

The record of new for the Russian fauna stygobiotic amphipod family Typhlogammaridae (Crustacea) in August cave in Sochi, Krasnodar Region

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The record of the representative of the new for Russian fauna stygobiotic amphipod genus *Zenkevitchia* and family Typhlogammaridae (Crustacea: Amphipoda) discovered in the cave August, Ahshtyr karst massif (Sochi, Krasnodar Territory) is reported. This report significantly expands the range of the family Typhlogammaridae to the northwest along the south-western slope of the Great Caucasus. Besides, the paper provides an overview of all Caucasian representatives of the family Typhlogammaridae and represent the map of their distribution in the region. The taxonomic status of stygobiotic amphipod genus *Zenkevitchia* is discussed, and it is suggested that the species discovered by us is a new for science and refers to the "admirabilis"-complex of cryptic species (*Z. admirabilis*, *Z. yakovi*) inhabiting the territory of Abkhazia. However, the taxonomic description of *Zenkevitchia* sp. will be carried out in a separate publication on the basis of an integrative taxonomy using morphological and molecular genetic methods.

Key words: *Zenkevitchia*; taxonomic status; complex of species; distribution; Abkhazia; Caucasus

Introduction

Caucasian hypogean fauna represent a high biodiversity of closely related endemic cryptic species specific to each karst massif following the diversity of Balkan (Dinaric) hypogean fauna in Europe. Relatively few data from the karst regions of the Caucasus indicate the extreme richness of the fauna with more than 180 described endemic troglo- and stygobiotic species (see review in Marin and Sokolova, 2014; Turbanov and Marin, 2015; Marin, 2015, 2017; Marin & Sinelnikov, 2017; review in Turbanov et al., 2016a-c). At the same time, the degree of study of the Balkan hypogean communities considerably exceeds that of the Caucasian ones, especially in Russian sector of Caucasus Mountains.

The stygobiotic amphipod family Typhlogammaridae Bousfield, 1978 is currently considered to be endemic for groundwater of the Balkan and Caucasian karst regions including 6 genera with 10 valid species (Väinölä et al., 2008; Lowry and Myers, 2012; Sidorov et al., 2015a, b; Sidorov, 2016). Among them, 5 genera are monotypic and strictly endemic while the genus *Zenkevitchia* Birstein, 1940 with 5 known species shows a relatively wide radiation. Status of two monotypic Caucasian stygobiotic amphipod genera *Anopogammarus* Derzhavin, 1945 and *Kruberia* Sidorov & Samokhin, 2016 are questionable but presently they are referring to the family Gammaridae (Sidorov et al., 2015b; Sidorov and Samokhin, 2016).

Representatives of *Zenkevitchia* and *Adaugammarus* Sidorov, Gontcharov & Sharina, 2015 are known from the territory of the Caucasus (Birstein, 1940a, b; Birstein and Ljovuschkin, 1970; Sidorov et al., 2015a, b; Sidorov, 2016) (see Fig. 1).

Adaugammarus pilosus Sidorov, Gontcharov & Sharina, 2015 is known from the Sarma Cave (Arabika massif) at depths of -1270 to -1700 meters (Sidorov et al., 2015b). Among *Zenkevitchia*, *Z. admirabilis* Birstein, 1940 is described from Andreevskaya Cave (=Akhalsheonia) near Sukhum, Abkhazia (Birstein, 1940a) and underground part of the Chornaya River flowing from Mchishta Cave (Derzhavin, 1945), Tarkila Cave (=Tarkiladze), New Athos Cave (=Novoafonskaya, Anokopiyskaya), Tsebdinskaya, Upper Shakuran (=Verkhnyaya Shakuranskaya), Middle Shakuran (=Srednyaya Shakuranskaya) and Lower Shakuran (=Nizhnyaya Shakuranskaya) caves (Birstein, 1940b; Birstein and Ljovuschkin, 1970).

According to the data (Sidorov et al., 2015a, b) *Z. admirabilis* from the above caves is a complex of species, which later was shown by the description of a number of new species. *Zenkevitchia revazi* Birstein & Ljovuschkin, 1970 is exclusively recorded from Motena Cave, Askhi karst massif, Western Georgia.

Recently described *Zenkevitchia yakovi* Sidorov, 2015 was discovered from Lower Shakuran and Tsebdinskaya caves on the basis of molecular genetic analysis and morphological differences (Sidorov et al., 2015a), and marked for Abrskila and Golova Otapa caves (Sidorov, 2016). *Z. sandroruffoi* Sidorov, Gontcharov & Sharina, 2015 is described from Sarma, Trojka and Orlinoe Gnezdo caves of Arabika karst massif (Sidorov et al., 2015b) and *Z. karamani* Sidorov, 2016 is from Novoafonskaya Cave (Sidorov, 2016).

In addition, there is an indication of undescribed species on typhlogammarid amphipods from Krubera Cave from a depth of -1697 meters, which seems to be a new genus (Turbanov, 2015). According to the literature, all records of representatives of Typhlogammaridae in the Caucasus are reported from the territory of Abkhazia, with the exception of *Z. revazi* reported from Western Georgia (Fig. 1). Up to date, representatives of the family Typhlogammaridae have never been recorded from the territory of Russian Federation (Takhteev et al., 2015) due to feebly studied hypogean fauna of Russian fauna of the southern slope of the Caucasian ridge.

At the same time, during the biospeleological survey in the Ahshtyr karst massif on the territory of Sochi (Krasnodar Region, Russia), we found stygobiotic amphipods clearly referring to typhlogammarid genus *Zenkevitchia* in the newly discovered Avgust Cave (Fig. 2).

Thus, this is the first reliable record of the genus as well as the family Typhlogammaridae in fauna of Russia, expanding the area distribution of Typhlogammaridae to the northwest part of the Caucasus. Specimens of *Zenkevitchia* sp. from Avgust Cave are morphologically similar to *Z. admirabilis* and *Z. yakovi*, and referring to cryptic species within *Z. admirabilis* species complex. The species will be recently described based on integrative taxonomy using morphological and molecular genetic data.

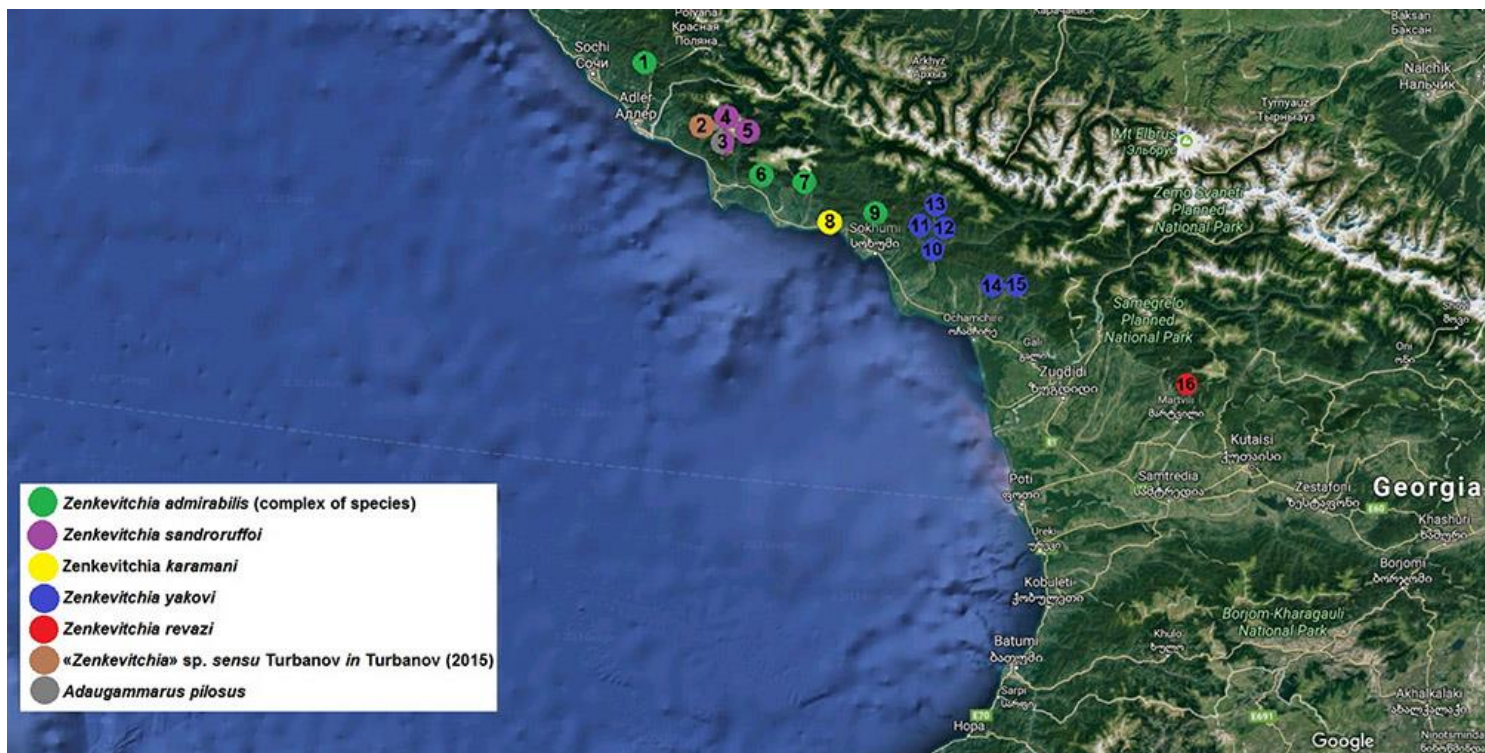


Fig. 1. Map of the distribution of representatives of the family Typhlogammaridae in the territory of the Western Caucasus. 1 – Avgust Cave; 2 – Krubera Cave; 3 – Sarma Cave; 4 – Trojka Cave; 5 – Orlinoe Gnezdo Cave; 6 – Mchishta Cave; 7 – Tarkila Cave; 8 – New Athos Cave; 9 – Andreevskaya Cave; 10 – Tsebdinskaya Cave; 11 – Upper Shakuran Cave; 12 – Middle Shakuran Cave; 13 – Lower Shakuran Cave; 14 – Golova Otapa Cave; 15 – Abrskila Cave; 16 – Motena Cave.



Fig. 2. Fixed specimens of *Zenkevitchia* sp. from August Cave, massif Ahshtyr, Sochi, Krasnodar Region, Russia.

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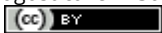
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