

FIRST RECORD OF NIPHARGID AMPHIPODS IN REGION OF BRATISLAVA (WESTERN SLOVAKIA)

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Abstract: *Niphargus tatrensis* Wrzesniowsky, 1888 has been found in springs of the Malé Karpaty Mts in Bratislava city, Slovakia for a first time. The record in western most tip of Carpathian mountains is situated outside the karstic area and forms important connection between western population of the species known from Austria and Czech republic and eastern ones occurring in Slovakia, southern Poland and north-eastern Hungary.

Key words: *Niphargus tatrensis*, phreatic waters, zoogeography, Bratislava, Slovakia.

INTRODUCTION

Highly morphologically diverse genus *Niphargus* Schiødte, 1947 (Amphipoda: Niphargidae) is rich on species and taxonomic problems reflecting its evolutionary pathway and adaptations to life in phreatic waters. Most niphargid species do inhabit subterranean waters and form a substantial part of the groundwater biodiversity in most of European countries (ZAGMAJSTER et al. 2014).

The subterranean amphipods of the family Niphargidae from Slovakia are represented by eight species of the genus *Niphargus*.

The record and description of *Niphargus tatrensis* Wrzesniowsky, 1888 in well at Zakopane can be considered as a start of research on fauna of phreatic waters in Western Carpathians (KOŠEL 2007), which in Slovakia started at the beginning of 20th century.

Ernö Dudich sampled fauna of wells at Tekovské Lužany (Nagysalló and Tekovské Šarluhy in past) in September 1923, where he found dozens of niphargids later described as *Niphargus dudichi* Hankó, 1924. This species is still known only from three sites and belong to list of Slovak endemic species. This species has confirmed two more times in

Slovakia by STLOUKAL (2004) in the Štiavnické vrchy Mts. and by NECPÁLOVÁ & STLOUKAL (2010) in Danube inland delta (Čičov).

Emanuel Hrabě significantly contributes to knowledge of groundwater fauna of Slovak karstic areas. His material of crustaceans was identified by SCHELLENBERG (1938), who listed in his famous publication „Tschechoslowakische Amphipoden“ *Niphargus tatrensis* in the Demänovská jaskyňa slobody cave and *N. t. aggtelekiensis* Dudich, 1932 in the Domica cave, *Niphargus rajecensis* (Schellenberg, 1938) in wells of Rajec and *Niphargus leopoliensis molnari* (later synonymized with *Niphargus inopinatus* Schellenberg, 1932). Further records of niphargids were published by ŠTĚRBA (1956) and STRAŠKRABA (1956), who described *Niphargus foreili carsicus* (Straškraba 1956) from springs of the Zádielska dolina gorge (recently accepted as *Niphargus carsicus* Straškraba, 1956). *Niphargus molnari* reported by Novikmec et al. (2007) in Poloniny NP was later identified as *N. tatrensis* by Hudec (NECPÁLOVÁ 2014).

KOŠEL (2009) presented a complete information on biology of subterranean fauna in Slovakia, their areal and origin of troglobiont species. FIŠER et al. (2010) revised distribution of species *N. tatrensis*



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and *N. aggtelekiensis* in Central Europe by molecular methods. HUDEC & MOCK (2011) analysed morphological characters of niphargid species with implication to potential hybridisation taxons at border of their distribution in Slovakia. Occurrence of amphipods in three carstic national parks (Muránska planina, Slovenský raj and Slovenský kras) was analysed by NECPÁLOVÁ & STLOUKAL (2011) in frames of the ATBI (All taxa biodiversity inventory) research and found several new sites of *N. tatrensis* occurrence at Muránska planina. NECPÁLOVÁ (2013) catalogued information on Amphipoda in Slovakia and compiled an identification key to species known from Slovakia.

Recent research indicates a convergent evolution of morphologically distinct species in the process of adaptation to subterranean ecosystem (TRONTELJ et al. 2012) what makes taxonomy of the whole family even more complicated.

MATERIAL AND METHODS

Area description

As a typical horst mountains formed by raised fault blocks bounded by normal faults or graben, the Malé Karpaty Mts present a mosaic structure of rocks and geological formations between Vienna and Danubian basins (KOVÁČ 2000).

Narrow mountain range is a borderline of the Inner Western Carpathians with highest points reaching altitude of 768 m (Záruby), 754 m (Vysoká) and 752 m (Vápenná).

All streams of Malé Karpaty Mts belong to the catchment of the Danube River.

Methods

Stream water was sampled for presence of macrozoobenthos by mesh, crustaceans were preserved in 96% ethanol and analysed in laboratory. Mounted slides were investigated and photographed by the Leica DMD108 digital microscope.

Sampling site

Malé Karpaty, Bratislava – Rača, 48° 13' 47" N, 17° 8' 17" E; March 2015

RESULTS AND DISCUSSION

Near to the asphalt road in forest area between Rača (suburb of the Bratislava city, Slovakia) and the Biele kríž were found three individuals of *Niphargus tatrensis* Wrzesniowsky, 1888. Ideálne podmienky v tejto oblasti mali 2 pramene, a to prameň rieky Vydrice a prameň pri chatke pod studničkou Himligárka. Obidva pramene boli upravené do istej miery spôsobom, ktorý napomáhal udržať pramenisko ako vhodný biotop (pridaná strieška). Mimo lesného parku som v Malých Karpatoch navštívil aj

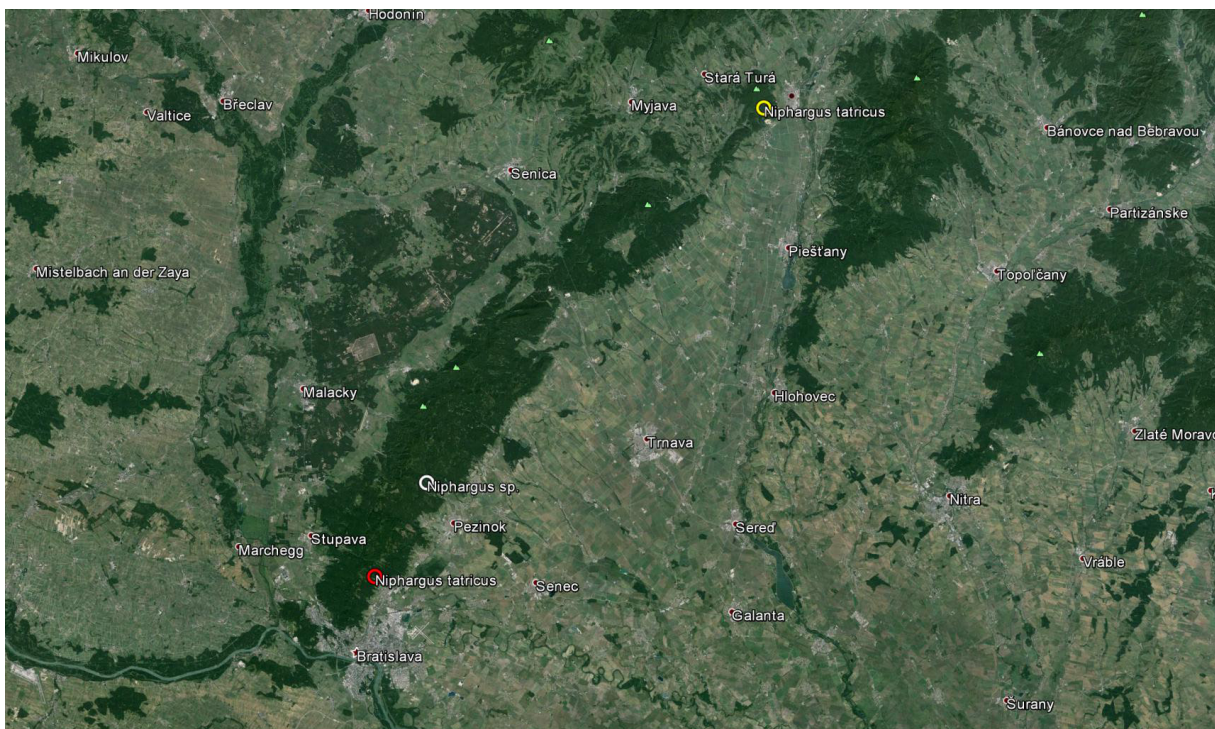


Figure 1. Map of *Niphargus tatrensis* occurrence in region of Bratislava and Malé Karpaty Mts with indication of distance to nearest sites.

Red circle – recent recort in area of Bratislava; yellow circle – nearest confirmed record of *N. tatrensis*; white circle – unidentified record of *Niphargus* sp. at region of Pezinok (Šmída pers. com.)

iné pramene, v ktorých bola zachovaná pramenná fauna.

Niphargus tatrensis (Wrześniowski, 1888) as the most common niphargid species occurring in Slovakia is a typical stygobiotic inhabitant of ground waters, cave streams and springs.

Areál rozšírenia sa tiahne prevažne severnou časťou Slovenska od Východných Karpát, kde bol nájdený v rieke Stužica, až po rieku Oravu v Oravskej Magure. Rovnako je zastúpený v centrálnej časti Slovenska v pohoriach Nízke Tatry, Slovenský Raj, Branisko a výskyt bol zaznamenaný aj v prameňoch v Čiernej hore, Volovských vrchoch a v Zvolenskej kotline (Huđec & Mock 2011). Fišer et al. (2010) opisujú, že areál druhu siaha na severe až do Poľska a na západe až do Českej republiky, avšak v Rakúsku už spomínajú druh *N. aggtelekiensis*. Autori taktiež uvádzajú výskyt rôznych populácií a poddruhov *N. tatrensis*. HUĐEC & MOCK (2011) spomínajú aj výskyt hybridov druhov *N. tatrensis* a *N. aggtelekiensis* z hraničnej zóny ich výskytu, ale ako už bolo spomínané pri predošlom druhu, práce FIŠER et al. (2010) a HUĐEC & MOCK (2010) podali vo svojich prácach informácie o spoľahlivom rozlíšení týchto druhov na základe morfológie. V určovacom kľúči Necpálová (2013) sú tieto morfológické štruktúry zaznamenané. Ide hlavne o tvar telsonu a počte terminálnych a distálnych štetín na ňom. Najvýznamnejším výsledkom bolo objavenie tohto druhu v Malých Karpatoch, z ktorých doteraz nebol tento druh potvrdený v žiadnej literatúre.

Zaznamenané lokality: Strážovské vrchy: 07. Čičmany – Zákľuka, 05. Čičmany – Vrchovany/lazy, Malá Fatra: 17. Prameň rieky Nitra, 13. Kľačno

– Tmavá dolina, Malé Karpaty: 61. Prameň za sídliskom Rača

DISCUSSION

While at the opposite end of Carpathian Mts in Serbia, PETKOVIĆ et al. (2015) described a new species of a lake ecomorph *Niphargus*, our research found a new site of *Niphargus tatricus* in western Carpathians, nearby to Bratislava, Slovakia. A new site is situated in narrow mountains range formed by mosaic bedrock connection between western and eastern parts of the species distribution.

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Figure 2. Gnatopod of *Niphargus tatrensis* found in area of Bratislava, Slovakia.

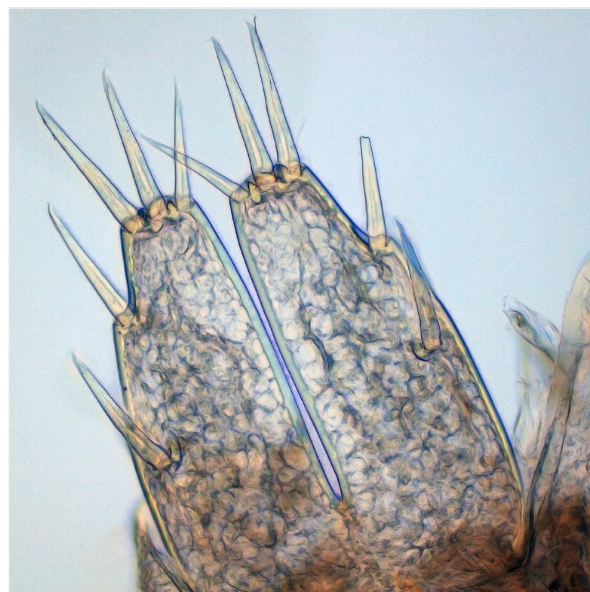


Figure 3. Telson of *Niphargus tatrensis* found in area of Bratislava, Slovakia.

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