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Evidence of novel plant-species specific ammonia oxidizing bacterial clades in acidic South African fynbos soils

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ABSTRACT

Ammonia-oxidizing bacteria (AOB) are essential in the biogeochemical cycling of nitrogen as they catalyze the rate-limiting oxidation of ammonia into nitrite. Since their first isolation in the late 19th century, chemolithoautotrophic AOBs have been identified in a wide range of natural (e.g. soils, sediments, estuarine, and freshwaters) and man created or impacted habitats (e.g. wastewater treatment plants and agricultural soils). However, little is known on the plant-species association of AOBs, particularly in the nutrient-starved fynbos terrestrial biome. In this study, we evaluated the diversity of AOBs in the plant canopy of three South African fynbos-specific plant species, namely *Leucadendron xanthoconus*, *Leucospermum truncatulum* and *Leucadendron microcephalum*, through the construction of *amoA*-gene clone libraries. Our results clearly demonstrate that plant-species specific and monophyletic AOB clades are present in fynbos canopy soils.