

## NOTES UPON THE HERPETOFAUNA OF THE NORTHERN AREA OF THE BOTOȘANI COUNTY (ROMANIA)

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**Key words:** *herpetofauna, Botoșani County, Rana arvalis, Rana temporaria, Zootoca vivipara*

### INTRODUCTION

The most recent work about the spread of herpetofauna in Romania only refers to Transylvania (Ghira et al, 2002). No complete data exists about the other regions of the country for more than 40 years, since the publication of the volumes from “Fauna României” (The Fauna of Romania) dedicated to *Amphibians* and *Reptiles* (Fuhn, 1960, Fuhn & Vancea, 1961). Only one monograph has been elaborated since the publishing of these volumes. This monograph is referring only to *Amphibians* (Cogălniceanu et al, 2000). There are only a reduced number of scientific articles in the Romanian specialty literature about the spread of herpetofauna and our country is a white spot at the level of *Amphibians*’ and *Reptiles*’ area of Europe (Gasc et al, 1997). It is being considered that the information of the last century covers only 5% from the real distribution of the herpetofauna in Romania (Ghira et al, 2002). A series of articles were published lately, articles referring to the herpetofauna in the western area of Romania (Covaciu - Marcov et al 2000, 2002, 2003 a, b). This research approaches the study of herpetofauna of a region that has not been investigated until now, that seeks the knowledge of the composition of the herpetofauna in the Northern region of Botoșani County. The results obtained are important not only quantitatively speaking, but also qualitatively, contributing to the altering of the traditional perception on *Zootoca vivipara* in Romania.

### MATERIAL AND METHOD

Our study was conducted at the end of June 2003. We investigated the herpetofauna of 12 localities situated in the Northern - Western part of Botoșani County and the different types of habitats, too. In the purpose of mapping the herpetofauna we used the method of transecting (Cogălniceanu, 1997). The animals were captured directly by hand. The use of nets or drags was not necessary, as the mating period of *Amphibians* had closed and the animals were found only on land habitats. As a consequence of this fact sightings of tritons are missing. They are difficult to be met outside the mating period, although there are, probably, two species present in that area. All the

individuals were let in their habitats, once being identified. The identification of animals killed by traffic was also important in order to establish the composition of the herpetofauna in the investigated region. For every identified species we made a list containing the names of the villages where the species had been identified. The result was a final list with the new identified localities and for each locality of the territory we identified several species of the herpetofauna.

The region we investigated is situated in the Northern part of Botoșani County (Figure 1), in the Northern-Eastern sector of Romania.

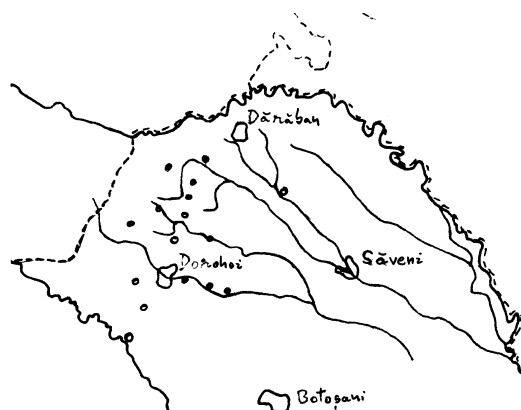


Fig.1. The investigated region in Botoșani County

This region is represented by the outside territory of the town of Dorohoi and the territory between Dorohoi and Dărăban. The altitude of the investigated region varies between 150 m and 350 m, growing towards the West and NorthWest. The landscape is represented by a series of short peaks intercalated with valleys, forming the Moldavian (Jijiei) Plain. A more important peak lies in the Western part of the investigated region with the altitude exceeding 300 m, the Bour Hill. Ibăneștilor Peak lies to the North. The water system belongs to the Prut River; the most important watercourses forming the area are the rivers Jijia and Bașeu. Several streams, a large number of swamps and wetlands are present in the area besides these two rivers. Most of the investigated region has been

deforested; forests are present only in the West, around Bour Hill. Farmlands and swamps with their characteristic vegetation occupy the rest of the region. The most important locality of the investigated region is the town of Dorohoi, along with a great number of communes and villages. There are two county roads and several communal roads in the region.

## RESULTS AND DISCUSSIONS

We identified 10 species belonging to the herpetofauna in the investigated region. Among these, 7 species belong to the *Amphibians*: *Bombina bombina*, *Bufo bufo*, *Bufo viridis*, *Pelobates fuscus*, *Rana ridibunda*, *Rana arvalis* and *Rana temporaria*. Except the moor frog, the identification of the other species is a premier for the investigated region and in some cases a premier for Botoșani county. Among *Reptiles*, we met only 3 species in the investigated region: *Lacerta agilis*, *Zootoca (Lacerta) vivipara* and *Natrix natrix*. Although the number of identified species of *Reptiles* is reduced, the identification of the mountain lizard in the plain region of Botoșani county is a premier for Moldavia, setting the way of understanding the area of this species in Romania in a new light. The spread of the identified species in the 12 investigated localities is shown in Table 1.

Table No.1. The list of the localities from the investigated region and the *Amphibian* and *Reptilian* species identified in these

Species	Bb	Bf b	Bf v	Pf	Rr	Ra	Rt	La	Zv	Nn
Broscăuți	x	x	x	x	x	s	-	x	x	-
Carasa	x	x	-	-	x	-	-	x	-	-
Dorohoi	x	x	-	-	x	s	-	x	-	x
Dragalina	x	x	-	-	x	x	-	x	-	x
Dumbrăvița	x	x	-	-	x	x	-	x	-	x
Goroieni	-	x	-	-	-	-	-	-	-	-
Horlăceni	-	x	-	-	-	-	-	-	-	-
Hudești	-	x	-	-	x	-	-	x	-	-
Lisna	-	x	x	-	-	-	-	-	-	-
Mlenăuți	-	x	-	-	x	-	-	-	-	-
Slobozia	x	-	-	-	x	-	-	x	-	-
Smârdan	x	x	x	-	x	x	x	x	x	-
∑(X)	7	11	3	1	9	3	1	8	2	3
∑(S)	-	-	-	-	-	2	-	-	-	-
∑(L)	7	11	3	1	9	5	1	8	2	3

X – new localities for Romanian herpetofauna

S – the localities in which was semnalated the species and was founded by us too

∑(L) – the sum of localities

**B.b.** -*Bombina bombina*, **Bf.b.** -*Bufo bufo*, **Bf.v.** -*Bufo viridis*, **P.f.** -*Pelobates fuscus*, **R.r.** -*Rana ridibunda*, **R.a.** -*Rana arvalis*, **R.t.** -*Rana temporaria*, **L.a.** -*Lacerta agilis*, **Z.v.** -*Zootoca vivipara*, **N.n.** -*Natrix natrix*,

We identified 10 species at the level of the 12 localities we had investigated, in each locality several

species being present. Reporting the number of species to the number of localities, we identified a total of 51 localities of which 49 are new localities for the herpetofauna of Romania.

***Bombina bombina*** - Linnaeus 1761 is a common species in the investigated region, being identified in 7 of the 12 investigated localities, in Romania being wide spread in the plain regions (Cogălniceanu et al, 2000), although it has not been reported in the area. We met fire bellied toads in low regions, with altitudes of approximately 150 m, being a wide spread species in the plain areas of Eastern Europe (Arntzen, 1978). It populates the puddling areas just outside the valleys, streams or swamps, preferring large, permanent, aquatic habitats (Madej, 1973). The populations we have identified in the north of Botoșani county are numerous. In the investigated region we did not identify the *Bombina variegata* species, although the altitude exceeds 200 m in several places. This was probably due to the drying of their temporary habitats. We did not identify hybrids between the two species, although in similar altitudes they are present in the Western part of Romania (Covaciu - Marcov et al 2000, 2001). Some exemplars of *Bombina bombina* of the investigated region show certain characteristics, especially on the ventral pattern, expressed like those of *Bombina variegata*, situation that was noted at some other populations of fire - bellied toad (Stugren, 1980).

***Bufo bufo*** - Linnaeus 1758 is also a common species in the region, being mentioned by us for the first time at this level. It is present in lower areas and at the level of the Bour hill. We met numerous exemplars, most of them killed on different roads in the area.

***Bufo viridis*** - Laurentus 1768 was identified in only 3 localities. Like the common toad, most of the exemplars were found killed on the roads.

***Pelobates fuscus*** - Laurentus 1768 was identified only in a single locality, in Broscăuți. The species was prior mentioned in Botoșani county but not in the region investigated by us (Cogălniceanu et al, 2000). We met a few juveniles recently metamorphosed in a very large swamp.

***Rana ridibunda*** - Pallas 1771 is a wide spread species in the investigated region, being present at the level of all the present aquatic habitats, the number of exemplars we met being very large. None of the individuals we captured did show any characteristics of the *Rana lessoane* or characteristics of the “*Rana esculenta*” (Berger, 1966, 1971), the hybrid between the two species, although populations of “*Rana esculenta*” had been prior signaled in Botoșani county (Cogălniceanu et al, 2000).

***Rana arvalis*** - Nilsson 1842 is present in five of the 12 investigated localities, in two of these being prior signaled (Vancea 1959, Fuhn 1960, Cogălniceanu et al 2000). We met a lot of exemplars, the species being common in the area. It is a glacially relict in Romania

(Poliş 1977), present only in colder regions in the Northern part of the country. It populates humid areas, with rich, grassy vegetation, situated on the shores of the swamps, where it can be found along with *Rana ridibunda*.

***Rana temporaria*** - Linnaeus 1758 was identified in premier for the investigated region and also in premier for Botoşani County. The common frog is one of the most common species of *Amphibians* in Europe (Mayer et al 1998), but it is spread especially in the Northern parts of the continent. In Romania, it is present in hilly and mountain areas at altitudes higher than 200 m (Cogălniceanu et al 2000). We met the common frog in the investigated area at an altitude of 150 m in a large swampy area, along with *Rana arvalis*, the habitat being characteristic for the moor frog. *Rana temporaria* is found in the North of Moldavia at reduced altitudes, in a swamp in the plains, due to the wet and humid climate of the region.

***Lacerta agilis*** - Linnaeus 1758 is the most common species of *Reptiles* in the region we investigated, being met in 8 localities. The subspecies *Lacerta a. chersonensis* is present in the investigated region, in our country being spread to the Eastern part of the Carpathian Mountains (Fuhn & Vancea 1961). The species is present mainly in the areas of streams and swamps shores, where we met numerous exemplars.

***Zootoca vivipara*** - Jacquin 1787 was identified in premier for the investigated region, for the Botoşani county and for the lower region of Moldavia, in general. We met two populations: at Smârdan and at Broscăuţi, at an altitude of approximately 150 m, the identification of a population of *Zootoca vivipara* in plain areas being a premier for Moldavia. Not long ago, this species was considered as being strictly living in mountain regions in Romania (Fuhn & Vancea 1961). Some populations were identified in the Western Plain (Ghira et al 2002, Covaciu - Marcov et al 2002 a, b). Plain populations in the Southern limit area of this species habitat were identified in Hungary (Dely 1978), Northern Italy, Ukraine (Stugren 1957), Slovenia (Huelin et al 2000). The identification of the populations of *Zootoca vivipara*, correlated with the populations from the Western Plain, leads to the altering of the traditional perception about the geographical spread of the species in Romania. At least in the Far North of the country, *Zootoca vivipara* is present in the plain areas (figure 2), at the level of an area that connects with the mountain area at the West (Covaciu - Marcov et al 2002). The species populates the wet and swampy areas, being seen along with *Rana arvalis* and *Rana temporaria*. The identification of the populations of *Zootoca vivipara* of the Moldavian Plain allows a different interpretation of the taxonomic status of the populations from the Panonic Plain, considered a different subspecies *Zootoca vivipara panonica* (Lac & Kluch 1968). In warmer regions in the South of Romania, *Zootoca vivipara* is present only in the mountain areas, while in the colder Northern parts

(Stoenescu et al 1966), plain populations in swampy, humid habitats still persist. An important aspect is needed to be clarified, zoogeographically speaking, to what extent the populations of the Moldavian Plain are connected with those of the Eastern slope of the Carpathian Mountains.

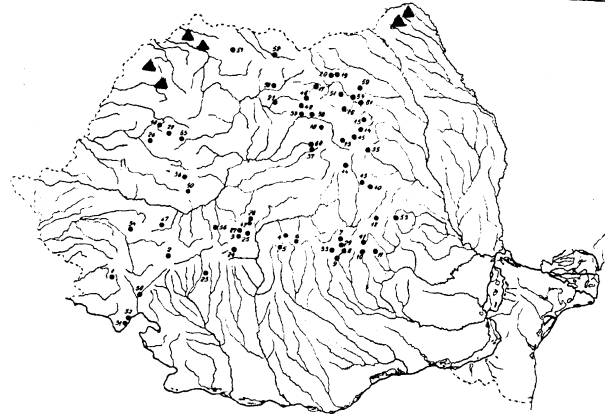


Fig.2. The Romanian areal of *Zootoca vivipara* Jacq.1787 (modified after Fuhn & Vancea, 1961)

-with dots: the populations from the Carpatians (Fuhn & Vancea, 1960)

-with triangle: the populations from plain (Covaciu - Marcov et al. 2002, Ghira et al. 2002)

***Natrix natrix*** - Linnaeus 1758 is the only species of *Ophidians* identified in the region. We met it in three localities, in swampy areas.

## CONCLUSIONS

The presence of some elements considered in Romania as mountainous in the swamps of the plain areas is characteristic to the herpetofauna of the observed region: *Rana temporaria* and *Zootoca vivipara*. A large number of glacially relicts, a characteristic of a colder and more humid climate compared to the rest of the country, was present. The most important result of our activity is the identification of two populations of *Zootoca vivipara* in the plain area. This species, traditionally considered as mountainous, is spread in the plain regions from the Northern part of the country, on both sides of the Carpathian Mountains. Most of the species and the localities in which these were identified represent premier records for the Romanian herpetofauna.

## REZUMAT

Studiul nostru a vizat o zonă a cărei herpetofaună nu a fost investigată corespunzător până în prezent. În urma cercetărilor am identificat 7 specii de *Amfibieni* și 3 specii de *Reptile* în cele 12 localități investigate. În premieră pentru județul Botoşani am identificat 2 populații de *Zootoca vivipara* la o altitudine de numai 150 m.

Aceasta este cea mai redusă altitudine la care specia a fost întâlnită în estul țării. Identificarea speciei *Zootoca vivipara* în câmpia din nord – estul Moldovei completează datele recente despre prezența acesteia în Câmpia de Vest, fiind astfel necesară renunțarea la punctul de vedere tradițional conform cărei specia este prezentă la noi doar în regiunea montană. În România *Zootoca vivipara* populează nu doar zonele montane, ci și zonele de câmpie din nordul țării, atât la est cât și la vest de Munții Carpați.

#### REFERENCES

- ANDREI M., & TÖRÖK Z., 1997 „A bibliographical checklist of Herpetology in Romania,, Trav. Mus. natl. Hist. nat. Grigore Antipa vol. XXXIX: 209-240.
- ARNTZEN J. W., 1978 „Some hypotheses on post glacial migrations of the fire – bellied toads, *Bombina bombina* L., and the yellow – bellied toads *Bombina variegata*., J. Biogeogr. 5, 339-345.
- BERGER L., 1966 „Biometrical studies on the population of water frog from the environs of Poznan,, Ann. Zool. 23, 303-324
- BERGER L., 1971. Viability, sex and Morphology of F2 generation within Forms of *Rana esculenta* Complex. Zool. Pol. 21, 345 - 393.
- COGĂLNICEANU D., 1997 „Practicum de ecologie a Amfibienilor – metode și tehnici în studiul ecologiei amfibienilor,, 1 – 122 pp., București (Universitatea din București).
- COGĂLNICEANU D., ANDREI M., 1992 „A bibliographical checklist of Herpetology in Romania,, Trav. Mus. natl. Hist. nat. Grigore Antipa vol. XXXII: 331-346.
- COGĂLNICEANU D., AIOANEI F., BOGDAN M., 2000 „Amfibienii din România,, – 99 pp., Determinator. București (Ars Docendi).
- COVACIU – MARCOV S. D., GHIRA I., VENCZEL M., 2000 „Contribuții la studiul herpetofaunei din zona Oradea,, Nymphaea, Folia Naturae Bihariae, Oradea XXVIII, 143-158.
- COVACIU – MARCOV S. D., TELCEAN I., CUPȘA DIANA, BAR NARCISA, SAS I., 2002 „Studiul unor populații ale genului *Bombina* (*Amfibia*) din sudul a bazinului hidrografic inferior al Crișului Repede (Jud. Bihor, România),, Analele Științifice ale U S M F “Nicolae Testemițanu”, Vol. 1. , pp: 91 - 97
- COVACIU – MARCOV S. D., TELCEAN I., CUPȘA DIANA, CADLEȚ DANA, ZSURKA RENÁTA, 2002 „Contribuții la studiul herpetofaunei din regiunea Marghita (jud. Bihor, România),, Analele Universității din Oradea, Fasc Biologie, Tom IX, 2002, In Pres.
- COVACIU – MARCOV S. D., TELCEAN I., SALA GEORGETA, SAS I., CICORT A., 2003 „Contribuții la cunoașterea herpetofaunei regiunii Beiuș, jud. Bihor, România,, Nymphaea, Folia naturae Bihariae, XXX Oradea, 127-141
- COVACIU – MARCOV S. D., SAS I., CUPȘA DIANA, TELCEAN I., ZSURKA RENÁTA, 2003 „Studii herpetologice în regiunea Munților Pădurea Craiului și Plopișului (Județul Bihor) ,, Analele Universității din Oradea, Fasc Biologie, Tom X, 2003, In Pres.
- COVACIU – MARCOV S. D., GHIRA I., SAS I., 2002 „Contribuții la studiul Herpetofaunei zonei Oașului (Județul SM, România),, Mediul cercetare, protecție și gestiune, Cluj –Napoca, in press. Volumul rezumatelor sesiunii, p 33.
- DÉLY O. G., 1978 „Hüllök – Reptilia,, Fauna Hungariae, 130, 20(4), 1-120, Akadémiai Kiadó, Budapest.
- FUHN I., 1960 „Amphibia, Fauna R.P.R., vol 14,, fascicola 1, Ed. Acad. R.P.R.
- FUHN I., VANCEA ȘT., 1961 „Fauna R.P.R. vol. XIV, fasciola 2, Reptilia,, – Editura Academiei R.P.R. București.
- GASC J. P., CABELA A., CRNOBRNJA – ISAILOVIC J., DOLMEN D., GROSSENBACHER K., HAFFNER P., LESCURE J., MARTENS H., MARTINEZ RICA J. P., MAURIN H., OLIVEIRA M. E., SOFIANIDOU T. S., VEITH M., ZUIDERWIJK A., 1997 „Atlas of Amphibians and Reptiles in Europe,, Societas Europaea Herpetologica & Museum National d’Histoire Naturelle Paris, 496 p.
- GHIRA I, VENCZEL M., COVACIU – MARCOV, S. D., MARA GY., GHILE P., HÁRTEL T., TÖRÖK Z., FARKAS L., RÁCZ T., FARKAS Z., BRAD T., 2002 „Mapping of Transylvanian Herpetofauna,, Nymphaea, Folia naturae Bihariae, Oradea XXIX, 145-203, Oradea.
- HUELIN B., GUILLAUME C. P., VOGRIN N., SURGET-GROBA Y., TADIC Z., 2000 „Further evidence of the existence of *Lacerta vivipara* in the NW of the Balkan Peninsula,, C. R. Acad. Sci. Paris, 323, 1 – 8.
- LÁC J, KLUCH E., 1968 „Die Bergeidechse der Ostsowakischen Tiefebene als selbständige Unterart *Lacerta vivipara pannonica* n subsp. zool. ,, Listy 17: 157 – 173.
- MADEJ Z., 1973 „Ecology of European fire-bellied toads (*Bombina* Oken 1816) ,, Przgl. Zool. Wroclaw 17: 200-204.
- MAYER A. H., SCHMIDT B. R., GROSSENBACHER K., 1998 „Analysis of three *Amphibian* populations with quarter – century long time – series,, Proc. R. Soc. Lond. B., 265, 523 - 528.
- POLIȘ R., 1977 „Răspândirea broaștei de mlaștină (*Rana arvalis*) în valea Erului (Județul Satu-Mare și Bihor),, Nymphaea, Folia Naturae Bihariae, 5: 417-425, Oradea.

24. STOENESCU Ș. M., ȘCHIOP A., DICA I., POPESCU E., PATRICHI E., ȚEPEȘ E., 1966 „Atlasul climatologic al R. S. R. „, București
25. STUGREN B., 1957 „Noi contribuții la problema originii faunei herpetologice din R. P. R. în lumina glaciațiunilor,, Bul. Șt. Secția de Biologie și Științe Agricole, Seria Zool. 9, 1, 35 – 47
26. STUGREN B., 1980 „Geographical variation of the fire – bellied toad (*Bombina bombina* (L.)) in the USSR. (Amphibia, Anura, Discoglossidae),, Zool. Abh. Mus. tierk. Dresden, 36 (5): 101-115
27. VANCEA ȘT. 1959 „Contribuții la cunoașterea răspândirii geografice a broaștei de mlaștină, *Rana*

*arvalis arvalis* în R. P. R., Stud. Cerc. Științ. Iași, Acad. R. P. R. 10, 1, 59-62.

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