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Title: *Distribution and diversity of Tardigrada along altitudinal gradients in Hornsund (Spitsbergen)*

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Tardigrada, commonly known as water bears, are microscopic (50-1200 µm) metazoans with a global distribution. Although widely distributed and being important elements of extreme ecosystems, not much is known about their ecology. The aim of our study was to investigate distribution and diversity patterns of tardigrades along altitudinal gradients. The study area was located in West Spitsbergen on the northern coast of Hornsund. During the survey two transects were established and sampled along altitudinal gradients on slopes of Ariekammen and Rotjesfielled, from their foothills to summits, at ca. 50 m altitude intervals along the gradient. Both slopes had a southern exposure. At each altitude 3-5 moss and lichen samples were collected from different substrates (e.g. rock, soil) at least a few meters away from each other. The variation in species composition and its relationship to environmental variables was analysed using Detrended Canonical Correspondence Analysis (DCCA).

In total 59 samples were collected, 38 on Ariekammen and 21 on Rotjesfielled. In all these samples 1143 tardigrades belonging to 32 species have been extracted. Species richness in positive samples (α diversity) ranged from 1 to 9 species per sample. Species richness increased significantly with altitude (Pearson's correlation; r^2=0.444, p=0.025), but surprisingly altitude had no effect on tardigrade abundance (Pearson's correlation; r^2=0.002, p=0.890). According to the results of DCCA, altitude was the most important factor influencing tardigrade communities in the investigated area. *Platicrista angustata*, *Macrobiotus crenulatus*, *M. hufelandi hufelandi* and *Hypsibius pallidus* dominated lower elevations whereas *Richtersius coronifer*, *Paramacrobiotus areolatus*, *Pseudechiniscus suillus* and *Milnesium asiaticum* prevailed in samples collected from higher plots.