

# **INQUA-SEQS 2014**

## **The Quaternary of the Urals: Global trends and Pan-European Quaternary records**

**Четвертичный период Урала:  
глобальные тенденции и их отражение  
в общеевропейской четвертичной летописи**

**Ekaterinburg  
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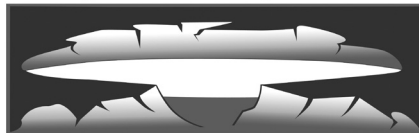
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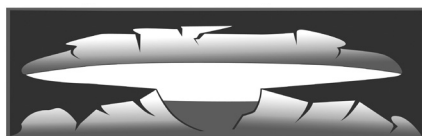
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МЕЖДУНАРОДНЫЙ СОЮЗ ПО ИЗУЧЕНИЮ ЧЕТВЕРТИЧНОГО ПЕРИОДА  
СЕКЦИЯ ЕВРОПЕЙСКОЙ ЧЕТВЕРТИЧНОЙ СТРАТИГРАФИИ  
ИНСТИТУТ ЭКОЛОГИИ РАСТЕНИЙ И ЖИВОТНЫХ УРО РАН  
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# **ЧЕТВЕРТИЧНЫЙ ПЕРИОД УРАЛА: глобальные тенденции и их отражение в общеевропейской четвертичной летописи**

**Материалы международной конференции  
INQUA-SEQS**



**Екатеринбург, Россия, 10–16 сентября 2014 года**

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The book presents the proceedings of the International Conference INQUA-SEQS 2014 held in Ekaterinburg, Russia. Reports concern a wide spectrum of issues connected to the study of the Quaternary Epoch (2.6 Ma) in Europe and Asia. Based on the results of local and regional Quaternary studies the authors focus on Quaternary stratigraphy and correlations across the Ural region and Europe and discuss the integration of pan-European and pan-Eurasian stratigraphical frameworks. The special attention is given to palaeontological, palaeoclimatological and palaeoenvironmental issues from the Quaternary of Europe and Asia.

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**Четвертичный период Урала: глобальные тенденции и их отражение**  
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В книге представлены материалы международной конференции INQUA-SEQS 2014, проводившейся в Екатеринбурге (Россия). Сообщения касаются широкого спектра вопросов, связанных с исследованиями четвертичного периода (2,6 млн лет) в Европе и Азии. На основании результатов локальных и региональных исследований авторы рассматривают проблемы стратиграфии и корреляции четвертичных отложений Уральского региона и Европы и обсуждают вопросы интеграции общеевропейских и евразийских стратиграфических схем. Особое внимание уделено вопросам палеонтологии, палеоклимата и палеосреды четвертичного периода Европы и Азии.

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## NEW DATA ON THE HOLOCENE SMALL MAMMAL COMMUNITIES FROM URAL-SAKMARA INTERFLUVE, SOUTHERN URALS

*Key words: small mammals, South Urals, Holocene*

Ural-Sakmara interfluve is a southern territory of extremity of Ural mountains. It is characterized by hummock-ridge-hilly relief, arid climate, steppe vegetation. It is bordered by forests of the mountain ridge of the Urals to the north and dry steppes and semideserts of Mugodzhar mountains to the south. The investigation of Holocene stage of the small mammal communities history was focused on fossil materials from caves: Chernorechka, Chernorechka-2; and subfossil materials made by eagle-owls activity on rock shelters Verbluzhka, Verbluzhka-2 (Orenburg region, Russia). Rodents and small lagomorphs were determined by cheek teeth – about 6 thousand elements in total. Loose deposits from Chernorechka cave (51°32'N, 56°43'E) contain 3 layers: 1 – black humus loamy sand with big quantity of multi-sized not-rounded detritus minerals (capacity till 0,3 m), late Holocene; 2 – taupe faintly humus loamy sand (capacity 0,4–0,5 m), more earlier phases of the Holocene; 3 – hazel loamy soil (maximum depth – 0,8 m), early Holocene – the end of Late Pleistocene(?). The core of the fauna of the most ancient 3 layer is formed by steppe and yellow steppe lemmings and narrow-skulled vole as in adjacent northern-east territory of the South Trans-Urals during Late Pleistocene time (Kuzmina, 2009). In upper layers 1 and 2 mole vole and common vole became dominant species. Yellow steppe lemming is on the third place of domination though it absent in the nowadays fauna of the Ural-Sakmara interfluve. This species as known was broadly distributed on the north of arid territories of North Eurasia in Late Pleistocene and greatly reduced its western part of the area during the Holocene time. Nowadays yellow steppe lemming inhabits eastern part of Zaisan depression (Kazakhstan), the north of China, eastern Khangai, Goby and Mongol Altay (Mongolia) (Gromov, Erbajeva, 1995).

Common species of the layers 1 and 2 are: steppe lemming, narrow-skulled vole, common hamster, forest voles from the group bank vole–northern red-backed vole, mice from the group small forest–field, steppe pika, Eversmann hamster. Species with fluctuating dynamics are: root vole, water and field voles, grey hamster, big and small sousliks, birch mouse, big and little jerboa, steppe

marmot. Little jerboa *Alactagulus pumilio* which is a marker of desert and semidesert conditions is presented in all layers of Chernorechka including the most upper parts. Present fauna of Ural-Sakmara interfluvium exclude this species, though it inhabits more southerner territories of Mugodzhar mountains.

Also 2 species of the modern European small mammal fauna – garden dormouse and yellow-necked mouse – are present in the 2 layer as rare ones. Garden dormouse is absent in the modern fauna of the Ural-Sakmara interfluvium but it's marked as rare species for adjacent more forest-covered northern-west and west territories of Orenburg region (Chibilev et al., 1993). Yellow-necked mouse is present in modern fauna of Ural-Sakmara interfluvium also as rare species (Chibilev et al., 1993). Yellow-necked mouse recorded in series of Holocene sites on the western slope of the South Urals (Danukalova, 2010; Yakovlev, 2003). Simultaneous presence of *Eliomis quercinus* and *Apodemus flavicollis* was discovered previously only in Holocene Sim fauna (Smirnov, 1990) on the western slope of the South Urals. Our investigation showed that the area of cohabitation of these two species arranged southerner than previously known data, in Ural-Sakmara interfluvium at 51°N in the south extremity of Ural mountains. Our finding of *Eliomis quercinus* in Chernorechka cave is the most southern-east point in the area history of this species.

Materials from Chernorechka-2, Verbluzhka, Verbluzhka-2 fixed disappearance of steppe and yellow steppe lemmings, little jerboa, grey hamster and root vole from the community composition during the time stages closed to contemporary. Narrow-skulled vole periodically disappeared from fauna composition and *Rattus* sp. on the contrary appeared. In Chernorechka-2 common hamster and *Sicista* sp. get into the core of communities in conjunction with common vole and mole vole. The same three species (besides birch mouse) dominated in subfossil materials from Verbluzhka and Verbluzhka-2. The share of forest voles, water vole and mice increased.

It is shown that the share of mesophilic species increased from ancient to modern layers on the background of xerophilic elements decreasing in small mammals communities. This tendency adjusts with the fixed fact of mesophytisation increase of steppe ecosystems of North Eurasia (Dinesman, 1999) through Holocene time to up-to-dateness.

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#### REFERENCES

- Chibilev A.A., Simak S.V., Yudichev E.N., 1993. Mammals of the Orenburg region and its protection: materials for the Red Book of the Orenburg region. Ekaterinburg: Science. 64 p. (in Russian)
- Gromov, I.M., Erbajeva, M.A., 1995. The mammals of Russia and adjacent territories. Lagomorphs and rodents. issue 167. Handbooks of Fauna of Russia. St. Petersburg, p. 522. (in Russian)
- Danukalova G.A., 2010. Refined regional stratigraphic scheme of the Pre-Urals Quarter and the main events on the territory of the South Ural region. Stratigrafiya. Geologicheskaya korrelyatsiya. Vol.18, № 3. P. 107–124. (in Russian)

- Dinesman L.G. Secular dynamics of recent ecosystems of North Eurasia, 1999. / Ecology in Russia on the boundary of XXI century. Moscow: Scientific world. P.112–146. (in Russian)
- Kuzmina E.A., 2009. Late Pleistocene and Holocene small mammal faunas from the South Trans-Urals. Quaternary International. 201, P. 25–30.
- Smirnov N.G., Bolshakov V.N., Kosintsev P.A., Panova N.K., Korobeynikov Yu.I., Olshvang V.N., Erokhin N.G., Bykova G.V., 1990. Historical Ecology of Animals of the South Urals Mountains. Publishing House of the UB of AN of USSR, Sverdlovsk. 244 p. (in Russian)
- Yakovlev A.G., 2003. Studies of fossil micromammals of the neo-Pleistocene and Holocene time in the South Pre-Urals and western macro-slope of the South Urals. Quaternary paleozoology in the Urals. Yekaterinurg. P. 116–122. (in Russian)

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## HOLOCENE HISTORY OF *CARABUS KARPINSKII* (KRYZHANOVSKIY ET MATVEEV, 1993) ENDEMIC TO THE SOUTHERN URALS

*Key words: ground beetle, Carabus karpinskii, Carabus odoratus, Holocene, area*

*Carabus karpinskii* is endemic of the highlands of the Southern Urals, it is relict species, which preserved here after the end of the Ice Age. It inhabits on the highest mountains of the axial part of the Southern Urals, found on ridges Urenga, Zigalga, Yamantau, Nurgush, Iremel (Lagunov, 2005). Species is included in the Red Book of the Russian Federation (the application) and the Red Book of the Chelyabinsk region (category 2, vulnerable).

*Carabus karpinskii* is taxonomically close to ground beetle *Carabus odoratus septentrionalis* Breuning, 1932 (Kryzhanovskij, Matveev, 1993). *Carabus odoratus* Motschulsky, 1844 is boreal-montan species, having main area in eastern Siberia (Kryzhanovskij, 1983). The area is clearly relict and consists of multiple isolates (Kryzhanovskij et al., 1995). The species is divided to more than 20 subspecies: *C. o. antropovi* Shilenkov, 1996 (Tuva, East&West Tannu-Ola Mt.); *C. o. baeri* Menetries, 1851 (NC,NE Siberia, Yenisey to Kolyma River, S-part of Taymyr Peninsula); *C. o. bargusinus* Shilenkov, 1996 (Barguzinsky Mt.); *C. o. chaffanjonii* Lesne, 1898 (arctic E-Siberia Verchanskaya Mt. area); *C. o. chlebnikovae* Obydov, 2005 (Severo-Baykalsk area); *C. o. czernyscheviellus* Obydov, 2002 (Chita, Nerchisko-Kuengsky Mt.); *C. o. dabanensis* Shilenkov, 1996 (Irkutsk, Khamar-Daban Mt.); *C. o. divnoensis Obydov*, 2006 (Krasnoyarsk); *C. o. dohrni* Gebler, 1847 (Kuznetsky Alatau);