

KARST RESEARCH INSTITUTE ZRC SAZU



## **INQUA Section on European Quaternary Stratigraphy**

# **Quaternary Stratigraphy in Karst and Cave Sediments**



**PROGRAM & ABSTRACTS & GUIDE BOOK**

Postojna, 2018

**INQUA Section on European Quaternary Stratigraphy**

# **Quaternary Stratigraphy in Karst and Cave Sediments**

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Postojna  
2018

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## **PROGRAM**

## SEQS \_ Quaternary Stratigraphy in Karst and Cave Sediments

Karst Research Institute ZRC SAZU, Titov trg 2, Postojna, 12 – 17 September 2018

### **TUESDAY, September 11**

**12.00-18.00 Registration of participants**

### **WEDNESDAY, September 12**

**08.00-12.00 Registration of participants**

#### **OPENING SESSION**

08.30-08.45 Opening

08.45-09.00 **Mihevc A.:** Karst – formation, morphology and sediments on examples from Slovenia

#### **SESSION 1a: Karst and Cave sequences**

09.00-09.15 **Zupan Hajna N., Mihevc A., Bosák P. & Pruner P.:** Cave sediments and their research in Slovenia

09.15-09.30 **Häuselmann P.:** Nothing IS possible - An introduction to stratigraphical studies in caves

09.30-09.45 **Bosák P. & Pruner P.:** Paleomagnetism and magnetostratigraphy: useful tool in analysis of karstogenesis

09.45-10.00 **Vrabec M., Pruner P., Zupan Hajna N., Mihevc A. & Bosák P.:** Neotectonic vertical-axis rotations in the Adria-Eurasia collision zone revealed from Paleomagnetic data of Pliocene-Quaternary cave sediments (Slovenia)

10.00-10.15 **Westaway R.:** Late Cenozoic uplift history of the Peak District, Central England, inferred from dated cave deposits and integrated with regional drainage development

*10.15-10.45 Coffee break*

10.45-11.00 **Bočić N.:** Some examples of cave sediments from Croatian karst

11.00-11.15 **Danukalova G., Yakovlev A., Kosintsev P., Kurmanov R., Osipova E., Yakovleva T., Sokolov Y., van Kolfschoten Th.:** Quaternary cave deposits of the Southern Uralian region (Russia)

11.15-11.30 **Sobczyk A., Szczygieł J., Kasprzak M., Stefaniak K., Marciszak A., Bosák P.:** Polyphase evolution of the karst system of the Jaskinia Niedźwiedzia Cave (Sudetes, SW Poland) – a review

11.30-11.45 **Gerasimenko N., Ridush B. & Avdieienko Yu.:** Late Pleistocene and Holocene environmental evolution on the Crimean karst plateau: palynology, palaeontology and lithology from the Emine-Bair-Khosar cave sequence

11.45-12.00 **Pawlak J., Błaszczuk M. & Hercman H.:** Last interglacial climate variability observed in stalagmites from Central and South Eastern Europe

12.00-12.15 **Hercman H., Błaszczuk M., Sierpień P., Gąsiorowski M., Pawlak J., Bosák P., Matoušková Š., Pruner P., Zupan-Hajna N. & Mihevc A.:** Climate change at Brunhes-

Matuyama boundary: multi-proxy record from flowstones from the cave Račiška pečina (SW Slovenia)

12.15-12.30 Błaszczyk **M.** & Hercman **H.**: Paleoclimate conditions from MIS 9 to MIS 7 in The Tatras recorded in stalagmite from Szczelina Chochołowska Cave

12.30-14.30 *Lunch break*

**14.30-17.00 Visit of the cave Postojnska jama** (walk from the Institute – **start at 14.30**; train at 15.00 exact! tourist cave, walking shoes)

#### **SESSION 1b: Karst and Cave sequences**

18.00-18.15 Horáček **I.**, Fejfar **O.**, Ložek **V.**, Čermák **S.**, Wagner **J.**, Knitlová **M.** & Hošek **J.**: Early-Middle Pleistocene transition in Central Europe in a high-resolution record of karst deposits

18.15-18.30 Ridush **B.**, Stefaniak **K.**, Nadachowsky **A.**, Ratajczak **U.**, Socha **P.**, Popiuk **Y.**, Ridush **O.** & Nykolyn **O.**: Pleistocene fauna of the Emine-Bair-Khosar Cave (Crimea, Ukraine): new data

18.30-18.45 Avdieienko **Yu.**, Gerasimenko **N.** & Ridush **B.**: Paleontological and lithological study of the Kryshtaleva cave (Ukraine)

18.45-19.00 Khenzykhenova **F.**, Erbajeva **M.**, Alexeeva **N.**, Shushpanova **G.** & Tumurov **E.**: The Late Pleistocene-Holocene Cave Small Mammal Fauna of the Fore-Baikal Area (Baikal region)

19.00-19.15 Fadeeva **T.** & Kosintsev **P.**: Mammal remains from Makhnevskaya ledyanaya cave (Perm Pre-Ural, Russia): biostratigraphic reconstruction

19.15-19.30 Gimranov **D.** & Kosintsev **P.**: Quaternary large mammals from the Imanay Cave

19.30-19.45 Križnar **M.**: Cave bears (*Ursus spelaeus* s.l.) in Slovenia: sites, species and datings

#### **THURSDAY, September 13**

#### **SESSION 2: Quaternary stratigraphy, geomorphology and tectonics**

09.00- 09.15 Schokker **J.** & Busschers **F. S.**: Stratigraphy of Eemian deposits near the classic type locality at Amersfoort (NL)

09.15-09.30 Susini **D.** & Pieruccini **P.**: The skin of Quaternary: Meghalayan stratigraphy and land use in small karst basin (Southern Tuscany, Italy)

09.30-09.45 Mencin **Gale E.**, Jamšek **Rupnik P.**, Trajanova **M.**, Bavec **M.**, Anselmetti **F.S.** & Šmuc **A.**: The Plio-Quaternary fluvial archives in the Slovenj Gradec and the Nazarje Basin, Northern Slovenia

09.45-10.00 Ferrarese **F.**, Palumbo **L.** & Fontana **A.**: Morphometric study of the epikarstic landforms of the western Karst (Italy) through the analysis of LiDAR derived data

10.00-10.15 Toker **M.** & Tur **H.**: 3D near-surface basin modelling and faulting styles of the Lake Erçek Basin, Eastern Anatolia (Turkey), from high-resolution seismic reflection images

10.15-10.30 Trifonov **V.G.**, Simakova **A.N.**, Çelik **H.**, Shalaeva **E.A.**, Aleksandrova **G.N.**, Trikhunkov **Ya.I.**, Frolov **P.D.**, Zelenin **E.A.**, Tesakov **A.S.**, Bachmanov **D.M.**, Latyshev **A.V.**, Sokolov **S.A.**: Brackish-water Caspian-type Upper Pliocene deposits in the

western Shirak Basin (NE Turkey), applied to estimation of the Quaternary uplift of the Lesser Caucasus

*10.30-11.00 Coffee break*

**SESSION 3: Assessing chronology of Quaternary deposits by Radiometric dating and Pedostratigraphy, Magnetostratigraphy and Lithostratigraphy**

- 11.00-11.15 **Lefort J-P., Dergacheva M.I., Danukalova G., Monnier J-L., Osipova E. & Bazhina N.:** Evidence for five short “warming” episodes during MIS 6 at the westernmost tip of continental Europe: Contribution of pedogenesis
- 11.15-11.30 **Stolpnikova E. & Kovaleva N.:** Biomarkers and paleolandscape indicators in early Pleistocene mountain soils and pedolithic sediments in the Caucasus
- 11.30-11.45 **Sanko A.F., Koloshich S.M. & Dubman A.V.:** Key-sites of the Belarus Upper Pleistocene
- 11.45-12.00 **Krokhmal A.:** Reference sections of the paleofaunal subdivisions of the Early Pleistocene (Eopleistocene) in the South of Eastern Europe (on the basis of small mammals)
- 12.00-12.15 **Kotowski A., Sobczyk A., Borówka R. K., Badura J., Stachowicz-Rybka R., Moskal-del Hoyo M., Hrynowiecka A., Alexandrowicz W. P., v. d. Made J., Shpansky A. V. & Stefaniak K.:** *Stephanorhinus kirchbergensis* from Gorzów Wielkopolski (Poland) – its significance in research on Polish Eemian Interglacial
- 12.15-12.30 **Tsydenova N.:** Late Pleistocene – Holocene transitional complexes in the Trans-Baikal region: stone industries and oldest ceramics

*12.30-14.30 Lunch break*

**SESSION 4: Major regional subdivisions of the Quaternary in European and Asian regions: toward a common data-base (DATESTRA)**

- 14.30-14.45 **Gerasimenko N.:** The candidate sections for DATESTRA from the North-Eastern Ukraine
- 14.45-15.00 **Lasberg K.:** Pleistocene stratigraphy key-sites of Estonia in DATESTRA
- 15.00-15.15 **Šeirienė V.:** Pleistocene stratigraphy and key sites in Lithuania
- 15.15-15.30 **Ponomarev D.:** Quaternary key sections in the north of European Russia – a contribution to DATESTRA
- 15.30-15.45 **Titov V.V., Tesakov A.S., Simakova A.N., Frolov P.D., Borisova O.K., Panin P.G., Timireva S.N., Konov Yu.M. & Syromyatnikova E.V.:** Key sections of Pleistocene continental deposits from North-Eastern Sea of Azov region
- 15.45-16.00 **Khenzykhenova F., Kradin N., Prokopets S., Simukhin A., Imenokhoev N., Namzalova O. & Namsaraeva S.:** The Art of the Hunnu Ivolsky Settlement (Baikal Siberia)
- 16.00-16.15 **Marks L.:** An input of key sites in Poland to the European stratigraphy
- 16.15-16.30 **Sobczyk A., Pitura M., Badura J. & Stefaniak K.:** Poland during the Eemian (MIS 5e) stage: a project of the Web GIS interactive database

*16.30- 16.45 Coffee break*



## POSTER SESSION

16.45-17.30 **Poster presentations** (3 minutes/poster)

1. **Borodin A., Tiunov M., Strukova T., Zykov S.:** New finds of *Mimomys* in the Late Pleistocene cave deposits in Russia
2. **Izvarin E. P & Ulitko A. I.:** Stratigraphical and paleotheriological description of Holocene sediments from Nizhneirginsky grotto (middle Urals)
3. **Kirillova I., Borisova O., Chernova O., van Kolfschoten T., van der Lubbe J., Panin A., Pečnerová P., van der Plicht J., Shidlovskiy F., Titov V. & Zanina O.:** Small mammoth from the Eastern Siberian Sea coast (Russia)
4. **Korsakova O. & Lavrova N.:** Neopleistocene (Middle and Upper Pleistocene) stratigraphy and applicable key points in the Karelia, N-W Russia
5. **Kosintsev P. A. & Bachura O. P.:** Chronostratigraphy of sediments in the Ural caves
6. **Maciejewski M., Sobczyk A. & Szczygiał J.:** 3-D structural model of the Niedźwiedzia Cave (Sudetes, SW Poland) karst system
7. **Makoś M. & Sobczyk A.:** Using a 3D model for visualisation of the Quaternary deposits within glacial cirque – a case study from the Łomniczka Valley, Eastern Karkonosze Mts.
8. **Pitura M. & Sobczyk A.:** Paleoglaciological record of the Scandinavian Ice Sheet advance during Mid-Pleistocene glaciation in Central Europe (Sudetes, SW Poland): an interplay of local topography and Quaternary stratigraphy reassessed
9. **Polak S.:** First evidence of Barbary macaque (*Macaca sylvanus* Linnaeus, 1758) (Primates, Cercopithecidae) from Pleistocene sediments in Slovenia
10. **Ratajczak U., Stefaniak K., Kotowski A. & Shpansky A. V.:** *Bison priscus* skull from the Eastern Europe and Siberia
11. **Rychel J., Woronko B. & Honczaruk M.:** Relict of Pleistocene permafrost in North-Eastern Poland – one of the proposal for datestra
12. **Sierpień P., Hercman H., Bosák P., Pruner P., Zupan-Hajna N. & Mihevc A.:** The paleoclimate reconstruction of Pliocene–Pleistocene transition: oxygen and carbon stable isotopes from flowstones in the cave Račiška pečina (SW Slovenia)
13. **Stefaniak K., Ratajczak U. & Kotowski A.:** Stratigraphic significance of Polish Pliocene and Quaternary deer
14. **Zambaldi M., Angelucci D. E. & Arzarello M.:** Rethinking stratigraphy and site formation processes of the Ciota Ciara Cave (Monte Fenera, Italy)
15. **Zaretskaya N.E., Panin A.V., Molod'kov A.N., Trofimova S.S. & Baranov D.V.:** Pleistocene chronostratigraphy and key-sections of the Vychegda River Basin (European North-East)
16. **Zykov S.V. & Izvarin E.P.:** Variations in yellow-necked mouse (*Apodemus flavicollis* Melch., 1834) dental morphologies of the Nizhneirginsky Grotto sediments (Middle Urals) in a phylogeographical context

## Posters

Poster size: max. format is 70 cm x 100 cm (width x height, **portret layout**).

Each author(s) should prepare a **2-3 minute presentation** where the essence of their poster is presented. These short presentations will be presented at Poster session.

Stand by your poster during the poster display.

#### **FRIDAY, September 14**

8.30-19.00 **Field trip:** Classical karst: caves Škocjanske jame, Črnotiče Quarry and Socerb

**Start:** bus station in Postojna.

**Bus & walk:** tourist cave, karst surface; walking shoes, umbrella or rainproof coat.

**Lunch** is provided.

**Dinner & Overnight:** in village of Divača; shared rooms in 2 guesthouses & breakfast.

#### **SATURDAY, September 15**

8.30-20.00 **Field trip:** Contact karst of Matarsko podolje: Odolina blind valey, caves Račiška pečina and Ulica pečina

**Start:** in Divača.

**Bus & walk:** easy short caves, karst surface; lamp/light, walking shoes, umbrella or rainproof coat.

**Packed lunch** is provided.

**Dinner & Overnight:** in Topolščica Spa; shared rooms in hotel & breakfast.

#### **SUNDAY, September 16**

8.30-18.00 **Field trip:** Alpine cave Snežna jama

**Start:** in Topolščica Spa.

**Bus & walk:** visit of managed ice cave through steep entrance across the ice and inner, warm part of the cave; lamp/light, walking shoes, umbrella or rainproof coat

**Packed lunch** is provided.

**Dinner & Overnight:** in Topolščica Spa; shared rooms in hotel & breakfast.

Farewell dinner and free swimming.

#### **MONDAY, September 17**

8.00-18.00 **Field trip:** Sedimentary environments of Ljubljana Basin

**Start:** in Topolščica Spa.

**Bus & walk:** cave Arneževa luknja, Sava fault and river terraces of Tržiška Bistrica young glacial till and fluvioglacial fill in Sava valley, glacial valley Vrata and North wall of Triglav (2864 m); walking shoes, umbrella or rainproof coat.

**Packed lunch** is provided.

**Return to Postojna.**

#### **Participation at the excursions is at your own risk!**

The organisers do not accept any liability for any loss, damage, injury or death arising from or connected with the excursions. Participants are advised to arrange an appropriate insurance policy. The participants are obliged to comply with the instructions of the organizer.

**Lamp/Light** is necessary if written. Organizer will provide few lamps, but if you have your own, please bring it with you.

Use of **insect repellents** is highly recommended because of ticks (possible infection with Lyme boreliosis and tick-borne encephalitis).

often up to 5 Ma old and even older. Studied sediment sequences are characterized by alternation of normal- and reverse-polarized magnetozone and short-lasting excursions of magnetic field. The Pliocene/Quaternary boundary was detected in some of them. The continuous Pliocene to Pleistocene deposition is characteristic for most of studied sections. Distinct phases of massive deposition in caves with as yet still preserved sediments were dated to about 5.4–4.1 Ma, 3.6–1.8 Ma and Quaternary, following the cessation of Miocene deposition in the Pannonian Basin in the central, E and SE Slovenia and post-Messinian evolution in the SW and W Slovenia. These depositional phases in underground suggest relief evolution in relation to surface climatic changes with massive flood events and to changes of the tectonic regimes since Neogene.

**Acknowledgements** The authors acknowledge the financial support from the Slovenian Research Agency (research core funding No. P6-0119), the CAS/SLO bilateral mobility cooperation (No. SAZU-16-03), and the Plan of the Institutional Financing of the Institute of Geology of the CAS (No. RVO67985831).

## Pleistocene chronostratigraphy and key-sections of the Vychegda River Basin (European North-East)

Zaretskaya N.E.<sup>1,2</sup>, Panin A.V.<sup>2,3</sup>, Molod'kov A.N.<sup>4</sup>, Trofimova S.S.<sup>5</sup> & Baranov D.V.<sup>2,3</sup>

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<sup>5</sup> Institute of Plant and Animal Ecology, UB RAS, 8 Marta 202, Ekaterinburg, Russia

### Session 4: Poster

According the current Quaternary System subdivisions for Russian European North-East (Tyman-Pechora-Vychegda subzone W-Ib, Zastrozhnov et al., in press), the Neopleistocene record within the Vychegda basin begins with the Rodionovo (Gorki, Schoningen, MIS 7a) horizon. The unique section containing the corresponding deposits is Kur'jador in the upper reaches of Vychegda: these are coarse alluvial (fluvial channel) sands and gravels with the OSL dates ~243-209 kyr BP (Lyså *et al.* 2011).

The next stratigraphic unit is the Vychegodsky (Moscow, Saalian, MIS 6) horizon. The deposits comprise glacial diamicton with rock clasts usually covered by glacio-fluvial sands and gravels/cobbles, sometimes including flaciolacustrine varved clays or silts. The numerous outcrops are known through the Vychegda valley from upper to lower reaches. Dated sections (glacifluvial sediments) are as follows: Myjoldino in the very upper reaches of Vychegda with the OSL-dates ~ 135-111 kyr BP (Lyså *et al.* 2011) and Don 1-2 in the middle reaches with IRSL dates  $130.8 \pm 12.8$  (RLQG 2359-085) and  $124.6 \pm 14.3$  (RLQG 2360-085).

The lower Sulinsky (Mikulino, Eemian, MIS 5e) horizon is not represented in the Vychegda river basin. The closest section with Sulinsky peat and loamy peat of oxbow lake origin dated by <sup>230</sup>Th/U to 120-104 kyr BP, containing *Picea* logs and megafauna remnants is Tolokonka located 100 km downstream the Vychegda- Severnaya Dvina confluence (Zaretskaya *et al.* 2013).

Fluvial deposits of the upper Sulinsky (lower Weichselian, MIS 5d-a) and Laysky (early Valdai, lower-middle Weichselian, MIS 4) horizons are represented in the lower parts of the 3rd 18 m terrace sections in lower Vychegda. These are coarse-grained sands with

gravel beds. Two exposures could be considered as key-sections: Gam with OSL-dates ~101-92 kyr BP (Lyså *et al.* 2014) and Yaren'ga (Zaretskaya *et al.* in press).

Two key sections of the 2<sup>nd</sup> 15 m river terrace are located in the very upper (Kur'jador) and lower (Baika) reaches of Vychegda and contain the continuous record of MIS 3 and 2 (Byzovo, upper-middle Weichselian, Leningradsky and Polar, upper Weichselian and Ostashkov horizons). Fluvial deposits forming the Byzovo horizon are different facies of alluvium (from active channel to oxbow lake) containing organic layers. OSL dates comprise the time interval 67-47 kyr BP (at Kur'jador, Lyså *et al.* 2011), radiocarbon - ~ 44 – 26 <sup>14</sup>C (48 – 30 cal) kyr BP and <sup>230</sup>Th/U – 50 – 38 kyr BP (Maksimov, Zaretskaya *et al.*, 2015). Pollen data shows the presence of *Picea* in the organic-bearing sediments (Andreicheva *et al.* 2015).

Sediments of the LGM Ostashkov (Polar) horizon are represented by the 1st terrace alluvium with cryoturbations (IRSL date of 23.1±2.0 (RLQG 2362-085)) and aeolian silts and sands of the upper parts of Kur'jador and Baika sections. Another generation of the 1st terrace contains the deposits of deglaciation time (17-11 cal kyr BP) (Zaretskaya *et al.* 2014). Holocene is represented by floodplain deposits dated from 11700 cal BP till now (Chernov *et al.* 2015).

This is a contribution to the DATESTRA project.

**Acknowledgements** Investigations of alluvial section stratigraphy were supported by Russian Science Foundation (RSF), project no. 17-17-01289. Financial support for geochronological studies was received from the Russian Foundation for Basic Research (RFBR), project no. 17-05-00706, following the plan of the scientific research of the Geological Institute of RAS № 0135-2018-0037.

## **Variations in yellow-necked mouse (*Apodemus flavicollis* Melch., 1834) dental morphologies of the Nizhneirginsky Grotto sediments (Middle Urals) in a phylogeographical context**

**Zykov S.V. & Izvarin E.P.**

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### **Session 1: Poster**

The yellow-necked mouse (*Apodemus flavicollis* Melch., 1834) is a typical representative of the European fauna, whose distribution range is confined to the broad-leaved forest zone and occupies a considerable territory of Eurasia from Great Britain and northern Spain to the Urals [1,2]. The Urals is the eastern boundary of the distribution of the yellow-necked mouse. More recently, the most northeastern habitat for the yellow-necked mouse has been described [3]. Also in this area the yellow-necked mouse molars were found in the late Holocene sediments of Nizhneirginsky Grotto (56°51' N, 57°24' E). In our work, we analyzed the variability of molars of the yellow-necked mouse from modern populations (marginal and from the main part of the range) and fossil molars in the phylogeography context of the yellow-necked mouse.

A comparative analysis of the morphological variability of the yellow-necked mouse molars was performed using a set of the non-metrical dental characters. The complex of the non-metrical dental characters was based on those described earlier and on own research [4,5].