

MWP – Young Researcher Abstract 2024

Project title: Nitrogen-fixing bacteria inside Scots pine needles	
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Abstract (approx. 200 words): The main factor limiting tree growth and productivity in the Scandinavian boreal forest is nitrogen. The tree growth can be improved by inorganic nitrogen fertilization of forest plots, but not without some negative environmental effects. However, conifer needles can host bacteria capable of nitrogen fixation, which transform atmospheric nitrogen into a form accessible by the plants. My research is focused on better understanding if these bacteria are present in the needles of Scots pine trees, their abundance, nitrogen fixation rates inside the needle tissues and if they are affected by forest nitrogen fertilization. Additionally, my research includes the isolation of several different nitrogen-fixing bacteria and their characterization. A better understanding of the nitrogen-fixing bacteria and their activity in conifer needles could potentially lead to their application in the forestry sector to help overcome the chronic nitrogen limitation present in the boreal forest. The isolated naturally present nitrogen-fixing bacteria could be used in the future as a more sustainable and environmentally friendly alternative to inorganic nitrogen fertilization. Their application in the boreal forests could provide the needed nitrogen for improved tree growth without leading to any negative environmental consequences.	
Key words: Scots pine, needles, diazotrophic bacteria, nitrogen fixation, boreal forest, fertilization	