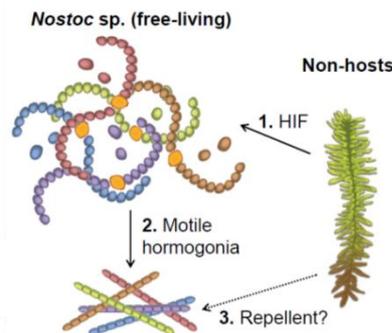


Unravelling the break-up strategies of non-host feather moss

Biological nitrogen fixation by cyanobacteria plays a major role in maintaining nitrogen cycle at the boreal forests. Feather moss present in this ecosystem, supports this process by hosting the cyanobacteria on its tissues. The microbe supplies the host with nitrogen sources in return for carbon, thus establishing a symbiotic relationship. This symbiosis results after a series of signal exchange between the partners. The first signal is observed to transform the cyanobacteria from a vegetative state to an infectious and motile form called hormogonia. The second signal is postulated to guide the bacteria to the feather moss and the third signal(s) are involved in colonization, nitrogen fixation, etc. However, not all cyanobacterial species can colonize and establish this association with the feather moss. The feather moss species only accommodate certain cyanobacterial species and evade communication with other incompetent bacteria. Bay et al. (2013) had reported that this break-up happens only at the later stage of symbiotic interaction. But the structural form of cyanobacterial species and the factors causing this incompatibility were not studied. We hypothesize that a hormogonia repression factor (HRF) is secreted which triggers the bacteria to transform back to vegetative state and this is the reason for symbiotic incompetence. Hence, this MSc project will expand the non-host experimental system and will aim to:

- (i) Study the dynamics of hormogonia during the later stage of this interaction.
- (ii) Identify the hormogonia repressing factor (HRF) or the other signal which is stopping this communication.



Information about me:

I am Kishore Vishwanathan, a new postdoc working under Dr. Marie-Charlotte Nilsson Hegethorn since October 2020. My goal is to identify and characterize all the unknown signals in this amazing symbiosis. This project will be a side project for my research work, helping me to achieve my targets.

Reference:

Bay G, Nahar N, Oubre M, Whitehouse MJ, Wardle DA, Zackrisson O, Nilsson M-C, and Rasmussen U (2013) Boreal feather mosses secrete chemical signals to gain nitrogen. *New Phytologist* 200: 54-60.