

Abstract

Relic Swiss stone pine forests were among the least studied plant communities in the Carpathians. These forests were distinguished as a separate plant association *Cembro-Piceetum* by Myczkowski (1970). Nevertheless, due to an insufficient number of data their syntaxonomical status was arguable. Matuszkiewicz (2008) included all of the patches of *Pinus cembra* forests in the Tatras into upper montane spruce forests *Plagiothecio-Piceetum*, limited only to the High Tatras and granite substrate. Moreover, the structure of Swiss stone pine stands was sparsely described in the Tatras. Therefore, the aim of this study was to settle the syntaxonomical status of *P. cembra* forests in the Tatras (Zięba et al. 2018), determine their distribution, habitat conditions, including the verification of their occurrence on the limestone (Zięba et al. 2019), as well as a description of the stand structure (Zięba et al. 2020).

We made 108 relevés (Braun-Blanquet 1964) in the entire distribution of *Pinus cembra* in the Tatras (Zięba et al. 2018). Furthermore, we mapped their patches (Zięba et al. 2019) based on the topographic method (Faliński 1990). Data regarding the stand structure were collected on the 8 circular plots (5-are) from the permanent sampling grid (500 m x 500 m) of the Tatra National Park (Bodziarczyk et al. 2019).

Numerical classification of collected relevés showed that *P. cembra* forests in the Tatras are distinct plant communities from the *Plagiothecio-Piceetum* (Zięba et al. 2018). Swiss stone pine forests growing on the silicate part of the Tatras are similar to their counterparts from the Alps and should be treated as one association, common for these two mountain ranges, *Vaccinio-Pinetum cembrae*. Swiss stone pine forests grow also on the limestones, where they form association *Swertio perennis-Pinetum cembrae* ass. nov. (Zięba et al. 2018). The total area of the *P. cembra* forests in the Tatras is 917 ha (166.38 ha in the Polish Tatras). These forests occur in all parts of the Tatras: High, Belianske and Western Tatras as well as on various types of substrate. Swiss stone pine forests prefer steep slopes, with Western exposure, located along the timberline (1300-1650 m a.s.l.) (Zięba et al. 2019). Mean tree density in these forests reaches 618 stems/ha, whereas basal area 23.17 m²/ha. Species composition of Swiss stone pine forests is much more diverse in comparison to the upper montane spruce forests. The stand is dominated by *Pinus cembra* and *Picea abies*, with admixture of *Sorbus aucuparia*, *Betula pubescens* subsp. *carpatica*, *Larix decidua* and *Salix silesiaca* (Zięba et al. 2020).

Key words: *Pinus cembra*, subalpine forests, *Vaccinio-Pinetum cembrae*, *Swertio perennis-Pinetum cembrae*, Natura 2000 habitat, geobotany, habitat modelling