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Surface Exposure Dating of the Paleoglacial Evidence in Verçenik Valley, Kaçkar Mountains, NE Turkey

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Anatolia is situated in the Eastern Mediterranean region (located between 36˚– 42˚N and 26˚–45˚E). The climate of the Eastern Mediterranean region is influenced by three main atmospheric systems; (1) by the main middle to high latitude westerlies to the north and northwest, (2) by the mid-latitude subtropical high-pressure systems that generally extend from the Atlantic across the Sahara, and (3) by the monsoon climates of the Indian subcontinent and East Africa. As the Anatolian Peninsula lies at the junction of these three atmospheric systems, it is extremely sensitive to even minor changes in the influence of each system resulting in precipitation changes.

Since glaciers react sensitively to changes in temperature, moisture and radiation balances and they produce a distinct geological record of their changes in mass balance, they constitute a direct geoarchive of climate change. Consequently, the information about the last climatic cycle can be obtained from the geological records of paleoglaciations in the high terrains of Anatolia. As the Kaçkar Mountain Range is sensitively situated for any paleoclimatic reconstruction during Quaternary, paleoglacial evidence in Verçenik valley is selected as a test valley for our studies.

Verçenik valley is situated in the Kaçkar Mountain range in northeastern Turkey. It is a north south oriented, typically U-shaped glacial valley approximately 11km in length. The U-shaped morphology extends down to an altitude of 1900m. Verçenik Mountain is the 2^{nd} highest peak of the mountain range (3907m). Verçenik valley consists of a main valley and five tributary valleys. These tributary valleys are connected to the

main valley by moraine bastions, which formed by the accretion of the glacial deposits due to a bedrock obstacle.

In the Verçenik valley system, we have defined quaternary deposits like moraines, moraine bastions, snow-avalanche ridges, rock glaciers, alluvial plain and alluvial fan deposits. There are 14 lakes associated with paleoglacial activity in this valley. Moreover, trimlines, roches moutonnées, polished bedrock surfaces, crecentic gauges, lunate fractures, and crecentic fractures provide evidence of glacial erosion in this area. In the field, we have mapped the trimlines and the orientations of the striations in order to define the movement of the Verçenik Paleoglacier.

21 samples from granitic boulders on the moraine ridges, roches moutonnées and polished bedrock were collected for surface exposure dating with ^{10}Be and ^{26}Al. These samples are being processed for the AMS measurements. Combining the surface exposure dates with data gathered from the field, it will be possible to interpret the evolution of the Verçenik Paleoglacier. Based on the present knowledge, it is difficult to pinpoint the classical LGM – YD – Little Ice Age moraine sequence. The results from the Kaçkar Mountains are encouraging for the reconstruction of glaciations in Turkey and related paleoclimatological modeling.