

Protozoa increase mineralization of nitrogen from organic patches for mycorrhizal uptake and translocation to *Plantago lanceolata*



TECHNISCHE

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BACKGROUND

- It is generally assumed that the heterotrophic arbuscular mycorrhiza (AM) ameliorate the supply of mineral nutrients for the plant in exchange for photosynthetically fixed carbon.
- Bacterivorous protozoa release mineral N from consumed bacterial biomass ('microbial loop'), which may be translocated by AM-mycelium to plant roots.

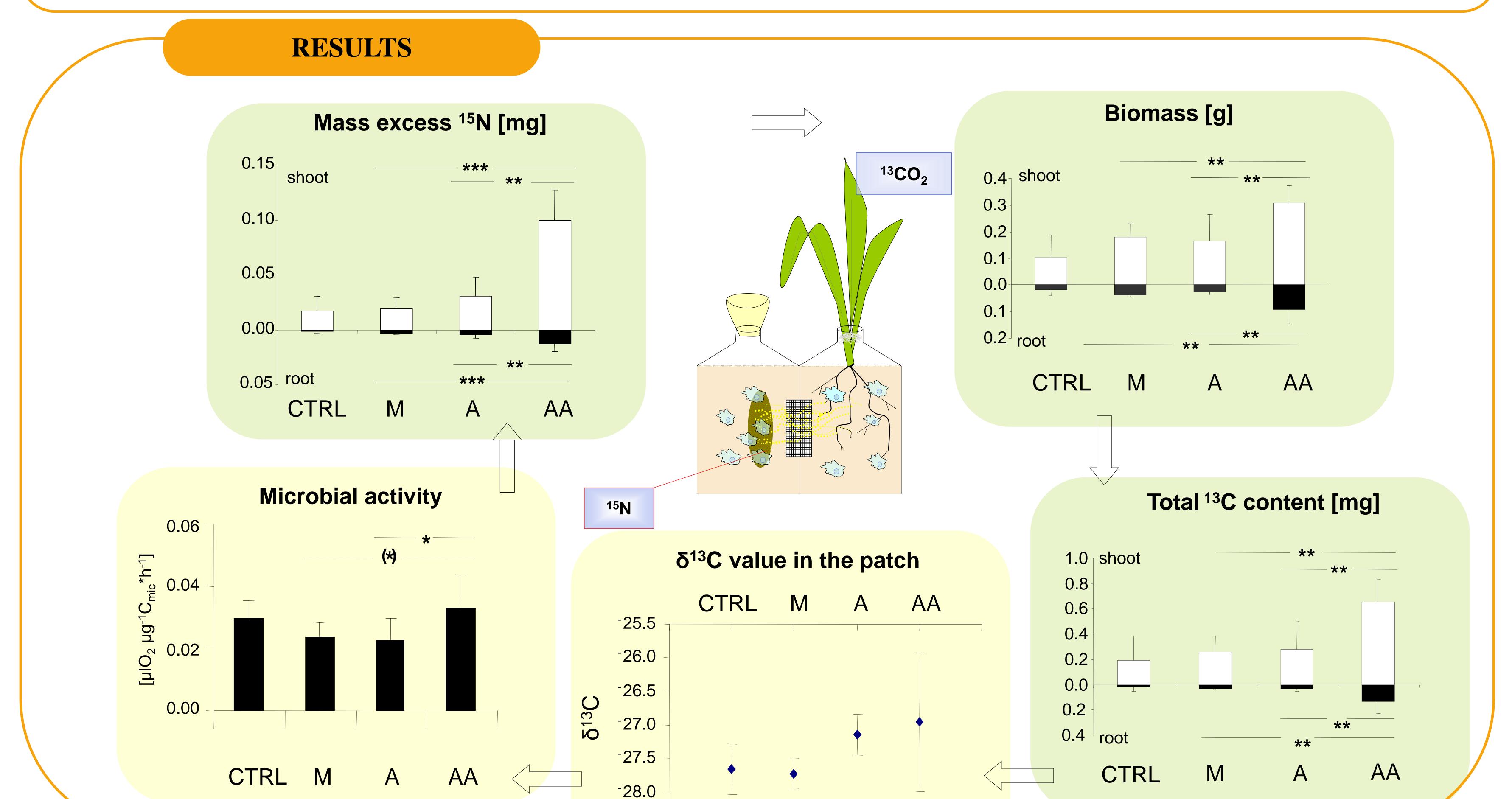
OBJECTIVES

What is the AM function in the nitrogen nutrition of plants in response to

(a) plant C investments, growth and morphology?(b) trophic interactions with free living rhizobacteria and their grazers?

CONCLUSION

- AM was unable to mineralize N_{org}, but has transferred N released from consumed bacterial biomass during amoebal grazing to the host plant
- Protozoa increased transfer of recently fixed C to -and mineralization of N from organic patches for mycorrhizal uptake and translocation to Plantago lanceolata.
- only the additional presence of protozoa in the rhizosphere caused a 'win-win' situation for all partners in the protozoa mycorrhiza - plant symbiosis



-28.5

MATERIAL & METHODS

Microcosms with different microbial communities were established:diverse natural bacterial community

- Glomus intraradices colonized Plantago lanceolata
- free-living naked amoeba Acanthamoeba castellanii

• ¹⁵N labelled nutrient patch \rightarrow plant's foraging capacity for N • ¹³CO₂ shoots pulse labelling \rightarrow plant's C allocation to the patch

(For more information on pulse labelling, see poster by C.Robin)

I. Control (CTRL) : no access of AM into the litter patch

TREATMENTS

II. Mycorrhiza (M): free access of AM into the litter patch

III. Amoeba (A): Free access of AM into the litter patch + Amoeba in the litter patch

IV. Amoeba Amoeba (AA): Free access of AM into the patch and AMO in litter patch and root compartment