

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Alphabetic listing of the 169 taxonomically identified deep-sea sponge species covered in this study. AphiaID refers to the official species identifier that is used in the World Register of Marine Species.

File Name: Supplementary Data 2

Description: List of 66 sponge species which harboured host species-exclusive ASVs. Species with ≥ 4 sponge individuals are marked in bold.

File Name: Supplementary Data 3

Description: Results of statistical testing (Dunn's tests) conducted to assess variations in microbial alpha diversity (Shannon index) between water masses for the different sample types. The tests were run two-sided and with Bonferroni corrections.

File Name: Supplementary Data 4

Description: Results of statistical testing (two-sided PERMANOVAs based on weighted UniFrac distances) conducted to assess differences in the microbial community composition between water masses for the different sample types.

File Name: Supplementary Data 5

Description: Results of statistical testing (two-sided Mantel tests) conducted to assess correlations between environmental parameters (euclidean distances) and microbial community composition (weighted UniFrac distances) for the three sponge types. Group indicates to which category in the variation partitioning model each of the listed environmental parameters belongs. Parameters belonging to the same group are highly correlated with each other. Only those parameters which turned out to be the most relevant ones in the final variation partitioning models are shown.

File Name: Supplementary Data 6

Description: Results of statistical testing (two-sided PERMANOVAs based on weighted UniFrac distances; 999 permutations) conducted to assess differences in the microbial community composition between sampling locations for the different sample types.

File Name: Supplementary Data 7

Description: Results of statistical testing (Dunn's tests) conducted to assess variations in microbial alpha diversity (Shannon index) between sampling locations for the different sample types. The tests were run two-sided and with Bonferroni

File Name: Supplementary Data 8

Description: Results of statistical testing (two-sided PERMANOVAs based on weighted UniFrac distances; 999 permutations) conducted to assess differences in the microbial community composition between realms for the different sample types.

File Name: Supplementary Data 9

Description: Results of statistical testing (Dunn's tests) conducted to assess variations in microbial alpha diversity (Shannon index) between realms for the different sample types. The tests were run two sided and with Bonferroni corrections.

File Name: Supplementary Data 10

Description: Basic metadata for all samples of the dataset which passed the quality filtering steps.

File Name: Supplementary Data 11

Description: Dates of DNA extraction and names of sequencing runs for all samples of the dataset which passed the quality filtering steps.