

# Microbiome composition in Antarctic and non-Antarctic sponges of several ecoregions

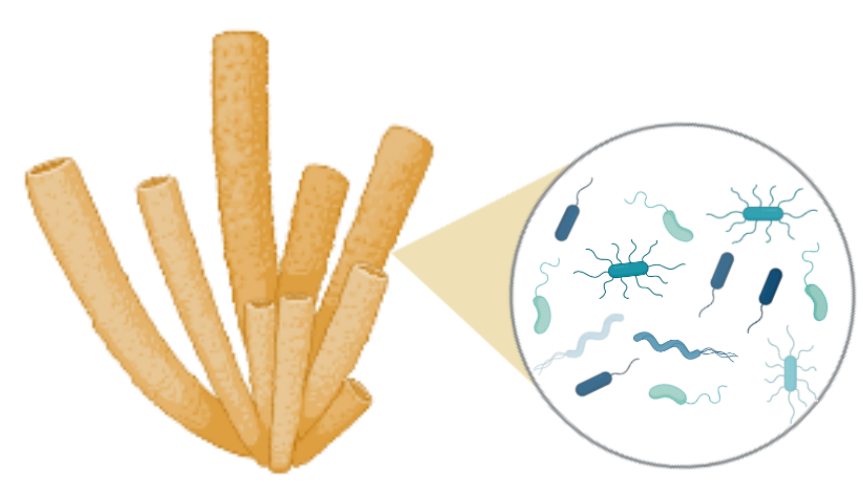


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## Introduction

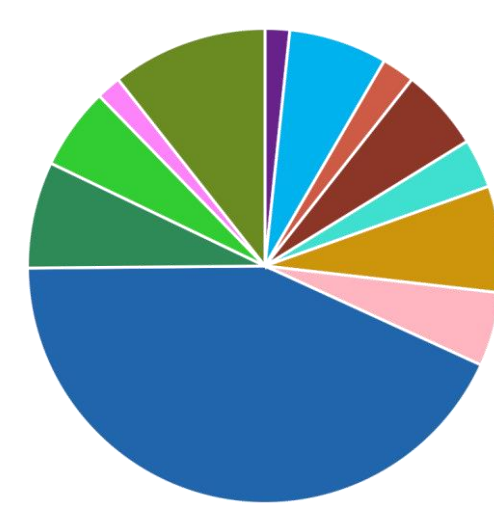
Marine sponges and their microbiomes are ecosystem engineers living in the bottom of seas with a global distribution. However, little is known about the microbiome of polar sponges living in environments that could promote symbiont specialization, such as Antarctica. Here, we compare the microbial composition patterns of Antarctic and non-Antarctic sponges of several ecoregions using the inference of amplicon sequence variants (ASVs).

## Methods

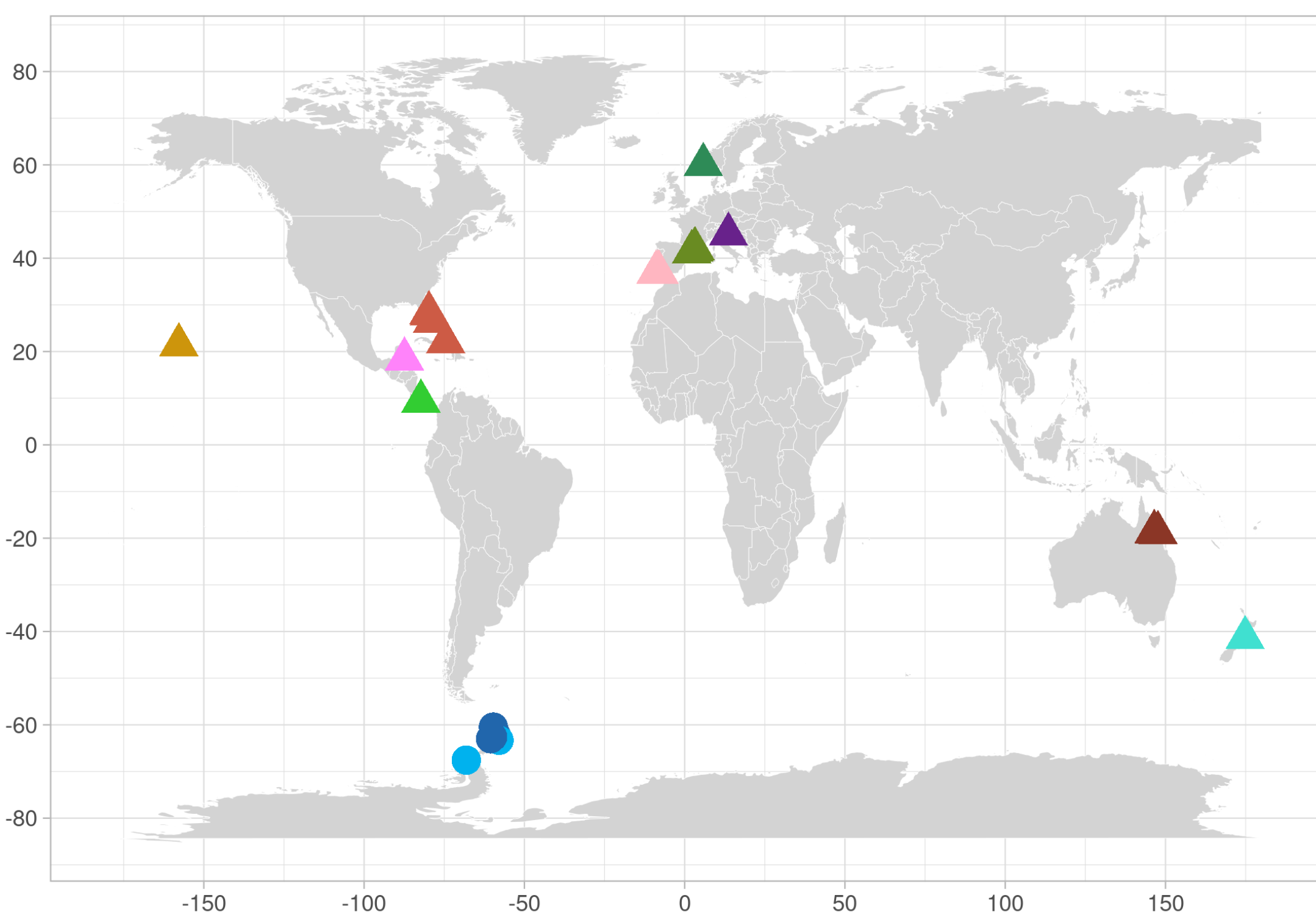
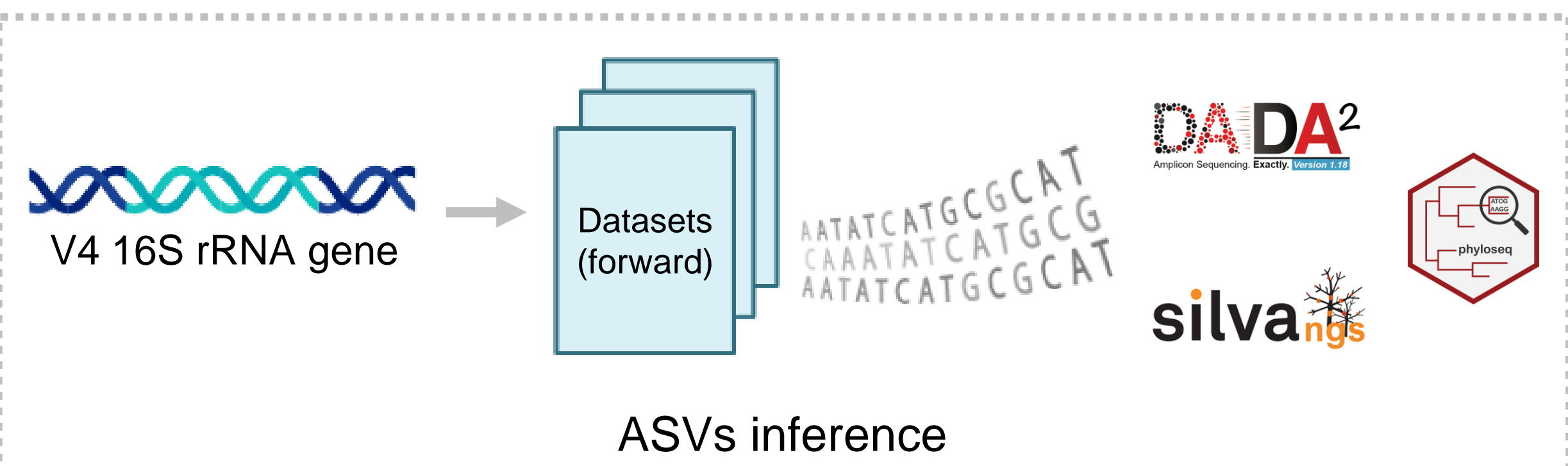


**Sponge Microbiome Project (SMP) sub-dataset selection criteria:**

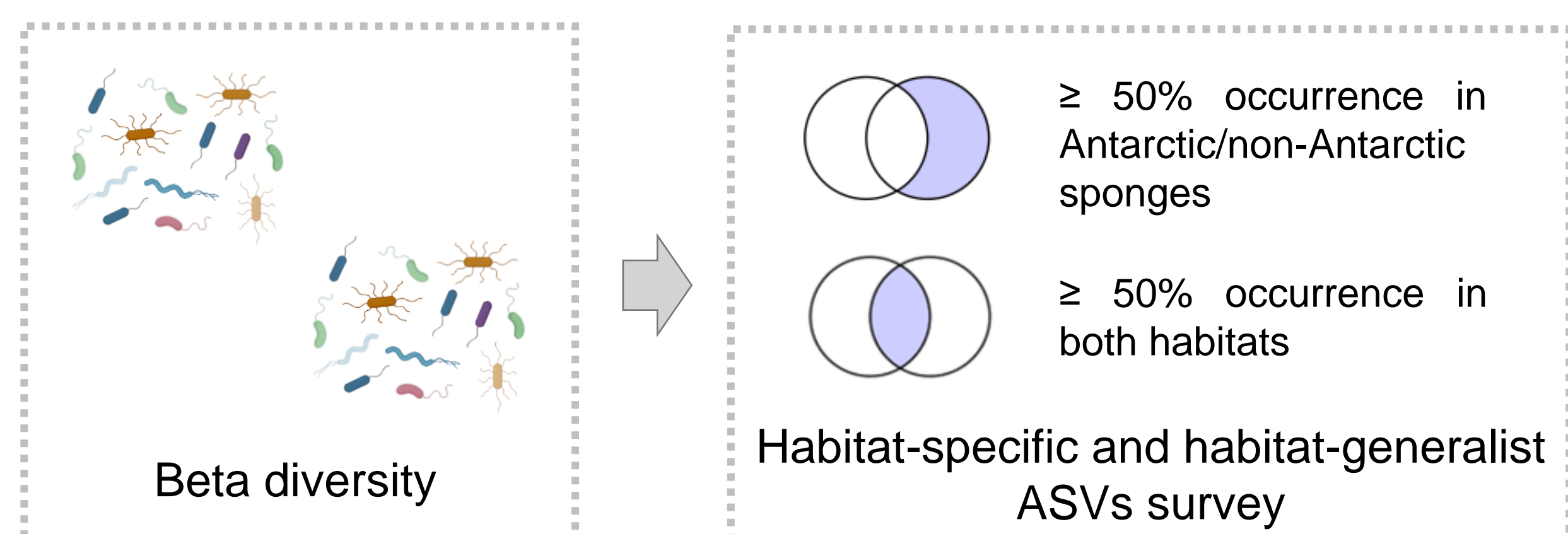
- Matching taxonomy within 16 Antarctic sponge families.
- Healthy individuals.
- Sampling depth <50m



Sponge microbiomes (n=179)



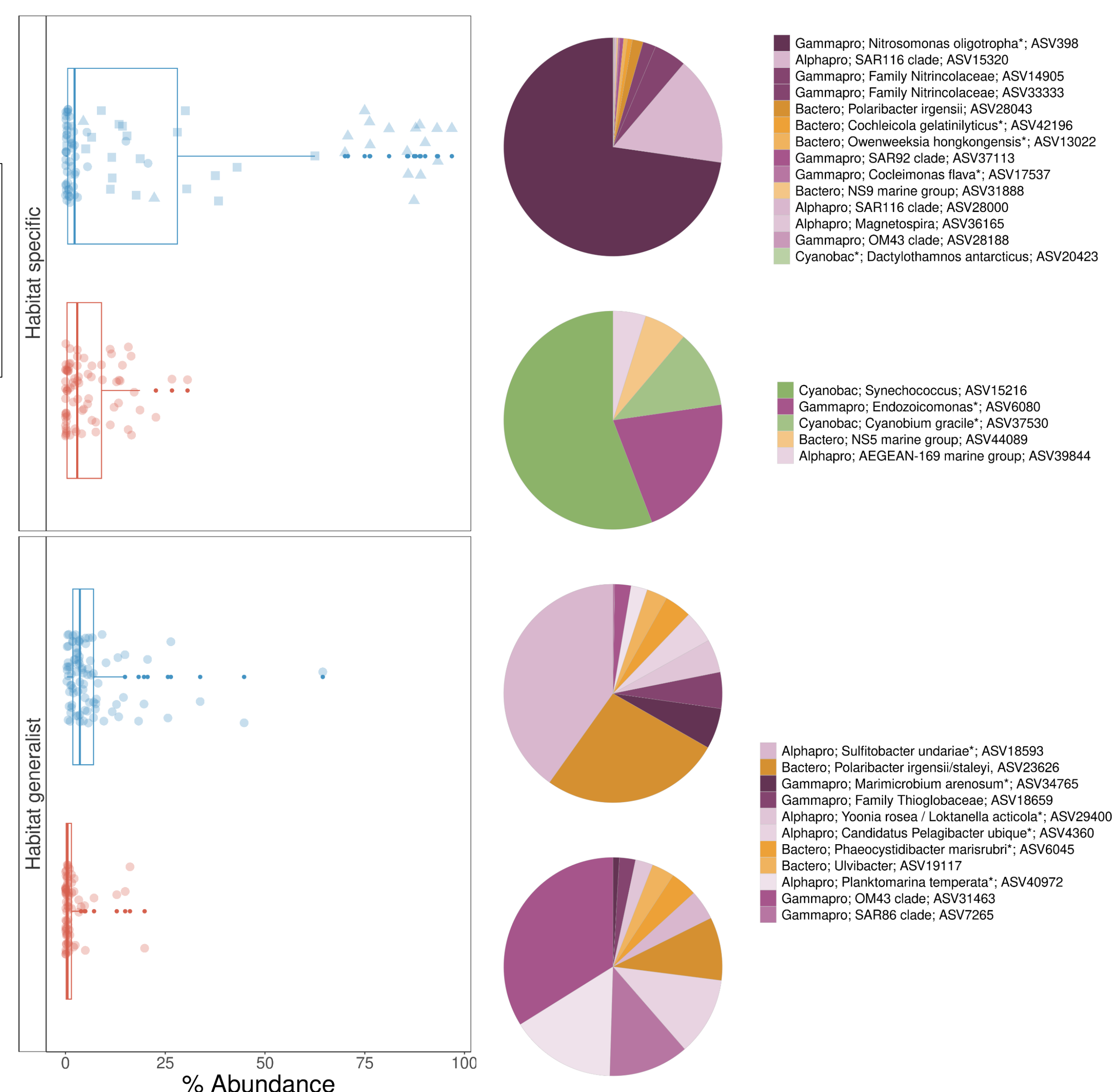
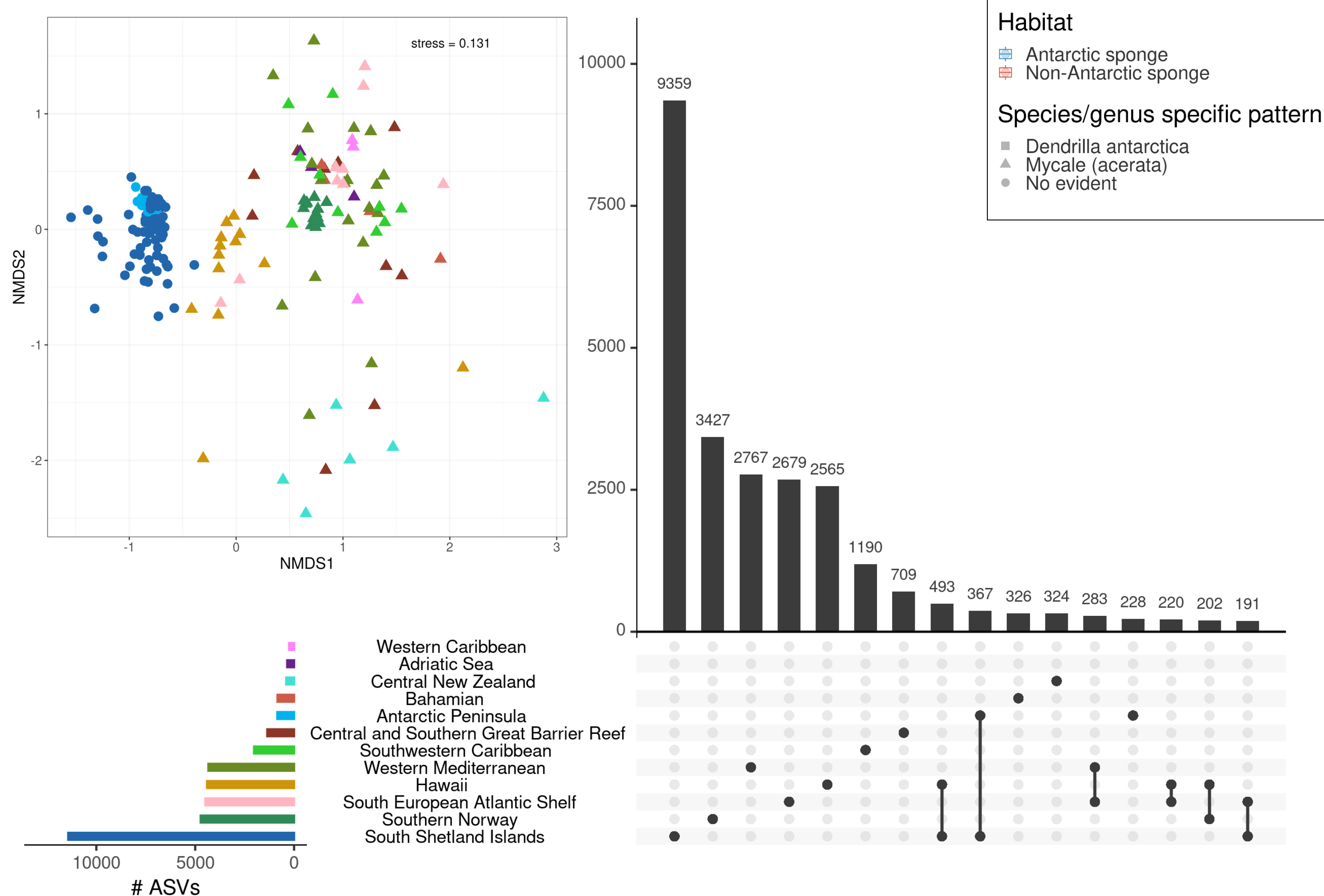
- Habitat**
- Antarctic sponge
  - ▲ Non-Antarctic sponge
- Ecoregion**
- Adriatic Sea
  - Antarctic Peninsula
  - Bahamian
  - Central and Southern Great Barrier Reef
  - Central New Zealand
  - Hawaii
  - South European Atlantic Shelf
  - South Shetland Islands
  - Southern Norway
  - Southwestern Caribbean
  - Western Caribbean
  - Western Mediterranean



**Fig. 1.** Geographical distribution of the sponge sampling and their classification according to the Marine Ecoregions of the World.

## Results

PERMANOVA,  $p=0.001$ ,  $r=0.2405$



**Fig. 2.** Microbiome composition differs between sponges of different ecoregions under dissimilarity-based distances. Antarctic sponges share more ASVs than others, followed by Hawaiian sponges.

**Fig. 3.** Difference in the abundance proportions and taxonomy of the habitat-specific and habitat-generalist bacteria in the microbiomes of Antarctic and non-Antarctic sponges.

## Acknowledgments



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## Conclusions

- The community composition of sponge microbiomes differs between ecoregions, but Antarctic sponge microbiomes are more similar between them than others.
- Habitat-specific and habitat-generalist microorganisms have different taxonomy and abundance patterns in Antarctic and non-Antarctic sponges.