



Exploring Biodiversity in a Glass Sponge Reef

Jessica Schultz on a dive off the coast of British Columbia.

Jessica Schultz, a PhD student in Integrative Biology at U of G supervised by Prof. Paul Hebert, is exploring how DNA barcoding can be used to monitor biodiversity in seafloor habitats with a focus on glass sponge reefs that are globally unique to British Columbia.

Based in Vancouver and working as manager of the Howe Sound Research and Conservation branch of Ocean Wise at the Vancouver Aquarium, Jessica says she's working in the only known location where glass sponge reefs are located in waters shallow enough to access by scuba diving.

Glass sponges (Hexactinellida) are a class of sponge that are characterized by skeletons made of silica, she explains. Often found in deep water, they grow as individuals on rock walls or sea floor sediments, and in rare cases, glass sponges form reefs which are structurally similar to coral reefs. Like coral, new sponges will grow on the remains of dead sponges to create a three-dimensional habitat. This sponge reef can support a diverse range of marine life, providing safe living spaces for many fish and invertebrate species.

"Previous biodiversity estimates using camera footage or visual surveys to quantify biodiversity on the reefs likely underestimate the number of species," says Jessica. She says these methods are unable to identify many organisms to the species level, or account for organisms that are hidden within sponge intricacies and sediments. *"DNA barcoding has the potential to unveil an unprecedented level of diversity on these glass sponge reefs."*

While Jessica conducts most of her field work in B.C., she travels periodically to the CBG to use its state-of-the-art Sequel platform to analyze her specimens. This high-throughput sequencing allows Schultz to look for symbionts and other associated organisms.

In the wake of COVID-19, Jessica says she's had to postpone some field work and readjust some research priorities with her colleagues in Vancouver, but is determined to continue to investigate biodiversity in glass sponge reefs as she says her goal is to better understand how improved biodiversity monitoring can inform planning and enhance ecosystem health.

"I feel very privileged to work on a doctorate amid a global crisis," says Jessica. *"I am safe and healthy and very fortunate compared to many, and I look forward to diving into a backlog of desktop analyses and writing in the coming weeks."*



Right: A decorator crab sitting on a glass sponge reef.