MARINE ANIMAL ECOLOGY GROUP

Multiple stress effects on deep-sea sponges.

PhD period:
2016 - 2020

Researcher	Supervisor	Promotor
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Motivation

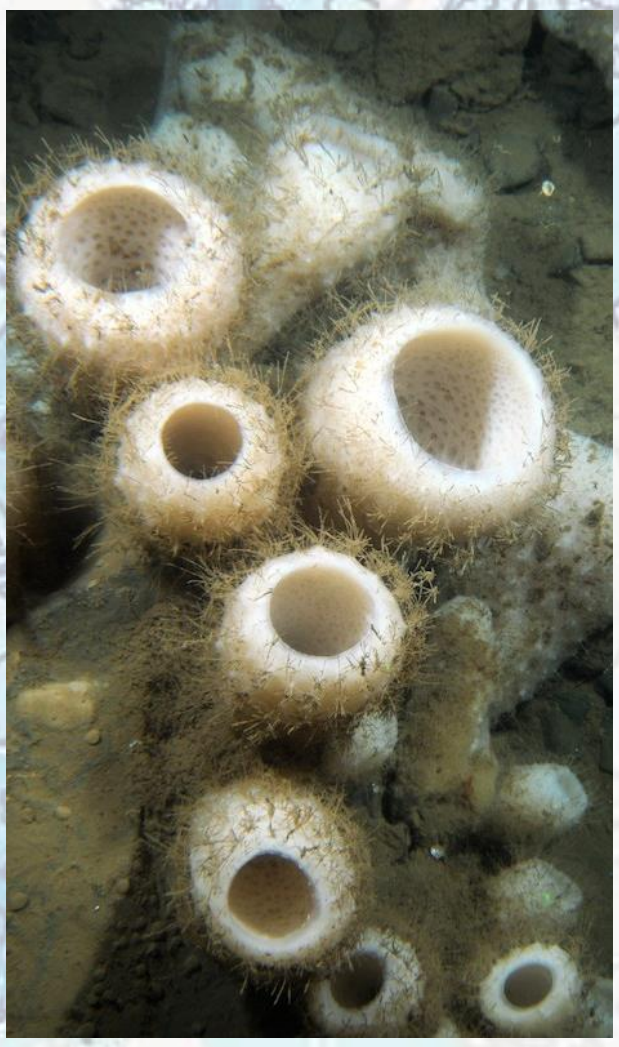
In pitch-black deep-sea environments large sponge aggregations provide a habitat for many invertebrates and economical important fish species by creating three-dimensional structures. These so called “sponge grounds” and “gardens” might have the same ecological importance as reef structures formed by cold-water corals. By filtering and processing thousands of liters of seawater per day, sponge grounds also might influence local or even regional seawater chemistry and properties. To unravel the ecophysiological response of deep-sea sponges to anthropogenic induced environmental changes, my PhD project at Wageningen University and Research focuses on:

Aims and Objectives

1) How does the biological activity of the sponge species *Geodia barretti* and *Vazella pourtalesi* respond to manipulated seawater properties, in particular seawater temperature and pH?
2) How does long-term exposure to different temperature and seawater pH regimes affect the response of sponge individuals to additional short term stressors?
3) How might deep-sea sponge grounds change under the influence of global ocean warming and acidification and local disturbances?

Methods

The experimental basis for my project is the cultivation of choanosomal explants of the deep-sea sponge *Geodia barretti* in a cold-water laboratory. In the unique facilities of Wageningen University and Research sponge explants will be maintained in aquaria with a newly developed DyMiCo filtration unit. The DyMiCo filter actively promotes the development of planktonic bacteria in the system so that an adequate nutrient supply for these cold-water adapted deep-sea sponges is warranted. In treatments with long term (seawater temperature and pH) and short term (low levels of dissolved oxygen, increased levels of silt and crude oil compartments) stress exposure, the ecophysiological response of the sponge species *Geodia barretti* and *Vazella pourtalesi* will be examined by documenting variations in growth-, respiration-, pumping- and clearance-rates. To assess treatment-dependent shifting in the rates of these physiological processes, custom made incubation chambers will be operated.



Several individuals of the deep-water sponge *Vazella pourtalesi* in their natural habitat. © DFO

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Curriculum Vitae

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