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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

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Session 2: Oral

The Pliocene-Quaternary Shirak Basin occupies NW Armenia and the adjacent part of NE Turkey. The 90-m thick clay and silt section that is covered by 5-m thick alluvial gravels is exposed in the Turkish side of the Akhurian River valley to the south of the Akyaka town (N 40°42.897'; E 43°40.367'; H = 1570 m a.s.l.). The whole section shows normal magnetic polarity. The Caspian-type dinocysts of the Lower Akchagylian (Upper Pliocene) aspect were identified by G.N. Aleksandrova from the lower part of the section. The presence of dinocysts in several layers denies their accidental appearance within the sediments. The maximum Akchagylian transgression level was probably ca. 100 m higher than the world sea level and decreased up to 0 to the Quaternary (~ 2.5 Ma). Therefore, the western Shirak Basin rose during the Quaternary to 1400–1500 m. The rise was caused mainly by total uplift of the region and partly by movements on the NE-trending Akhurian Fault. The similar fine-grained deposits were found by boreholes in the Armenian part of the Shirak Basin near the Marmashen Monastery. The top of these deposits is situated at the height of 1440 m a.s.l. and they are covered by basaltic trachyandesites with K-Ar dates 2.0–2.3 Ma.

According to the Sayadyan (2009) data, the mollusk fauna was found in the drilling probes. The mollusks were dated to Upper Akchagylian at 4–8 m under the top and to Lower Akchagylian at 43–126 m under the top of fine-grained deposits. Therefore, the vertical offset on the Akhurian Fault is about 170 m. The fault displacement occurred in the Early Pleistocene after accumulation of the Lower Akchagylian deposits and before the Ani unit sedimentation finished. This is proved by geomorphological position of the deposits: the Upper Pliocene section with dinocysts in the Turkish side of the fault and the Ani unit (ca.

1.5–0.75 Ma) in its Armenian side compose a single terrace, and the Arapi unit terrace (0.70 + 0.05 Ma) is incised into it.

The represented data show that the average rate of the Quaternary rise is about 0.6 mm/year. According to the data on NW Armenia, the uplifting accelerated about 0.6 Ma, when its rate reached 1.1–1.8 mm/year in the Lori and Upper Akhuryan basins and 2.0–2.3 mm/year in the adjacent ridges (Trifonov *et al.* 2017).

Sayadyan Yu.V., 2009: The newest geological history of Armenia. Ghitutyun, Yerevan, 357 p. In Russian.

Trifonov V.G., Shalaeva, E.A., Sahakyan, L.Kh., Bachmanov, D.M., Lebedev, V.A., Trikhunkov Ya.I., Simakova A.N., Avagyan A.V., Tesakov A.S., Frolov P.D., Lyubin V.P., Belyaeva E.V., Latyshev A.V., Ozherelyev D.V. & Kolesnichenko A.A., 2017: Quaternary Tectonics of Recent Basins in Northwestern Armenia. *Geotectonics* 51/5, 499–519.