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Opis prvih najdb nimfnega netopirja (*Myotis alcathoe*) v Sloveniji

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Izvleček. V prispevku podajamo opis prvih najdb nimfnega netopirja (*Myotis alcathoe*) v Sloveniji. Samec in dve samici te vrste so bili ujeti ob mlaki pri Rdečem kamnu sredi starih bukovih-jelovih gozdov na Kočevskem rogu, kjer je bilo zabeleženo še 16 drugih vrst netopirjev. Nimfni netopir je 30. vrsta netopirjev v Sloveniji. Predvidevamo, da je razširjen po starih listopadnih gozdovih, kar pa bodo lahko potrdile le nadaljnje terenske raziskave v povezavi z genetskimi metodami.

Ključne besede: nimfni netopir, morfologija, gozd, Kočevski rog, Slovenija

Abstract. DESCRIPTIONS OF FIRST RECORDS OF *MYOTIS ALCATHOE* IN SLOVENIA – We present first observations of *Myotis alcathoe* in Slovenia. A male and two females of this species were mistnetted at a pond surrounded by an old full-grown beech-fir forest near Rdeči kamen (Kočevski rog), where other 16 bat species were found as well. *Myotis alcathoe* is the 30th bat species in Slovenia, and we assume that it inhabits other similar old broadleaf forests as well, which could be confirmed by further fieldwork coupled with genetic testing.

Key words: *Myotis alcathoe*, morphology, forest, Kočevski rog, Slovenia

Uvod

Preučevanje biodiverzitete je nemogoče brez poznavanja vrst. Biodiverziteta kot življenjska in zlasti vrstna raznolikost pa je primarno domena biogeografije, biološke znanosti, ki tudi z ekološkimi in zgodovinskimi dejavniki razlaga porazdelitev živih bitij (Mršić 1997). Podatki o razširjenosti vrste ter posledično o njenih specifičnih potrebah so osnova za varstveno biologijo, saj brez potrditve pojavljanja vrste na nekem območju ni mogoče načrtovati učinkovitih ohranitvenih ukrepov. Poznavanje števila vrst se je v zadnjem desetletju močno izboljšalo z uvedbo razlikovanja vrst s pomočjo molekularnih analiz genetskih zapisov. V Evropi, na primer, so pri redu netopirjev (Chiroptera) izključno na podlagi morfoloških metod zadnji novi vrsti netopirjev opisali že v šestdesetih letih 20. stoletja (Dietz et al. 2007) in od takrat je kar do devetdesetih let veljalo, da na celinskem ozemlju Evrope živi 30 vrst netopirjev (npr. Schober & Grimberger 1993). Atlas sesalcev Evrope je na celinski Evropi tako obravnaval še enako število vrst, vendar se je že domnevalo, da tu živi verjetno živi vsaj še ena vrsta (Mitchel-Jones et al. 1999). Genetske metode so v naslednjih letih pokazale veliko verjetnost o pojavljanju kriptičnih vrst, ki se od sestrskih malce razlikujejo le po zunanji morfologiji, očitno pa so različni njihovi genetski zapisi (Mayer & Helversen 2001). Leta 2007 Dietz et al. (2007) naštevajo za Evropo brez otokov 35 vrst netopirjev, Mayer et al. (2007) pa so že predvidevali možnost dodatnih vrst. Med novo opisanimi vrstami je tudi nimfni netopir (*Myotis alcathoe* von Helversen & Heller, 2001), sestrska vrsta brkatega netopirja (*Myotis mystacinus* (Kuhl, 1817)). Vrsto so opisali na osebkih iz Grčije in Madžarske (Helversen et al. 2001) in je bila kmalu najdena tudi na Slovaškem in Češkem, v Poljski, Bolgariji, Nemčiji, Švici, Franciji, Španiji in Albaniji (Benda et al. 2003, Niermann et al. 2007, Lučan et al. 2009) in mnogih drugih evropskih državah (Wikipedia 2011). Najden je bil v vseh sosednjih državah, poleg Madžarske tudi na Hrvaškem (Croatian Natural History Museum Bat Group 2006), v Avstriji (Spitzenberger et al. 2008) in Italiji (Parco Nazionale della Majella 2008). Glede na tako razširjenost nimfnega netopirja sta že Koselj & Aupič (2001) predvidevala, da živi tudi v Sloveniji, kasneje pa so na podlagi poročila Presetnik et al. (2007) kratko navedbo o pojavljanju v Sloveniji objavili Presetnik et al. (2009a). Namen tega prispevka je objaviti nekatere podrobnosti o tej in sledečih najdbah nimfnega netopirja v Sloveniji.

Material in metode

Kočevski rog je 25 km dolgo in 14 km široko dinarsko planotasto pogorje v južni Sloveniji. Večina ozemlja leži v višinskem pasu med 600 in 1000 metrov (Perko et al. 1999). Površje je zakraselo z mnogo jamami, tekočih vod skoraj ni, obstajajo le majhni studenci ter umetno narejene mlake. Podnebje je celinsko, povprečna letna temperatura je med 6 in 8 °C, najtoplejši je mesec je julij, ko se ogreje na 14 do 16 °C. Padavine so med letom dokaj enakomerno razporejene, povprečno na leto pa je od 1300 do 1400 milimetrov padavin (Perko et al. 1999). Naselij praktično ni, gostota poselitve je manjša kot 3 ljudi na km^2 (Perko 1998, Perko et al. 1999). Kočevski rog je skoraj popolnoma porasel z bukovo-jelovimi gozdovi, v katerih prebivajo tri vrste velikih zveri: medved, volk in ris. Zabeleženih je bilo tudi 19 vrst netopirjev (Kryštufek 1997, Presetnik & Govedič 2006, Presetnik et al. 2009).

Pri opuščenem zaselku Rdeči kamen na nadmorski višini 866 m na severu Kočevskega roga leži ob gozdnem robu približno 8 × 10 m velika mlaka, ki je bila predlagana za redno mesto spremljanja stanja (monitoring) izbranih vrst netopirjev z metodo mreženja (Presetnik et al. 2007). Tretjina mlake je bila tik ob bregu gosto zaraščena z drevjem in grmovjem, ki je segalo tudi nad vodno gladino. Okrog preostalih dveh tretjin mlake smo v mesecu avgustu v letih 2007–2011 (Presetnik et al. 2007, 2009b, 2011) postavili 21 m dolge in c. 4 m visoke najlonske mreže, kakršne uporabljajo tudi za lovljenje ptic (Gaisler 1973, Kunz & Kurta 1990). V letu 2007 smo mrežili od sončnega zahoda do sončnega vzhoda naslednjega dne, vsa preostala leta smo mreženje zaključili 5,5 ure po sončnem zahodu. Ujetim netopirjem smo določili vrsto, spol in reprodukcijsko stanje (Anthony 1990, Racey 1990) ter s kljunastim merilom na 0,1 mm natančno opravili nekaj telesnih meritev (Diezt & Heleversen 2004) in jih stehtali na 0,5 g natančno. Netopirje smo čim hitreje izpustili in ob tem z ultrazvočnim detektorjem (Pettersson D 240x) z načinom 10-kratne upočasnitve časa in digitalnim snemalnikom (Marantz PMD 670) posneli njihove ultrazvočne klice. Netopirjem iz skupine brkatih netopirjev (*Myotis mystacinus* s. lat.) smo leta 2007 z endopatagija vzeli delček opne, ki smo ga spravili v fiolo z 90-odstotnim alkoholom, in jih poslali v nadaljnjo analizo dr. Friederju Mayerju z Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitätsforschung Humboldtove univerze v Berlinu. Raziskave so bile opravljene v skladu z dovoljenjem Agencije Republike Slovenije za okolje (št. 35701-80/2004 in št. 35601-35/2010 - 6).

Rezultati

Med mreženjem s 24. na 25. avgust 2007 smo vmrežili tudi odraslega samca iz skupine brkatih netopirjev (Sl. 1). Nekatere meritve morfoloških znakov so bile na zgornji meji mer, ki jih za nimfnega netopirja podajajo Dietz & Helversen (2004) in Dietz et al. (2007) (Tab. 2), cingulum tretjega zgornjega premolarja pa ni bil očiten. Samec ni imel zelo temnega – skoraj črnega obraza, ki je značilen za brkatega netopirja (*Myotis mystacinus* s. str.) in je po videzu malo spominjal na majhnega obvodnega netopirja (*M. daubentonii*). Zato smo na terenu osebku pripisali status taksona *Myotis mystacinus* s. lat. Rezultati kasnejših genetskih analiz, ki jih je opravil dr. Mayer, so pokazali, da je vmrežen samček nedvomno pripadal vrsti nimfnega netopirja (*Myotis alcathoe* von Helversen & Heller, 2001). V kasnejših letih smo v noči 13./14. avgusta 2008 in v noči 16./17. avgusta 2011 ujeli po eno odraslo samico, ki sta glede na stanje seskov v istem letu tudi dojili. Njune mere so podane v Tab. 1.

Slika 1. Samec nimfnega netopirja, vmrežen ob mlaki pri Rdečem kamnu (foto: Primož Presetnik).
Picture 1. *Myotis alcathoe* male mistnetted at the pond by Rdeči kamen (photo: Primož Presetnik).

Tabela 1. Mere nimfnih netopirjev (*Myotis alcathoe*), vmreženih ob mlaki pri Rdečem kamnu, in mere, ki jih za to vrsto podajajo različni avtorji. (1) – Dietz et al. 2007; (2) – Niermann et al. 2007
Table 1. The measurments of *Myotis alcathoe* mistnetted in Slovenia at the Rdeči kamen pond and measurements given by other writers. (1) – Dietz et al. 2007; (2) – Niermann et al. 2007

mera / mesurement	**Slovenija / Slovenia**			**srednja Evropa / Central Europe** (1)	**Poljska / Poland** (2)
leto najdbe / year of find:	**2007** ♂	**2008** ♂	**2011** ♀		
dolžina podlaktnice / forearm length [mm]	33,0	33,3	33,4	<32,8 (30,8 – 34,6; do 34,8)	28,4 – 33,4
masa / weight [g]	5,0	6,0	6,0	3,5 – 5,5	3,2 – 4,7
dolžina palca / thumb length [mm]	5,0	4,8	4,8	< 4,7 (3,8 – 5,0)	4,0 – 4,5
dolžina 3. dlančnice in prstnic / 3rd finger length [mm]	51,9	53,6	/	50 – 56	/
dolžina 5. dlančnice in prstnic / 5th finger length [mm]	41,1	41,8	/	37 – 44	44,7 – 53,1
dolžina goleni / tibia length [mm]	15,2	15,8	15,4	< 14,8 (13,5 – 15,9)	/
dolžina stopala / foot length [mm]	5,8	/	5,2	< 5,6 (5,1 – 5,8)	/

Nimfni netopir je tako 17. vrsta netopirjev, zabeležena ob mlaki Rdečem kamnu oz. 19. vrsta netopirjev, najdena na območju Kočevskega roga (Kryštufek 1997, Presetnik & Govedič 2006, Presetnik et al. 2009a). Druge vrste netopirjev, zabeležene ob mlaki pri Rdečem kamnu v letih 2003–2011 so bile: veliki podkovnjak (*Rhinolophus ferrumequinum*), južni podkovnjak (*R. euryale*), navadni netopir (*Myotis myotis*), velikouhi netopir (*M. bechsteinii*), resasti netopir (*M. nattereri*), vejicati netopir (*M. emarginatus*), Brandtov netopir (*M. brandtii*), brkati netopir (*M. mystacinus*), obvodni netopir (*M. daubentonii*), navadni mračnik (*Nyctalus noctula*), gozdni mračnik (*N. leisleri*), mali netopir (*Pipistrellus pipistrellus*), drobni netopir (*P. pygmaeus*), pozni netopir (*E. serotinus*), rjavi uhati netopir (*Plecotus auritus*) in širokouhi netopir (*Barbastella barbastellus*). Najdba brkatega netopirja, ki ga za mlako pri Rdečem kamnu navajata Presetnik & Govedič (2006), je zanesljiva glede na preverjene fotografije živali.

Razprava

Samec nimfnega netopirja, vmrežen nad mlako pri Rdečem kamnu leta 2007 in potrjen z genetsko analizo, je prva zanesljiva najdba te vrste v Sloveniji. Stalno pojavljanje in razmnoževanje te vrste potrjujeta v letih 2008 in 2011 na istem mestu vmreženi odrasli samici nimfnega netopirja. Nimfni netopir je tako 30. vrsta netopirjev, zabeležena v Sloveniji, oz. 28. trenutno pri nas bivajoča vrsta netopirjev (Presetnik et al. 2009a). Pri tem pa Koselj (2009) opozarja, da je treba predhodne najdbe brkatega netopirja jemati kot najdbe taksona *Myotis mytacinus* s. lat. To opozorilo velja zlasti za najdbe sredi gozdov, saj je avtor tega prispevka v takšnem okolju (npr. ob ribnikih 750 m severno od nekdanje vasi Ponikva; Presetnik et al. 2009a) že videval »brkate netopirje«, ki so po videzu spominjali na majhne obvodne netopirje. Glede na sedanje poznavanje te živali najverjetneje niso pripadali brkatim netopirjem (*M. mystacinus* s. str.), vendar fotografije omenjenih netopirjev ne obstajajo, zato tega s popolno gotovostjo ne moremo potrditi.

Pestrost netopirske združbe ob mlaki pri Rdečem kamnu oz. v Kočevskem rogu na splošno kaže na dobro strukturiran in ohranjen gozdni habitat, primeren za mnoge vrste netopirjev. V podobnih habitatih, torej v starih listopadnih gozdovih z večjim deležem starih odmrlih dreves in v bližini večjih ali manjših tekočih ali stoječih vod, so nimfnega netopirja našli tudi v drugih delih Evrope (Niermann et al. 2007, Lučan et al. 2009). Druga podobnost s preostalimi najdišči je tudi simpatrično pojavljanje s sorodnima vrstama brkatega in Brandtovega netopirja, vendar naj bi bili nimfni netopir redkejši (Niermann et at. 2007) in naj praviloma ne bi uporabljal antropogeno ustvarjenih zatočišč (Lučan et al. 2009). S Češke tako Lučan et al. (2009) poročajo, da so bila zatočišča tudi do 80 osebkov velikih skupin nimfnega netopirja v majhnih razpokah na deblih in vejah krošenj, približno 16 m nad tlemi. Pri tem so bila zatočišča pogostejša v višjih in debelejših drevesih, ki so delno že odmirala oz. so imela druge poškodbe. Niermann et al. (2007) zaključujejo, da je glede na domnevno specializacijo nimfnega netopirja na podobne vedno redkejše in ogrožene gozdne habitate tej vrsti netopirjev nujno dati visoko prednost pri vseh upravljavskih programih. S tem mnenjem se strinjajo tudi Lučan et al. (2009), ki menijo, da je vzrok za razdrobljeno razširjenost nimfnega netopirja v Evropi prav njegova specializacija na stare sestoje gozda. Glede na razmeroma dobro ohranjenost in povezanost gozdov pri nas pričakujemo, da je nimfni netopir v Sloveniji precej razširjen. Verjetno ga lahko pričakujemo v vseh dinarskih gozdovih, pa tudi v starejših kompleksih gozdov v nižjih predelih.

Slovenija se je s podpisom konvencije o biotski diverziteti (Ur. l. RS 1996) med drugim zavezala, da bo pozornost pri opazovanju namenila ogroženim vrstam. Hkrati pa ji spremljanje stanja ogroženih vrst in njihovih habitatov nalaga tudi Direktiva o habitatih (Direktiva Sveta 92/43/EGS) in iz nje izvedena slovenska zakonodaja. Zato bi bilo smiselno v izbranih starejših gozdnih sestojih napraviti ciljni popis nimfnega netopirja z metodo mreženja. Poleg morfoloških znakov pa bi morala biti vsaj pri osnovni inventarizaciji uporaba genetskih analiz standardna za potrditev pojavljanja nimfnega netopirja.

Zahvala

Hvala dr. Christianu Dietzu za posredovanje vzorcev dr. Friederju Mayerju, slednjemu pa za opravljeno genetsko analizo. V letih 2003-2011 je pri mreženjih ob mlaki pri Rdečem kamnu sodelovala vrsta ljudi, hvala Katerini Jazbec, Andreju Hudoklinu, Tei Knapič, Manci Markelj, Moniki Podgorelec, Marjetki Šemrl in Maji Zagmajster.

Summary

Studying biodiversity is impossible without knowing about species and species distribution (Mršić 1997). In the past decade, the use of genetic molecular analysis has revealed many new species, known as cryptic species, that are morphologically almost identical to an existing species but have distinct genetic lineages. Consequently, even in the well-studied fauna of Europe the number of recognised bat species has risen from 30 to 35 in the last decade (Dietz et al. 2007). One of the first species described was Alcathoe's bat (*Myotis alcathoe* von Helversen & Heller, 2001) belonging to the group of whiskered bats (*Myotis mystacinus* s. lat.). Later, Alcathoe's bat was found in many countries across continental Europe (e.g. Niermann et al. 2007, Wikipedia 2011), making it just a matter of additional research and genetic testing for its presence to be confirmed in Slovenia. During the night of August 24th/25th 2007, a male of the whiskered bat group was mistnetted at a small pond on the forest edge near the abandoned village of Rdeči kamen (Presetnik et al. 2007) in the northern part of Kočevski rog – a plateau covered with old beech-fir forests at 866 m a.s.l. The bat's appearance (Fig. 1) was not typical of *M. mystacunis* (s. str.) and to some extent resembled the small Daubenton's bat (*M. daubenitonii*), and the measurements were at the top end of measurements given for Alcathoe's bat (Tab. 1). A sample of the wing membrane was removed for genetic analysis, which was performed by Frieder Mayer (Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitätsforschung an der Humboldt-Universität zu Berlin; the analysis confirmed that it was an Alcathoe's bat, with the find published by Presetnik et al. (2009a). In the nights of August 13 th /14th 2009 and August 16th /17th 2011 (Presetnik et al. 2009b, 2011), two post lactating females of Alcathoe's bat were found on the same location (Tab. 1). This is the first reliable confirmation of Alcathoe's bat occurring in Slovenia, although small Daubenton bat like whiskered bats had previously been seen in similar forest habitats. Alcathoe's bat was the 17th bat species recorded at the pond by Rdeči kamen in the 2003–2011 period (*Rhinolophus ferrumequinum*, *R. euryale*, *Myotis myotis*, *M. bechsteinii, M. nattereri*, *M. emarginatus*, *M. mystacinus*, *M. brandtii*, *M. daubentonii*, *Nyctalus noctula*, *N. leisleri*, *Pipistrellus pipistrellus*, *P. pygmaeus*, *E. serotinus*, *Plecotus auritus* and *Barbastella barbastellus*). The habitat surrounding Rdeči kamen – an old deciduous broadleaf forest with large trees in the advanced stages of decay and a very small body of water are similar to the habitats of Alcathoe's bat in the rest of Europe (Niermann et al. 2007, Lučan et al. 2009), the other similarity being the sympatric occurrence of *M. mystacinus* and *M. brandtii*. The restrictive habitat requirements of Alcathoe's bat are perhaps responsible for the island-like pattern of its distribution in Europe and highlight the conservation value of

the old tree stands where it occurs (Lučan et al. 2009). Since similar forest habitat is widespread in Slovenia, further finds of Alcathoe's bat are expected. To gain a better idea of the distribution of Alcathoe's bat in Slovenia, we recommend a survey of potential habitats where the morphological determination of the species should, at least initially, be coupled with genetic analysis.

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New records of *Epallage fatime* (Charpentier, 1840) in Macedonia (Odonata: Euphaeidae)

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Abstract. Formerly known from Macedonia only from two old records made in the southeasternmost part of the country, the species has been newly recorded on 20-VII-2008 at the Luda Mara stream south of Kavadarci (S Macedonia), on 24-VII-2008 at the Konska Reka stream west of Gevgelija (SE Macedonia) and on 26-IV-2010 at the Sermeninska Reka stream northwest of Gevgelija (SE Macedonia). At all localities, the species' development has been confirmed. Its currently known distribution in Macedonia and the neighbouring countries is presented and a short zoogeographical discussion provided.

Key words: *Epallage fatime*, dragonflies, distribution, Macedonia, the Balkans

Izvleček. NOVE NAJDBE VRSTE *EPALLAGE FATIME* (CHARPENTIER, 1840) V MAKEDONIJI (ODONATA: EUPHAEIDAE) – Predhodno znana iz Makedonije le na podlagi dveh starih podatkov s skrajnega jugovzhodnega dela države, je bila vrsta ponovno najdena 20-VII-2008 na potoku Luda Mara pri mestu Kavadarci (J Makedonija), 24-VII-2008 na potoku Konska Reka zahodno od mesta Gevgelija (JV Makedonija) in 26-IV-2010 na potoku Sermeninska Reka severozahodno od Gevgelije. Na vseh lokalitetah je bil potrjen razvoj vrste. Prikazana je njena trenutno znana razširjenost v Makedoniji in sosednjih državah ter dodana kratka zoogeografska razprava.

Ključne besede: *Epallage fatime*, kačji pastirji, razširjenost, Makedonija, Balkan

Introduction

Until recently, the dragonfly fauna of the Republic of Macedonia has been known only from very fragmentary sources. The most comprehensive older works include Karaman (1972, 1979) and Peters & Hackethal (1986). In the last few years, Bedjanič & Bogdanović (2006) refer to 56 species for Macedonia, while the Atlas of the Odonata of the Mediterranean and North Africa lists 59 species for the country (Boudot et al. 2009). Recent new contributions to the Macedonian dragonfly fauna made by Micevski et al. (2008) and Bedjanič et al. (2009) were included in the before-mentioned overview, while the work by Jović & Mihajlova (2009) brought another species addition, thus bringing the number of recorded dragonfly species for Macedonia to a current total of 60 species. However, the knowledge on individual species distribution has numerous gaps and is still far from being complete, not to mention biology, ecology or nature conservation aspects.

One of the most enigmatic dragonfly species, the sole representative of the family Euphaeidae in Europe, is *Epallage fatime*. For Macedonia, only two older records have been known. A single male of this damselfly was first recorded back in 1918 at the state border between Macedonia and Greece in the village of Nikolić north of Lake Dojran (Bilek 1966). More than half a century later, larvae of *E. fatime* were found a few kilometres northwards in a stream on the southern slopes of Mt. Belasica (Karaman 1979, 1981). Quotation by Bedjanič & Bogdanović (2006) on the record of the species in the hills north of Lake Dojran relates to the two aforementioned sources.

In the summers of 2008 and 2010, field surveys were carried out by the senior author in different habitats throughout Macedonia, aiming at improving knowledge of the dragonfly fauna of this particular part of the Balkan Peninsula. In addition, biology students of the University of Ljubljana organized a field research camp named »Ekosistemi Jadrana 2010 - Makedonija« in the spring 2010, focusing on different animal groups, including dragonflies. Here, some interesting new records gathered on the occurrence of *E. fatime* are presented.

New records of *Epallage fatime* in Macedonia

Between 10 and 27 July 2008, merged with family summer holidays, the senior author undertook an odonatological survey in Macedonia. In the morning of 20-VII-2008, we surveyed the Luda Mara stream south of Kavadarci. Car was left at a small artificial accumulation lake 5.5 km SE of Kavadarci; from there, we headed upstream (N41°23'22", E22°02'24", alt. 380 m). At the stream, numerous individuals of *Calopteryx virgo* and *C. splendens* prevailed in sunny weather around noon, while *Platycnemis pennipes*, *Onychogomphus forcipatus*, *Libellula depressa*, *L. fulva* and *Orthetrum brunneum* were found only in low numbers, and *Gomphus vulgatissimus* only in its larval stage. More than 500 m of the Luda Mara stream were investigated when turning over a larger stone and work with our water net surprisingly resulted in 2 larvae of *Epallage fatime*. In the same moment, children found a wing of an adult male of the species along the stream, probably a leftover of a bird's feast. Additional searching resulted in observation of 2♂ and 1♀ of *E. fatime* (Figs. 1 & 2). The species' habitat aspect at the Luda Mara stream is shown in Fig. 3.

Figures 1 & 2. *Epallage fatime* male and larva, photographed on 20-VII-2008 at the Luda Mara stream south of Kavadarci. Photo: M. Bedjanič.
Sliki 1 & 2. Samček in ličinka vrste *Epallage fatime*, fotografirana 20-VII-2008 na potoku Luda Mara južno od Kavadarcev. Foto: M. Bedjanič.

Figures 3 & 4. Localities with new records of *Epallage fatime* – Luda Mara stream south of Kavadarci (Fig. 3) and Konska Reka stream west of Gevgelija (Fig. 4). Photo: M. Bedjanič.
Sliki 3 & 4. Lokaliteti z novimi podatki o pojavljanju vrste *Epallage fatime* – potok Luda Mara južno od Kavadarcev (Sl. 3) in potok Konska Reka zahodno od Gevgelije (Sl. 4). Foto: M. Bedjanič.

On 24-VII-2008, while travelling from Lake Dojran towards the northern part of Macedonia, a stop was made at the Konska Reka stream 1 km W of Novo Konjsko village, approximately 6.5 km SSW of the town of Gevgelija (N41°09'20", E22°25'34", alt. 190 m; Fig. 4). In cloudy weather around noon, *C. splendens* was again the most abundant species, accompanied only by two juveniles of *P. pennipes* and 2♂ of *O. forcipatus*, while larvae of the latter and *G. vulgatissimus* were found in approximately 300 m stretch of the stream. Initially, no adults or larvae of *E. fatime* were found until our prolonged sampling by turning stones and sweeping produced 3 larvae from under partly decomposed small trunk at the edge of a larger pool.

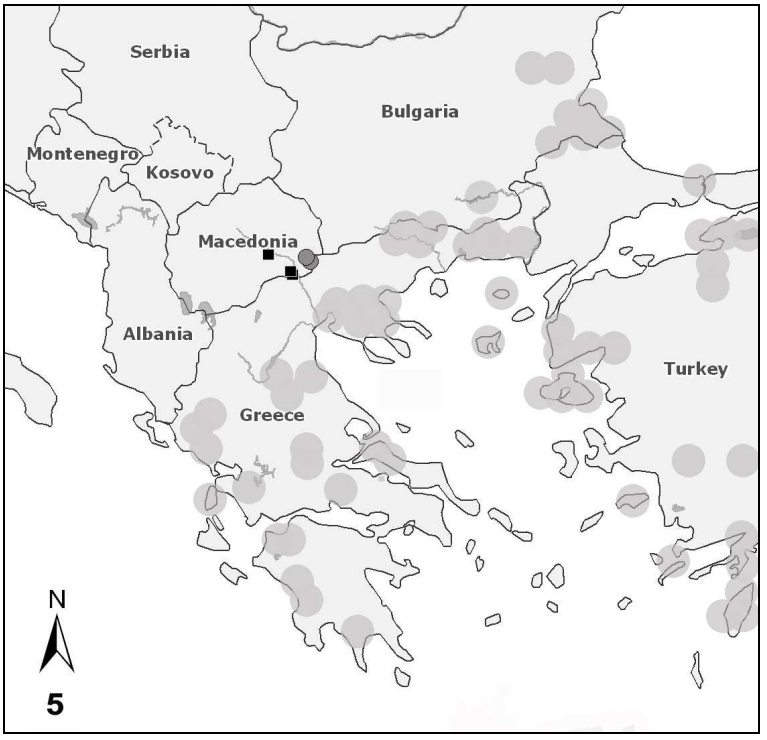

Figure 5. The distribution of *Epallage fatime* in Macedonia and in the Balkans, on Greece islands and in western Turkey (compiled after Boudot et al. 2009 and Lopau 2010 and marked with large light grey circles). Two older records from Macedonia (Bilek 1966, Karaman 1979, 1981) are marked with grey circles, while three new localities are delineated with black squares.

Slika 5. Razširjenost vrste *Epallage fatime* v Makedoniji in na Balkanu, na grških otokih ter v zahodni Turčiji (prirejeno po Boudot et al. 2009 in Lopau 2010 in označeno z velikimi svetlo sivimi krogci). Dva stara podatka za Makedonijo (Bilek 1966, Karaman 1979, 1981) sta označena s sivima krogcema, tri nove lokalitete pa s črnimi kvadratki.

On the same day, the nearby Sermeninska Reka stream, 2km SWW of Negorci village and approximately 5.5 km NW of Gevgelija, was also visited (N41°10'45", E22°27'24", alt. 150 m). The dragonfly community resembled that of Konska Reka, with *C. splendens*, *P. pennipes*, *O. forcipatus* and *G. vulgatissimus* present, but with no signs of *E. fatime*. However, almost two years later, on 26-IV-2010, the butterfly group of the »Ekosistemi Jadrana 2010 - Makedonija« field research camp managed to confirm the development of the species in Sermeninska Reka. They surprisingly secured a single freshly emerged male of *E. fatime* at Sermeninska Reka near Mrzenci village, just 3 km SE of the locality visited in 2008 (N41°09'48", E22°29'11", alt. 80 m; N. Kogovšek leg., D. Vinko det.). Without detailed faunistic data, the above record of *E. fatime* is referred to in the report by odonatological group from the above-mentioned field research camp (Vinko 2012).

Discussion

The distribution of *Epallage fatime,* the only Mediterranean representative of the Oriental damselfly family Euphaeidae consisting of about 60 species in Southeast Asia, extends from Kashmir in the East to Greece and Macedonia in the West (Boudot et al. 2009, Dijkstra & Lewington 2006).

In the Mediterranean, *E. fatime* it is not uncommon in western Turkey, Cyprus and Greece (Fig. 5). According to Lopau (2010), the relative scarcity of records from continental Greece and Peloponnese could be due to lower intensity of fieldwork in late spring and early summer when flight season of the adults takes place. The species has also been found on some of the Aegean islands like Evia, Kos, Lesvos, Lemnos, Rhodes, Samos and Samothrace and on Lefkada Island in the Ionian Sea (Lopau 2010). In Bulgaria, *E. fatime* is rare and distributed only in the southeastern part of the country, along the Black Sea coast, with individual records known from the Eastern Rhodopes and the Eastern Balkan Mts. (Marinov 2000, Beschovski & Marinov 2007; Fig. 5).

As mentioned in the introduction, *E. fatime* was first recorded in Macedonia literally at the state border with Greece in the village of Nikolić north of Lake Dojran. Bilek (1966) reported on a single male specimen in the State Collection of Zoology in Munich, collected there on 17-VII-1918. This old record could not be confirmed in the field by Karaman (1972), but some years later the same author, without describing the exact locality or other details on the habitat, reports on larvae of *E. fatime* found some kilometres northwards in a stream on the southern slopes of Mt. Belasica (Karaman 1979, 1981).

Our three new records contribute to the knowledge on the species distribution in Macedonia (Fig. 5). The records from Konska Reka and Sermeninska Reka streams near Gevgelija come from the area approximately 25km southwest of Mt. Belasica, while the record from Luda Mara stream south of Kavadarci extends the known range of the species in Macedonia some 50 km northwest. It is interesting to note that recently *E. fatime* was also mentioned in an unpublished report of the Environmental impact assessment study for the highway section Demir Kapija – Smokvica (Melovski *et al.* 2008). Even more, together with

Orthetrum brunneum, *Sympetrum sanguineum* and *Calopteryx splendens*, it is stated to be among the commonest dragonfly species and distributed in the entire investigated area. Unfortunately, no details for such judgement were provided. Due to the fact that obviously no odonatologists were involved in the fieldwork and report elaboration, the records and assessments by Melovski et al. (2008) are doubtful. On the other hand, it should be added that *E. fatime* has not been found during few relatively extensive odonatological studies carried out by Peters & Hackethal (1986) and recently by Jović (2009) and Kitanova et al. (2008). On top of it all, it is not included in the rich odonatological collection of the Macedonian Museum of Natural History in Skopje (Jović & Mihajlova 2009).

Further fieldwork oriented both in search of larvae and especially adults in the period from the end of April to mid July will surely bring additional *E. fatime* records for the country. From the hereto gathered knowledge on species distribution it is clear that it favours areas with very warm climate. In Macedonia, the influence of the Aegean Sea stretches from Gevgelija in the southeast along the Vardar River valley northwards to Demir Kapija and to a lesser extent also further northwest towards Veles. Effects of this climate also reach the Strumica River valley as well as the proximity of Lake Dojran. Speculating from the climatic point of view and based on presumed existence of suitable habitats as read from the maps, *E. fatime* could eventually occur at some of the streams originating on the southern slopes of Plavuš, Gradeška Planina and Konečka Planina Mts., perhaps even reaching the vicinity of the towns of Štip or Veles. On the southern edge of the Vardar valley, streams on the eastern slopes of Klepa and Visoka Glava Mts. as well as streams originating from Vitačevo, Bošava and Kožuf Mts. and flowing towards the Vardar valley should be checked for the presence of this species.

However, the above speculations may be too optimistic for several reasons. One is the scarcity of hitherto known records and the fact that southeastern and southern Macedonia delineates the extreme northwestern edge of *E. fatime* distribution. Furthermore, the whole Vardar valley with surrounding slopes is under considerable agricultural pressure, which is responsible for the increasing water extraction from streams as well as for stream pollution. For now, the European IUCN Red list of dragonflies classifies *E. fatime* only as a near threatened (NT) species, but with annotation that its population trend is decreasing (Kalkman *et al.* 2010). The regional threat status of the species in Macedonia might better be classified as falling between the official IUCN categories of vulnerable (VU) and endangered (EN). However, more fieldwork and faunistic data are needed for such evaluation.

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Morphological evidence for the presence of the Danube Crested Newt, *Triturus dobrogicus* (Kiritzescu, 1903), in Slovenia

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Abstract. We offer preliminary reports on the presence of the Danube Crested Newt, *Triturus dobrogicus*, in Slovenia. This species reaches its western border of distribution in Hungary, Austria and Croatia, but untill recently it was not known from Slovenia. Here we report on the first record of this species in Slovenia, found in Dolinsko polje of the Prekmurje region during the herpetological surveys carried out in the spring of 2009 and 2010. The species identity was determined by coloration, body shape and the Wolterstorff Index values. Only with additional genetic analysis could we answer if this is a pure population or whether hybridisation with *T. carnifex* is present.

Key words: *Triturus dobrogicus*, Dolinsko polje, Slovenia, Wolterstorff Index

Izvleček. PRVA NAJDBA PANONSKEGA PUPKA, *TRITURUS DOBROGICUS* (KIRITZESCU, 1903), V SLOVENIJI – V bližini Slovenije je panonski pupek poznan iz Avstrije, Hrvaške in Madžarske. Spomladi 2009 in 2010 smo na Dolinskem polju v Prekmurju na podlagi vzorca obarvanja, oblike telesa in Wolterstorffovega indeksa prvič določili in zabeležili to vrsto v Sloveniji. V prispevku so predstavljeni preliminarni rezultati, medtem ko bodo za ugotovitev, ali je populacija iz Dolinskega polja čista ali pa se križa z velikim pupkom, potrebne nadaljnje genetske analize.

Ključne besede: *Triturus dobrogicus*, Dolinsko polje, Slovenija, Wolterstorffov indeks

The Crested Newt (*Triturus cristatus*) superspecies consists of closely related parapatric taxa, which are characterized by narrow hybrid zones and share a complex evolutionary history (Arntzen et al. 2007, Espregueira Themudo et al. 2009). The large-bodied Crested Newts differ both in genetic and morphological features (Wallis & Arntzen 1989). The most reliable features for morphological distinction of the taxa are the number of rib bearing vertebrae (RBV) and the Wolterstorff index (WI): length of forelimb × 100 / inter-limb length (Arntzen & Wallis 1999). Ivanović et al. (2007) showed that the size and the shape of the head are not reliable characters for this group, especially as the skull of *T. dobrogicus* undergoes significant post-metamorphic changes.

In Slovenia, the only Crested Newt species recorded so far is *T. carnifex* (Poboljšaj 2003, Veenvliet & Kus Veenvliet 2008). *T. dobrogicus* is spread throughout the Pannonian Basin and, after a gap in the Iron Gates area, along the Danube floodplain and its tributaries, where it is found in oxbows, along river margins and other permanent water bodies, and can coexist with fish. It was recorded in close vicinity of the Slovenian border, both on the Austrian and Hungarian sides (Mayer 2001, Puky et al. 2005); in Croatia, the nearest records were made near the confluence of the Mura and Drava Rivers and south-east of Zagreb (Kalezić et al. 1990, Tvrtković 2006). However, there are examples in the literature where the presence of *T. dobrogicus* × *T. carnifex* hybrids has either been speculated or it could be concluded so from the data. First, »The IUCN Red List of Threatened Species« (Artzen et al. 2008) states that individual hybrids of *T carnifex* × T. *dobrogicus* occur in north-eastern Slovenia (Mura River). Secondly, Kalezić et al. (1990), Crnobrnja-Isailović et al. (1997) and Kalezić et al. (1997) found a Crested Newt population in vicinity of Radenci (Turjanci) in north-eastern Slovenia that showed both RBV number (Crnobrnja-Isailović et al. 1997) and WI values (Kalezić et al. 1990) that could be characteristic of either *T. dobrogicus* × *T. carnifex* hybrids or *T. cristatus* (Arntzen & Wallis 1999). However, it seems most improbable that the latter species would have been encountered in this area (Espregueira Themudo et al. 2009). Specifically for this population, the WI values for females span from just above the diagnostic threshold for *T. dobrogicus*, across the range characteristic for *T. cristatus* and into the lower half of the variation for *T. carnifex*, while WI values for males were well above the diagnostic threshold for *T. dobrogicus* and mostly in the range characteristic of *T. cristatus* and *T. carnifex* (the WI range for *T. dobrogicus* is < 54.0 for males and < 46.2 for females and for *T. carnifex* 63.7 – 67.09 for males and 53.9 – 59.19 for females - Arntzen & Wallis, 1999). Also, Kalezić et al. (1997) studied both qualitative traits and morphometric characteristics of Crested Newts in the western Balkans and identified Radenci (Turjanci) populations as *T. carnifex*; they did not find significant differences in regard to other studied *T. carnifex* populations. Although morphological characters, especially when backcrosses are involved, are not necessarily intermediate in *Triturus* hybrids (Kalezić et al. 1997, Arntzen & Wallis 1999), this appears to be the case at least with the RBV count in *T. carnifex* × *T. dobrogicus* hybrid populations in the adjacent areas (Vedropolje, Croatia and Donja Čadjavići, Bosna and Herzegovina; Arntzen & Wallis 1999). Furthermore, there are known hybrid and pure *T. dobrogicus* populations in Austria near to Radenci (Mayer 2001). Therefore, the deviation of RBV count and the WI in Radenci population is either a result of hybridisation or can be attributed to intraspecific biological variation. Similar conclusions can be made for Žumberak and Slavonski Brod populations from Croatia (Kalezić et al. 1990, Crnobrnja-Isailović et al. 1997, Kalezić et al. 1997).

During the herpetology surveys of the Prekmurje region, Slovenia, in the spring of 2009 and 2010, *T. dobrogicus*-like specimens (Fig. 1) were recorded for the first time. The research area was limited to the eastern part of the Dolinsko polje, consisting of a floodplain forest, Murska Šuma, and adjacent swampy meadows. In this area, there are a few large and a number of smaller and shallower oxbows (Fig. 2). The area is typical sparsely inhabited Pannonian lowland. Newts were captured with dip nets and floating water traps and with torches at night. All specimens were released to the original sites of capture after measurements were taken. Material was identified based on chromatic and morphological characters indicated, mainly upon WI; inter-limb distance was measured excluding the extremities as recommended by Arntzen & Wallis (1994). The newts were anesthetized with MS 222 diluted to 0.3 % (Sigma-Aldrich, Vienna), photographed and measured on the site with 0.1 mm precision vernier calliper.

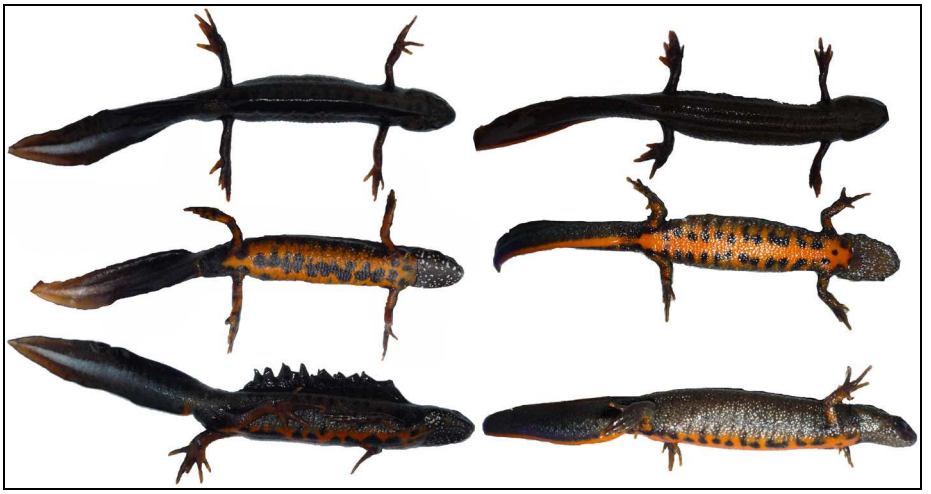

Figure 1. Male (left) and female (right) specimens of the Danube Crested Newt, *T. dobrogicus,* from a small oxbow east of the Muriša oxbow (Photo: Teo Delić).
Slika 1. Samec (levo) in samica (desno) panonskega pupka, *T. dobrogicus,* iz manjše mrtvice vzhodno od Muriše (Foto: Teo Delić).

Figure 2. A typical habitat of the Danube Crested Newt, *T. dobrogicus* (Photo: David Stanković).
Slika 2. Habitat, značilen za panonskega pupka *T. dobrogicus* (Foto: David Stanković).

The body shape and the chromatic features taken into account were more characteristic of *T. dobrogicus* than *T. carnifex*. All specimens were lean built with short legs and had white-stippled sides, black to dark brown gular coloration with angular white spots and deep orange ventral surface with many small to medium sized sharply delineated black roundish black spots, which showed a tendency to unite longitudinally. By way of comparison, *T. carnifex* is a larger medium built newt with large legs and usually has yellow ventral colouration with few large roundish blurred and ill-defined blotches and spots (Arntzen & Wallis, 1999, Jehle et al. 2011). Measurements of WI and localities are presented in Tab. 1. In total, fifteen adult newt specimens from five sampling localities were collected. For thirteen specimens, the WI is within the known range of variation for *T. dobrogicus*, while two specimens had WI values just above and were identified as possible *T. carnifex* × *T. dobrogicus* hybrids; none of the individuals was classified as *T. carnifex*. All newts were either captured in floodplain woodland or oxbows, were they coexist with fish. *T. carnifex* populations in Slovenia rarely coexist with fish and are therefore almost never found in oxbows. *T. carnifex* populations from other parts of Prekmurje and the rest of Slovenia were studied quite intensely in the recent years in accordance with Natura 2000 implementation, and there are no reports on populations that were morphologically as distinct as this population from Dolinsko polje (Poboljšaj & Lešnik 2003, Cipot & Lešnik 2007, Lešnik & Cipot 2007).

Table 1. List of known localities inhabited by the Danube Crested Newt, *Triturus dobrogicus* (Tdob), and hybrids, *Triturus dobrogicus* × *Triturus carnifex* (Tdob x Tcor) from NE Slovenia with geographic coordinates, applied survey method and biometric data. WI diagnostic range for *T. dobrogicus* was taken from Arntzen & Wallis (1999).
Tabela 1. Seznam najdišč panonskega pupka, *Triturus dobrogicus* (Tdob), in križancev panonskega in velikega pupka, *Triturus dobrogicus* × *Triturus carnifex* (Tdob x Tcar) iz SV Slovenije z geografskimi koordinatami, metodo lova in biometričnimi podatki. Značilen razpon WI za *T. dobrogicus* je povzet po Arntzen & Wallis (1999).

Habitat type	**Lat**	**Lon**	**Survey method**	**Sex**	**Length of forelimb** [mm]	**Inter-limb length** [mm]	**Wolter-storff index** [%]	**Determi-nation based on WI**
oxbow	46°28'56''	16°32'27	water trap	juvenile	11	24	45,83	Tdob
oxbow	46°29'14''	16°32'6''	water trap	male	16,5	31,9	51,72	Tdob
oxbow	46°29'14''	16°32'6''	water trap	male	14,9	28,5	50,17	Tdob
oxbow	46°29'40''	16°32'6''	water trap	female	15,4	38,5	40	Tdob
forest	46°30'1''	16°30'49''	torching	male	16,1	32,4	49,69	Tdob
forest	46°30'0''	16°30'41''	torching	male	15,3	29,7	51,52	Tdob
forest	46°30'0''	16°30'41''	torching	female	19,3	45,1	42,8	Tdob
oxbow	46°28'37''	16°34'23''	water trap	male	17,3	32	54,06	Tdob x Tcar
oxbow	46°28'37''	16°34'23''	water trap	male	17,3	35,1	49	Tdob
oxbow	46°28'37''	16°34'23''	water trap	male	23,1	45,4	50,88	Tdob
oxbow	46°28'39	16°34'52''	water trap	female	18,8	44,7	42,06	Tdob
oxbow	46°28'39	16°34'52''	water trap	female	20	49,1	40,73	Tdob
oxbow	46°28'39	16°34'52''	water trap	female	19,3	41,6	46,39	Tdob x Tcar
oxbow	46°28'39	16°34'52''	water trap	female	15,5	40,4	38,37	Tdob
oxbow	46°28'39	16°34'52''	water trap	female	20	48,5	41,24	Tdob

Based on chromatic and morphological characters, geographical characteristics and habitat type, we can conclude that the range of *T. dobrogicus* also extends into Slovenia, at least into Dolinsko polje. Further morphological (RBV) and genetic analyses on mitochondrial and independent nuclear loci are required to undisputedly determine if this population is a pure *T. dobrogicus* population or whether hybridisation with *T. carnifex* is present.

The Danube Crested Newt is a strictly protected species under the Bern Convention and furthermore listed as globally Near Threatened by the IUCN (2008) with an additional comment of being close to qualifying for Vulnerable. In Slovenia, *T. dobrogicus* is protected by the Decree on Protected Wild Animal Species Annex II Chapter B. This chapter lists animals that are not considered to be indigenous to Slovenia and their habitats are protected by law only, if they appear or expand to Slovenia without human interference. This is clearly the case with *T. dobrogicus*. The absence of records for *T. dobrogicus* in Slovenia does not indicate recent colonization or introduction by humans, but is more likely to be a consequence of a high degree of similarity with *T. carnifex* and inappropriate survey methods for this species (dip nets). *T. dobrogicus* is also protected by the EU Habitats Directive, where it is listed on Annex II and therefore requires designation of Special Areas of Conservation. This means that it is protected by the Directive only in designated Nature 2000 areas, while *T. carnifex* is also protected by Annex IV, which additionally provides protection outside those areas. Protection of their hybrids presents an interesting question and cannot be addressed similarly to the protection of *Bombina bombina* × *B. variegata* hybrids, where both parent species are listed only on Annex IV.

The importance of the first record of *T. dobrogicus* in Slovenia is even greater as this species inhabits habitats that are different from those of *T. carnifex*, which leads to different requirements for its successful conservation, protection and management. Apart from genetic analysis, we have to proceed with further investigation of the distribution of this amphibian and also re-evaluation of previous studies to determine whether its presence has been overlooked elsewhere in the Slovenian lowlands. If genetic analysis reveals that Dolinsko polje population is a hybrid population, it should still be protected by more strict measures of conservation and considered as Annex II species.

Povzetek

Spomladi leta 2009 in 2010 smo v Sloveniji prvič potrdili pojavljanje panonskega pupka (*Triturus doborogicus*). Panonski pupek je razširjen po Panonski nižini in poplavnem pasu Donave od Djerdjapa dolvodno, kjer naseljuje mrtvice, rečne rokave, struge počasi tekočih voda ter druga večja in trajnejša vodna telesa. V vodi se zadržuje dlje kot veliki pupek (*Triturus carnifex*) in pogosteje sobiva z ribami. Od velikega pupka, ki je v Sloveniji sicer splošno razširjen, ga ločimo po relativno krajši dolžini nog, vitkejšemu telesu, manjši velikosti, večjem številu reber in vzorcu obarvanosti. Prve osebke te dvoživke smo našli v Murski Šumi in njeni bližini. Določili smo jih po vzorcu obarvanosti in obliki telesa - predvsem na podlagi Wolterstorffovega indeksa, to je razmerja med dolžino nog in dolžino trupa. Ker se veliki in donavski pupek lahko križata, zgolj na podlagi morfoloških podatkov ne moremo z gotovostjo trditi, da gre za populacijo čistih donavskih pupkov in da ne prihaja vsaj do občasnega križanja. Panonski pupek je zaščiten po Bernski konvenciji, na rdečem seznamu IUCN pa je označen kot potencialno ogrožena vrsta. V EU je zaščiten s Habitatno direktivo, kjer je uvrščen v Prilogo II, in nacionalno z Uredbo o zavarovanih prostoživečih vrstah. V tej Uredbi je uvrščen v Prilogo 2 Poglavja B, to je seznam v Sloveniji alohtonih vrst, katerih habitati pa postanejo zaščiteni, če se ta vrsta k nam razširi brez človeške pomoči. Če se izkaže, da v populaciji prihaja do križanja z velikim pupkom, jo vendarle velja zaščiti v skladu s Prilogo II Habitatne direktive.

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First record of a cave maternity roost of *Rhinolophus hipposideros* (Bechstein, 1800) in Slovenia

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Abstract. The first cave maternity roost of *Rhinolophus hipposideros* in Slovenia was discovered in the summer of 2011 in the »Pod kevdrom« cave. The cave is located in the Idrijca River canyon, SSW of the town of Idrija (Western Slovenia). Here, we present information on preliminary observations as to the number of adult and juvenile animals, along with temperature statistics and cave morphology.

Key words: *Rhinolophus hipposideros*, cave, maternity roost, Slovenia

Izvleček. PRVO JAMSKO KOTIŠČE MALIH PODKOVNJAKOV (*RHINOLOPHUS HIPPOSIDEROS* (BECHSTEIN, 1800)) V SLOVENIJI – V jami Pod kevdrom v kanjonu reke Idrijce JJZ od Idrije (zahodna Slovenija) smo poleti 2011 odkrili prvo jamsko kotišče malih podkovnjakov (*Rhinolophus hipposideros*). V prispevku predstavljamo predhodna opažanja o številu odraslih in mladičev, o temperaturi in oblikovanosti jame.

Ključne besede: mali podkovnjak *Rhinolophus hipposideros*, jama, kotišče, Slovenija

Rhinolophus hipposideros is a common bat species found in most of Slovenia. With a single exception, all known maternity roosts of *R. hipposideros* are situated in the attics of buildings (Presetnik et al. 2009). This is in contrast to the two other rhinolophid species present in Slovenia (*R. ferrumequinum* and *R. euryale*) that are known to establish their maternity roosts regularly in caves. An exceptional type of *R. hipposideros* maternity roost, used by a small group (2-6 adult animals) was found under a bridge in Črni Kal. By morphology, this artificial underground roost resembled entrance parts of natural caves and therefore indicated the possibility that in the warmest parts of Slovenia this species could also form their maternity colonies in the warmer entrance parts of caves (Presetnik 2005, Petrinjak 2009).

This hypothesis was confirmed by the finding of a cave maternity roost of *R. hipposideros* in the Pod kevdrom cave (cave cadastre number 1169) located in the narrow canyon of the Idrijca River approximately 4 km SSW of the town of Idrija (lat. 45.96, long. 14.01, 390 m above sea level). During a herpetological inventarisation conducted by the second author on June 29th 2011, this small cave was examined and a tight cluster of more than 50 adult (including subadults) *R. hipposideros* was seen just 4.5 metres inside the cave. Subsequent visits made on July 1st and July 14th proved that the colony used the cave as a permanent maternity roost site. On July 1st, 65 grown up animals with a minimum of 12 small juveniles were counted. And on July 14th, a minimum of 29 females had a pup attached to them, with

one additional juvenile already able to fly and another 26 grown up animals roosting in the cave. Since young *R. hipposideros* generally take their first flight in the third week of their lives (Dietz et al. 2009), we could assume that the first births took place in the beginning of the last week of June, and were probably not seen on the first visit, due to bats hanging in tight cluster and very short observation time. The temperature at the roosting location of the bats (Fig. 1) was 15.3°C on the afternoon (at c. 19:00) of July 1st, and 22.5°C on the afternoon (again at c. 19:00) of July 14th (Fig. 1). Interestingly, Savnik & Gantar (1959) report a similar temperature (17.4°C) for this cave on July 20th 1955, but do not mention bats. During all our three visits, bats were hanging in a tight cluster, 4.5 m from the cave entrance and 3 m above the floor (Fig. 1), just slightly sheltered from full daylight. Clustering behaviour was not surprising, since at temperatures lower than 22°C *R. hipposideros* females in maternity roosts form a tight group as a method of temperature regulation called social thermoregulation (Roer & Schoeber 2001). However, since this clustering behaviour can be only observed during cold weather and consequently at low roost temperatures in attic roosts of central Europe or caves of the Mediterranean, the temperatures of the cave and the permanent clustering behaviour could be an indication for suboptimal temperature conditions of the roost.

The cave is situated 30 m above the bottom of the canyon on a steep, northeast facing and forest covered riverbank. It is just 7 m long, with an entrance measuring 2.3×2.7 m (Fig. 1) and an estimated volume of 50 m^3. The floor and ceiling rise upwards slightly towards the back of the cave. In the ceiling is a small dome 1.5 m from the entrance, and the cave ends with an approximately 5 m high chimney (Fig. 1). With this kind of morphology, the cave could be a textbook example of a cave that accumulates warm air during the day and preserves it during the night (Gams 2004), the so-called »oven-cave«. However, lower temperature in the chimney in comparison with other temperatures (Fig. 1) advocate caution and additional research before the hypothesis in the previous sentence could be confirmed. Nevertheless, temperatures regime in the cave made it obviously suitable as a maternity roost for the bats. Additional favourable factors for heat accumulation are that the cave entrance faces south, and that the cave lies at the end of an approximately 10 m long and equally high bare rock wall that also accumulates heat during the day.

Cave maternity roosts of *R. hipposideros* are known in warmer regions of Europe, in the Balkan peninsula, for example in Bulgaria (Dietz et al. 2009) and Serbia (personal observation). Although *R. hipposideros* forms, in the »Pod kevdrom« cave the northern cave maternity roost in the Balkan Peninsula, it is not the northernmost roost of this type of the species. According to the available literature and personal information from chiropterologists, no such cave roost exists in Austria (Spitzenberger & Bauer (2001), Slovakia (Uhrin 1996, in litt.), Bavaria (Zahn 2012, in litt.). However, several cave maternity roosts of *R. hipposideros* are known from warmer karst parts of Thuringia (IFT 2002, Biedermann et al. 2006, Dietz et al. 2009).

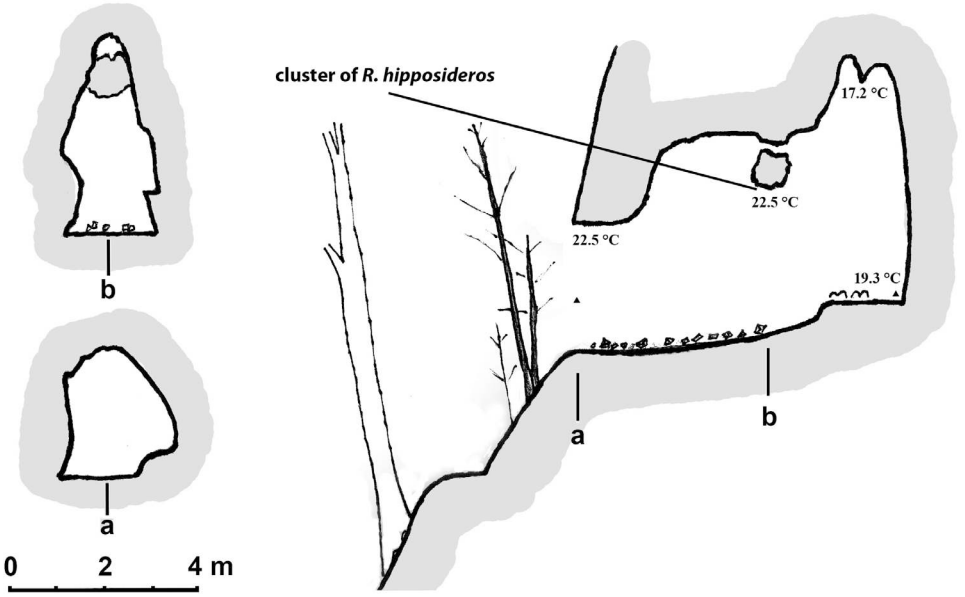

Figure 1. Map of the Pod kevdrom cave – the first recorded finding of a cave maternity roost of *Rhinolophus hipposideros* in Slovenia, and temperature recordings taken on 14.7.2011 (map made by Primož Presetnik).
Slika 1. Načrt jame Pod kevdrom, prvega znanega jamskega kotišča malega podkovnjaka (*Rhinolophus hipposideros*) v Sloveniji, in temperature, zmerjene 14.7.2011 (načrt: Primož Presetnik).

Povzetek

Dne 29.6.2011 je bila v komaj 7 m dolgi jami Pod Kevdrom (številka jamskega katastra 1169, Sl. 1) v dolini reke Idrijce, JJV od Idrije, opažena in 1.7. ter 14.7. potrjena prva jamska porodniška skupina malih podkovnjakov v Sloveniji. Jama zaradi tipične oblike spada med jame, ki lahko podnevi akumulirajo toploto in jo zadržujejo prek noči ter s tem omogočajo ustrezne razmere za kotišče netopirjev. 1.7. je bila tik pod visiščem gruče izmerjena temperatura 15,3 °C, 14.7. pa 22,5 °C, zato so verjetno živali ob vseh obiskih visele v tesni gruči, kar je značilno za socialno termoregulacijo, ki jo uporablja ta vrsta pri nižjih temperaturah na kotiščih. 1.7. je bilo opaženih 62 odraslih živali in 12 mladičev, 14.7. pa je mladiče na sebi imelo 29 samic, dodatno je en mladič že lahko letel, v jami pa se je zadrževalo tudi ostalih 26 odraslih živali. Prvi skoti so bili leta 2011 verjetno na začetku zadnjega tedna junija. S tem opazovanjem so potrjena predhodna predvidevanja, da imajo lahko mali podkovnjaki v Sloveniji tudi jamska kotišča.

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Record of the China mussel *Sinanodonta woodiana* (Lea, 1834) (Bivalvia: Unionidae) in Slovenia

NAJDBA KITAJSKE BREZZOBKE *SINANODONTA WOODIANA* (LEA, 1834) (BIVALVIA: UNIONIDAE) V SLOVENIJI

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China mussel (*Sinanodonta woodiana*) is a species native to the East Asia (from the river Amur to Cambodia). Introduction of this invasive species in Europe most likely occurred with import of exotic fishes (Fechter & Falkner 1990). According to Watters (1997), this species has been recorded in Europe, i.e. Romania, Hungary and France, where it was found in fish farms. In the last decade, it has also been found in Austria (Edlinger & Daubal 2000, Reischütz & Reischütz 2000, Taurer 2003), Serbia (Paunović et al. 2006), Romania (Popa et al. 2007), Poland (Kraszewski & Zdanowski 2007), Czech Republic (Beran 2008), Italy (Cianfanelli et al. 2007, Cappelletti et al. 2009) and Croatia (Lajtner & Crnčan 2011). Due to its presence in the neighbouring countries, its occurrence in Slovenia has been expected. The species presence in Slovenia has erroneously been given in Cianfanelli et al. (2007), with Slovakia mistaken for Slovenia, as can be deduced from the cited references. The error has been repeated in Cappelletti et al. (2009).

China mussel is found in flowing and standing waters. As it lives parasitically on fish gills during its larval stage (glochidium), the species can successfully and quickly expand not only downstream but upstream as well. Grass carp (*Ctenopharyngodon idella)*, silver carp (*Hypophthalmichthys molitrix)* and bighead carp (*H. nobilis)* are most common vectors for the China mussel. Stocking of this species is the main reason for the China mussel's rapid and large distance spreading.

Six large (max 8.5 cm) live specimens of China mussel were found on 11.5.2011 in drained fish pond Prilozje near Metlika (Bela krajina, SE Slovenia; Fig. 1). According to the information from the pond's concessionaire (Metlika Fishing Club), stocking of grass carp occurred more than 10 years ago. In the last 10 years, only carp (*Cyprinus carpio*) and common bream (*Abramis brama*) were in stocking program at the pond. We can assume that China mussel has been present in the pond for more that 10 years. This find is presently the only known record of China mussel in Slovenia, but as grass carps originated from a pond in NE Slovenia, we can assume that the species is much more common than actually recorded.

In Slovenia, grass, silver and bighead carps do not breed naturally, mostly owing to insufficiently high summer water temperatures. Juveniles have been imported by breeders from abroad, mostly from Hungary. Grown fish were later sold to fishing clubs. As non-breeding species, they have been stocked recklessly in gravel pits, lakes and fish ponds in the last two decades, unaware of the potential spreading of another invasive species.

At least one of three carp species is found in the entire lowland area of Slovenia (Fig. 2), representing the potential distribution of China mussel in Slovenia. Last tests confirmed that China mussel is a broad host generalist and can complete its development not only on carp species but also chub (*Leuciscus cephalus)* and barble (*Barbus barbus*) (Douda et al. 2012). For this very reason, urgent identification of ponds with China mussel is required, especially ponds from where fish are distributed to other areas.

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Figure 1. The found specimen of *Sinanodonta woodiana* (photo: Dušan Klenovšek)
Slika 1. Najdeni primerek vrste *Sinanodonta woodiana* (foto: Dušan Klenovšek)

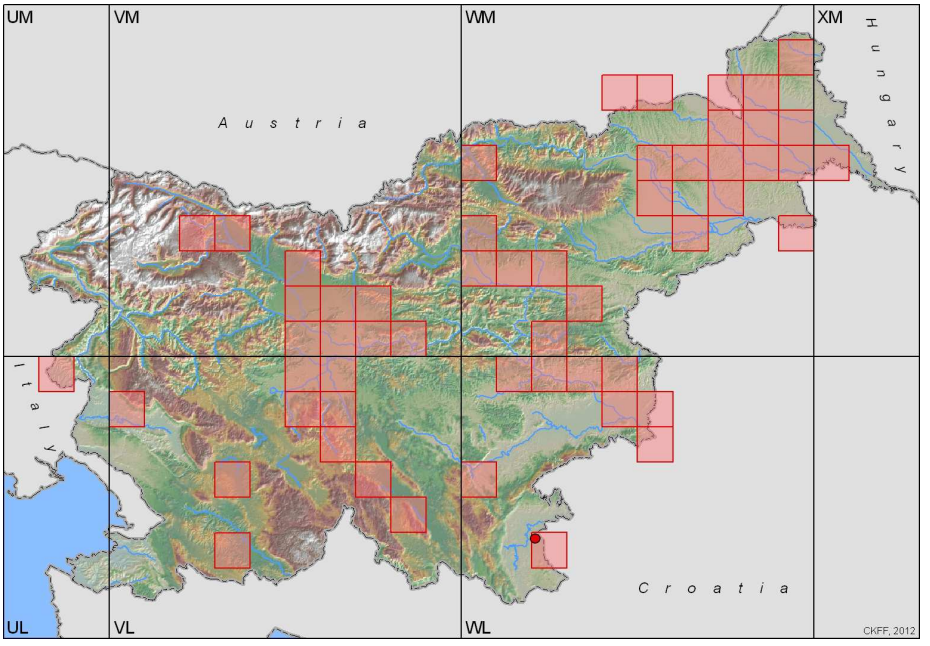

Figure 2. Location of the mussel (red dot) and distribution of grass carp (*Ctenopharyngodon idella*), silver carp (*Hypophthalmichthys molitrix*) and bighead carp (*H. nobilis*) in Slovenia at the UTM10 squares level (Smolar et al. 2004 supplemented upon CKFF, 2012).
Slika 2. Lokacija najdbe školjke (rdeča pika) in razširjenost amurja (*Ctenopharyngodon idella*) ter srebrnega (*Hypophthalmichthys molitrix*) in sivega tolstolobika (*H. nobilis*) v Sloveniji na nivoju mreže UTM10 (Smolar et al. 2004 dopolnjeno po CKFF, 2012).

On the occurrence of the Italian agile frog (*Rana latastei* Boulenger, 1879) in the Slovenian part of Istria

PODATKI O POJAVLJANJU LAŠKE ŽABE (*RANA LATASTEI* BOULENGER, 1879) V SLOVENSKEM DELU ISTRE

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The Italian agile frog (*Rana latastei* Boulenger, 1879) has its distribution range centred in the lowlands of the Padano Venetian plain, a highly degraded region of northern Italy, where the majority of appropriate habitats have been altered a great deal. Its distribution range extends into southern Switzerland (Canton Ticino) in the north, while to the east it reaches western Slovenia along the Vipava River. It has also been reported from the Croatian part of northern Istria (Mirna River valley with its tributaries). Burlin & Dolce (1986) suggest that the presence of the Italian agile frog in the Mirna River Valley is disjunctive from the rest of the range, as a result of sea level increase after the Würm glaciation. A new insight into the history of the species was offered by Garner et al. (2004), who proposed, based on microsatellite analysis results, that the recent distribution of the species is a result of its postglacial expansion from the Balkan refugium.

The Italian agile frog is one of the European amphibian species of major conservation concern. Due to the high fragmentation of its habitat and continuing decline in the extent and quality of its habitat, the species is listed as Vulnerable (VU) in the IUCN red data list (Sindaco et al. 2009). It is also included in all national red data lists throughout its distribution range (Bulgarini et al. 1998, Anonymous 2002, Schmidt & Zumbach 2005, Janev Hutinec et al. 2006). The species is included in all major European conservation agreements. *Rana latastei* is listed as a strictly protected species in Appendix II of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and in Annexes II and IV of the Directive on the Conservation of Natural Habitats of Wild Fauna and Flora. The Habitat Directive provides a legal basis for the establishment of Special Areas of Conservation sites (SCI) within the Natura 2000 network of protected areas. In Slovenia, two SCI sites were established for the protection of the Italian agile frog, Dolina Branice (SI3000225) and Dolina Vipave (SI3000226) (Poboljšaj & Lešnik 2005).

Until the late 1990s, the Italian agile frog had been known in our country only from the Panovec forest near Nova Gorica (coll. Schreiber 1900 in Naturhistorisches Museum Wien cit. after Sket 1992, Poboljšaj & Lešnik 2005). Activities related to the implementation of Natura 2000 network in Slovenia enabled us to get a deeper insight into the occurrence of the species in Slovenia. Due to intensive field research in recent years, the species was found on many localities in the Vipava and Branica Valleys and subsequently also in the Goriška Brda region, as well as in the valley of the Idrija River (Poboljšaj & Lešnik 2005, Brstilo 2007). The occurrence of the Italian agile frog in the Slovenian part of Istria is primarily associated with its presence on the Croatian side. According to Janev Hutinec et al. (2006) and Kuljerić (2011), the species occurs in the Mirna Valley, penetrating along its tributaries all the way to the border with Slovenia. Kletečki (2003) even reports on its presence in the Dragonja River Valley, but without specifying any exact locality. However, despite regular field surveys of the area, the species has never been confirmed to occur in the Slovenian part of Istria (Cipot 2005, Poboljšaj & Lešnik 2005, Poboljšaj 2007).

Here I report on the finding of a single adult Italian Agile Frog recorded on the 29th of October 2011 on the woodland slopes of Suje along the left bank of the river Dragonja, about 4.5 km east from the village of Dragonja (UTM square UL93; Fig. 1). The specimen was determined on the basis of its characteristic colouration: (1) the typical white line above the lip that ends under the eye, and (2) the characteristic dark coloured throat interrupted by a white line in the centre (Veenvliet & Kus Veenvliet 2003). The animal was photo documented for additional verification of species identification (Figs. 2 and 3). The location of the finding is covered by a wood association of hop hornbeam and pubescent oak (*Ostryo–Quercetum pubescentis*) and belongs to a forest reserve »Krkavška komunela«, which is managed by the

Slovenian Forest Service. Similar conditions, which may create a suitable environment for the species, continue to the east reaching the highest point on the hill Novi Brič (312 m a.s.l.), covered mainly by vineyards, while the slopes to the west continue within the Croatian national territory.

The new finding suggests that the occurrence of the species may be wider in this part of its distribution range. Other similar habitats in this area should be surveyed in order to reveal the status of the species in the region. The major part of the Dragonja River Valley is located within the SCI area Slovenska Istra (SI3000212). The Italian agile frog is not a qualifying species for the site. In the future, it would be necessary to determine the extent of its occurrence and the population size. Based on these findings, it would be possible to assess the importance of this area for the species' conservation status in Slovenia.

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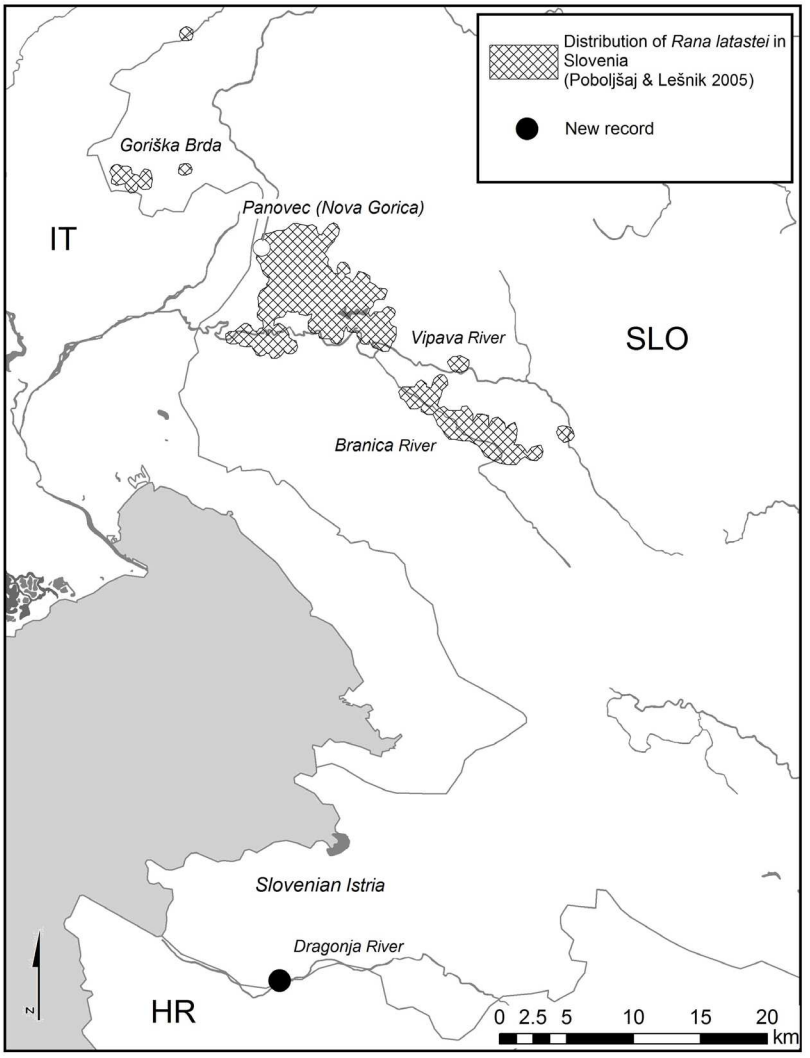

Figure 1. Distribution map of Italian agile frog (*Rana latastei*) in Slovenia according to Poboljšaj & Lešnik (2005) with the new additional record.
Slika 1. Razširjenost laške žabe (*Rana latastei*) po Poboljšaj & Lešnik (2005) z označenim novim podatkom.

Figure 2. Italian agile frog (*Rana latastei*), lateral view.
Slika 2. Laška žaba (*Rana latastei*), pogled na bočno stran.

Figure 3. Italian agile frog (*Rana latastei*), ventral view.
Slika 3. Laška žaba (*Rana latastei*), pogled na ventralno stran.

First record of the European pond turtle (*Emys orbicularis*) in the Nanoščica River basin, central Slovenia

PRVA NAJDBA MOČVIRSKE SKLEDNICE (*EMYS ORBICULARIS*) V POREČJU REKE NANOŠČICE, OSREDNJA SLOVENIJA

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The European pond turtle (Linnaeus, 1758) is the only autochthonous freshwater turtle in Slovenia. In recent years, larger populations have been recorded in the bogs of Ljubljana (Vamberger 2008, Vamberger & Kos 2011), Bela krajina and in the Sava River basin (Poboljšaj et. al. 2008) and on the Slovenian coast (Vamberger 2009), but nothing is known about its presence in the Nanoščica River (Krofel et. al. 2009), that flows along the edge of the large depression of the lower Pivka Valley, which is part of the NATURA 2000 network (SI3000126). The first person to mention the European pond turtle occuring in the area of the Pivka Valley was Polak (2002). He provides data on its occurrence for Lake Cerknica, Cerkniščica River, Planinsko polje (Planina Plain) and Pivka Valley, but these data have not been scientifically verified as yet. He also notes that some of the local elders still remember the olive green turtles at Lake Cerknica and around the Cerkniščica River. Similar sightings have also been reported for Planinsko polje and the Pivka Valley.

In the late afternoon of August 1st 2011 an adult specimen of the European pond turtle was observed in a small pond in the marshy area of the Nanoščica River basin while searching for food on the shore of the pond. On August 2nd 2011 we returned to the spot where we could observe the turtle while basking at the edge of the pond and searching for food (Fig. 1).

The pond is surrounded with swamp meadows, small streams, areas of reed (*Sparganium* sp.), sedge (*Carex* sp.) and mixed forest. On the edges of the pond and in the water broadleaf cattail (*Typha latifolia*) and Eurasian watermilfoil (*Myriophyllum spicatum*) grow. In the same pond we also observed other protected reptiles and amphibians such as grass snakes (*Natrix natrix*), Italian crested newts (*Triturus carnifex*), agile frogs (*Rana dalmatina*) and European tree frogs (*Hyla arborea*) as well as sand lizards (*Lacerta agilis*) in the nearby meadows. This pond - in all probability a man-made body of standing water, with a surface of ca 30 square meters - is located approximately 1 km from the nearest settlement, more specifically in the UTM square VL37 between the villages of Zagon and Hrašče (Y=435225, X=71506; 523 m a. s. l.). As this is an open rather than an enclosed location, importation of the observed pond turtle is improbable. The area is traversed by small streams enabling the turtle to move freely along this entire part of the Nanoščica basin.

This is the first confirmation of its occurrence in the Nanoščica River basin. The discovery is not important only in terms of geographic occurrence of the species, but also in terms of nature conservation, as it is appears that the species is more common than previously believed when NATURA 2000 sites for the European pond turtle were declared (Tome 2003).

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Figure 1. Photo of the European pond turtle (*Emys orbicularis*) while basking at the edge of the pond (photo: Teja Grželj).
Slika 1. Fotografija močvirske sklednice (*Emys orbicularis*) med sončenjem na robu ribnika (foto: Teja Grželj

NAVODILA AVTORJEM

NATURA SLOVENIAE objavlja izvirne prispevke, ki imajo za ozadje terensko delo s področja biologije in/ali prispevajo k poznavanju favne in flore osrednje in jugovzhodne Evrope. Prispevki so lahko v obliki znanstvenih člankov, kratkih vesti ali terenskih notic.

Znanstveni članek je celovit opis izvirne raziskave in vključuje teoretično ozadje tematike, območje raziskav in metode uporabljene pri delu, podrobno predstavljene rezultate in diskusijo, sklepe ter pregled literature. Dolžina naj ne presega 20 strani.
Kratka znanstvena vest je izvirni prispevek, ki ne vsebuje podrobnega teoretičnega pregleda. Njen namen je seznaniti bralca z delnimi ali preliminarnimi rezultati raziskave. Dolžina naj ne presega petih strani.
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Prispevke lahko oddate na naslov Natura Sloveniae, Oddelek za biologijo Univerze v Ljubljani, Večna pot 111, 1111 Ljubljana, Slovenija, (telefon: (01) 423 33 88, fax: 273 390, E-mail: rok.kostanjsek@bf.uni-lj.si).

FORMAT IN OBLIKA PRISPEVKA

Prispevki naj bodo napisani v programu Word for Windows, v pisavi "Times New Roman CE 12", z levo poravnavo in 3 cm robovi na A4 formatu. Med vrsticami naj bo dvojni razmak, med odstavki pa prazna vrstica. Naslov prispevka in naslovi posameznih poglavij naj bodo natisnjeni krepko v velikosti pisave 14. Latinska imena rodov in vrst morajo biti pisana ležeče. Uredniku je potrebno prispevek oddati v primerni elektronski obliki (disketa, CD, elektronska pošta) v Rich text (.rtf) ali Word document (.doc) formatu.

Naslov prispevka (v slovenskem in angleškem jeziku) mora biti informativen, jasen in kratek. Naslovu naj sledijo celotna imena avtorjev in njihovi naslovi (vključno z naslovi elektronske pošte).
Izvleček v slovenskem jeziku mora na kratko predstaviti namen, metode, rezultate in zaključke. Dolžina izvlečka naj ne presega 200 besed za znanstveni članek oziroma 100 besed za kratko znanstveno vest. Pod izvlečkom naj bodo ključne besede, ki predstavljajo področje raziskave. Njihovo število naj ne bo večje od 10. Sledi abstract in key words v angleškem jeziku, za katere velja enako kot za izvleček in ključne besede.

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Navajanje literature v besedilu mora biti na ustreznem mestu. Kadar citiramo enega avtorja, pišemo Schultz (1987) ali (Schultz 1987), če sta avtorja dva (Parry & Brown 1959) in če je avtorjev več (Lubin et al. 1978). Kadar navajamo citat večih del hkrati, pišemo (Ward 1991, Pace 1992, Amman 1998). V primeru, ko citiramo več del istega avtorja objavljenih v istem letu, posamezno delo označimo s črkami (Lucas 1988a, b). Literatura naj bo urejena po abecednem redu.

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Lubin Y.D., Eberhard W.G., Montgomery G.G. (1978): Webs of Miagrammopes (Araneae: Araneaidae) in the neotropics. Psyche 85: 1-13.

Lucas S. (1988a): Spiders in Brasil. Toxicon 26: 759-766.

Lucas S. (1988b): Spiders and their silks. Discovery 25: 1-4.

- knjige, poglavja iz knjig, poročila, kongresne povzetke citiramo:

Foelix R.F. (1996): Biology of spiders, 2. edition. Harvard University Press, London, pp. 155-162.

Nentwig W., Heimer S. (1987): Ecological aspects of spider webs. In: Nentwig W. (Ed.), Ecophysiology of Spiders. Springer Verlag, Berlin, 211 pp.

Edmonds D.T. (1997): The contribution of atmospheric water vapour to the formation of a spider's capture web. In: Heimer S. (Ed.), Proceedings of the 17th European Colloquium of Arachnology. Oxford Press, London, pp. 35-46.

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Papers should be written with Word for Windows using "Times New Roman CE" size 12 font, align left and margins of 3 cm on A4 pages. Double spacing should be used between lines and paragraphs should be separated with a single empty line. The title and chapters should be written bold in font size 14. The latin names of all genera and species must be written italic. All submissions should be sent to the editor in the appropriate electronic version on diskette, CD or via e-mail in Rich text format (.rtf) or Word document (.doc) format.

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LITERATURE
References should be cited in the text as follows: a single author is cited, as Schultz (1987) or (Schultz 1987); two authors would be (Parry & Brown 1959); if a work of three or more authors is cited, (Lubin et al. 1978); and if the reference appears in several works, (Ward 1991, Pace 1992, Amman 1998). If several works by the same author published in the same year are cited, the individual works are indicated with the added letters a, b, c, etc. (Lucas 1988a, b). The literature should be arranged in alphabetical order.

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Lucas S. (1988a): Spiders in Brasil. Toxicon 26: 759-766.
Lucas S. (1988b): Spiders and their silks. Discovery 25: 1-4.

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Foelix R.F. (1996): Biology of spiders, 2. edition. Harvard University Press, London, pp. 155-162.
Nentwig W., Heimer S. (1987): Ecological aspects of spider webs. In: Nentwig W. (Ed.), Ecophysiology of Spiders. Springer Verlag, Berlin, 211 pp.
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