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CONTRIBUTION TO THE KNOWLEDGE OF THE HERPETOFAUNA OF BACĂU COUNTY (ROMANIA)

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Abstract. The already rich inventory of herpetofaunal records in Bacău County is increased with 405 new records of 23 amphibian and reptile species from 54 localities, including a species now firstly found in the county. Some data regarding the habitat preferences of the recorded species are also given, especially if local populations show peculiar characteristics in this respect. *Podarcis muralis* is firstly recorded in Bacău county. When available from long-term observations, tentative data on the multi-year dynamics of some species are given, showing decline in some of these.

Résumé. L'inventaire déjà riche des signalements herpétologiques dans le département de Bacau est agrandi avec 409 nouveaux signalements de 23 espèces d'amphibiens et de reptiles dans 54 localités, dont une espèce signalée pour la première fois dans ce département. Quelques données sur les préférences d'habitat sont aussi présentées pour toutes les espèces mentionnées, surtout si les populations locales manifestent des caractéristiques spéciales. *Podarcis muralis* est signalée pour la première fois dans le département de Bacau. Si des observations de longue durée ont été disponibles, indiquant le déclin de quelques espèces, les auteurs ont essayé aussi de présenter la dynamique multi-annuelle de ces espèces.

Key words: Bacău, amphibians, reptiles, records, habitat.

INTRODUCTION

The herpetofauna of Bacău county is relatively well explored, with a greater number of works dealing with the distribution (Fuhn, 1960; Fuhn & Vancea, 1961; Șova & Tărăbuță, 1963; Cogălniceanu et al., 2000; Tatole et al., 2003; Ghiurcă, 2006; Ghiurcă et al., 2006; Covaciu-Marcov et al., 2006), morphometric characteristics (Șova, 1968, 1969, 1973) or biological and ecological traits of amphibians and reptiles in this area (Șova, 1972, 1973; Fuhn et al., 1975; Ghiurcă, 2006; Ghiurcă & Gherghel, in press) than in most Romanian counties outside of Transsylvania and Dobrogea. Most of these works deal with amphibians, Fuhn & Vancea (1961) giving a limited number of reptile records, upon which Ghiurcă et al. (2006) build with a larger number. Our study adds new distribution records and some data of ecological and conservation significance to this already substantial body of data.

MATERIALS AND METHODS

This paper is based upon field work performed by the first author (Alexandru Iftime) at Slănic Moldova, Pârgărești, Târgu Ocna, Valea Uzului, Poiana Sărată, Târgu Trotuș, Secueni and Bogdănești (*Bufo viridis* record only), between 1985 and 2007, by the second author (Iulian Gherghel) at Bolătău, Schitu Frumoasa, Cucuieții, Zemeș, Păltiniș, Solonț, Berești-Bistrița, Cândești, Letea Veche, Luizi Călugăra, Mărgineni, Săucești, Cârligi, Onești, Borzești, Răcăuți, Hârlești, Onișcani, Boanța, Cornești, Cotu Grosului, Brad, Șerbești, Drageși, Călinești and Mâgla, between 2006 and 2007, and by the third author (Daniel Ghiurcă) at

Sănduleni, Bereşti-Tazlău, Berzunţi, Helegiu, Strugari, Scorţeni, Grigoreni, Podiş, Bârsăneşti, Oituz, Bogdăneşti, Mănăstirea Caşin, Caşin, Glăvăneşti, Lipova, Orbeni, Parincea, Horgeşti and Ungureni, between 2006-2007. The study of amphibians and reptiles was carried following the active transects method (after Heyer et al., 1994, and McDiarmid, 1992, *in* Cogălniceanu, 1997), the transect being 4 m wide, but also, and mainly, through non-standardized qualitative observations. The amphibians and reptiles were observed in the field; photographs were taken whenever possible. Relations were recorded between habitat type, human disturbance and presence of reptile species.

For any given species, records are given below only if they are "new", i. e. the species was not previously recorded in that precise locality, or, if already published, if they are not confirmed by the most recent source (Ghiurcă et al., 2006). Habitat and conservation data also incorporate, in some cases, information from additional sites, where the species was recorded by previously workers (if this is the case the locality is mentioned).

RESULTS

23 species of amphibians and reptiles were recorded by us:

Salamandra salamandra L., 1758 – Fire Salamander: recorded by us at Bolătău, Cucuieţii, Păltiniş, Cândeşti, Luizi Călugăra, Mărgineni, Oneşti, Târgu Ocna, Grigoreni, Podiş, Mănăstirea Caşin and Caşin, inhabiting beech forest crossed by streams and springs.

Triturus cristatus (Laur., 1768) – Great Crested Newt: recorded by us at Bolătău, Zemeş, Păltiniş, Cândeşti, Mărgineni, Hârleşti, Onişcani, Cârligi, Cornesti, Cotu Grosului, Drageşti, Pârgăreşti and Târgu Ocna, in habitats such as beech or beech-spruce forest, meadows, hay meadows, pastures or orchards, utilizing for reproduction natural or man-made ponds of various size and use: marshes, abandonned fish-ponds, cattle water-holes, etc. It generally lives in larger, preferably permanent ponds.

Triturus (*Lissotriton*) *vulgaris* (L., 1758) – Smooth Newt (Fig. 1): recorded by us at Bolătău, Schitu Frumoasa, Zemeş, Cucuieţii, Păltiniş, Solonţ, Bereşti-Bistriţa, Cândeşti, Mărgineni, Hârleşti, Boanţa, Oneşti, Drageşti, Pârgăreşti, Târgu Ocna, Grigoreni, Podiş, Mănăstirea Caşin and Caşin, in habitats such as beech or beech-spruce forest, meadows, hay meadows, pastures or orchards, utilizing for reproduction natural or man-made ponds of various size and use: abandonned fish-ponds, cattle water-holes, riverside or roadside puddles, springs etc. It utilises smaller ponds than any other newt species. During the terrestrial phase it appears to be nocturnal and partly subterranean, sometimes making its way through interstices in the stone lining into damp rustic wine-cellars.

Triturus (*Lissotriton*) *montandoni* (Boulenger, 1880) – Carpathian Newt (Fig. 1): recorded by us at Bolătău, Schitu Frumoasa, Cucuieţii, Zemeş, Păltiniş, Târgu Ocna and Poiana Sărată. We also found it in Slănic Moldova, where it was not confirmed by Ghiurcă et al. (2006). No hybrids between this species and *T. vulgaris* were recorded; however, the classic hybridization site at Crăcurele lake in Nemira massif (Fuhn et al., 1975) was not checked. It inhabits mixed beech-spruce forests (at Târgu Ocna a pure beech forest) and reproduces in waterbodies such as natural ponds, abandonned fish-ponds or roadside ditches. It is extremely rare at Slănic Moldova and Târgu Ocna.

Triturus (*Mesotriton*) *alpestris* (Laur., 1768) – Alpine Newt (Fig. 2): recorded by us at Bolătău, Schitu Frumoasa, Zemeş, Păltiniş, Târgu Ocna, Mănăstirea Caşin and Caşin. It inhabits beech and mixed beech-spruce forests and reproduces in waterbodies such as natural ponds and marshes, abandonned fish-ponds or roadside ditches.

Bombina bombina (L., 1761) – Fire-Bellied Toad: recorded by us at Hârleşti, Onişcani, Cârligi, Boanţa, Cornești, Cotu Grosului, Brad, Şerbeşti, Drageşti, Călineşti and Mâgla. It inhabits various types of waterbodies, such as temporary and permanent ponds, natural or man-made lakes, wetlands and river beds, in deciduous forest skirts, pastures or even within human habitations.

Bombina variegata (L., 1758) – Yellow-Bellied Toad: recorded by us at Bolătău, Schitu Frumoasa, Zemeş, Cucuieţii, Păltiniş, Solonţ, Bereşti-Bistriţa, Cândeşti, Letea Veche, Luizi Călugăra, Mărgineni, Săucești, Cârligi, Onești, Borzeşti, Răcăuţi, Drageşti, Valea Uzului, Sănduleni, Bereşti-Tazlău, Berzunţi, Helegiu, Strugari, Scorţeni, Grigoreni, Podiş, Bârsăneşti, Bogdăneşti, Oituz, Mănăstirea Caşin, Caşin, Lipova and Orbeni. It is quite frequent in most localities and utilizes almost all kinds of natural and artificial waterbodies: ponds, puddles, lakes (including Valea Uzului dam lake), rivers and rivulets, springs, even cattle-watering troughs and cattle footprints in mud, which collect a few water (some such footprints were found to hold well-developped tadpoles). At Pârgăreşti the population abundance and spatial extent have, however, diminished considerably from 1986 to 2007, probably in conjunction with severe drought spells – a natural occurence, but for some reason recolonization has not always happened after retreat during drought events.

Hybrids between *B. bombina* and *B. variegata* were found at Cârligi, Parincea, Horgeşti and Ungureni.

Pelobates fuscus (Laur., 1768) – Common Spadefoot Toad (Fig. 3): recorded by us Hârleşti, Cârligi, Boanţa, Cornești, Cotu Grosului, Brad, Şerbeşti, Călineşti, and Mâgla. It was found in pasture and agricultural areas and in adjacent wetlands where it probably reproduces.

Hyla arborea (L., 1758) – European Treefrog: recorded by us at Schitu Frumoasa, Cucuieţii, Zemeş, Solonţ, Cândeşti, Letea Veche, Săucești, Hârleşti, Onişcani, Cârligi, Boanţa, Cornești, Cotu Grosului, Borzeşti, Brad, Şerbeşti, Drageşti, Călineşti, Mâgla, Pârgăreşti, Târgu Ocna, Grigoreni, Podiş and Orbeni. In Pârgăreşti and Târgu Ocna it was observed during reproduction at permanent, reed-lined larger ponds, surrounded by pasture, orchards and mixed deciduous forest. At Pârgăreşti, juveniles were found dispersing through orchards, ca. 1 km away from known reproduction sites.

Bufo bufo (L., 1758) – Common Toad: recorded by us at Bolătău, Schitu Frumoasa, Cucuieţii, Zemeş, Păltiniş, Solonţ, Cândeşti, Cârligi, Onești, Borzeşti, Răcăuţi, Pârgăreşti, Sănduleni, Bereşti-Tazlău, Berzunţi, Helegiu, Strugari, Scorţeni, Grigoreni, Podiş, Bârsăneşti, Bogdăneşti, Oituz, Mănăstirea Caşin, Caşin and Lipova. It inhabits beech and beech-spruce forests, orchards, meadows and hay meadows, and even villages, where they show up in vegetable and flower gardens, etc. They reproduce in various temporary and permanent water bodies.

Bufo (*Pseudepidalea*) *viridis* Laur., 1768 – Green Toad: recorded by us at Schitu Frumoasa, Zemeş, Solonţ, Letea Veche, Luizi Călugăra, Săucești, Hârleşti, Onişcani, Cârligi, Boanţa, Cornești, Cotu Grosului, Borzeşti, Brad, Şerbeşti, Pârgăreşti and Bogdăneşti. In the last two locations this species lives in villages and

adjacent man-influenced habitats: orchards, hay meadows, pastures, gardens etc. In Pârgăreşti it reproduces in ponds and puddles formed by a small stream (males were observed emitting their mating call from water or even from locations on land, but nearby the water), in Bogdăneşti probably in man-made ponds and natural riverside pools of the Oituz river. In Pârgăreşti it appears to have declined in numbers from 1986 to 2006 when last observed; in 2003 one out of ca. 4 males found calling in the stream was observed dying, apparently of disease, having become listless, and showing a bloated abdomen.

Rana dalmatina Bonaparte, 1839 – Agile Frog: recorded by us at Schitu Frumoasa, Cucuieţii, Solonţ, Cândeşti, Drageşti, Pârgăreşti, Târgu Ocna, Sănduleni, Bereşti-Tazlău, Helegiu, Scorţeni, Grigoreni, Podiş, Mănăstirea Caşin and Caşin. It inhabits beech and mixed deciduous forests, as well as orchards and hayfields, and reproduces in larger ponds (e. g. at Târgu Ocna); in Pârgăreşti reproduction was not observed, but it can only take place in small ponds or puddles formed by springs or streams, the only available choice.

Rana temporaria L., 1758 – Grass Frog: recorded by us at Bolătău, Schitu Frumoasa, Cucuieţii, Zemeş, Păltiniş, Solonţ, Cândeşti, Luizi Călugăra, Oneşti, Borzeşti, Pârgăreşti, Târgu Ocna, Sănduleni, Bereşti-Tazlău, Berzunţi, Helegiu, Strugari, Scorţeni, Grigoreni, Podiş, Bârsăneşti, Oituz, Bogdăneşti, Mănăstirea Caşin, Caşin, Horgeşti and Ungureni. It inhabits beech and beech-spruce forests, but also orchards and hay meadows, and reproduces in ponds, temporary and permanent, natural and man-made, of various size and use, from large ponds and marshes to small ponds formed by springs and streams (e. g. at Pârgăreşti).

Rana (*Pelophylax*) *ridibunda* Pall., 1771 – Marsh Frog (Fig. 4): recorded by us at Bolătău, Schitu Frumoasa, Zemeş, Solonţ, Bereşti-Bistriţa, Cândeşti, Letea Veche, Luizi Călugăra, Mărgineni, Săucesti, Cârligi, Oneşti, Borzeşti, Răcăuţi, Hârleşti, Onişcani, Boanţa, Cornesti, Cotu Grosului, Brad, Şerbeşti, Drageşti, Călineşti, Mâgla, Pârgăreşti, Târgu Ocna, Bogdăneşti, Târgu Trotuş, Sănduleni, Bereşti-Tazlău, Berzunţi, Helegiu, Strugari, Scorţeni, Grigoreni, Podiş, Bârsăneşti, Glăvăneşti, Lipova, Orbeni, Parincea, Horgeşti and Ungureni. It inhabits a great variety of water bodies, natural and artificial, such as ponds, streams, riverside pools, etc.

Rana (*Pelophylax*) kl. *esculenta* L., 1758 – Edible Frog: recorded by us at Schitu Frumoasa, Solonţ, Bereşti-Bistriţa, Letea Veche, Luizi-Călugăra, Mărgineni, Săucesti, Hârleşti, Onişcani, Boanţa, Cornesti, Cotu Grosului, Borzeşti, Şerbeşti, Drageşti, Mâgla, Valea Uzului and Târgu Ocna. It was found in much the same habitats as *R. ridibunda*.

Rana (*Pelophylax*) *lessonae* (Camerano, 1878) – Pool Frog (Fig. 4): recorded by us at Târgu Ocna. This population inhabits a large pond, overgrown with submerged macrophytes, in a beech forest.

Emys orbicularis (L., 1758) – European pond Turtle: recorded by us at Letea Veche, Săucesti, Cotu Grosului, Brad, Călinesti and Pârgăreşti. In the last location a single specimen was found in 1986 in a permanent pond, lined by reed and surrounded by pasture; in other locations it inhabits rivers, lakes (both natural and man-made) and permanent ponds.

Lacerta viridis (Laur., 1768) – Green Lizard: recorded by us at Letea Veche, Săucesti, Hârleşti, Onişcani, Cârligi, Boanţa, Cornesti, Cotu Grosului, Brad, Şerbeşti, Drageşti, Călineşti, Mâgla, Pârgăreşti, Târgu Ocna, Bogdăneşti, Târgu

Trotuş, and Secueni. It inhabits forest skirts, orchards, hay meadows, bushy areas, hedges, etc.

Lacerta agilis L., 1758[1] – Sand Lizard: recorded by us at Cândeşti, Oneşti, Bolătău, Schitu Frumoasa, Cucuieţii, Zemeş, Păltiniş, Solonţ, Pârgăreşti, Târgu Ocna, Poiana Sărată, Mănăstirea Caşin (*L. a. agilis*), Letea Veche, Săuceşti, Borzeşti, Răcăuţi, Hârleşti, Boanţa, Cornesti, Cotu Grosului, Brad, Drageşti (*L. a. chersonensis*), Bereşti-Bistriţa, Luizi Călugăra, Mărgineni (populations which are morphologically intermediate between the two subspecies), Sănduleni, Bereşti-Tazlău, Berzunţi, Helegiu, Strugari, Scorţeni, Grigoreni, Podiş, Bârsăneşti, Oituz, Bogdăneşti, Mănăstirea Caşin, Caşin, Glăvăneşti, Lipova, Orbeni, Parincea, Horgeşti and Ungureni[2]. At a site by the Bereşti reservoir, published by the second author in collaboration (Tatole et al., 2003) and without refering to the subspecies, *L. a. chersonensis* is present. We also found it in Valea Uzului, where it was not confirmed by Ghiurcă et al. (2006). It makes use of habitats such as meadows and hay meadows, forest clearings and forest skirts (in beech and beech-spruce forest), but also bushy areas, pasture (including on landslides) and river-edge humid grasses, sand and gravel banks.. The *erythronotus* morph is also found, but infrequent (less than 10% in the upper Trotuş valley, with none seen in the Bereşti *L. a. chersonensis*).

Lacerta (*Zootoca*) *vivipara* Jacquin, 1787 – Viviparous Lizard: recorded by us at Bolătău, Păltiniş, Târgu Ocna and Mănăstirea Caşin. We also found it in Slănic Moldova, where it was not found by Ghiurcă et al. (2006). It appears in beech-spruce forests, their skirts, clearings, meadows, and rocky places, but also wet meadows, marshes and bogs. A decline was noted from ca. 1995 to 2007 in places such as Târgu Ocna (where last seen in 1999) and Slănic Moldova (where part of its habitat was built-up or altered).

Podarcis muralis (Laur., 1768) – Wall Lizard (Fig. 5): recorded by us at Valea Uzului, where it occurs on rocky outcrops and concrete enbankments near the dam. Apparently the first record of this species in Bacău county.

Anguis fragilis L., 1758 – Slowworm: recorded by us at Cucuieţii, Păltiniş, Luizi Călugăra, Oneşti, Pârgăreşti, Grigoreni and Podiş. We also found it in Slănic Moldova, where it was not confirmed by Ghiurcă et al. (2006). It lives in forests (beech and beech-spruce, but also Scotch pine, which is both native and planted in this area), forest skirts, meadows, hay meadows and orchards. It can reach relatively high densities in hay meadows but it is also killed in numbers by locals when these are mowed: six were killed in a day in a ca. 1 ha. combination orchard and hay-meadow mowed in 1986.

Natrix natrix (L., 1758) – Grass Snake: recorded by us at Schitu Frumoasa, Solonţ, Bereşti-Bistriţa, Letea Veche, Luizi Călugăra, Hârleşti, Onişcani, Cârligi, Boanţa, Cornesti, Cotu Grosului, Borzeşti, Răcăuţi, Brad, Şerbeşti, Drageşti, Mâgla, Pârgăreşti, Târgu Ocna, Sănduleni, Bereşti-Tazlău, Berzunţi, Helegiu, Strugari,

[1] Bischoff (1988) treats central European *L. a. agilis* populations as a separate subspecies, *L. a. argus* (Laur., 1768); Rahmel (1988) demonstrates the irrelevance of morphological differences between *L. a. agilis* and *L. a. argus*, and Kalyabina et al. (2001) consider that *L. a. agilis* and *L. a. argus* „show no or little genetic differences" (p. 154). The first two authors consider therefore that *L. a. argus* is a junior synonym of *L. a. agilis*.

[2] The third author (D. Ghiurcă) considers all *L. agilis* populations in Bacău to be *L. a. chersonensis*, a position not shared by the first two authors (A. Iftime, I. Gherghel) who follow Fuhn & Vancea (1961) in considering *L. a. agilis* present in montane and submontane habitats East and South of the Carpathians, and *L. a. chersonensis* in lower-lying steppe and forest-steppe habitats.

Scorţeni, Grigoreni, Podiş, Bârsăneşti, Oituz, Bogdăneşti, Mănăstirea Caşin, Caşin, Glăvăneşti, Lipova, Orbeni, Parincea and Ungureni. It is usually found close to water: streams, ponds, etc., but also in meadows, hay meadows and other relatively humid habitats. Locals generally kill this species (and any snake) on sight, but the impact upon *N. natrix* populations cannot be appreciated.

Vipera berus (L., 1758) – Adder: recorded by us at Slănic Moldova (where it is not confirmed by Ghiurcă et al., 2006), in a bog and in adjacent bushes, slopes and forest skirts. The melanic morph was also found. This species is apparently declining; it is killed by locals, and also afflicted by habitat destruction (the bog where it occurred in Slănic Moldova is now drained); it was last seen in 1999, but most likely still occurs. It also occurred in Pârgăreşti where a specimen was killed (by a cat) in 1982, but never since this and is therefore most likely extinct in this location.

DISCUSSION

Of the 23 species that we found, one (*Podarcis muralis*) was not previously recorded in Bacău county. *Rana lessonae*, known in Bacău county from Bacău, the city (Ghiurcă, 2006) where a number of individuals were identified in mixed „*Rana esculenta* complex" populations, is now recorded as a numerous, if localized, population; more research is needed on this species and *Pelophylax* „green frogs" in general. However, four species recorded by previous authors were not found by us: *Coronella austriaca* (Fuhn & Vancea, 1961; Ghiurcă et al., 2006), *Rana arvalis*, *Natrix tessellata*, *Elaphe longissima* (Ghiurcă et al., 2006). The snake species above mentioned are given by Ghiurcă et al. (2006) to be rare; this is a probable reason for their absence in our records. The region where *Rana arvalis* is recorded by the above-mentionned authors was not checked by us. Besides, the search effort is also a very important factor in enriching the species list for a given locality: for instance, in Pârgăreşti, where Ghiurcă et al. (2006) found only one species (*Bombina variegata*), we could list 15 species, thanks to observations effectuated along more than 20 years; accordingly, the species richness by locality is biased by the uneven distribution of recording effort.

The species list for Bacău county reaches now 27 species (16 amphibians and 11 reptiles).

The presence of both *Lacerta agilis* subspecies: *L. a. agilis* and *L. a. chersonensis* is noted[3]; subspecific apartenence of *L. agilis* in Bacău is not discussed by Ghiurcă et al. (2006), the species is not recorded in Bacău by Covaciu-Marcov et al. (2006), and knowledge on this matter remains insufficient since Fuhn & Vancea (1961) recorded *L. a. agilis* at Tazlău and Slănic-Bacău (i. e. Slănic-Moldova).

We may also note the apparent scarcity of some montane species such as *Triturus montandoni* and *Lacerta vivipara*. *T. montandoni* is given by Şova (1972) as present in some low-altitude localities (e. g. Căiuţi, Răcăciuni) up to the Siret river, records uncritically accepted by Cogălniceanu et al. (2000) and Iftime (2005), but our data, in accord with Ghiurcă et al. (2006), show *T. montandoni* to have a more restricted distribution in Bacău, being limited to higher altitudes, unlike *T. alpestris* which reaches record low altitudes here (Ghiurcă et al., 2006). It is, however, premature to appreciate now whether the range of *T. montandoni* has contracted since Şova's (1972) records, or these records were mistaken, or our

[3] But see note 2 on the opinion of one of the authors.

failure to find *T. montandoni* at lower altitudes is the consequence of scarcity and insufficient search effort.

In some cases our data show population reduction in numbers and/or occupation area, as the result of human pressure. These highlight the need for increased conservation efforts, for which detailed distribution data are always needed.

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CONTRIBUȚII LA CUNOAȘTEREA HERPETOFAUNEI DIN JUDEȚUL BACĂU (ROMÂNIA)

REZUMAT

Inventarul deja bogat de semnalări herpetologice din județul Bacău este sporit cu 405 semnalări noi a 23 specii de amfibieni și reptile din 54 localități, inclusiv *Podarcis muralis*, specie găsită acum pentru prima dată în județ. Sunt prezentate și unele date legate de preferințele de habitat ale speciilor înregistrate, mai ales dacă populațiile locale au caracteristici deosebite în această privință. În măsura în care sunt disponibile din observații pe termen lung, sunt prezentate și date tentative asupra dinamicii multianuale a populațiilor unor specii, evidențiind un declin la unele din acestea.

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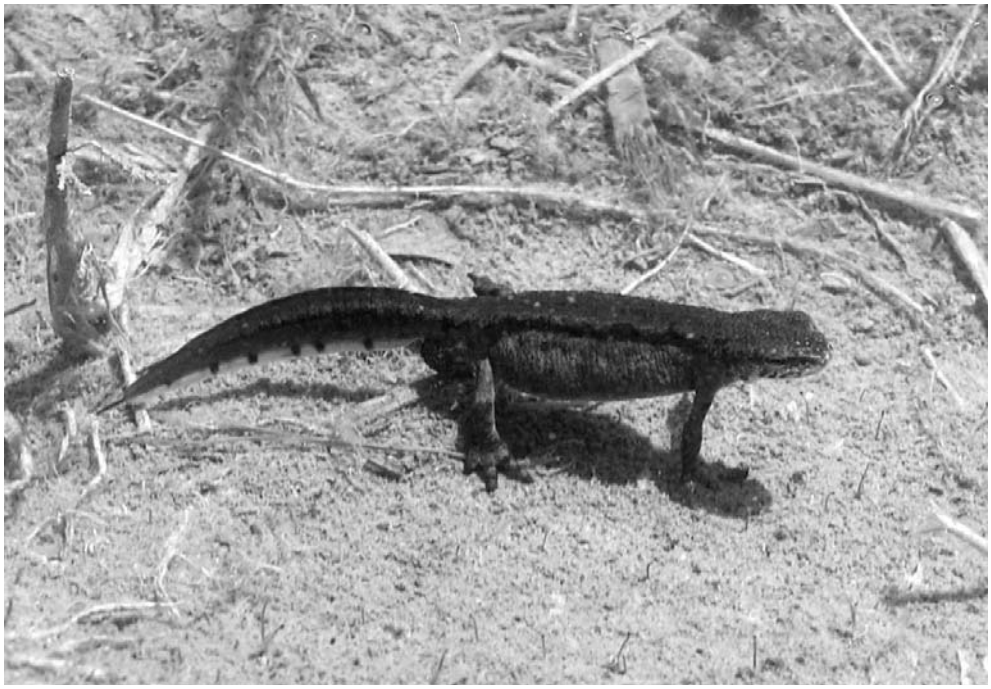

Fig. 1 – *Triturus montandoni*, male, in water, Bolătău (photo by I. Gherghel).

Fig. 2 – *Triturus alpestris*, male, near water, Bolătău (photo by I. Gherghel).

Fig. 3 – *Pelobates fuscus*, in water, Cârligi (photo by I. Gherghel).

Fig. 4 – *Rana lessonae*, male, at edge of pond, Târgu Ocna (note small size, relatively short tibias; on original colour photo, yellow and black coxal marbling, yellowish coloration on flanks and head, white and yellow tympanic coloration can also be seen) (photo by A. Iftime).