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BOOK OF ABSTRACTS



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THE WEATHERING OF ROCKS AND SOIL ORGANIC MATTER FORMATION IN THE ALPINE TERRAIN DEPENDING ON ALTITUDE, THE HIGH TATRAS, SLOVAKIA

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The aim of this study is to determine the development of weathering in the alpine terrain depending on altitude. The basic physical and chemical properties of soil, mineralogy of soil and clay fraction and $\delta^{13}\text{C}$ of organic matter were determined for that purpose. The study of mineral composition (XRD analysis) was also performed with the aim to track source areas for mountain lakes (tarns) sediments (Veľké Hincovo pleso, 1946 m a.s.l., Biele pleso, 1612 m a.s.l. and Popradské pleso, 1494 m a.s.l.). The contribution belongs to complex paleolimnological study of High Tatras tarns with aim to determine a timing of the glacier disappearance and amplitude of climatic and ecological changes on the glacial/interglacial boundary (<http://www.geo.sav.sk/en/depovyt-apvv-15-0292/>).

The samples were collected along the altitudinal gradient from 1540 to 2350 m a.s.l that includes four altitudinal zones: supramontane zone with tree line at 1550 m a.s.l. (one sample), subalpine zone (1550-1850 m a.s.l.) with dwarf pine (*Pinus mugo*; tree samples); alpine zone (1850-2300 m a.s.l.) with rocky terrain and alpine meadows without trees (one sample) and subnival zone (over 2300 m a.s.l.) with rocky terrain and occasional snow also during the summer months (one sample). The bedrocks of studied areas are dominantly biotite-muscovite granodiorites to granites and biotite tonolite to granodiorites and glacier sediments derived from mentioned rocks [1]. The only difference is sample from Belianska kopa (1832 m a.s.l.). This bedrock is composed by Anisian and Ladinian dolomite [1]. The soils studied profile were dominated by undeveloped leptosols (rankers) and partly by podzol (determined base on FAO, [2]). The similar soil groups were defined by Kopáček et al, [3]. The initial stages of soil development are caused by their young age, the glacier retreat are predicted about 10000 cal BP and by alpine climate.

The values of $\delta^{13}\text{C}$ from the first six analysed soil samples range from -24.19 to -25.91. There is weak hint of a relationship of $\delta^{13}\text{C}$ and altitude in soil on granitic bedrocks. The increasing of $\delta^{13}\text{C}$ values with increasing of altitude, however, has to be confirmed by other measurements. Our other preliminary results shows that soil pH slightly increase with altitude and depth of soil profile. The soil pH is strongly dependent on bedrock. Any relationship between of Corg amount and the $\delta^{13}\text{C}$ was observed.

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References

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