

Climatic settings of Carpathians' treelines

Abstract

Alpine treeline ecotone is phenomenon widely studied around the world. Its shift to greater altitudes is connected mainly with climatic changes recently. However, many authors take into account changes in landuse as well. The aim of this thesis was to depict dynamics of treeline and factors influencing temperature metrics which delimitate advancing of the treeline to higher altitudes. For 6 sites within Carpathians were found the uppermost positions of treeline and several temperature metrics based on available meteorological data were calculated for these locations. Results of calculated thermal metrics revealed that treeline positions in most of the studied areas are situated at altitudes under their climatic limit. Varful Omu with $T_{\text{JUN-SEP}} = 7,1 \text{ }^{\circ}\text{C}$ was the only one location which meets the stated interval of minimal mean temperatures for growing season (Paulsen & Körner 2004) necessary for tree growth. This fact points out that treelines found within Carpathian Mts. are under pressure of other limiting factors than thermal ones. Persistent anthropogenic activities have a significant influence on treeline positions in some regions of Carpathian Mts. Altitudes of treeline stands are most negatively influenced by human activities in the Western and Eastern Carpathians. Results of calculated thermal metrics were compared with other European mountain ranges and possible inaccuracies and uncertainties regarding thermal metrics of treelines within Carpathians were discussed.

Key words: treeline, Carpathians, vegetation, temperature metrics, landuse