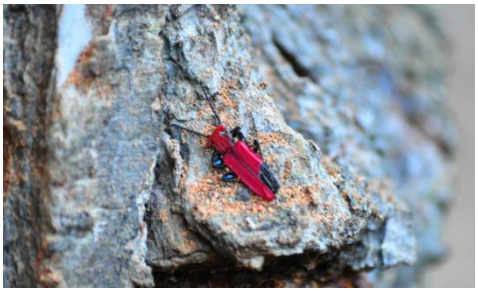
***10. Bombina variegata Linnaeus* 1758**

Widespread in central and south-eastern Europe in hilly and mountainous areas. In Romania is a common species.

Because of the geomorphology of the site, the species can be found sporadically. Favourable areas in this perimeter are formed by the flat part of the stairs where water from the torrents stagnates or springs from the slopes. The species was located either outside the site, in an open area, or inside, in a valley within the forest.

Two points have been identified for this species: one in the southern part into the stagnant water of a spring and a second in the puddle of a torrent in the forest.

Austropotamobius torrentium Schrank, 1803



Cucujus cinnaberinus Scopoli, 1763

Carabus variolosus Fabricius, 1787

Nymphalis vaualbum Denis&Schiffermüller, 1775

Figure 1. Protected species in the site ROSCI0032 Cheile Rudăriei (photos Prunar F.)

II. Assessment of impacts

Identified threats acting against the species are either from inside or outside the site. For aquatic species, the outside threats are the most important (table 2).

Table 2.

Identified and possible pressures on the Natura 2000 species

Code Natura 2000	Threats, Pressures and Activities	Affected species	Effects	Ways to avoid, reduce or minimize
B	Sylviculture, forestry			
B02.03	removal of forest undergrowth	*C. cerdo* *C. cinnaberinus* *M. funereus* *C. variolosus* *T. hermanni* *C. heros* *A. torrentium*	-Saproxylic larvae removal with wood -changing of the characteristic habitats for life or development -increases water temperature and reduces the degree of oxygenation (aquatic species) -further possible flow changes (aquatic species) -increase the amount of suspensions in water (aquatic species)	-interdiction of the wood extraction in site -interdiction of the wood extraction in river meadow for the outside the site
B02.04	removal of dead and dying trees			
B02.05	non- intensive timber production (leaving dead wood/ old trees untouched)			
B02.06	thinning of tree layer			
C	Mining, extraction of materials and energy production			
C01.01	Sand and gravel extraction	*C. heros* *A. torrentium*	-increase the amount of suspensions in water	-interdiction of the sand and gravel extraction within the site -interdiction of the sand and gravel extraction outside the site,upstream
D	Transportation and service corridors			
D01.01	paths, tracks, cycling tracks	*B. variegata*	-crushing and disturbance of microhabitat	-closure of the forest roads for vehicles
E	Urbanisation, residential and commercial development			
E03.01	disposal of household / recreational facility waste	*A. torrentium*	-indirect disturbances of habitat by pollution, catching, intervention in biocenotic relationships	-creation and continuous control of the tourist facilities -popularization of the management objectives
F	Biological resource use other than agriculture & forestry			
F03.02	Taking and removal of animals (terrestrial)	*T. hermanni* *C. cerdo* *A. torrentium* *M. funereus*	-intrapopulational direct intervention	-installation of the warning panels -popularization
G	Human intrusions and disturbances			
G01.02	walking, horseriding and non-motorised vehicles	*M. funereus* *T. hermanni*	-crushing -catching,	-installation of the warning panels -popularization -closure of the forest roads for vehicles
G01.03	motorised vehicles			
G02.06	attraction park			
G02.08	camping and caravans			
G05.11	death or injury by collision			
H	Pollution			
H01.02	pollution to surface waters by storm overflows	*C. heros* *A. torrentium*	-disturbances of the habitat quality	-prohibiting the use of pollutants in the site and the area upstream the river
H01.05	diffuse pollution to surface waters due to agricultural and forestry activities			
J	Natural System modifications			
J02.05	Modification of hydrographic functioning, general	*C. heros* *A. torrentium*	-disturbances of the habitat quality hold back upstream migration	-the identification and the use of alternative solutions
J02.06	Water abstractions from surface waters			
K	Natural biotic and abiotic processes (without catastrophes)			
K03.04	predation	*T. hermanni*	-predators are common in the site: dogs, cats, *Sus scrofa, Martes foina, Vulpes vulpes, Corvidae etc.*	-
K03.06	antagonism with domestic animals			
M	Climate change			
M01.01	temperature changes (e.g. rise of	*C. heros*	-disturbances of the habitat	-

	temperature & extremes)	*A. torrentium*	quality	
M01.02	droughts and less precipitations			

To increase the status of conservation favourable to the protected species, especially of those with aquatic development it is necessary to:

- amend the limits for the integration of upper river part and of his tributaries,
- increasing the size of the protected area to have sustainable population sizes
- enhance the corridors linking with neighbouring sites

Other species of national or community interest observed in the site: *Vipera ammodytes, Coronella austriaca, Natrix natrix, Lacerta viridis, Podarcis muralis, Salamandra salamandra, Rana temporaria, Euscorpius carpathicus.*

CONCLUSIONS

The mention of the *Testudo hermanni* in the protected area is at least doubtful. There were identified traces and characteristic habitat for *Cerambyx cerdo,* which may be present in the site, however, it requires further investigation. The presence of populations for eight species of Community interest was confirmed, two of which being priority species. The population of the *Austropotamobius torrentium* species in the site is marginal, it might penetrate here from the upper river and its tributaries.

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BIBLIOGRAPHY

1.ALBERT, J., PLATEK, M., CIZEK, L., 2012. Vertical stratification and microhabitat selection by the Great Capricorn Beetle *(Cerambyx cerdo) (Coleoptera: Cerambycidae)* in open-grown, veteran oaks. Eur. J. Entomol. 109, 553–559

2.ALMA LIOARA GRIGORIU, ILINCA MERIMA IMBREA, NATALIA RODICA ALDA, 2005–Vegetation of Cheile Rudăriei (Rudăriei Gorge), south-west of Romania, Scientific Conference „State-of-the-Art and Problems of Agricultural Science and Education", 19-20 October 2005– Agricultural University-Plovdiv, Scientific Works, vol. L, book 6, 2005, Bulgaria, p. 345-350.

3.BARLOY, J., PRUNAR, F. 2012: Considerations on the genus *Carabus* species protected in Romania by the Natura 2000 Network. Research Journal of Agricultural Science, 44 (2), 151-163.

4.BÍLÝ, S., MEHL, O., 1989. Longhorn beetles (*Coleoptera, Cerambycidae*) of Fennoscandia and Denmark. Fauna Entomologica Scandinavica 22, E.J. Brill, Leiden.

5.BUSE J, SCHRODER B, ASSMANN T (2007) Modelling habitat and spatial distribution of an endangered longhorn beetle—a case study for saproxylic insect conservation. Biol Conserv 137:372–381

6.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: implications for conservation. J Insect Conserv (2014) 18:99–109.

7.COVACIU-MARCOV, S.D., SAS, I., CICORT-LUCACIU, A.S., PETER, I., BOGDAN, H.V. -2005- Notes upon the herpetofauna of the county of Caraş -Severin, Romania. Revue Roumaine de Biologie, Serie: Biologie Animale 50: 47–56

8.HELSDINGEN, P.J. VAN, WILLEMSE, L. & SPEIGHT, M.C.D. (eds.) 1996: Background information on invertebrates of the Habitats Directive and the Bern Convention. Part I-Crustacea, Coleoptera nd Lepidoptera. Nature and Environment, No. 79. Strasbourg Cedex.

9.HORÁK J, VÁVROVÁ E, CHOBOT K 2010-Habitat preferences influencing populations, distribution and conservation of the endangered saproxylic beetle Cucujus cinnaberinus (Coleoptera: Cucujidae) at the landscape level. European Journal of Entomology 107 (1)

10.IFTIME, A. 2002- *Testudo hermanni* Gmelin, 1789 in Dobroudja (SE Romania), with comments on conservation. Herpetozoa 15(3/4): 183–186

11.IMBREA ILINCA, NICOLIN ALMA, 2006–Aspecte privind flora (de stâncărie) a rezervaţiei naturale Cheile Rudăriei, Simpozionul internaţional „Agricultura durabilă–Agricultura viitorului", Ediţia a II -a, 23-24 noiembrie 2006, Craiova, ISSN–1582-9391, p. 132-136

12.JIŘÍ S., MAŇÁK V., ČECHOVSKÝ. P. 2008-On the mass occurrence of two rare saproxylic beetles, *Cucujus cinnaberinus (Cucujidae)* and *Dircea australis (Melandryidae)*, in South Moravian floodplain forests. Revue d'Écologie (La Terre et la Vie), Paris: Société nat. de protection de la nature, 2008, roč. 2008, Suppl. 10, s. 115-121. ISSN 0249-7395.

13.MANCI O. 2012- Fauna de libelule (*Insecta: Odonata*) din România. Rezumat teză doctorat. The fauna of dragonflies (*Insecta: Odonata*) of Romania summary doctoral thesis. Cluj Napoca.

14.NICOLIN ALMA L., IMBREA ILINCA M., LAŢCU MARIANA, 2007–Notes on the meadow vegetation in the Rudăria Gorges, Lucr. Şt. Fac. Agricultură XXXIX, partea a II-a, USAMVB Timişoara, Ed. Agroprint, Timişoara, p. 571-576

15.PÂRVULESCU L, PETRESCU I., 2010-The distribution of stone crayfish *Austropotamobius torrentium* (Schrank, 1803) (Crustacea: Decapoda: Astacidae) in the south-west Romanian mountain and sub-mountain area. *Travaux du Museum National d'Histoire Naturelle "Grigore Antipa" 53*: 103–113

16.PARVULESCU L. 2010- Crayfish field guide of Romania. Editura Bioflux, Cluj-Napoca

17.PÂRVULESCU L., 2012- The distribution and ecological preferences of the stone crayfish *Austropotamobius torrentium* (Schrank, 1803) (Decapoda: Astacidae) in the northwest Romania. *Travaux du Museum National d'Histoire Naturelle "Grigore Antipa" 55*: 41–50

18.PETRESCU I, PETRESCU AM 2010: The catalogue of the freshwater crayfish (Crustacea: Decapoda: Astacidae) from Romania preserved in "Grigore Antipa" National Museum of Natural History of Bucharest. *Travaux du Museum National d'Histoire Naturelle "Grigore Antipa" 53 115–123*

19.ROZYLOWICZ, L., TETELEA, C., POPESCU, V. 2003-Assessing the distribution of Hermann's tortoise (*Testudo hermanni boettgeri* Mojsisovics, 1888) in the Iron Gates Natural Park, Romania. Pp. 355-366. In: Pătroescu, M. (ed.) Proceedings of the First International Conference on Environmental Research and Assessment, March 23–27, 2003. Ars Docendi, Bucharest.

20.SOS, T., DAROCZI, S., ZEITZ, R., PÂRÂU, L. 2008- Notes on morphological anomalies observed in specimens of Testudo hermanni boettgeri Gmelin, 1789 (Reptilia: Chelonia: Testudinidae) from Southern Dobrudja, Romania. North-Western Journal of Zoology 4: 154–160.

21.SZÉKELY L., 2008-The Butterflies of Romania – Fluturii de zi din Romania, 305 pp. 22 color plates, Brastar -Print Brasov.

22.TOLMAN T., LEWINGTON R. 1999-Guide des papillons d'Europe et d'Afrique du nord. Delachaux et Niestlé, pp. 1-320.

23.TURIN, H., PENEV, L., CASALE, A., ARNDT, E., ASSMANN, TH.,MAKAROV, K.,MOSSAKOWSKI, D.,SZÉL,GY., WEBER, F. 2003: 5. Species account. – In: TURIN,H., PENEV, L. and CASALE, A. (eds): *The genus Carabus L. in Europe. A synthesis. Fauna Europaea Nevertebrata*. *No 2*. Pensoft, Sofia-Moscow, pp. 151–280.