# Lithologic Influences on Mycorrhizal Weathering

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Mycorrhizal fungi are important components of nutrient cycling in the terrestrial ecosystem. Both ectomycorrhizal (EcM) and arbuscular mycorrhizal (AM) symbioses can provide their host plants access to nutrients by weathering minerals in the soil. The relative effectiveness of AM and EcM fungi at weathering is uncertain, with some field studies arguing that AM and EcM fungi both contribute to weathering processes (Remiszewski et al., 2016; Koele et al., 2014) while Smits et al., (2014) argued EcM fungi may inhibit weathering. Here we tested weathering patterns in a controlled growth chamber setting with AM and EcM symbioses across two lithologies. The results of this study address the hypotheses that a) weathering is enhanced in rocks containing minerals with plant necessary nutrients, and b) weathering is enhanced in microcosms that contain EcM symbioses versus those with AM symbioses. Elemental concentrations were measured and elemental enrichment factors were calculated for AM and EcM samples grown on a nutrient-rich (marl) and nutrient-poor (granite) lithology. The data suggest that AM weathering can be important when grown on nutrient-poor lithologies. Rare Earth elements (REE) were also measured as markers of mineral weathering. Depleted europium (Eu), indicative of enhanced weathering, was seen in AM but not EcM symbioses. Together with elemental enrichment data this finding supports the idea that rock type influences mycorrhizal weathering, with nutrient-poor lithologies requiring active weathering by mycorrhizal fungi.