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## Cosmogenic $^{36}\text{Cl}$ glacial chronology and ice-flow modelling (PISM) of Aladağ and Karanfil Mountains, Central Taurus Range, Turkey

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Several mountains in Turkey were glaciated during the Late Pleistocene. One of them, Mt. Aladağ, is located in the central Taurus Range and covers an area of 800 km<sup>2</sup>. The elevation changes from 400 to 3771 m asl, making the mountain one of the most profound karst systems in the world. It is limited by several outwash fans, cut and offset by the left-lateral Ecemiş Fault Zone on the west, Zamantı River on the east, and Mt. Karanfil on the south. Two major local ice caps >3000 m asl, on Yedigöller and Körmenlik Plateaux, occupied the summits of Mt. Aladağ in the past. Although several glacier tongues derived from these ice caps and deposited moraines and outwash fans, today, only a few debris-covered glaciers and rock glaciers are left. We used the cosmogenic  $^{36}\text{Cl}$  surface exposure dating method on limestone bedrock, moraine and outwash fan boulder samples to constrain the timing of paleoglaciations. A total of 121 samples indicate several episodes of deglaciation during the last glacial cycle. The oldest moraines (~47 and ~38 ka old) are found in the W-NW of Mt. Aladağ in two adjacent valleys. An outwash fan (~78 ka) at the exit of the northern valley also indicates the existence of earlier glacial conditions, also confirmed by previous outwash fan ages obtained from the SW of the mountain. The highest peaks (>3200 m) became ice-free by ~55 ka, but two ice caps remained active till the onset of the Holocene. Interestingly, the Last Glacial Maximum (LGM; ~21 ka) moraines are rare and only preserved at high altitudes. On the other hand, the longest paleoglacier (>15 km) of Mt. Aladağ, on the eastern side, rapidly retreated from ~15 ka to ~12.5 ka, indicating Late Glacial to Younger Dryas deglaciation. Additionally, Early Holocene moraines are found in eastern and western valleys abundantly.

On the other hand, Mt Karanfil (3059 m asl), a small mountain 20 km south of Mt. Aladağ, contains four well-preserved terminal and lateral moraine complexes, each originating from one to three cirque areas from the mountain's N-NW face. The mean ages of moraines range from ~17 ka to ~19 ka, indicating mostly an LGM deglaciation. One sample from a relict rock glacier in a cirque floor was dated to ~10 ka, testifying to the development of permafrost conditions on the onset of Holocene. We also used the Parallel Ice Sheet Model (PISM) to reconstruct the glaciers and climate during the LGM on Mt. Karanfil. We ran 21 paleoclimate simulations as a function of present temperature and precipitation to reach the steady-state glacier extents and compared the results with the modelled glacial areas and the field-observed ice extents. The best-fit setups imply that Mt. Karanfil's LGM climate was  $8.3 \pm 0.5$  °C colder than today if the precipitation levels were the same as today. More humid (20% wetter) or arid (20% drier) conditions produce paleotemperatures  $6.9 \pm 0.4$  °C or  $10.4 \pm 0.6$  °C lower than today, respectively. Financial support by TÜBİTAK 116Y155 and ANSTO (AP11366) projects are greatly acknowledged.

