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## **Thema**

Kommission III: Bodenbiologie und Bodenökologie

Die Rhizosphäre: Ein Hotspot biogeochemischer Prozesse in Waldböden

## **Autoren**

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## **Titel**

Biogenic weathering bridges the nutrient gap in pristine ecosystems - a global comparison

## **Abstract**

In many pristine ecosystems there seems to be negative nutrient budget existent, meaning that export exceeds the input received by aeolian deposition and physico-chemical weathering. Such ecosystems should degrade rather quickly, but are often found surprisingly stable on the long run. Our hypothesis was that this nutrient gap is an artefact caused by not considering the contribution of photoassimilatory-mediated biogenic weathering to the overall nutrient input, which might constitute an additional, energetically directed and demand driven pathway. Here, we firstly evaluated the evolution of mutualistic biogenic weathering along an Antarctic chronosequence and secondly compared the biogenic weathering rates under mycorrhized ecosystems over a global gradient of contrasting states of soil development. We found the ability to perform biogenic weathering increasing along its evolutionary development in photoautotroph-symbiont interaction and furthermore a close relation between fungal biogenic weathering and available potassium across all 16 forested sites in the study, regardless of the dominant mycorrhiza type (AM or EM), climate, and plant-species composition. Our results point towards a general alleviation of nutrient limitation at ecosystem scale via directional, energy driven and on-demand biogenic weathering.