Effect of combined nitrogenous nutrition and CO_2 concentration in biomass and gene expression profile in *Pinus pinaster*

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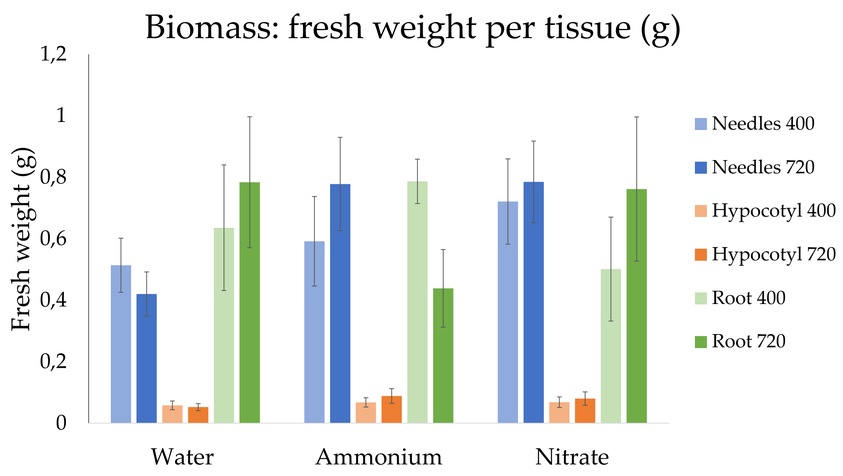
Introduction

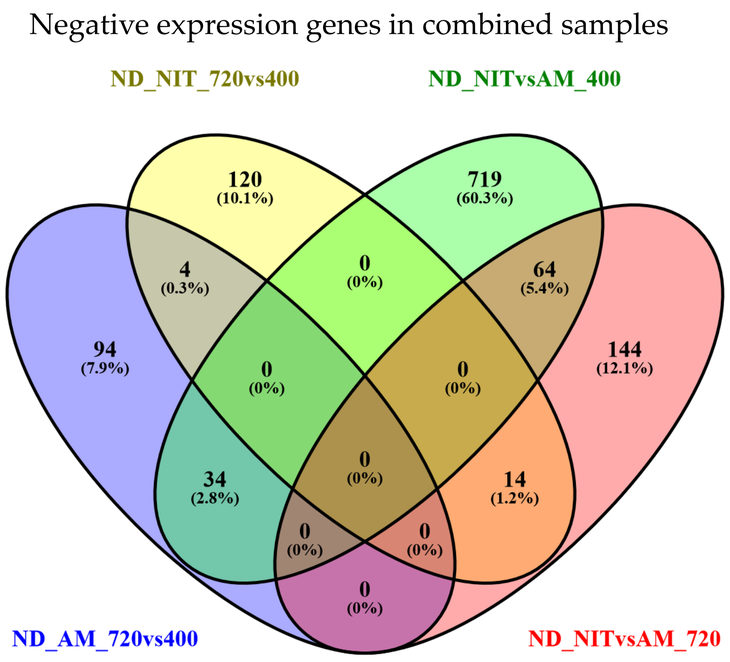
Plants show preference depending on the nitrogen source and, while culture plants prefer nitrate as inorganic nitrogen source, others like conifers show strong preference for ammonium. Given the progressive increase of CO_2 concentration due to human action on environment and its effect on climate change, plants are now on a new environment that seeming propitious, might not be so.

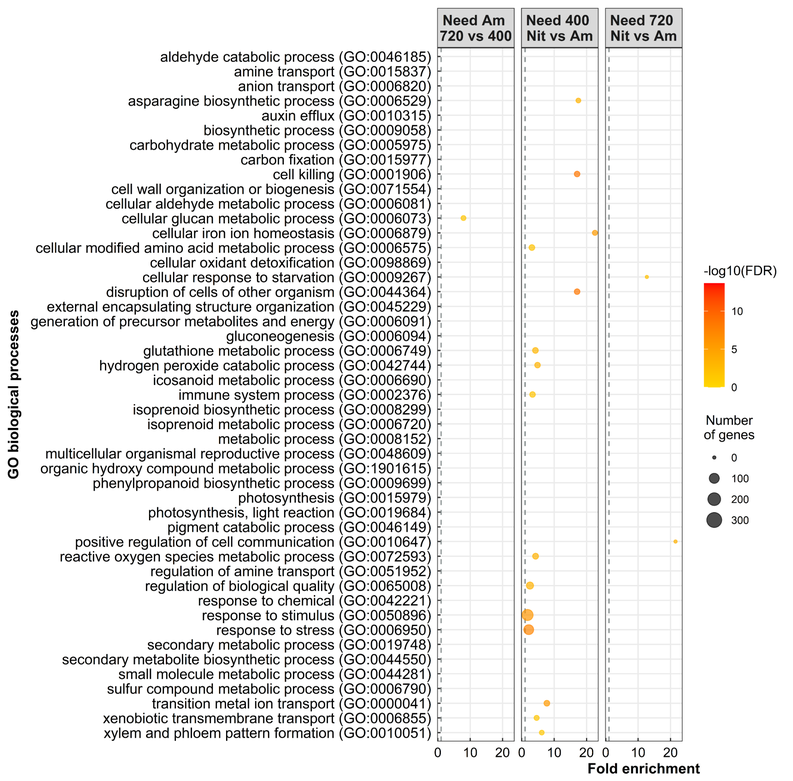
Photorespiration process fixes one O_2 molecule per 2-3 CO_2 molecules, depending on conditions. Although it may seem to be a negative phenomenon for the plant, energy obtained as reducing power is used for the assimilation of nitrate. By this way, plants that have high preference for nitrate also show a reduction in total protein content when exposed to high CO_2 concentration levels, because photorespiration events are reduced, therefore diminishing the reducing power available for nitrate assimilation (Bloom, 2015).

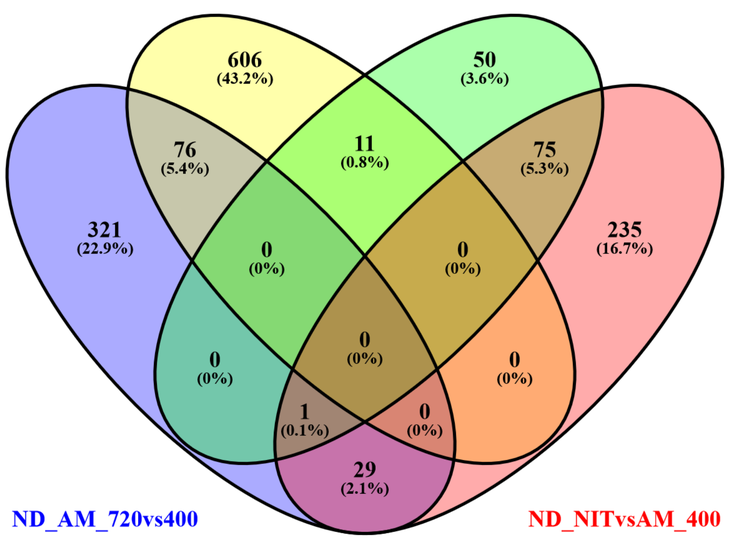
In plants that exhibit preference for ammonium, as previously mentioned conifers, the increase in atmospheric CO_2 promotes photosynthesis and as result, there is a higher production of carbon-based molecules, which results in a greater assimilation of ammonium. Because of that, is essential to determine the mechanisms that are used by plants with ammonium preference to be able to transfer them to culture plants ad sustain human nutrition (South et al., 2018).

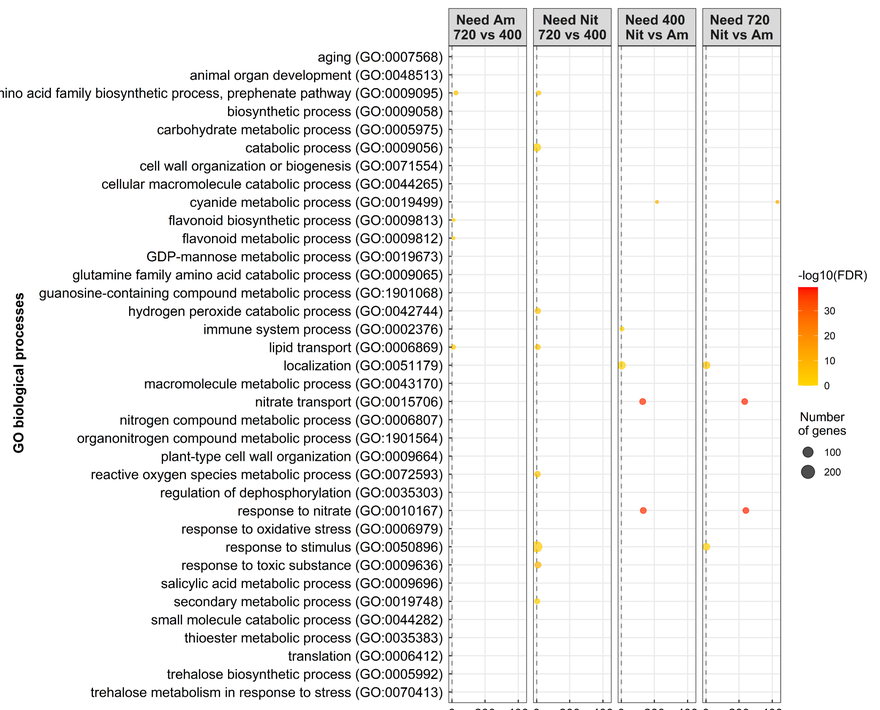
The goal of this project is to determine the preference of the conifer *Pinus pinaster* for ammonium or nitrate in different CO_2 concentrations and research on possible genes responsible for its assimilation in high CO_2.

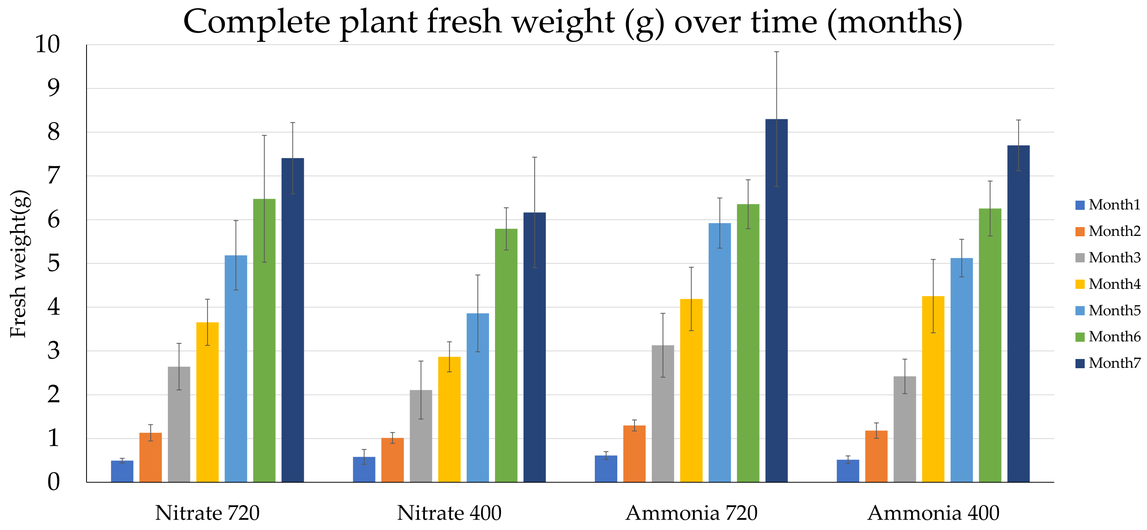


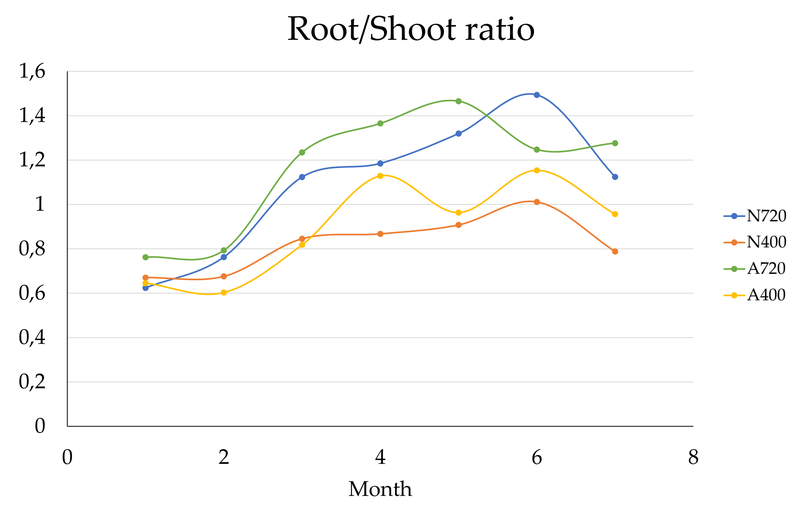












Bloom AJ. Photosynth Res. 2015 Feb;123(2):117-28. *South PF et al. J Integr Plant Biol. 2018 Dec;60(12):1217-1230.*

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