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# Water capacity of red-stemmed feathermoss (Pleurozium schreberi Mitt.)

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Mosses (bryophyta) have the ability to absorb and retain large amounts of water. This property results from the specific way in which these organisms uptake, conduct, and store water.

The aim of the study was to investigate the water storage capacity (S) of red-stemmed feathermoss Pleurozium schreberi (Mitt.) in the fresh state (current capacity) and after drying (maximum capacity), depending on the initial moisture content, and depending on the percentage of the various structural parts of the moss sample which included soil.

Forty moss samples of equal size were used in the study; they were sprayed with a constant dose of water in laboratory conditions. The actual water capacity was obtained from the difference in the weight of the sample after spraying with a constant dose of water, and the weight of the sample in the fresh state. After the stimulated rainfall cycle, the samples were divided into individual fractions (part with green leaves, stalks and rhizoids, and soil) and dried in an airoven for 24 hours at 105$^{o}$C.

The weight of the dry sample, the initial moisture, the maximum water capacity, and the current water capacity were calculated. The analyses conducted led to the conclusion that water capacity of moss is extremely important for the water cycle as it retained, on average, as much as 29% of the total rainfall.

The initial moisture depends above all on the amount of soil that dominated the entire sample volume. **Retention capacity of the moss must be higher than that of the soil, as each additional gram of soil reduced the initial moisture content of the samples.**

**Experiments have additionally shown that the higher the initial moisture, i.e. the more water in the fresh moss samples collected with the soil lump, the higher the maximum capacity.** The calculated maximum water capacity relates to the dry weight of the entire sample. This conclusion can be compared to the water properties of soil where the wetter fresh soil is able to retain more water, and the excessively dry soil becomes hydrophobic.

**In turn, the higher the initial moisture, the less water is retained in the fresh moss sample after rainfall.** This observation is similar to the actual situation that occurs in natural conditions,

e.g. in a forest. This may be due to the fact that the more water is contained in the moss assimilation apparatus, the higher the cell turgor pressure, which makes the surface tighter. The moss absorbs water from the atmosphere, and the largest increases in retained water are recorded for drier samples. This may also result from external and internal structure of moss, which is different than in vascular plants. The leaves of bryophytes have characteristic vertical rows of cells of the collenchyma on their upper surface. Such arrangement of cells promotes water absorption.

The obtained results remain in line with the research on the hydrological properties of forest ecosystems, and they show that the role of moss in the forest is very important but not yet fully understood.