

Appendix A: Temporality of biodiversity data

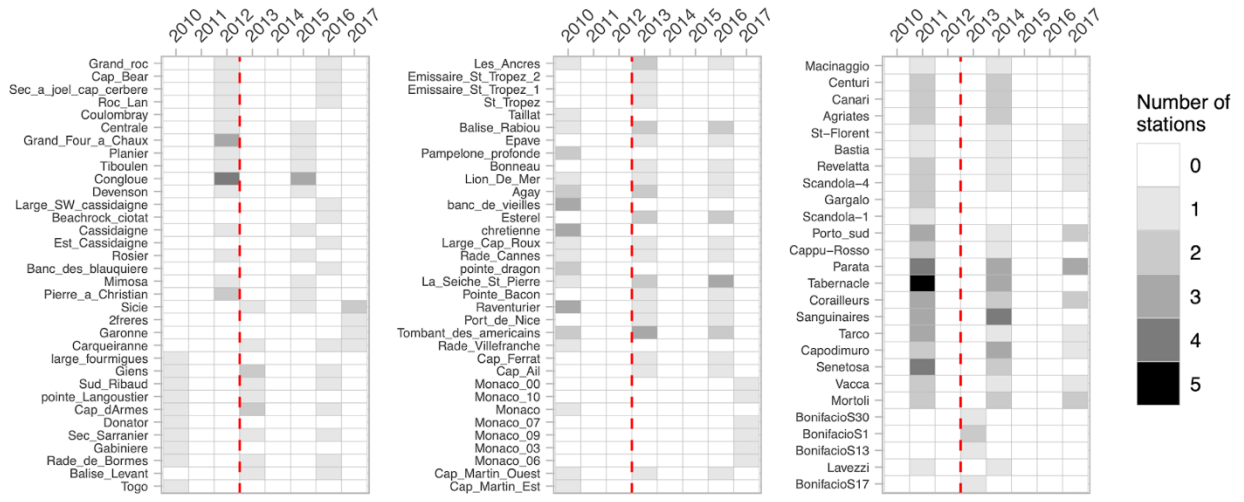


FIG. A.1: Number of stations (sampling depth) sampled per year and per site. Sites are ordered by their latitude for the two first tables (mainland sites) and by their longitude in the last table (Corsica). Doxa et al., 2016 used data from 2010, 2011 and 2012 (before the red dotted line) whereas we used all data available.

Appendix B: Functional traits

Table B.1: Traits of the 177 species considered in this study

ID code	ID name	Colonial	Gregarious	Unit height	Base cover	Base type	Consistency	Condition of food	Size of food	Engineering	Coralligenous builder	Thermal Preference	Sedimentation	Organic Pollution	Salinity	Hydrodynamism	Light	Number of defense strategy	Number of preferred substrate	Number of dominant interactions
ACAC	<i>Acanthella acuta</i>	0	1	100	100	2	2	3	1	2	0	2	2	2	1	2	3	0	1	1
ACET	<i>Acetabularia acetabulum</i>	0	2	70	10	3	1	1	0	2	0	3	2	2	1	2	1	0	2	1
ADC	<i>Adeonella calveti</i>	1	2	150	150	3	3	2	1	3	1	1	2	2	1	1	3	2	1	1
AGOR	<i>Agelas oroides</i>	0	1	200	200	2	2	3	1	2	0	3	2	2	1	2	3	0	1	1
AIMU	<i>Aiptasia mutabilis</i>	0	2	120	30	2	1	4	1	1	0	2	2	2	1	2	2	2	3	2
ALAC	<i>Alcyonium acaule</i>	1	1	200	30	3	1	3	1	2	0	3	2	2	1	3	3	1	2	1
ALCO	<i>Alcyonium corraloides</i>	1	2	35	80	1	3	3	1	2	0	1	2	2	1	2	3	1	1	2
ALGL	<i>Alcyonium glomeratum</i>	1	1	120	80	3	2	3	1	2	0	2	2	2	1	1	3	2	1	1
ALMI	<i>Alicia mirabilis</i>	0	1	500	80	2	1	4	1	2	0	3	2	2	1	3	2	2	3	1
AMSP	<i>Amphiroa</i> sp	0	1	100	100	3	2	1	0	3	1	2	2	2	1	2	3	0	1	1
ANME	<i>Antedon mediterranea</i>	0	3	20	150	1	3	3	1	2	0	2	2	2	1	3	3	1	2	1
ANSU	<i>Antipathes subpinnata</i>	1	3	600	10	3	3	3	1	2	0	1	2	2	1	2	3	2	1	1
APAE	<i>Aplysina aerophoba</i>	0	2	35	150	3	1	3	1	2	0	3	2	2	1	1	1	1	1	1
APCA	<i>Aplysina cavernicola</i>	0	2	200	200	3	2	3	1	2	0	2	2	2	1	2	3	1	1	1
APLI	<i>Aplidium</i> sp	1	2	50	50	3	1	3	1	2	0	3	2	2	1	1	1	1	1	1
ASAS	<i>Asciidiella aspersa</i>	0	3	90	30	2	2	3	1	2	0	1	3	2	0	1	1	1	2	2
ASCA	<i>Astroides calycularis</i>	1	1	120	40	3	3	3	1	3	1	3	2	2	1	3	3	3	1	1
ASME	<i>Ascidia mentula</i>	0	3	75	75	2	2	3	1	3	0	1	3	2	0	2	2	1	2	3
ASSP	<i>Asparagopsis</i> sp	0	3	300	300	3	2	1	0	2	0	1	2	2	1	2	1	0	2	1
ASTM	<i>Astropartus mediterraneus</i>	0	3	50	300	1	2	3	1	2	0	2	2	2	0	2	3	3	3	1

ASVI	<i>Ascidia virginea</i>	0	2	80	30	2	2	3	1	3	0	1	3	2	1	2	3	2	2	2
AXAU	<i>Axinyssa aurantiaca</i>	0	1	30	150	1	2	3	1	2	0	2	2	2	1	2	2	1	1	1
AXDA	<i>Axinella damicornis</i>	0	2	100	100	3	2	3	1	2	0	2	3	2	1	2	3	0	1	1
AXPO	<i>Axinella polypoides</i>	0	2	500	15	3	2	3	1	2	0	2	3	2	1	2	3	0	1	1
AXVA	<i>Axinella vacaleti</i>	0	1	55	45	3	2	3	1	2	0	2	3	2	1	1	3	0	1	1
AXVE	<i>Axinella verrucosa</i>	0	1	120	15	3	2	3	1	2	0	2	2	2	1	1	3	0	1	1
BAEU	<i>Balanophyllia europaea</i>	0	2	35	40	3	3	4	1	3	1	3	2	2	1	2	2	3	1	1
BOVI	<i>Bonellia viridis</i>	0	2	15	300	1	1	3	1	2	0	2	2	2	0	2	2	4	2	1
BRSP	<i>Bryopsis</i> sp	0	2	150	5	2	1	1	0	2	0	2	2	2	1	2	1	0	2	1
CAIN	<i>Caryophyllia inornata</i>	0	3	17	11	3	3	3	1	3	1	2	1	2	1	2	3	3	1	1
CARA	<i>Caulerpa racemosa</i>	1	3	50	10	2	1	1	0	3	0	3	2	2	1	2	2	1	2	1
CASC	<i>Cacospongia scalaris</i>	0	1	100	200	2	1	3	1	2	0	2	2	2	1	3	3	0	1	1
CASM	<i>Caryophyllia smithii</i>	0	3	17	15	3	3	3	1	3	1	2	3	2	1	2	3	3	1	1
CATA	<i>Caulerpa taxifolia</i>	1	3	80	80	2	1	1	0	3	0	3	2	2	1	2	1	1	2	1
CEL	<i>Centrostephanus longispinus</i>	0	1	150	150	2	3	3	2	2	0	2	2	2	1	2	3	2	2	1
CELL	<i>Cellaria</i> sp	1	2	100	100	3	2	4	1	3	0	2	2	2	1	1	2	2	2	1
CHNU	<i>Chondrilla nucula</i>	0	3	20	20	1	2	3	1	2	0	2	2	2	1	2	1	0	1	1
CHRE	<i>Chondrosia reniformis</i>	0	2	40	250	1	3	3	1	2	0	2	2	2	1	2	2	0	1	1
CHTE	<i>Chartella tenella</i>	1	2	100	100	3	2	4	1	3	0	2	2	2	1	1	3	2	1	1
CHVE	<i>Chrysomenia ventricosa</i>	0	1	200	100	3	1	1	0	2	0	2	2	2	1	2	1	0	2	1
CIED	<i>Ciona edwardsi</i>	0	1	200	30	2	2	3	1	2	0	2	2	2	1	3	2	1	2	2
CIIN	<i>Ciona intestinalis</i>	0	3	200	30	2	2	3	1	3	0	2	2	3	0	2	2	1	2	2
CLAD	<i>Cladophora</i> sp	0	2	100	150	1	1	1	0	3	0	2	3	2	0	1	3	0	2	1
CLCE	<i>Cliona celata</i>	0	2	50	700	1	3	3	1	1	0	2	2	2	1	2	2	0	1	1
CLCL	<i>Clathrina clathrus</i>	0	2	100	75	1	1	3	1	2	0	2	2	2	1	2	3	1	1	1
CLDE	<i>Clavelina dellavallei</i>	1	2	40	40	3	1	3	1	2	0	2	2	2	1	2	2	0	2	2
CLIO	<i>Cliona</i> sp	0	2	20	300	1	3	3	1	1	0	2	3	2	1	2	2	0	1	1
CLLE	<i>Clavelina lepadiformis</i>	1	1	30	170	3	1	3	1	2	0	2	2	2	1	3	1	0	2	1

CLPI	<i>Cladocora caespitosa</i>	1	2	100	5	3	3	4	1	3	1	2	2	2	1	2	1	3	1	1
CLSP	<i>Clathrina</i> sp	0	2	100	75	1	1	3	1	2	0	2	2	2	1	2	3	1	1	1
CLVI	<i>Cliona viridis</i>	0	2	8	250	1	3	3	1	1	0	2	3	2	1	2	2	0	1	1
COBU	<i>Codium bursa</i>	0	2	200	200	2	2	1	0	3	0	2	2	2	1	2	1	0	1	1
COCA	<i>Corticium candelabrum</i>	0	2	125	25	1	3	3	1	2	0	2	2	2	1	2	3	0	1	1
COCO	<i>Codium coralloides</i>	0	2	20	150	1	2	1	0	2	0	2	2	2	1	2	3	0	1	1
COEF	<i>Codium effusum</i>	0	2	10	100	1	2	1	0	3	0	2	2	2	1	2	3	0	1	1
COEL	<i>Corallina elongata</i>	0	3	120	120	3	2	1	0	3	0	2	2	3	1	3	1	0	1	1
CORU	<i>Corallium rubrum</i>	1	3	200	10	3	3	3	1	3	1	1	1	2	1	3	3	3	1	1
COVI	<i>Corynactis viridis</i>	0	3	15	15	3	1	4	1	2	0	2	2	2	1	3	3	2	2	2
CRAM	<i>Crambe crambe</i>	0	2	15	75	1	1	3	1	3	0	2	2	2	1	2	1	1	2	1
CRCR	<i>Cribrinopsis crassa</i>	0	1	65	50	2	1	4	1	2	0	2	2	2	1	1	2	2	2	2
CRPU	<i>Crella pulvinar</i>	0	2	30	150	1	1	3	1	2	0	2	2	2	1	2	3	0	1	1
CRSP	<i>Crisia</i> sp	1	2	25	30	3	2	2	1	3	0	2	2	2	1	2	3	2	2	1
CRT	<i>Crambe tailliezi</i>	0	2	15	75	1	1	3	1	2	0	2	2	2	1	2	3	0	1	1
CYSP	<i>Cystoseira</i> sp	0	3	700	300	3	2	1	0	3	0	1	1	1	1	2	3	0	1	1
CYZO	<i>Cystoseira zosteroides</i>	0	3	400	300	3	2	1	0	3	0	1	1	1	1	2	3	0	1	1
DECO	<i>Dendrophyllia cornigera</i>	1	1	200	200	3	3	4	1	3	1	2	2	2	1	2	1	3	1	1
DELE	<i>Dendroxea lenis</i>	0	2	30	200	1	1	3	1	2	0	2	2	2	1	2	3	0	1	1
DESA	<i>Dentiporella sardonica</i>	1	2	30	100	3	3	1	1	3	1	2	2	2	1	3	2	2	1	1
DIDE	<i>Didemnum</i> sp	1	1	20	300	1	2	3	1	2	0	1	2	2	1	2	1	0	2	2
DIDI	<i>Dictyota dichotoma</i>	0	3	250	250	3	1	1	0	2	0	2	1	2	1	2	2	0	1	1
DIIM	<i>Dictyota implexa</i>	0	2	140	140	3	1	1	0	2	0	3	2	2	1	2	1	0	2	1
DILI	<i>Diplosoma listerianum</i>	1	2	4.5	60	1	1	3	1	2	0	2	2	2	0	1	2	1	2	1
DIPO	<i>Dictyopteris polypodioides</i>	0	3	200	100	3	1	1	0	2	0	2	2	2	1	1	1	0	1	1
DIRO	<i>Distaplia rosea</i>	0	3	50	50	2	1	3	1	2	0	2	2	2	1	1	3	0	1	0
DISP	<i>Dictyonella</i> sp	0	2	40	100	1	1	3	1	2	0	2	2	2	1	2	3	0	1	1
DIVE	<i>Diporula verrucosa</i>	1	2	40	40	3	3	2	1	3	1	2	3	2	1	2	2	2	2	1

DIVI	Diazona violacea	1	1	40	400	3	1	3	1	2	0	1	2	2	1	3	2	0	1	1
DUVE	Dudresnaya verticillata	0	2	250	2	3	1	1	0	2	0	2	2	2	0	1	2	0	1	1
DYAV	Dysidea avara	0	2	50	200	1	2	3	1	2	0	2	2	2	1	2	3	1	1	2
DYFR	Dysidea fragilis	0	2	20	150	1	1	3	1	2	0	2	3	2	0	1	3	1	3	1
ECME	Echinus melo	0	0	150	150	2	3	2	2	2	0	2	2	2	0	2	2	2	1	1
EPAR	Epizoanthus arenaceus	0	3	10	10	1	2	3	1	2	0	2	3	2	1	3	3	2	1	1
EUCA	Eunicella cavolini	1	2	30	10	3	2	4	1	3	0	1	1	2	1	2	3	3	1	3
EUSI	Eunicella singularis	1	3	300	8	3	2	4	1	3	0	1	2	2	1	3	1	3	2	3
EUVE	Eunicella verrucosa	1	3	270	10	3	2	4	1	3	0	1	2	2	1	2	3	3	1	3
FARE	Faucha repens	0	1	120	120	3	1	1	0	2	0	2	2	2	1	2	3	0	1	1
FISA	Filograna or Salmacina sp	1	2	100	40	2	3	3	1	2	0	2	3	2	1	1	3	2	3	1
FLPE	Flabellia petiolata	0	3	65	2	3	1	1	0	2	0	2	2	2	1	2	3	0	1	1
FRVE	Fron dipora verrucosa	1	2	50	100	3	3	2	1	3	1	2	3	2	1	3	3	2	2	1
GULA	Guancha lacunosa	0	1	35	35	2	1	3	1	2	0	2	2	2	0	1	2	0	2	1
HALA	Halymenia latifolia	0	1	300	70	3	1	1	0	2	0	2	2	2	1	3	3	0	1	1
HALI	Haliclona Sp	0	2	100	150	2	1	3	1	2	0	2	2	2	1	2	2	0	1	1
HAME	Haliclona mediterranea	0	2	100	150	2	1	3	1	2	0	2	2	2	1	2	2	0	1	1
HAPA	Halocynthia papillosa	0	2	100	30	3	2	4	1	2	0	1	2	2	1	2	3	1	2	2
HAPO	Haliclona poecillastroides	0	2	30	500	2	2	3	1	2	0	2	2	2	1	2	3	0	1	1
HATU	Halimeda tuna	0	3	80	15	3	2	1	0	2	0	3	2	2	1	2	3	0	1	1
HECO	Hemimycale columella	0	3	30	200	1	2	3	1	2	0	2	2	2	1	3	1	0	1	1
HEPR	Hexadella pruvoti	0	2	5	100	1	1	3	1	2	0	2	2	2	1	2	3	0	1	1
HERA	Hexadella racovitzae	0	3	5	400	1	1	3	1	2	0	2	2	2	1	2	3	0	1	1
HODU	Hoplangia durotrix	1	3	30	300	2	3	4	1	3	1	2	2	2	1	2	3	3	1	1
HOFR	Hornera frondiculata	1	2	100	80	3	3	2	1	3	1	2	2	2	1	3	3	2	1	1
IDAT	Idmidronea atlantica	1	2	40	40	3	3	2	1	3	1	2	2	2	1	3	3	2	2	1
IROR	Ircinia oros	0	1	100	100	2	3	3	1	2	0	2	2	2	1	2	2	1	1	1
IRVA	Ircinia variabilis	0	1	150	150	1	3	3	1	2	0	2	2	2	1	2	1	1	2	1

JARU	<i>Jania rubens</i>	0	2	50	50	3	2	1	0	2	0	2	2	2	1	2	1	0	2	1
LARO	<i>Laminaria rodriguezii</i>	0	2	1000	300	3	2	1	0	2	0	2	2	1	1	3	3	0	1	1
LEPR	<i>Leptopsammia pruvoti</i>	1	3	30	300	3	3	3	1	3	1	2	2	2	1	2	3	3	1	1
LESA	<i>Leptogorgia sarmentosa</i>	1	3	400	5	3	2	3	1	3	0	1	3	3	1	3	1	3	2	3
LICA	<i>Lithophyllum cabiochae</i>	0	2	2	150	1	3	1	0	3	1	2	1	2	1	2	3	0	1	1
LICO	<i>Lithothamnion corallioides</i>	0	3	50	50	1	3	1	0	3	0	2	2	2	0	2	2	1	1	1
LIIN	<i>Lithophyllum incrustans</i>	0	2	0.8	100	1	3	1	0	3	1	2	2	2	1	2	1	0	1	1
LISP	<i>Lithophyllum sp</i>	0	2	1	120	1	3	1	0	3	1	2	1	2	1	2	3	0	1	1
LIST	<i>Lithophyllum stictaeforme</i>	0	2	1	150	1	3	1	0	3	1	2	1	2	1	2	3	0	1	1
MAED	<i>Maasella edwardsii</i>	1	1	15	10	3	1	4	1	2	0	2	3	2	1	2	2	2	2	1
MAPH	<i>Madracis pharensis</i>	1	3	3	3	1	3	3	1	3	1	2	2	2	1	2	3	3	1	1
MEAL	<i>Mesophyllum alternans</i>	0	3	1.2	120	1	3	1	0	3	1	2	2	3	1	2	1	0	1	1
MEEX	<i>Mesophyllum expansum</i>	0	2	0.45	200	1	3	1	0	3	1	2	2	2	1	2	3	0	1	1
MESP	<i>Mesophyllum sp</i>	0	2	0.6	150	1	3	1	0	3	1	2	2	2	1	2	3	0	1	1
MIMI	<i>Miniacina miniacea</i>	0	3	5	5	2	3	3	1	3	1	2	2	2	1	2	3	2	3	2
MISA	<i>Microcosmus sabatieri</i>	0	1	130	50	2	2	3	1	3	0	1	2	2	1	2	2	1	3	2
MYIN	<i>Myxilla incrustans</i>	0	1	50	200	1	1	3	1	2	0	2	1	2	1	2	1	0	3	1
MYRO	<i>Myxilla rosacea</i>	0	1	10	100	2	1	3	1	2	0	2	2	2	1	3	2	0	2	1
MYT	<i>Myriapora truncata</i>	1	2	100	100	3	3	2	1	3	1	1	2	2	1	3	3	2	2	1
NEMA	<i>Neogoniolithon mamillosum</i>	0	2	0.8	30	1	3	1	0	3	1	2	2	2	1	2	3	0	1	1
OSSP	<i>Oscarella sp</i>	0	2	5	170	2	1	3	1	2	0	2	2	2	1	2	2	0	1	1
OSVO	<i>Osmundaria volubilis</i>	0	2	300	10	3	1	1	0	2	0	2	2	2	0	2	2	0	1	1
PAAX	<i>Parazoanthus axinellae</i>	1	3	15	5	1	3	3	1	3	1	2	1	2	1	2	3	2	2	1
PACL	<i>Paramuricea clavata</i>	1	3	1000	10	3	2	3	1	3	0	1	2	2	1	2	3	3	1	3
PACR	<i>Palmophyllum crassum</i>	0	2	2	60	1	2	1	0	2	0	2	2	2	1	2	3	0	2	1
PALI	<i>Paracentrotus lividus</i>	0	3	80	80	2	3	2	2	2	0	2	2	2	1	2	2	2	2	1
PAMA	<i>Paramuricea macrospina</i>	1	2	110	10	3	2	3	1	3	0	1	2	2	1	2	3	3	3	3
PCSP	<i>Peyssonnelia encrusting sp</i>	0	3	0.15	150	1	3	1	0	3	1	2	3	2	1	2	3	0	1	1

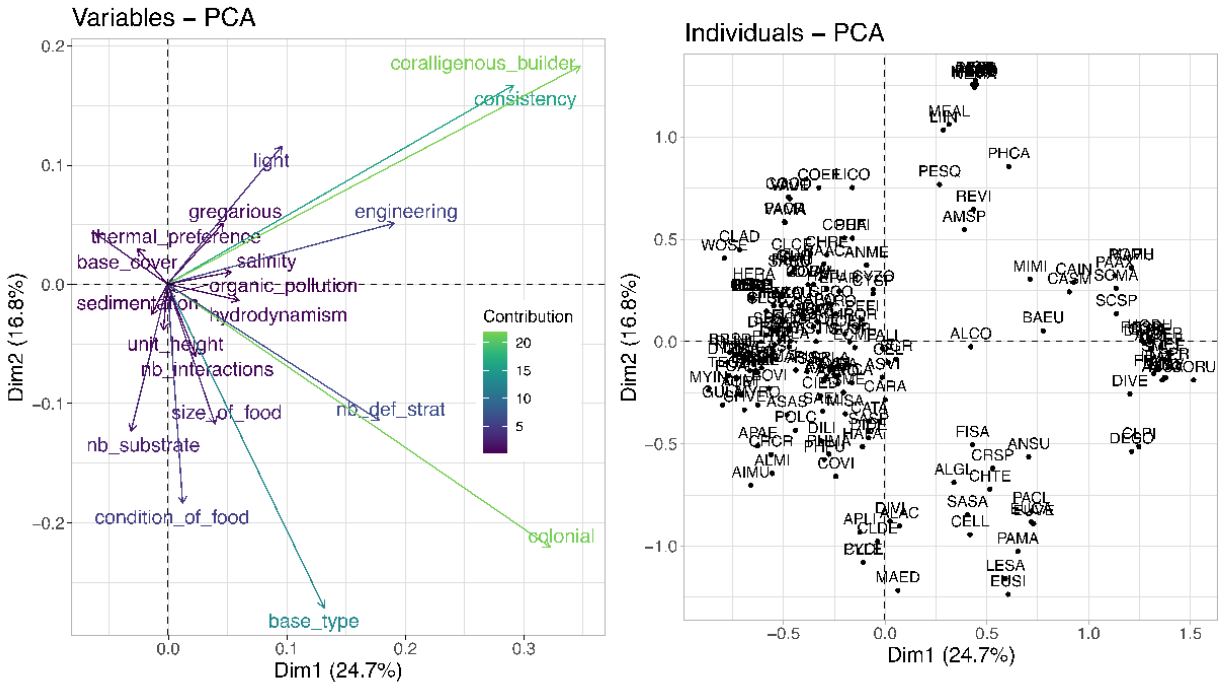
PEF	<i>Pentapora fascialis</i>	1	2	200	300	3	3	2	1	3	1	1	2	2	1	3	3	2	1	1
PEFI	<i>Petrosia ficiformis</i>	0	2	100	200	2	3	3	1	2	0	2	2	2	1	2	2	1	1	1
PEPO	<i>Peyssonnelia polymorpha</i>	0	3	0.15	180	1	3	1	0	3	1	2	3	2	1	2	3	0	1	1
PERO	<i>Peyssonnelia rosa-marina</i>	0	3	0.15	100	1	3	1	0	3	1	2	3	2	1	2	3	0	1	1
PESP	<i>Peyssonnelia sp</i>	0	2	0.15	100	1	3	1	0	3	1	2	1	2	1	2	3	0	1	1
PESQ	<i>Peyssonnelia squamaria</i>	0	3	0.2	80	2	2	1	0	3	1	2	2	2	1	1	3	0	2	1
PHCA	<i>Phymatolithon calcareum</i>	0	3	2	70	2	3	1	0	3	1	2	2	2	1	2	3	1	2	1
PHFI	<i>Phorbas fictitius</i>	0	2	100	150	1	3	3	1	2	0	2	2	2	1	3	3	0	1	1
PHFU	<i>Phallusia fumigata</i>	0	1	110	30	3	2	3	1	2	0	2	2	2	1	2	2	1	3	1
PHMA	<i>Phallusia mamillata</i>	0	2	200	50	3	2	3	1	2	0	2	2	2	1	2	2	1	3	1
PHTE	<i>Phorbas tenacior</i>	0	2	3	150	2	1	3	1	2	0	2	2	2	1	2	3	0	1	1
PHYL	<i>Phyllariopsis Sp</i>	0	2	700	300	3	1	1	0	2	0	2	2	1	1	3	3	0	1	1
PLSP	<i>Pleraplysilla spinifera</i>	0	2	8	100	1	1	3	1	2	0	2	2	2	1	2	3	0	1	1
POAU	<i>Polyclinum aurantium</i>	0	3	50	50	2	1	3	1	2	0	2	2	2	1	1	1	0	1	0
POLC	<i>Polycitor sp</i>	0	2	50	50	2	1	3	1	2	0	2	2	2	1	2	2	3	2	1
POMU	<i>Polycyathus muellerac</i>	1	3	10	6	1	3	3	1	3	1	2	2	2	1	2	3	3	1	1
POOC	<i>Posidonia oceanica</i>	0	3	105	10	3	2	1	0	3	0	3	2	3	1	1	1	0	1	1
PYCL	<i>Pycnoclavella sp</i>	1	1	30	170	3	1	3	1	2	0	2	2	2	1	3	1	0	2	1
RAAC	<i>Raspaciona aculeate</i>	0	1	11	75	1	3	3	1	2	0	2	2	2	1	2	2	0	1	1
REFU	<i>Reniera fulva</i>	0	1	9	150	1	2	3	1	2	0	2	2	2	1	2	3	0	1	1
RESP	<i>Reteporella sp</i>	1	2	150	150	3	3	2	1	3	1	2	2	2	1	1	3	2	1	1
REVI	<i>Reptadeonella violacea</i>	0	2	0.5	50	1	3	3	1	3	1	3	1	2	1	2	1	2	1	1
RHNE	<i>Rhopalaea neapolitana</i>	0	2	70	70	1	1	3	1	2	0	2	2	2	1	2	1	1	1	1
SAEL	<i>Sagartia elegans</i>	0	2	45	35	2	2	3	1	2	0	2	2	2	1	2	2	2	3	1
SARC	<i>Sarcotragus sp</i>	0	1	400	400	1	2	3	1	2	0	2	2	2	1	2	3	0	1	1
SASA	<i>Savalia savaglia</i>	1	1	50	150	3	2	3	1	2	0	1	2	2	1	2	3	2	2	1
SASP	<i>Sabella spallanzanii</i>	0	1	300	17	3	2	3	1	2	0	2	2	3	1	3	3	2	2	1
SCMA	<i>Schizomavella mamillata</i>	1	2	30	100	1	3	3	1	3	1	2	2	2	1	3	3	2	2	1

SCSE	Schizotheca serratimargo	1	2	200	250	3	3	2	1	3	1	2	2	2	1	2	3	2	1	1
SCSP	Scrupocellaria sp	1	2	30	30	2	3	2	1	3	1	2	2	2	1	2	2	2	1	1
SGR	Sphaerechinus granularis	0	3	100	100	2	3	2	2	2	0	2	2	2	1	2	2	3	2	1
SMCE	Smittina cervicornis	1	2	120	120	3	3	2	1	3	1	1	2	2	1	2	3	2	1	2
SPCO	Sphaerococcus coronopifolius	0	2	150	3	3	2	1	0	2	0	2	2	2	1	2	3	0	1	1
SPCU	Spirastrella cunctatrix	0	1	400	400	1	2	3	1	2	0	2	2	2	1	2	3	0	1	1
SPLA	Spongia lamella	0	1	8	500	3	2	3	1	2	0	2	2	2	1	2	3	0	1	1
SPOF	Spongia officinalis	0	1	350	500	2	2	3	1	2	0	1	2	2	1	2	3	0	1	1
SPSO	Spatoglossum solieri	0	2	150	150	3	1	1	0	2	0	2	2	2	1	1	3	0	1	1
SUSP	Suberites sp	0	1	100	100	2	3	3	1	2	0	2	2	2	1	2	3	0	3	1
TEGE	Terpios gelatinosa	0	1	100	100	1	1	4	1	2	0	2	2	2	1	2	2	0	2	1
TUAV	Turbicellepora avicularis	1	2	180	180	3	3	2	1	3	1	1	2	2	1	3	3	2	2	1
VAMA	Valonia macrophysa	0	2	35	25	1	2	1	0	2	0	2	2	2	1	2	3	0	2	1
VAUT	Valonia utricularis	0	2	40	75	1	2	1	0	2	0	2	2	2	1	2	3	0	1	1
VAVE	Valonia ventricosa	0	2	30	30	1	2	1	0	2	0	2	2	2	1	2	3	0	1	1
WOSE	Womersleyella setacea	0	3	200	500	1	1	1	0	2	0	3	2	2	1	2	3	0	3	1
ZATY	Zanardinia typus	0	2	300	100	3	1	1	0	2	0	2	2	1	1	2	3	0	1	1

Table B.2: List of the traits used to compute the functional diversity with their nature and modalities.

<i>Trait types</i>	<i>Trait</i>	<i>Nature</i>	<i>Modalities</i>
Morphology	Colonial	categorical	0 = no (individual), 1 = yes
	Gregarious	ordinal	1 = solitary, 2 = small groups, 3 = big groups
	Unit height	continuous	mean height (in mm)
	Base cover	continuous	mean base cover (in mm)
	Base type	ordinal	1 = encrusting, 2 = semi-erected, 3 = erected
	Consistence	ordinal	1 = soft, 2 = resistant, 3 = solid
Feeding	Condition of food	categorical	0 = inorganic, 1 = organic alive, 2 = organic dead, 3 = organic alive and dead, 4 = inorganic and organic
	Size of food	categorical	0 = nutriments, 1 = microphagous, 2 = macrophagous
Defence strategy	Number of defense strategy	continuous	integer between 0 and 4. Possible defense strategies are "piked, retractable, stinging, mobile, cryptic and shell
Sustrate preference	Number of preferred substrate	continuous	integer between 1 and 3. Possible substrates are sand, living solid organisms and solid materials
Dominant species interaction	Number of dominant interaction with other species	continuous	integer between 0 and 3. Possible interactions are parasitisme, symbiosis, commensalism, competition and predation
Ecology	Engineering	ordinal	1 = bioeroder, 2 = no ecosystem engineering, 3 = engineer
	Coralligenous builder	categorical	0 = no, 1 = yes (coralligenous builder)
	Dominant interaction	categorical	0 = no dominant interaction, 1 = amensalism (inhibe), 2 = parasitisme (- obligatoire), 3 = predation, 4 = commensalism (+ non obligatoire), 5 = symbiose (+ obligatoire)
	Thermal preference	ordinal	1 = cold preferred (20°C), 2 = no preference/tolerant, 3 = hot preferred or hot resistant
	Sedimentation tolerance	ordinal	1 = no sludge tolerance, 2 = low sludge tolerance, 3 = sludge tolerance
	Organic pollution tolerance	ordinal	1 = no organic pollution tolerance, 2 = low organic pollution, 3 = organic pollution tolerance
	Salinity preference	categorical	0 = no ie the species is tolerant, 1 = yes salinity preferred
	Hydrodynamics preference	ordinal	1 = calm water preference, 2 = no preference/tolerant, 3 = water current preference
	Light preference	ordinal	1 = light preference, 2 = no preference, 3 = shadow-dark zone preference

FIG. B.1: (a) Contribution of the 32 considered traits to the two first axes of the PCA. (b) Coordinates of the species in the plane formed by the two first axes of the PCA on the functional traits.



Appendix C: Cladistic information

Table C.1: Cladistic information on the 177 taxa.

<i>ID code</i>	<i>Species</i>	<i>Genus</i>	<i>Family</i>	<i>Order</i>	<i>Class</i>	<i>Phylum</i>	<i>Kingdom</i>
ACAC	<i>Acanthella acuta</i>	<i>Acanthella</i>	Dictyonellidae	Halichondrida	Demospongiae	Porifera	Animalia
ACET	<i>Acetabularia acetabulum</i>	<i>Acetabularia</i>	Polyphysaceae	Dasycladales	Ulvophyceae	Chlorophyta	Plantae
ADC	<i>Adeonella calveti</i>	<i>Adeonella</i>	Adeonellidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
AGOR	<i>Agelas oroides</i>	<i>Agelas</i>	Agelasidae	Agelasida	Demospongiae	Porifera	Animalia
AIMU	<i>Aiptasia mutabilis</i>	<i>Aiptasia</i>	Aiptasiidae	Actinaria	Anthozoa	Cnidaria	Animalia
ALAC	<i>Alcyonium acaule</i>	<i>Alcyonium</i>	Alcyoniidae	Alcyonacea	Anthozoa	Cnidaria	Animalia
ALCO	<i>Alcyonium corralloides</i>	<i>Alcyonium</i>	Alcyoniidae	Alcyonacea	Anthozoa	Cnidaria	Animalia
ALGL	<i>Alcyonium glomeratum</i>	<i>Alcyonium</i>	Alcyoniidae	Alcyonacea	Anthozoa	Cnidaria	Animalia
ALMI	<i>Alicia mirabilis</i>	<i>Alicia</i>	Aliciidae	Actinaria	Anthozoa	Cnidaria	Animalia
AMSP	<i>Amphiroa</i> sp	<i>Amphiroa</i>	Corallinaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
ANME	<i>Antedon mediterranea</i>	<i>Antedon</i>	Antedonidae	Comatulida	Crinoidea	Echinodermata	Animalia
ANSU	<i>Antipathella subpinnata</i>	<i>Antipathella</i>	Myriopathidae	Antipatharia	Anthozoa	Cnidaria	Animalia
APAE	<i>Aplysina aerophoba</i>	<i>Aplysina</i>	Aplysinidae	Verongida	Demospongiae	Porifera	Animalia
APCA	<i>Aplysina cavernicola</i>	<i>Aplysina</i>	Aplysinidae	Verongida	Demospongiae	Porifera	Animalia
APLI	<i>Aplidium</i> sp	<i>Aplidium</i>	Polyclinidae	Aplousobranchia	Ascidiacea	Chordata	Animalia
ASAS	<i>Asciidiella aspersa</i>	<i>Asciidiella</i>	Asciidiidae	Phlebobranchia	Ascidiacea	Chordata	Animalia
ASCA	<i>Astroides calycularis</i>	<i>Astroides</i>	Dendrophylliidae	Scleractinia	Anthozoa	Cnidaria	Animalia
ASME	<i>Ascidia mentula</i>	<i>Ascidia</i>	Asciidiidae	Phlebobranchia	Ascidiacea	Chordata	Animalia
ASSP	<i>Asparagopsis</i> sp	<i>Asparagopsis</i>	Bonnemaisoniaceae	Bonnemaisoniales	Florideophyceae	Rhodophyta	Plantae
ASTM	<i>Astropartus mediterraneus</i>	<i>Astropartus</i>	Gorgonocephalidae	Euryalida	Ophiuroidea	Echinodermata	Animalia
ASVI	<i>Ascidia virginea</i>	<i>Ascidia</i>	Asciidiidae	Phlebobranchia	Ascidiacea	Chordata	Animalia
AXAU	<i>Axinyssa aurantiaca</i>	<i>Axinyssa</i>	Halichondriidae	Halichondrida	Demospongiae	Porifera	Animalia
AXDA	<i>Axinella damicornis</i>	<i>Axinella</i>	Axinellidae	Halichondrida	Demospongiae	Porifera	Animalia
AXPO	<i>Axinella polypoides</i>	<i>Axinella</i>	Axinellidae	Halichondrida	Demospongiae	Porifera	Animalia
AXVA	<i>Axinella vacaleti</i>	<i>Axinella</i>	Axinellidae	Halichondrida	Demospongiae	Porifera	Animalia
AXVE	<i>Axinella verrucosa</i>	<i>Axinella</i>	Axinellidae	Halichondrida	Demospongiae	Porifera	Animalia
BAEU	<i>Balanophyllia europaea</i>	<i>Balanophyllia</i>	Dendrophylliidae	Scleractinia	Anthozoa	Cnidaria	Animalia
BOVI	<i>Bonellia viridis</i>	<i>Bonellia</i>	Bonelliidae	Bonelliida	Echiuroidea	Echiura	Animalia
BRSP	<i>Bryopsis</i> sp	<i>Bryopsis</i>	Bryopsidaceae	Bryopsidales	Bryopsidophyceae	Chlorophyta	Plantae
CAIN	<i>Caryophyllia inornata</i>	<i>Caryophyllia</i>	Caryophylliidae	Scleractinia	Anthozoa	Cnidaria	Animalia
CARA	<i>Caulerpa racemosa</i>	<i>Caulerpa</i>	Caulerpaceae	Bryopsidales	Bryopsidophyceae	Chlorophyta	Plantae
CASC	<i>Scalarispongia scalaris</i>	<i>Scalarispongia</i>	Thorectidae	Dictyoceratida	Demospongiae	Porifera	Animalia
CASM	<i>Caryophyllia smithii</i>	<i>Caryophyllia</i>	Caryophylliidae	Scleractinia	Anthozoa	Cnidaria	Animalia
CATA	<i>Caulerpa taxifolia</i>	<i>Caulerpa</i>	Caulerpaceae	Bryopsidales	Bryopsidophyceae	Chlorophyta	Plantae

CEL	Centrostephanus longispinus	Centrostephanus	Diadematidae	Diadematoidea	Echinoidea	Echinodermata	Animalia
CELL	Cellaria sp	Cellaria	Cellariidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
CHNU	Chondrilla nucula	Chondrilla	Chondrillidae	Chondrosida	Demospongiae	Porifera	Animalia
CHRE	Chondrosia reniformis	Chondrosia	Chondrillidae	Chondrosida	Demospongiae	Porifera	Animalia
CHTE	Chartella tenella	Chartella	Flustridae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
CHVE	Chrysomenia ventricosa	Chrysomenia	Rhodymeniaceae	Rhodymeniales	Florideophyceae	Rhodophyta	Plantae
CIED	Ciona edwardsi	Ciona	Cionidae	Phlebobranchia	Asciacea	Chordata	Animalia
CIIN	Ciona intestinalis	Ciona	Cionidae	Phlebobranchia	Asciacea	Chordata	Animalia
CLAD	Cladophora sp	Cladophora	Cladophoraceae	Cladophorales	Ulvophyceae	Chlorophyta	Plantae
CLCE	Cliona celata	Cliona	Clionidae	Hadromerida	Demospongiae	Porifera	Animalia
CLCL	Clathrina clathrus	Clathrina	Clathrinidae	Clathrinida	Calcarea	Porifera	Animalia
CLDE	Clavelina dellavallei	Clavelina	Clavelinidae	Aplousobranchia	Asciacea	Chordata	Animalia
CLIO	Cliona sp	Cliona	Clionidae	Hadromerida	Demospongiae	Porifera	Animalia
<i>ID code</i>	<i>Species</i>	<i>Genus</i>	<i>Family</i>	<i>Order</i>	<i>Class</i>	<i>Phylum</i>	<i>Kingdom</i>
CLLE	Clavelina lepadiformis	Clavelina	Clavelinidae	Aplousobranchia	Asciacea	Chordata	Animalia
CLPI	Cladocora caespitosa	Cladocora	Caryophylliidae	Scleractinia	Anthozoa	Cnidaria	Animalia
CLSP	Clathrina sp	Clathrina	Clathrinidae	Clathrinida	Calcarea	Porifera	Animalia
CLVI	Cliona viridis	Cliona	Clionidae	Hadromerida	Demospongiae	Porifera	Animalia
COBU	Codium bursa	Codium	Codiaceae	Bryopsidales	Bryopsidophyceae	Chlorophyta	Plantae
COCA	Corticium candelabrum	Corticium	Plakinidae	Homosclerophorida	Homoscleromorpha	Porifera	Animalia
COCO	Codium coralloides	Codium	Codiaceae	Bryopsidales	Bryopsidophyceae	Chlorophyta	Plantae
COEF	Codium effusum	Codium	Codiaceae	Bryopsidales	Bryopsidophyceae	Chlorophyta	Plantae
COEL	Corallina elongata	Corallina	Corallinaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
CORU	Corallium rubrum	Corallium	Coralliidae	Alcyonacea	Anthozoa	Cnidaria	Animalia
COVI	Corynactis viridis	Corynactis	Corallimorphidae	Corallimorpharia	Anthozoa	Cnidaria	Animalia
CRAM	Crambe crambe	Crambe	Crambeidae	Poecilosclerida	Demospongiae	Porifera	Animalia
CRCR	Cribrinopsis crassa	Cribrinopsis	Actiniidae	Actinaria	Anthozoa	Cnidaria	Animalia
CRPU	Crella pulvinar	Crella	Crellidae	Poecilosclerida	Demospongiae	Porifera	Animalia
CRSP	Crisia sp	Crisia	Crisiidae	Cyclostomatida	Stenolaemata	Bryozoa	Animalia
CRT	Crambe tailliezi	Crambe	Crambeidae	Poecilosclerida	Demospongiae	Porifera	Animalia
CYSP	Cystoseira sp	Cystoseira	Sargassaceae	Fucales	Phaeophyceae	Ochrophyta	Chromista
CYZO	Cystoseira zosteroides	Cystoseira	Sargassaceae	Fucales	Phaeophyceae	Ochrophyta	Chromista
DECO	Dendrophyllia cornigera	Dendrophyllia	Dendrophylliidae	Scleractinia	Anthozoa	Cnidaria	Animalia
DELE	Dendroxea lenis	Dendroxea	Chalinidae	Haplosclerida	Demospongiae	Porifera	Animalia
DESA	Dentiporella sardonica	Dentiporella	Phidoloporidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
DIDE	Didemnum sp	Didemnum	Didemnidae	Aplousobranchia	Asciacea	Chordata	Animalia
DIDI	Dictyota dichotoma	Dictyota	Dictyotaceae	Dictyotales	Phaeophyceae	Ochrophyta	Chromista
DIIM	Dictyota implexa	Dictyota	Dictyotaceae	Dictyotales	Phaeophyceae	Ochrophyta	Chromista
DILI	Diplosoma listerianum	Diplosoma	Didemnidae	Aplousobranchia	Asciacea	Chordata	Animalia

DIPO	Dictyopteris polypodioides	Dictyopteris	Dictyotaceae	Dictyotales	Phaeophyceae	Ochrophyta	Chromista
DIRO	Distaplia rosea	Distaplia	Holozoidae	Apousobranchia	Ascidiacea	Chordata	Animalia
DISP	Dictyonella sp	Dictyonella	Dictyonellidae	Halichondrida	Demospongiae	Porifera	Animalia
DIVE	Diporula verrucosa	Diporula	Microporellidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
DIVI	Diazona violacea	Diazona	Diazonidae	Apousobranchia	Ascidiacea	Chordata	Animalia
DUVE	Dudresnaya verticillata	Dudresnaya	Dumontiaceae	Gigartinales	Florideophyceae	Rhodophyta	Plantae
DYAV	Dysidea avara	Dysidea	Dysideidae	Dictyoceratida	Demospongiae	Porifera	Animalia
DYFR	Dysidea fragilis	Dysidea	Dysideidae	Dictyoceratida	Demospongiae	Porifera	Animalia
ECME	Echinus melo	Echinus	Echinidae	Camarodonta	Echinoidea	Echinodermata	Animalia
EPAR	Epizoanthus arenaceus	Epizoanthus	Epizoanthidae	Zoanthidea	Anthozoa	Cnidaria	Animalia
EUCA	Eunicella cavolini	Eunicella	Gorgoniidae	Alcyonacea	Anthozoa	Cnidaria	Animalia
EUSI	Eunicella singularis	Eunicella	Gorgoniidae	Alcyonacea	Anthozoa	Cnidaria	Animalia
EUVE	Eunicella verrucosa	Eunicella	Gorgoniidae	Alcyonacea	Anthozoa	Cnidaria	Animalia
FARE	Gloiocladia repens	Gloiocladia	Faucheaceae	Rhodymeniales	Florideophyceae	Rhodophyta	Plantae
FISA	Filigrana or Salmacina sp	Filigrana	Serpulidae	Sabellida	Polychaeta	Annelida	Animalia
FLPE	Flabellia petiolata	Flabellia	Udoteaceae	Bryopsidales	Bryopsidophyceae	Chlorophyta	Plantae
FRVE	Fron dipora verrucosa	Fron dipora	Fron diporidae	Cyclostomatida	Stenolaemata	Bryozoa	Animalia
GULA	Guancha lacunosa	Guancha	Clathrinidae	Clathrinida	Calcarea	Porifera	Animalia
HALA	Halymenia latifolia	Halymenia	Halymeniaceae	Halymeniales	Florideophyceae	Rhodophyta	Plantae
HALI	Haliclona sp	Haliclona	Chalinidae	Haplosclerida	Demospongiae	Porifera	Animalia
HAME	Haliclona mediterranea	Haliclona	Chalinidae	Haplosclerida	Demospongiae	Porifera	Animalia
HAPA	Halocynthia papillosa	Halocynthia	Pyuridae	Stolidobranchia	Ascidiacea	Chordata	Animalia
<i>ID code</i>	<i>Species</i>	<i>Genus</i>	<i>Family</i>	<i>Order</i>	<i>Class</i>	<i>Phylum</i>	<i>Kingdom</i>
HAPO	Haliclona poecillastroides	Haliclona	Chalinidae	Haplosclerida	Demospongiae	Porifera	Animalia
HATU	Halimeda tuna	Halimeda	Halimedaceae	Bryopsidales	Bryopsidophyceae	Chlorophyta	Plantae
HECO	Hemimycale columella	Hemimycale	Hymedesmiidae	Poecilosclerida	Demospongiae	Porifera	Animalia
HEPR	Hexadella pruvoti	Hexadella	Ianthellidae	Verongida	Demospongiae	Porifera	Animalia
HERA	Hexadella racovitzai	Hexadella	Ianthellidae	Verongida	Demospongiae	Porifera	Animalia
HODU	Hoplangia durotrix	Hoplangia	Caryophylliidae	Scleractinia	Anthozoa	Cnidaria	Animalia
HOFR	Hornera frondiculata	Hornera	Horneridae	Cyclostomatida	Stenolaemata	Bryozoa	Animalia
IDAT	Idmidronea atlantica	Idmidronea	Tubuliporidae	Cyclostomatida	Stenolaemata	Bryozoa	Animalia
IROR	Ircinia oros	Ircinia	Irciniidae	Dictyoceratida	Demospongiae	Porifera	Animalia
IRVA	Ircinia variabilis	Ircinia	Irciniidae	Dictyoceratida	Demospongiae	Porifera	Animalia
JARU	Jania rubens	Jania	Corallinaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
LARO	Laminaria rodriguezii	Laminaria	Laminariaceae	Laminariales	Phaeophyceae	Ochrophyta	Chromista
LEPR	Leptopsammia pruvoti	Leptopsammia	Dendrophylliidae	Scleractinia	Anthozoa	Cnidaria	Animalia
LESA	Leptogorgia sarmentosa	Leptogorgia	Gorgoniidae	Alcyonacea	Anthozoa	Cnidaria	Animalia
LICA	Lithophyllum cabiochae	Lithophyllum	Corallinaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
LICO	Lithothamnion corallioides	Lithothamnion	Hapalidiaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae

LIIN	Lithophyllum incrustans	Lithophyllum	Corallinaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
LISP	Lithophyllum sp	Lithophyllum	Corallinaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
LIST	Lithophyllum stictaeforme	Lithophyllum	Corallinaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
MAED	Maasella edwardsii	Maasella	Paralcyoniidae	Alcyonacea	Anthozoa	Cnidaria	Animalia
MAPH	Madracis pharensis	Madracis	Pocilloporidae	Scleractinia	Anthozoa	Cnidaria	Animalia
MEAL	Mesophyllum alternans	Mesophyllum	Hapalidiaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
MEEX	Mesophyllum expansum	Mesophyllum	Hapalidiaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
MESP	Mesophyllum sp	Mesophyllum	Hapalidiaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
MIMI	Miniacina miniacea	Miniacina	Homotrematidae	Rotaliida	Polythamea	Foraminifera	Chromista
MISA	Microcosmus sabatieri	Microcosmus	Pyuridae	Stolidobranchia	Asciacea	Chordata	Animalia
MYIN	Myxilla incrustans	Myxilla	Myxillidae	Poecilosclerida	Demospongiae	Porifera	Animalia
MYRO	Myxilla rosacea	Myxilla	Myxillidae	Poecilosclerida	Demospongiae	Porifera	Animalia
MYT	Myriapora truncata	Myriapora	Myriaporidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
NEMA	Neogoniolithon mamillosum	Neogoniolithon	Corallinaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
OSSP	Oscarella sp	Oscarella	Oscarellidae	Homosclerophorida	Homoscleromorpha	Porifera	Animalia
OSVO	Osmundaria volubilis	Osmundaria	Rhodomelaceae	Ceramiales	Florideophyceae	Rhodophyta	Plantae
PAAX	Parazoanthus axinellae	Parazoanthus	Parazoanthidae	Zoanthidea	Anthozoa	Cnidaria	Animalia
PACL	Paramuricea clavata	Paramuricea	Plexauridae	Alcyonacea	Anthozoa	Cnidaria	Animalia
PACR	Palmophyllum crassum	Palmophyllum	Palmophyllaceae	Palmophyllales	Chlorophyta incertae sedis	Chlorophyta	Plantae
PALI	Paracentrotus lividus	Paracentrotus	Parechinidae	Camarodonta	Echinoidea	Echinodermata	Animalia
PAMA	Paramuricea macrospina	Paramuricea	Plexauridae	Alcyonacea	Anthozoa	Cnidaria	Animalia
PCSP	Encrusting Peyssonnelia sp	Peyssonnelia	Peyssonneliaceae	Peyssonneliales	Florideophyceae	Rhodophyta	Plantae
PEF	Pentapora fascialis	Pentapora	Bitectiporidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
PEFI	Petrosia ficiformis	Petrosia	Petrosiidae	Haplosclerida	Demospongiae	Porifera	Animalia
PEPO	Peyssonnelia polymorpha	Peyssonnelia	Peyssonneliaceae	Peyssonneliales	Florideophyceae	Rhodophyta	Plantae
PERO	Peyssonnelia rosa marina	Peyssonnelia	Peyssonneliaceae	Peyssonneliales	Florideophyceae	Rhodophyta	Plantae
PESP	Erected Peyssonnelia sp	Peyssonnelia	Peyssonneliaceae	Peyssonneliales	Florideophyceae	Rhodophyta	Plantae
PESQ	Peyssonnelia squamaria	Peyssonnelia	Peyssonneliaceae	Peyssonneliales	Florideophyceae	Rhodophyta	Plantae
PHCA	Phymatolithon calcareum	Phymatolithon	Hapalidiaceae	Corallinales	Florideophyceae	Rhodophyta	Plantae
PHFI	Phorbas fictitius	Phorbas	Hymedesmiidae	Poecilosclerida	Demospongiae	Porifera	Animalia
PHFU	Phallusia fumigata	Phallusia	Asciidae	Phlebobranchia	Asciacea	Chordata	Animalia
<i>ID code</i>	<i>Species</i>	<i>Genus</i>	<i>Family</i>	<i>Order</i>	<i>Class</i>	<i>Phylum</i>	<i>Kingdom</i>
PHMA	Phallusia mamillata	Phallusia	Asciidae	Phlebobranchia	Asciacea	Chordata	Animalia
PHTE	Phorbas tenacior	Phorbas	Hymedesmiidae	Poecilosclerida	Demospongiae	Porifera	Animalia
PHYL	Phyllariopsis sp	Phyllariopsis	Phyllariaceae	Tilopteridales	Phaeophyceae	Ochrophyta	Chromista
PLSP	Pleraplysilla spinifera	Pleraplysilla	Dysideidae	Dictyoceratida	Demospongiae	Porifera	Animalia
POAU	Polyclinum aurantium	Polyclinum	Polyclinidae	Aplousobranchia	Asciacea	Chordata	Animalia
POLC	Polycitor sp	Polycitor	Polycitoridae	Aplousobranchia	Asciacea	Chordata	Animalia

POMU	<i>Polycyathus muelleriae</i>	Polycyathus	Caryophylliidae	Scleractinia	Anthozoa	Cnidaria	Animalia
POOC	<i>Posidonia oceanica</i>	Posidonia	Posidoniaceae	Alismatales	Monocots	Tracheophyta	Plantae
PYCL	<i>Pycnoclavella</i> sp	Pycnoclavella	Pycnoclavellidae	Aplousobranchia	Ascidiacea	Chordata	Animalia
RAAC	<i>Raspaciona aculeate</i>	Raspaciona	Raspailiidae	Poecilosclerida	Demospongiae	Porifera	Animalia
REFU	<i>Reniera fulva</i>	Haliclona	Chalinidae	Haplosclerida	Demospongiae	Porifera	Animalia
RESP	<i>Reteporella</i> sp	Reteporella	Phidoloporidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
REVI	<i>Reptadeonella violacea</i>	Reptadeonella	Adeonidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
RHNE	<i>Rhopalaea neapolitana</i>	Rhopalaea	Diazonidae	Aplousobranchia	Ascidiacea	Chordata	Animalia
SAEL	<i>Sagartia elegans</i>	Sagartia	Sagartiidae	Actinaria	Anthozoa	Cnidaria	Animalia
SARC	<i>Sarcotragus</i> sp	Sarcotragus	Irciniidae	Dictyoceratida	Demospongiae	Porifera	Animalia
SASA	<i>Savalia savaglia</i>	Savalia	Parazoanthidae	Zoanthidea	Anthozoa	Cnidaria	Animalia
SASP	<i>Sabella spallanzanii</i>	Sabella	Sabellidae	Sabellida	Polychaeta	Annelida	Animalia
SCMA	<i>Schizomavella mamillata</i>	Schizomavella	Bitectiporidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
SCSE	<i>Schizotheca serratimargo</i>	Schizotheca	Phidoloporidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
SCSP	<i>Scrupocellaria</i> sp	Scrupocellaria	Candidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
SGR	<i>Sphaerechinus granularis</i>	Sphaerechinus	Toxopneustidae	Camarodonta	Echinoidea	Echinodermata	Animalia
SMCE	<i>Smittina cervicornis</i>	Smittina	Smittinidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
SPCO	<i>Sphaerococcus coronopifolius</i>	Sphaerococcus	Sphaerococcaceae	Gigartinales	Florideophyceae	Rhodophyta	Plantae
SPCU	<i>Spirastrella cunctatrix</i>	Spirastrella	Spirastrellidae	Hadromerida	Demospongiae	Porifera	Animalia
SPLA	<i>Spongia lamella</i>	Spongia	Spongiidae	Dictyoceratida	Demospongiae	Porifera	Animalia
SPOF	<i>Spongia officinalis</i>	Spongia	Spongiidae	Dictyoceratida	Demospongiae	Porifera	Animalia
SPSO	<i>Spatoglossum solieri</i>	Spatoglossum	Dictyotaceae	Dictyotales	Phaeophyceae	Ochrophyta	Chromista
SUSP	<i>Suberites</i> sp	Suberites	Suberitidae	Hadromerida	Demospongiae	Porifera	Animalia
TEGE	<i>Suberites affinis</i>	Suberites	Suberitidae	Hadromerida	Demospongiae	Porifera	Animalia
TUAV	<i>Turbicellepora avicularis</i>	Turbicellepora	Celleporidae	Cheilostomatida	Gymnolaemata	Bryozoa	Animalia
VAMA	<i>Valonia macrophysa</i>	Valonia	Valoniaceae	Siphonocladales	Ulvophyceae	Chlorophyta	Plantae
VAUT	<i>Valonia utricularis</i>	Valonia	Valoniaceae	Siphonocladales	Ulvophyceae	Chlorophyta	Plantae
VAVE	<i>Valonia ventricosa</i>	Valonia	Valoniaceae	Siphonocladales	Ulvophyceae	Chlorophyta	Plantae
WOSE	<i>Womersleyella setacea</i>	Womersleyella	Rhodomelaceae	Ceramiales	Florideophyceae	Rhodophyta	Plantae
ZATY	<i>Zanardinia typus</i>	Zanardinia	Cutleriaceae	Cutleriales	Phaeophyceae	Ochrophyta	Chromista

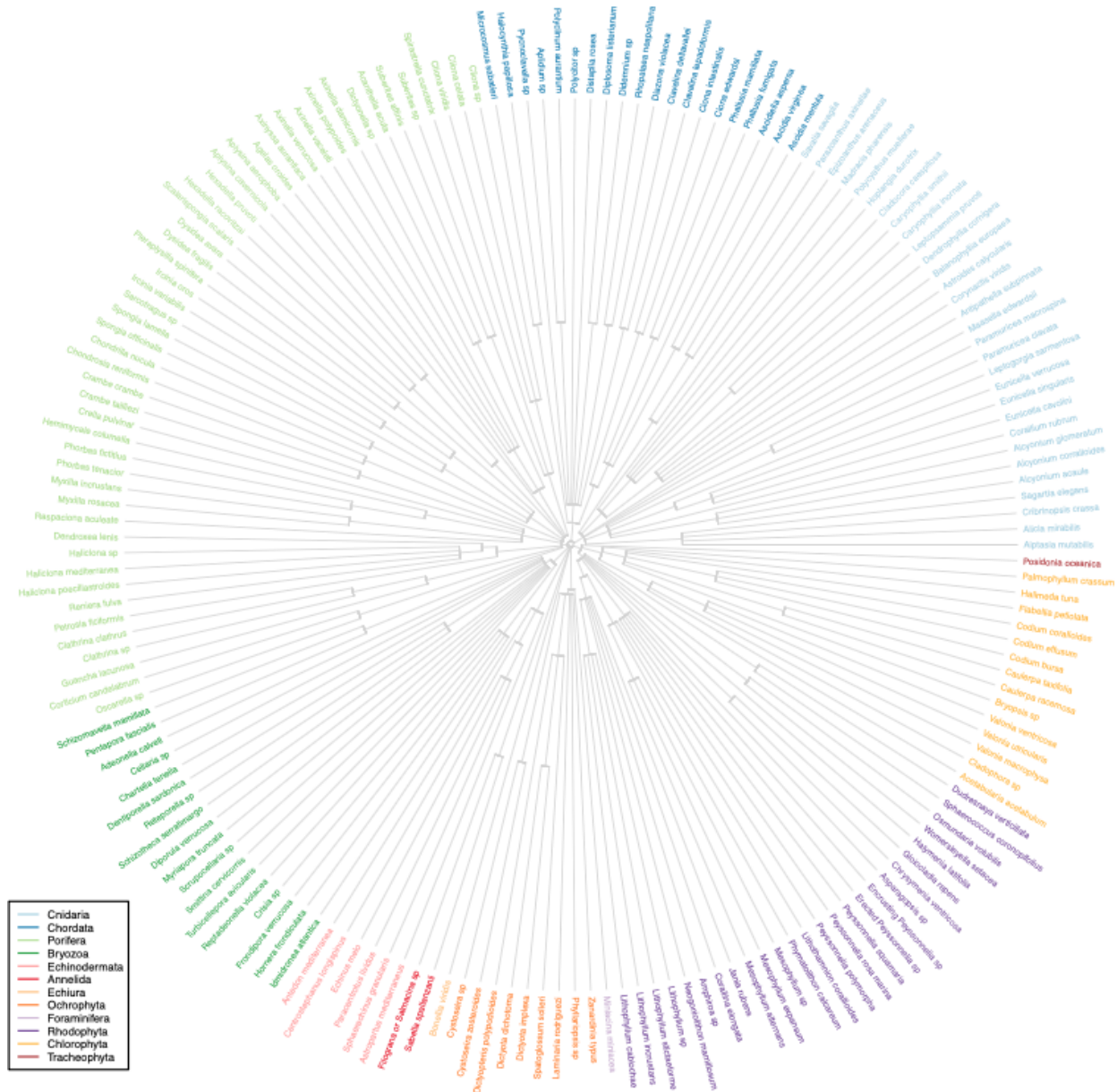


FIG. C.1: Phylogenetic tree of the 177 taxa identified at the species or genus level. This tree was built from cladistic data (Appendix S3: Table S3.1). Each colour represents a phylum.

Appendix D: PCA of the anthropogenic pressures

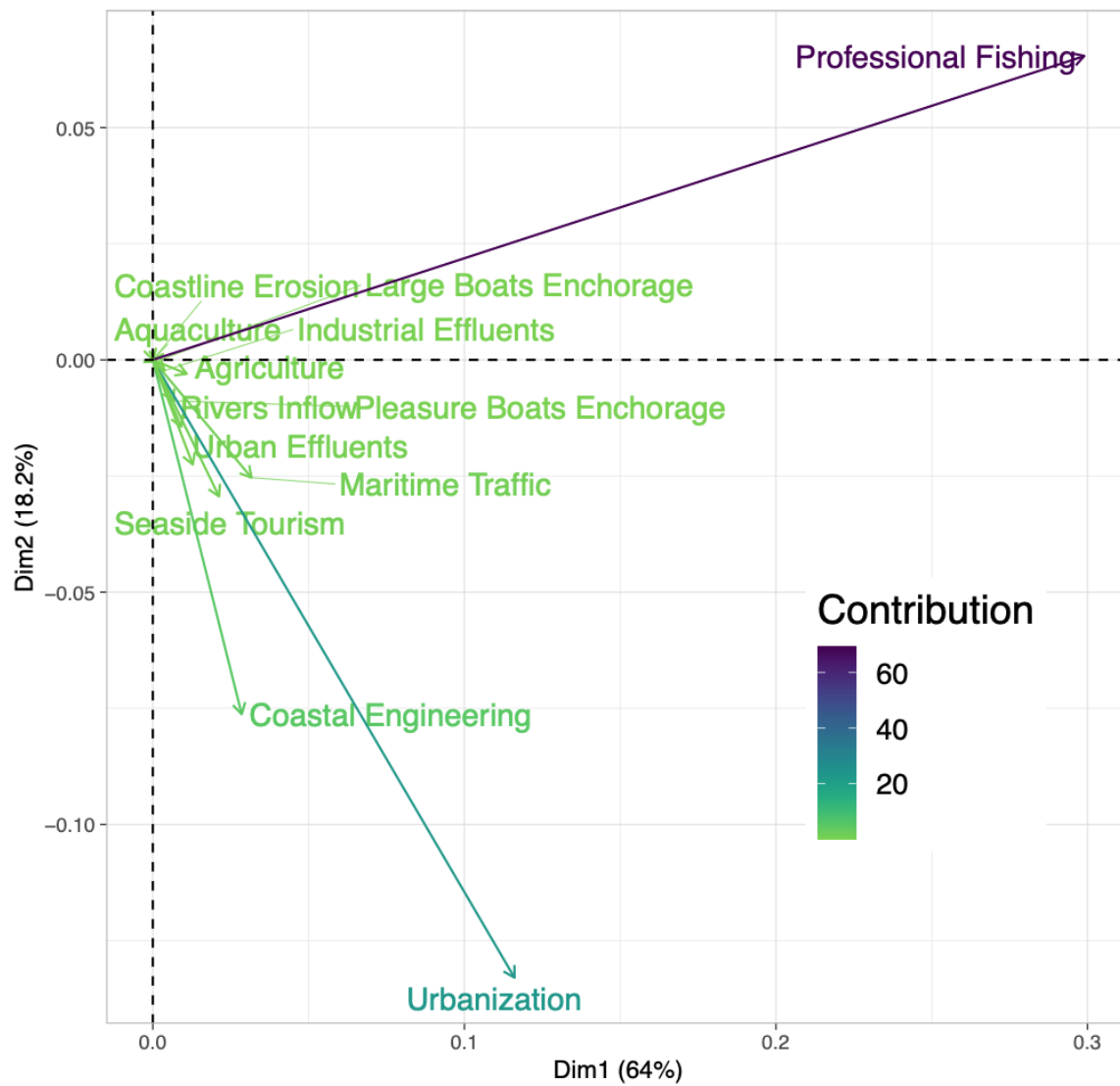


FIG. D.1: Representation of the contribution of the 13 anthropogenic pressures on the plane of the first and second axes of the PCA. The first axis explains 64% of the variance of the 13 pressures. It is mainly driven by Professional Fishing, so it is called Exploitation (link to the original survey: https://medtrix.fr/portfolio_page/impact/)

Appendix E: Variables included in the SEM (Structural Equation Model).

Table E.1: List of the variables included in the SEM with a short description and the level of evaluation.

Variable	Description	Level of evaluation
Aesthetic Value	Aesthetic value of the quadrat, predicted with the deep learning algorithm	Quadrat
qTD	Taxonomic Hill number	Quadrat
qPDSES	Phylogenetic Hill number standardized from the species richness	Quadrat
qFDSES	Functional Hill number standardized from the species richness	Quadrat
Exploitation	First axis of the PCA on the 13 anthropogenic pressure. Professional fishing was the major contributor	Station
Sediment	% of the 64 points generated with CPCe 4.1 where sludge, rubble or sand were identified	Quadrat
Depth	Depth of the station where the quadrat was photographed	Station

Equations E.1 to E.8 are the equations of the final Structural Equation Model

Equation E.1

$\text{lmerTest::lmer}(\text{esth_score} \sim \text{qTD} + \text{SES_qPD} + \text{SES_qFD} + \text{Sediment} + \text{depth} + (1 | \text{site/station}))$

Equation E.2

$\text{lmerTest::lmer}(\text{esth_score} \sim \text{depth} + \text{qTD} + \text{SES_qPD} + \text{SES_qFD} + \text{Sediment} + \text{Exploitation} + (1 | \text{site/station}))$

Equation E.3

$\text{lmerTest::lmer}(\text{qTD} \sim \text{Sediment} + \text{depth} + (1 | \text{site/station})),$

Equation E.4

$\text{lmerTest::lmer}(\text{SES_qPD} \sim \text{qTD} + \text{Sediment} + \text{depth} + (1 | \text{site/station}))$

Equation E.5

$\text{lmerTest::lmer}(\text{SES_qFD} \sim \text{qTD} + \text{SES_qPD} + \text{Sediment} + \text{depth} + (1 | \text{site/station}))$

Equation E.6

$\text{lmerTest::lmer}(\text{qTD} \sim \text{depth} + \text{Sediment} + \text{Exploitation} + (1 | \text{site/station}))$

Equation E.7

$\text{lmerTest::lmer}(\text{SES_qPD} \sim \text{depth} + \text{qTD} + \text{Sediment} + \text{Exploitation} + (1 | \text{site/station}))$

Equation E.8

$\text{lmerTest::lmer}(\text{SES_qFD} \sim \text{depth} + \text{qTD} + \text{SES_qPD} + \text{Sediment} + \text{Exploitation} + (1 | \text{site/station}))$

Appendix F: Computation of the taxonomic, functional and phylogenetic Hill numbers

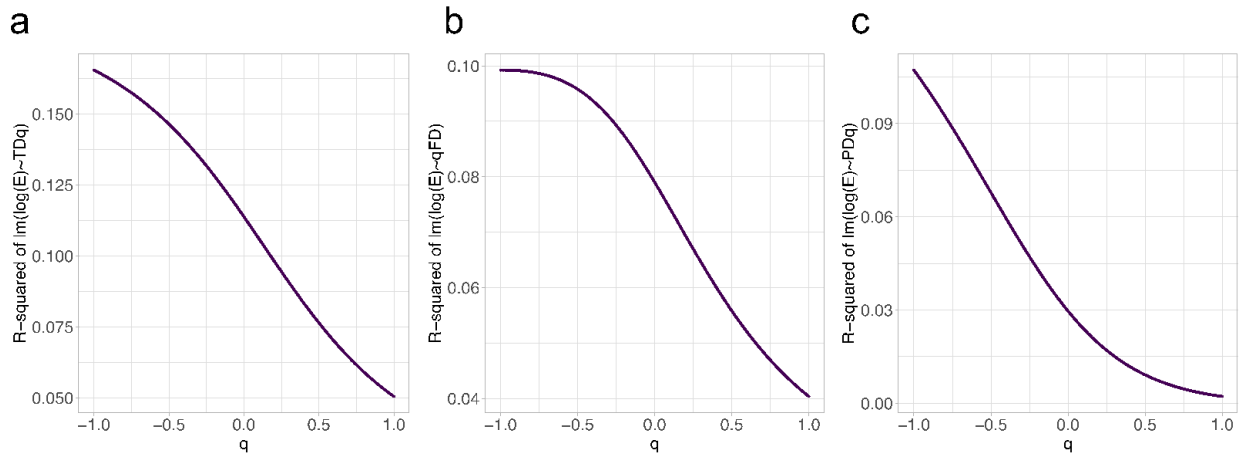


FIG. F.1: Variation of the R^2 of the linear relation between the aesthetic values (E) and, respectively (a) qTD, (b) qFD, (c) qPD, according to the value of the Hill q coefficient.

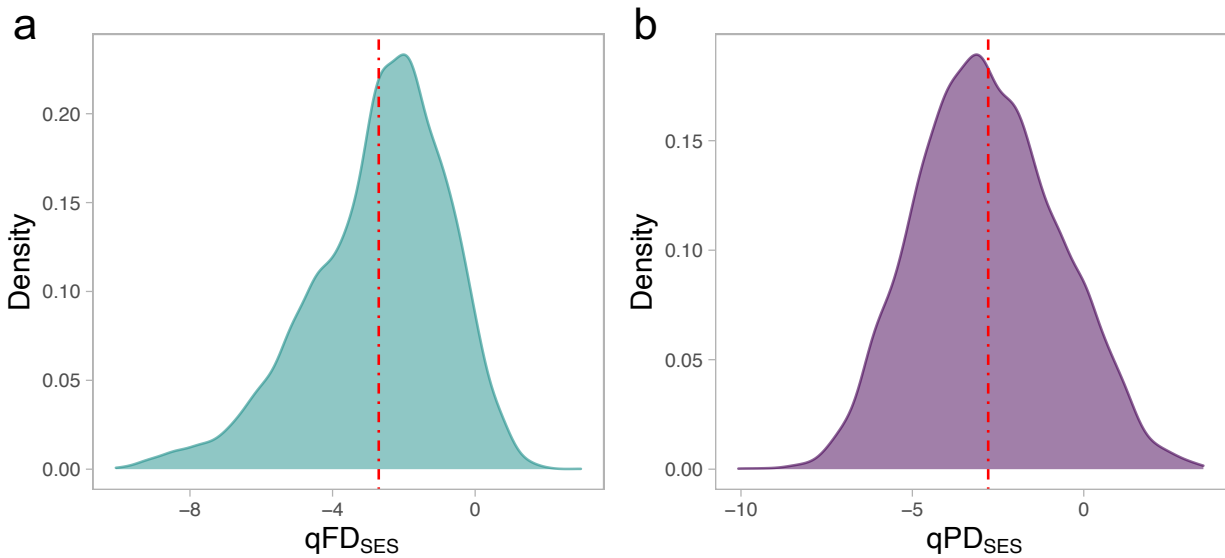


FIG. F.2: (a) Density of the standardized qFD. The associated skewness is -0.68 which suggests that functional diversity within quadrats is lower than expected by chance. (b) Density of the standardized qPD the associated skewness is 0.14 suggesting that phylogenetic diversity within the quadrat is slightly higher than expected by chance. The red vertical line represents the mean value for each distribution.

Appendix G: Significant individual effect of the relative abundances of 68 species on the aesthetic value

The contribution of each species (or taxonomic entity) on the aesthetic values of the photographic quadrats was assessed using multiple regression: we first ranked the species according to the strength of their individual effect on the aesthetic values to enter them in a linear model explaining the aesthetic values. Non-significant terms were removed through a sequential backwards selection to obtain a minimal adequate model. The coefficients of this final model were used to assess the contribution of each taxonomic entity to the aesthetic values.

Table G.1: Effect of the relative abundance of the 68 species that have a significant effect on the aesthetic values of the quadrats where they are present.

Code	Name	Effect	Standard Error	Code	Name	Effect	Standard Error
ADC	Adeonella calveti	0.099	0.046	HERA	Hexadella racovitzai	0.118	0.015
ALCO	Alcyonium corralloides	0.084	0.043	IDAT	Idmidronea atlantica	0.142	0.045
ANSU	Antipathella subpinnata	0.506	0.056	IRVA	Ircinia variabilis	0.785	0.334
APCA	Aplysina cavernicola	0.206	0.013	LEPR	Leptopsammia pruvoti	0.244	0.024
APLI	Aplidium sp	0.913	0.124	LICA	Lithophyllum cabiochae	0.540	0.072
ASVI	Ascidia virginea	0.297	0.143	LIIN	Lithophyllum incrustans	0.060	0.017
AXDA	Axinella damicornis	-0.073	0.024	LISP	Lithophyllum sp	0.180	0.061
AXPO	Axinella polypoides	0.175	0.049	LIST	Lithophyllum stictaeforme	0.225	0.015
BRSP	Bryopsis sp	-0.757	0.336	MEAL	Mesophyllum alternans	0.105	0.007
CASC	Scalarispongia scalaris	0.146	0.029	MEEX	Mesophyllum expansum	0.216	0.029
CELL	Cellaria sp	0.102	0.037	MESP	Mesophyllum sp	-0.044	0.012

CHNU	Chondrilla nucula	0.178	0.061	MYT	Myriapora truncata	0.181	0.042
CLSP	Clathrina sp	0.742	0.230	OSVO	Osmundaria volubilis	1.186	0.474
CLVI	Cliona viridis	-0.185	0.030	PACL	Paramuricea clavata	0.284	0.010
COEF	Codium effusum	0.360	0.051	PACR	Palmophyllum crassum	0.199	0.041
CORU	Corallium rubrum	0.219	0.021	PAMA	Paramuricea macrospina	0.196	0.051
CRSP	Crisia sp	-0.067	0.022	PEF	Pentapora fascialis	0.204	0.030
CRT	Crambe tailliezi	0.027	0.011	PEPO	Peyssonnelia polymorpha	0.180	0.009
CYSP	Cystoseira sp	0.173	0.018	PERO	Peyssonnelia rosa marina	0.157	0.008
DESA	Dentiporella sardonica	1.041	0.494	PESP	Erected Peyssonnelia sp	0.208	0.007
DIDI	Dictyota dichotoma	0.113	0.044	PESQ	Peyssonnelia squamaria	0.067	0.008
DIIM	Dictyota implexa	-0.278	0.108	PHFI	Phorbas fictitius	-1.004	0.333
DIPO	Dictyopteris polypodioides	0.169	0.045	PHTE	Phorbas tenacior	0.085	0.023
DIRO	Distaplia rosea	0.336	0.085	PLSP	Pleraplysilla spinifera	0.171	0.075
DISP	Dictyonella sp	0.135	0.047	PYCL	Pycnoclavella sp	0.096	0.028
DYAV	Dysidea avara	-0.091	0.039	REFU	Reniera fulva	0.089	0.042
ECME	Echinus melo	0.127	0.047	RESP	Reteporella sp	0.176	0.040
EUCA	Eunicella cavolini	0.204	0.014	RHNE	Rhopalaea neapolitana	0.534	0.078
EUSI	Eunicella singularis	0.140	0.023	SASP	Sabella spallanzanii	0.445	0.136
FARE	Gloiocladia repens	-0.091	0.028	SCMA	Schizomavella mamillata	0.219	0.027
FISA	Filograna or Salmacina sp	0.157	0.045	SPCU	Spirastrella cunctatrix	0.161	0.019
FLPE	Flabellia petiolata	0.222	0.009	SPSO	Spatoglossum solieri	0.588	0.210
HAME	Haliclona mediterranea	0.281	0.060	TUAV	Turbicellepora avicularis	0.293	0.071
HATU	Halimeda tuna	0.294	0.025	ZATY	Zanardinia typus	0.284	0.032

Appendix H: Relationships between the taxonomic, functional and phylogenetic ranks of the quadrats

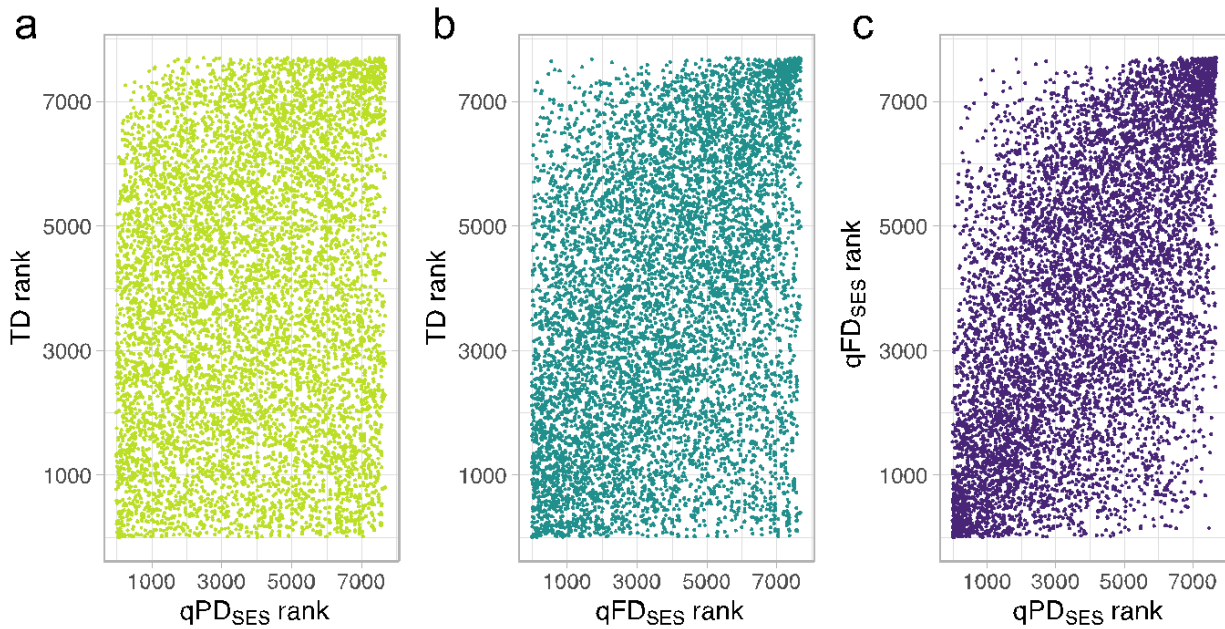


FIG. H.1: (a) Relationship between the ranks of the photographic quadrats according to their taxonomic diversity (TD rank) and their rank according to their standardized phylogenetic diversity (qPD_{SES} rank). $R^2 = 0.01$, p-value < 0.001. (b) Relationship between the taxonomic diversity rank (TD rank) and the standardized functional diversity (qFD_{SES} rank) rank. $R^2 = 0.12$, p-value < 0.001 (c) Relation between the standardized phylogenetic (qPD_{SES} rank) and functional (qFD_{SES} rank) diversities ranks. $R^2 = 0.33$, p-value < 0.001.

Appendix I: Correlation between the aesthetic values of the quadrats and the averaged station value

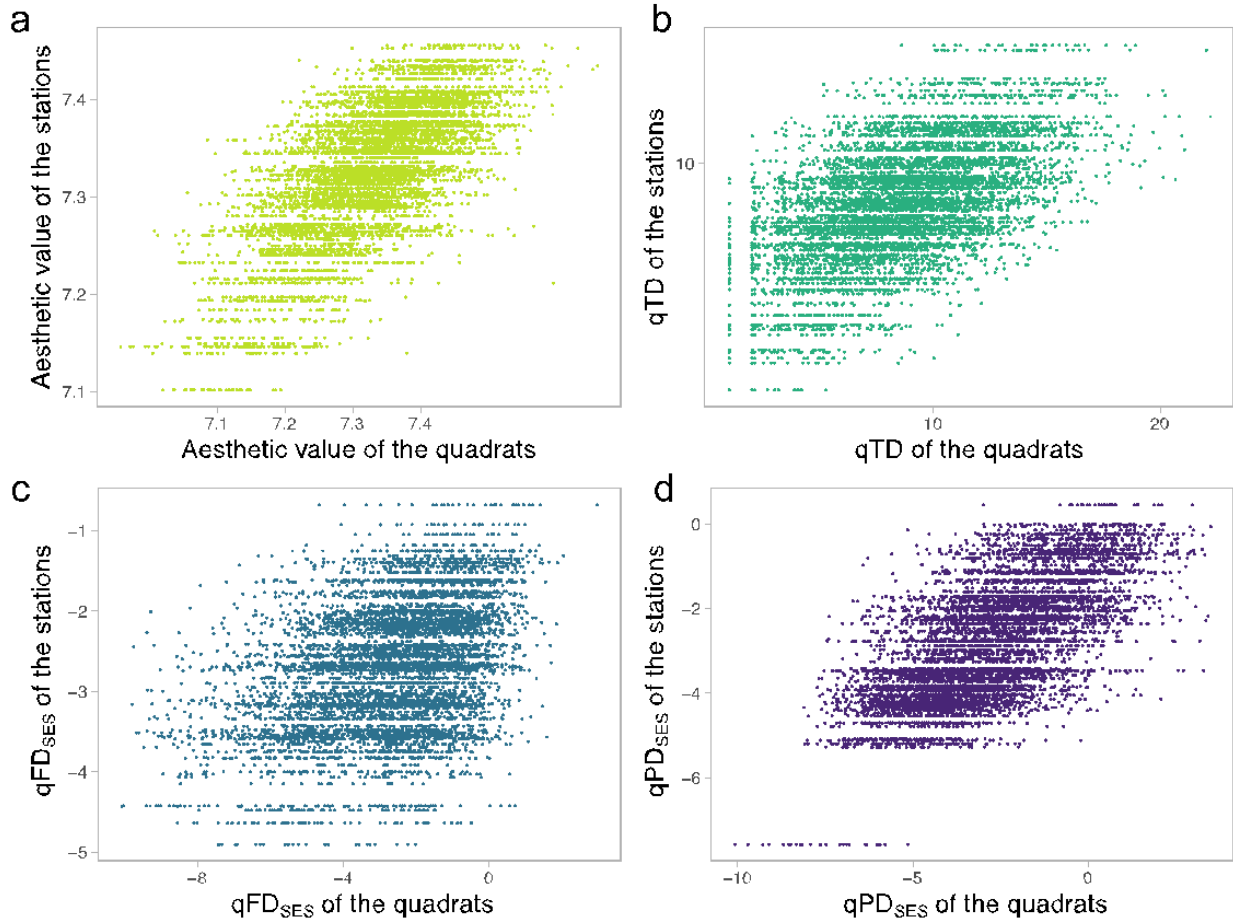


FIG. I.1: (a) Relation between the mean aesthetic values of the stations and the aesthetic values of the quadrats. At both levels, the aesthetic values are log transformed. $R^2 = 0.50$. (b) Relation between qTD at the station level and qTD at the quadrat level. $R^2 = 0.34$. (c) Relation between qFD_{SES} at the station level and qFD_{SES} at the quadrat level. $R^2 = 0.17$. (d) Relation between qPD_{SES} at the station level and qPD_{SES} at the quadrat level. $R^2 = 0.45$.

Appendix J: Relationship between the aesthetic values and the depth of all stations and between the aesthetic values and the longitude of the stations at the east of Marseille.

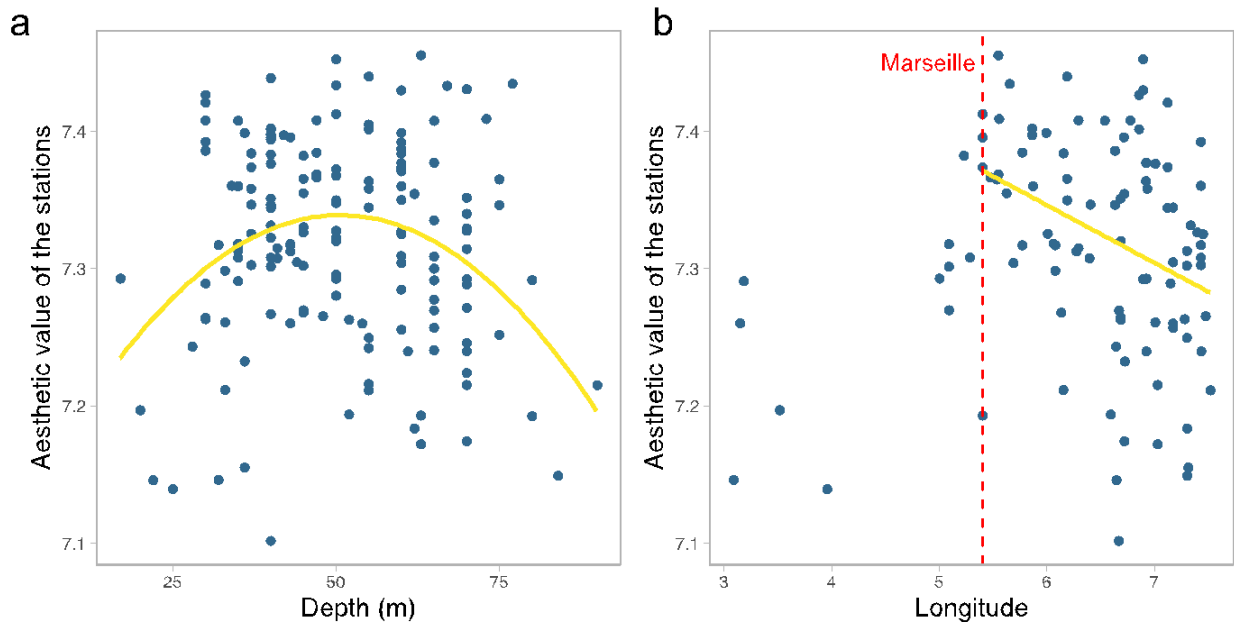


FIG. J.1: (a) Quadratic relationship between the aesthetic values and the depth of the 160 stations. $R^2 = 0.09$, p -value < 0.001 . (b) Relationship between the aesthetic values and the longitude of the 102 mainland stations. Linear regression for the 91 stations located at the east of Marseille, $R^2 = 0.11$, p -value $= 0.001$.