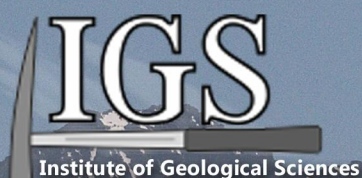




**INQUA**

International Union for Quaternary Research



Institute of Geological Sciences



Institute of Archaeology  
and Ethnography

# **INQUA – SEQs SECTION ON EUROPEAN QUATERNARY STRATIGRAPHY WORKSHOP**

**03 – 10 SEPTEMBER 2016**

**Bridging Europe and Asia:  
Quaternary stratigraphy and  
Paleolithic human occupation in Armenia  
and Southern Georgia**

**Yerevan  
ARMENIA**



Q  
u  
a  
t  
e  
r  
n  
a  
r  
y

P  
l  
e  
i  
s  
t  
o  
c  
e  
n  
e

E  
a  
r  
l  
y

former  
formal base  
Quaternary  
1948-2007

former  
formal base  
Pleistocene  
1948-2007

*Scheme ICS 2007*

L  
a  
t  
e  
  
M  
i  
d  
d  
l  
e  
  
E  
a  
r  
l  
y  
  
GSSP



## THE LATE QUATERNARY RIVER TERRACES AND ARCHEOLOGICAL SITES AS INDICATOR OF MODERN TECTONIC DEFORMATIONS OF THE WESTERN CAUCASUS

Yaroslav I. Trikhunkov<sup>1</sup>, Egor A. Zelenin<sup>1</sup>, Elena Y. Novenko<sup>2</sup>, Alexey A. Kolesnichenko<sup>1</sup>, Eugenia A. Shalaeva<sup>1</sup>, Pavel D. Frolov<sup>1</sup>, Anna V. Revunova<sup>3</sup>

*1 Geological Institute, Russian Academy of Sciences, Moscow, Russia*

*2 Moscow State University, Geography department, Moscow, Russia*

*3 Moscow State Pedagogical University, Geography department, Moscow, Russia*

New data on modern folded deformations of the anticlinal and synclinal depressions, which prevail in peripheral Sochi Region of the Western Caucasus, were obtained. Very similar anticlinal ridges Alek, Galitsinsky, Akhun, Nikolaevsky are uplifting in the main Caucasus direction (NW – SE) and are crossed by narrow antecedent river valleys. These ridges stand out contrasting to synclinal depressions, where fluviatile accumulation prevails. At the intersection of the Mzymta River and the Galitsinsky anticlinal ridge a narrow Akhshtyr canyon with steep 150 meters high slopes is being formed. Downstream in the adjacent Akhshtyr synclinal depression the valley is expanding, and the floodplain and several levels of terraces are being formed. The most presentative in this place are the first and second terraces with the height of 20 – 30 and 50 – 60 m correspondingly. The age of these terraces was estimated by UI dating of their marine analogs, by Rostovtsev *et al.* (1999), and by our geodesic correlation of them with the river terraces in Akhshtyr depression. Also we have data on pollen analysis which have confirmed the mentioned above data. The age of the first terrace was defined as  $33,6 \pm 0,57 - 35,1 \pm 1,2$  ka and the second –  $118 \pm 3,5 - 124 \pm 3,5$  ka (Eemian interglacial, Late Karangat marine terrace) correspondingly. The field research and analysis of the elevations by ASTER GDEM allowed us to trace both terraces in the southern structural slope of the Galitsinsky ridge above the canyon, adjacent to the Akhshtyr depression, at the heights of 70 and 110 m correspondingly. Alluvial deposits in outcrops of lower terrace (elongated pebbles, which look like modern alluvium of the Mzymta) were traced on the surface of the slope. Thereby, described fragments of the Mzymta terraces were uplifted above the level of the corresponding terraces in the synclinal depression as they are located on the slope of the actively uplifting anticlinal Galitsinsky ridge.

The axial zone of the ridge hosts the famous Paleolithic site of the Akhshtyr cave. Its infilling deposits span the time interval from 250 ka to Recent and consists from two sections: alluvial and cave colluvial. The age of upper layer of alluvial section was defined by S. Nesmeyanov as 210 – 150 ka. According to the archeological data, in time of 124 ka and later that habitat was used by *Homo neanderthalensis* and later *Homo sapiens*. Last settlement of the cave is related to the period of 40 ka. In all that period the cave was much closer to the river level and provided a direct access to water. At present the cave is located directly under the steep wall of the Akhshtyr canyon on the shelf of 98 – 103 m high erosion terrace (a fragment of the second terrace).

Considering the age and the modern height of the terraces we can evaluate relative uplift velocity of the Galitsinsky Ridge as 1 – 0,7 mm per year, and the minimum evaluation of the folding deformation of 50 – 60 m during the last 70 ka. The active uplift of the folded structures of the main Caucasus direction indicates domination of lateral contraction with SW – NE direction.