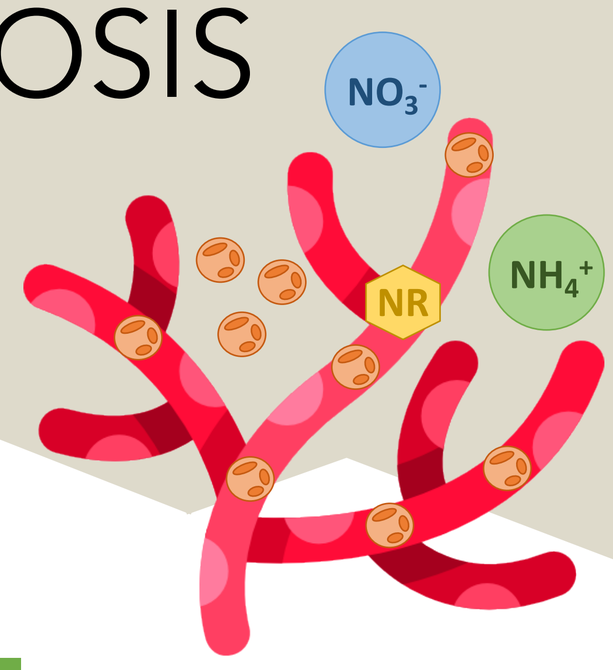
NITRATE IN THE CORAL SYMBIOSIS

From the regulation of its assimilation to its impact on the physiology of the holobiont



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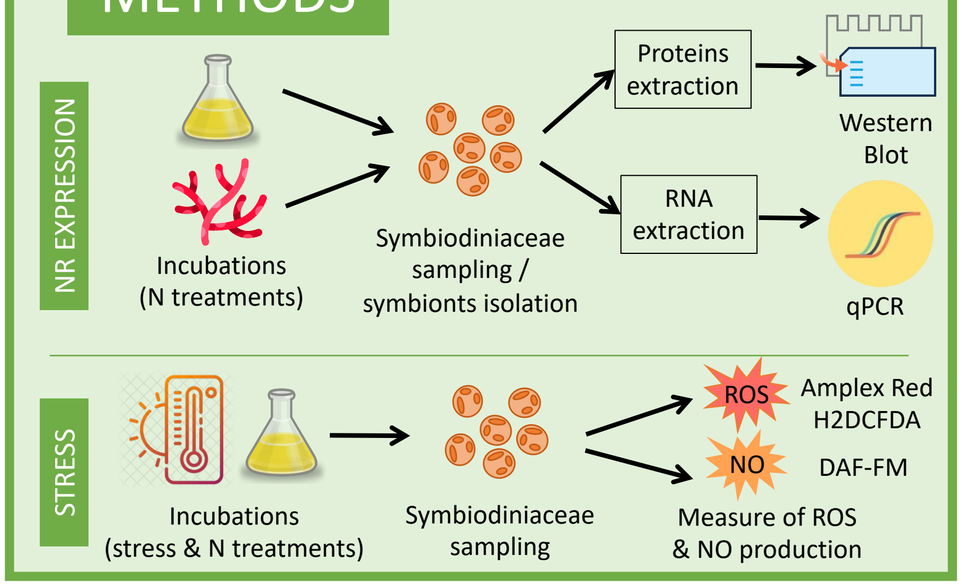
INTRODUCTION

Algal symbionts play vital roles in the assimilation of nutrients by the coral holobiont. Although nitrate (NO_3^-) is the most abundant form of inorganic N in marine environments, few studies have investigated the expression and regulation of the enzyme nitrate reductase (NR) in Symbiodiniaceae and the pathways of NO_3^- assimilation.
In addition, evidence of the impacts inorganic N source and availability have on coral resilience to stress remains equivocal.

AIMS

- Decipher **NR expression** and **regulation** in both free-living and *in hospite* symbionts (kinetic of synthesis & degradation, influence of NH_4^+ concentration).
- Investigate the relevance of **inorganic N source** in physiological **responses to stress**.

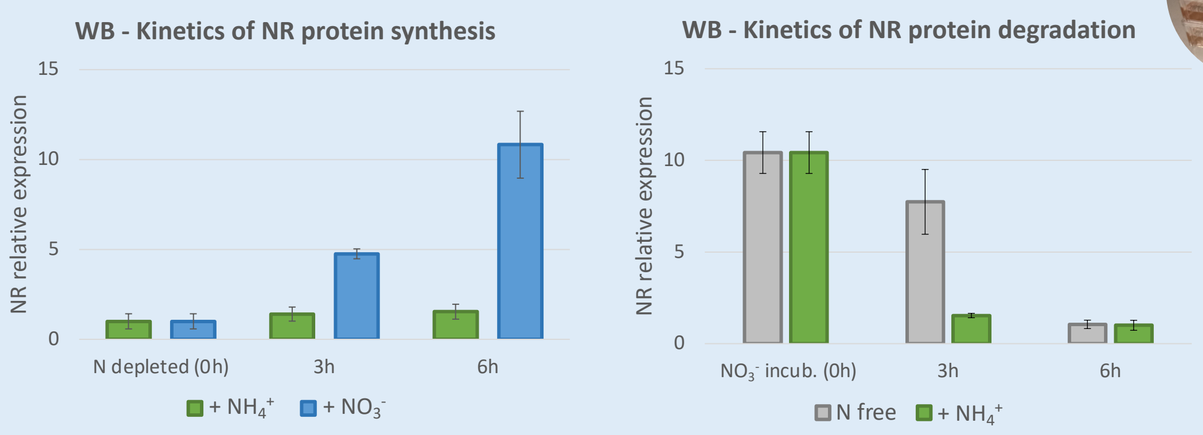
METHODS

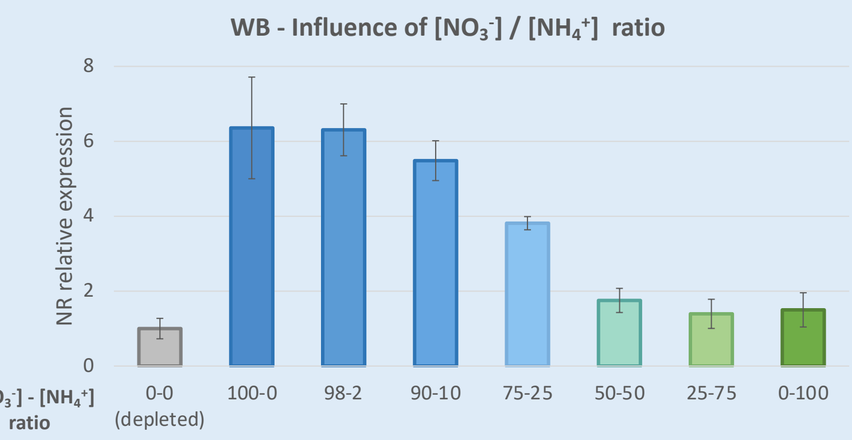


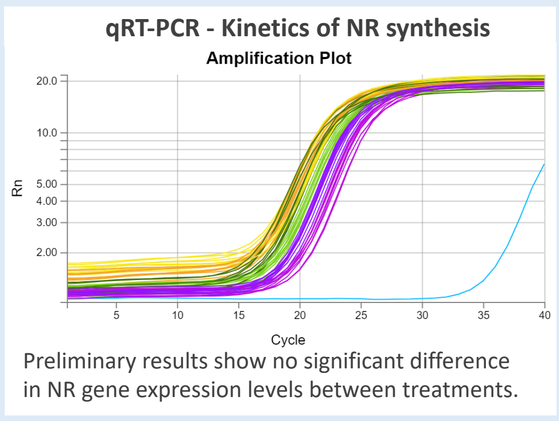
RESULTS

NITRATE REDUCTASE EXPRESSION

Free-living Symbiodiniaceae

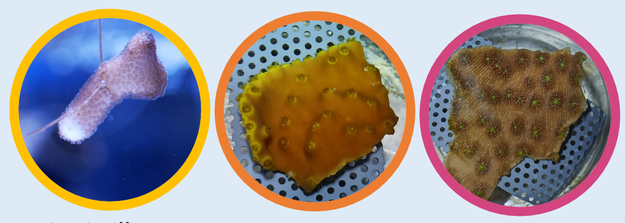


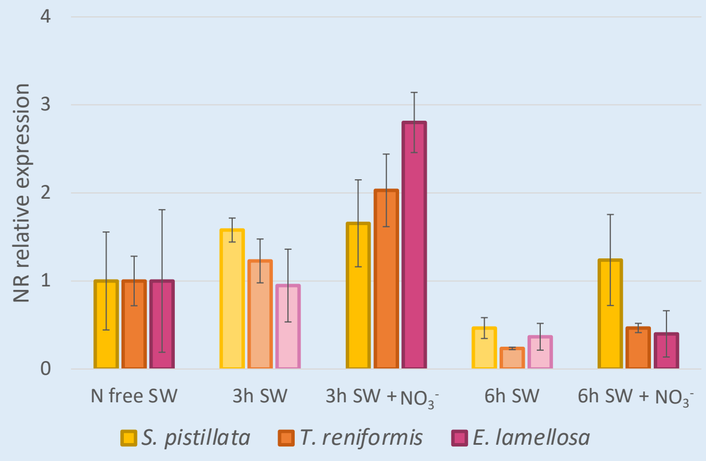




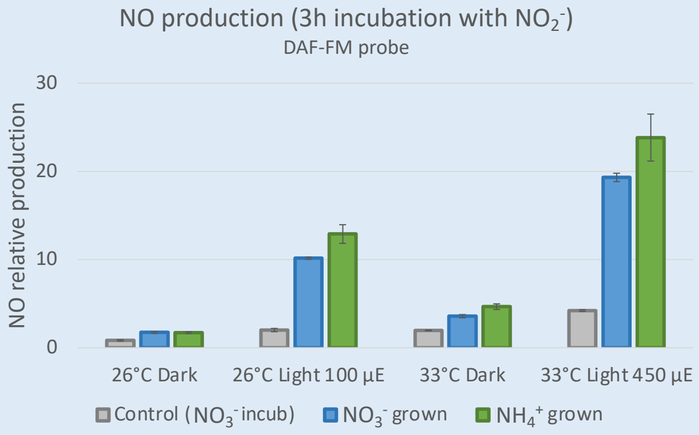
Preliminary results show no significant difference in NR gene expression levels between treatments.

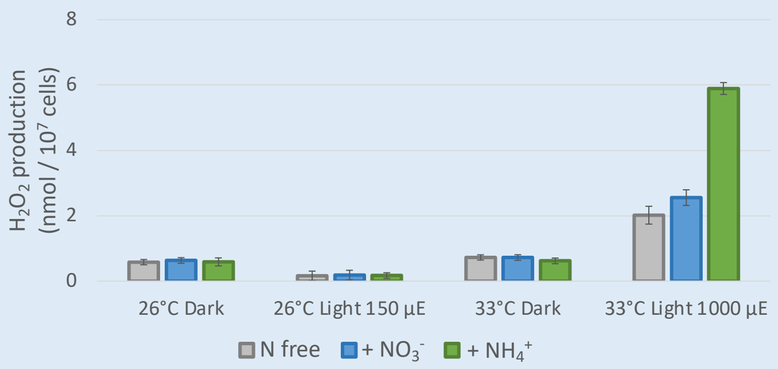
In hospite symbionts

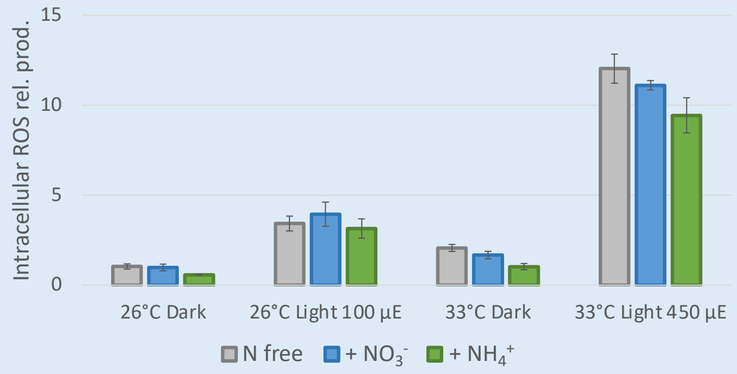




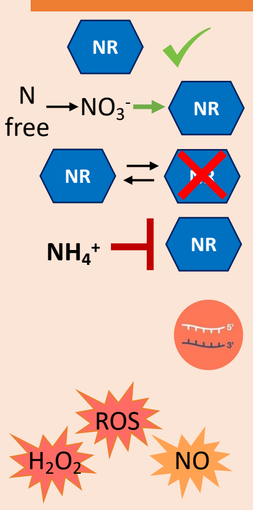
STRESS & N SOURCE







CONCLUSION



- Symbiodiniaceae are capable of expressing NR
- NO_3^- induces the expression of NR in Symbiodiniaceae, especially after N depletion
- NR protein expression / repression is a dynamic and reversible process
- NH_4^+ influences the levels of NR expression and accelerates NR protein degradation in the absence of NO_3^-
- NR protein expression levels are not reflected in NR gene expression levels
- NO, H_2O_2 and intracellular ROS productions in response to thermal and light stress seem to be differentially impacted by the N source

PERSPECTIVES

- Influence of light on NR expression
- Investigating transcriptional vs translational regulation of NR expression
- Refine stress & N source experiment results

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