

CLIMATE CHANGE DRIVES PLANT SPECIES COMPOSITION SHIFT IN THE FLORA OF THE TATRY MOUNTAINS SUMMITS OVER PAST 100 YEARS

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Many studies find that recent shifts in alpine plant species composition are often explained by an increase in air temperature resulting from climate warming. The most dramatic temperature increase took place from the 1950s onward in parallel with the rapid global increase in industrial development. However, very few detailed studies were carried out within the highest parts of the Carpathians. The aim of this study was to evaluate whether alpine flora of summits in the Tatra Mountains has changed over the last 100 years, and if observed changes could be explained by climate change. Historical data on the flora of the investigated summits dates back to the years 1878-1948. We resurveyed the flora of 14 mountain summits in 2014. To find whether climate change has influenced changes in the floras of mountain summits in the Tatra Mountains we used climatic data from the Meteorological Observatories on Kasprowy Wierch and Łomnica summit. We used ordination methods to quantify changes in species composition. To check whether there are changes in the mean value of ecological indicators between the two sampling periods we used a paired t-test. Changes in alpine flora were greater on lower-elevation summits. On higher elevation ones the share of warm-demanding species decreased. Average values for temperature, soil moisture and trophism ecological indicators changed significantly over time. Climate change influenced the species composition changes on the higher-elevation summits in a considerable way over the timescale of our resampling.

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