

Appendix 1 – List of macroalgal taxa with corresponding biomasses measurement (g wet wt per 0.25 m², mean, SD, n = 30) by year in each region across continental Portugal.

Macroalgal taxa are listed by morpho-functional groups. Climate affinity (C.A.: I, warm-water; II, cold-water; III, widely distributed).

Taxa	Viana do Castelo		Peniche		Sines		C.A.
	2012	2018	2012	2018	2012	2018	
	mean±SD	mean±SD	mean±SD	mean±SD	mean±SD	mean±SD	
"Incrustant" group							
<i>Agissea harveyana</i>			0.119±0.394		2.372±4.246	0.026±0.142	III
<i>Codium adhaerens</i>					19.460±54.563	13.497±40.228	I
<i>Colpomenia peregrina</i>				0.043±0.184		0.097±0.534	III
<i>Cutleria adspersa</i>					0.019±0.058	2.738±5.297	I
<i>Peyssonnelia rubra</i>			1.043±3.462				III
<i>Zanardinia typus</i>	1.171±2.464	1.454±2.055	0.522±1.415	1.557±2.745	0.348±0.955	0.663±1.494	I
"Turf" group							
<i>Acrosorium ciliolatum</i>		0.096±0.437	4.761±3.791	3.331±4.129	0.062±0.234	0.95±2.607	III
<i>Acrosorium venulosum</i>					0.003±0.004		III
<i>Aglaothamnion sp.</i>		0.001±0	0.147±0.785	0.039±0.206	0.003±0.013	0.393±1.991	II
<i>Ahnfeltiopsis devoniensis</i>	0.004±0.024			0.006±0.034			III
<i>Anotrichium furcellatum</i>			0±0.002				I

<i>Asparagopsis armata</i>			27.276±40.490	6.845±18.562	1.079±2.304	74.792±97.276	III
<i>Bonnemaisonia asparagoides</i>			0±0.002	0.312±1.676	0.926±2.201	0.207±0.73	III
<i>Bornetia secundiflora</i>			0.195±0.994	0.08±0.282	0.022±0.064	0.026±0.144	I
<i>Callithamnion sp.</i>					0±0.002	0.038±0.147	III
<i>Carpomitra costata</i>			0.011±0.049				III
<i>Carradoriella denudata</i>	1.686±5.014	0.014±0.037		0.039±0.093		0.091±0.332	III
<i>Ceramium ciliatum</i>					0.219±0.918		II
<i>Ceramium echionotum</i>					0.001±0.003		III
<i>Ceramium virgatum</i>			0±0.002				III
<i>Ceramium sp.</i>		0.001±0	0.001±0.003	0.001±0		0.737±2.322	III
<i>Champia parvula</i>				1.134±3.632	0.024±0.093	0.008±0.03	III
<i>Chondracanthus acicularis</i>			0.225±0.608		0.154±0.186	0.284±0.626	III
<i>Chondria dasyphylla</i>				0.323±1.67	0.24±0.409	0.008±0.031	III
<i>Chylocladia verticillata</i>						0.067±0.296	III
<i>Cladophora sp.</i>			0.001±0.003	0.191±0.34	0.265±0.362	0.558±1.38	III
<i>Cladostephus spongiosus</i>		0.001±0.004	0±0.002	0.015±0.082		4.587±11.319	III
<i>Compsothamnion thuioides</i>				0.001±0.007			III
<i>Corallina officinalis</i>	0.025±0.139	12.431±27.991		3.446±5.395	0.022±0.089	5.41±7.359	III

<i>Cryptonemia palmetta</i>		0.099±0.47		0.299±0.967			I
<i>Cryptopleura ramosa</i>	4.37±8.633	4.638±6.791		9.599±11.847	0.033±0.123	2.663±7.664	III
<i>Delesseriaceae</i>				0.002±0.01			III
<i>Dictyota dichotoma</i>	9.726±26.449	11.981±15.915	2.787±3.664	2.586±3.381	3.756±4.77	7.573±21.959	III
<i>Drachiella heterocarpa</i>					0±0.002		II
<i>Drachiella spectabilis</i>			0±0.002				III
<i>Dilsea carnosa</i>	37.722±86.296						III
<i>Ellisolandia elongata</i>		1.645±5.075	0.014±0.059	3.644±9.369	6.004±10.771	0.232±1.234	III
<i>Erythroglossum laciniatum</i>	0.11±0.604		0.017±0.055		0±0.002		III
<i>Gastroclonium ovatum</i>				0.005±0.027			II
<i>Gelidium corneum</i>	0.187±0.521	31.195±71.916	0.006±0.035	14.579±55.594		0.001±0	III
<i>Gigartina pistillata</i>	0.023±0.1						I
<i>Griffithsia sp.</i>					0±0.002		I
<i>Halopithys incurva</i>		0.014±0.079	0.642±2.764	19.747±47.606		22.999±105.214	I
<i>Halopteris filicina</i>				1.522±4.861	0±0.002	0.06±0.211	III
<i>Halopteris scoparia</i>			3.136±6.162	1.928±5.997	7.388±18.292	0.989±2.503	III
<i>Halurus equisetifolius</i>		0.009±0.05	0.03±0.155	0.475±1.537	0.003±0.009	0.071±0.257	II
<i>Heterosiphonia plumosa</i>	0.07±0.383		0.94±2.085	0.068±0.276	0.033±0.127	0.934±3.55	III

<i>Hypoglossum hypoglossoides</i>	0.022±0.084	0.024±0.075	0.006±0.026	0.133±0.263	0±0.002		III
<i>Jania rubens</i>			1.253±3.697	0.153±0.702	0.146±0.332	1.904±4.125	III
<i>Lomentaria clavellosa</i>			0±0.002				III
<i>Lychaete pellucida</i>			0.014±0.037		0.958±2.028	2.569±13.881	I
<i>Myriogramme minuta</i>				0.005±0.027			III
<i>Monosporus pedicellatus</i>			<0.0001±0		0±0.002		III
<i>Nitophyllum punctatum</i>			0.316±0.945	1.513±2.99	0.192±0.8	0.467±1.962	III
<i>Osmundea pinnatifida</i>				0.006±0.025	0.004±0.017	0.385±1.808	III
<i>Phycodrys rubens</i>				0.711±2.706			II
<i>Plocamium cartilagineum</i>	4.444±17.529	1.101±2.132	45.183±59.1	32.127±50.271	13.118±22.747	5.673±11.934	III
<i>Polysiphonia sp.</i>			0.049±0.246	1.192±4.352	1.445±3.596	0.027±0.146	III
<i>Porphyra umbillicallis</i>		0.01±0.047					III
<i>Pterocladella capillacea</i>						0.146±0.802	II
<i>Pterosiphonia complanata</i>	0.046±0.237	0.107±0.556	5.832±7.997	11.555±16.803	0.167±0.351	1.91±3.24	III
<i>Pterothamnion plumula</i>				0.072±0.356			II
<i>Pterothamnion crispum</i>				<0.0001±0	<0.0001±0	0.059±0.27	I
<i>Pterothamnion sp.</i>				<0.0001±0	<0.0001±0		III
<i>Rhodophyllis sp.</i>			0.792±2.738				III

<i>Rhodymenia ardissoni</i>						0.041±0.172	III
<i>Rhodymenia holmesii</i>	4.565±10.263	3.029±7.515	0.614±1.781		0.002±0.011		III
<i>Schizymenia dubyi</i>		0.682±3.32		0.073±0.26			II
<i>Scinaia furcellata</i>	0.003±0.015	0.013±0.073					III
<i>Sphaerococcus coronopifolius</i>				3.346±10.123	18.894±40.404	49.645±115.806	III
<i>Stenogramma interruptum</i>		0.243±0.652					III
<i>Symphiocladia marchantioides</i>				42.801±57.524			III
<i>Symphyocradiella parasitica</i>		0.001±0.006	0±0.002	0.115±0.317			I
<i>Taonia atomaria</i>		11.749±30.071		0.87±2.663	0.087±0.380	9.846±29.281	III
<i>Thuretella schousboei</i>						0.477±2.294	III
<i>Ulva lactuca</i>						3.099±5.161	III
<i>Ulva rigida</i>		0.049±0.109	0.005±0.020	0.588±2.835			III
<i>Ulva sp.</i>			0.01±0.048		0.009±0.037		III
<i>Vertebrata fucoides</i>				0.004±0.022			III
<i>Xiphosiphonia ardreana</i>	0.001±0.007	0.021±0.058	0.396±0.835	1.01±2.597	0.002±0.004	0.025±0.124	I
<i>Xiphosiphonia pennata</i>		0.004±0.023	0±0.002	0.481±1.774		0.005±0.029	III
<i>Womersleyella setacea</i>				0.024±0.133		0.426±1.139	III

"Subcanopy" group

<i>Calliblepharis ciliata</i>		0.799±3.584	0.006±0.035				II
<i>Calliblepharis jubata</i>						0.009±0.048	II
<i>Chondracanthus teedei</i>	2.747±11.492	0.680±2.840		0.227±1.195	0.033±0.181	0.333±1.223	III
<i>Chondria coerulescens</i>	0.056±0.299						III
<i>Chondrus crispus</i>	6.175±21.794	0.019±0.069		0.007±0.04	0.004±0.020		II
<i>Codium tomentosum</i>		0.003±0.016		8.058±18.134	0.521±1.688	7.795±15.052	III
<i>Desmarestia ligulata</i>		0.473±2.593					II
<i>Dictyopteris polypodioides</i>	0.448±2.186	0.453±1.238			0.009±0.041	0.016±0.086	III
<i>Gynmogongrus crenulatus</i>	0.420±2.302	0.092±0.282	0.006±0.035		0.003±0.016	0.003±0.018	I
<i>Liagora distenta</i>						0.584±3.001	I
<i>Liagora viscida</i>					0.002±0.013	4.963±17.301	I
<i>Phyllophora crispa</i>	2.569±6.678	0.532±1.400	2.099±6.781	4.039±9.403	0.058±0.186	0.106±0.382	II
<i>Rhodophyllis divaricata</i>					0.004±0.024		I
<i>Rhodymenia pseudopalmata</i>	0.543±2.072	24.225±51.215	0.072±0.378	0.141±0.548			III
<i>Spatoglossum solieri</i>					0.064±0.241		III
"Canopy" group							
<i>Gongolaria baccata</i>			1.007±3.055				II
<i>Gongolaria nodicaulis</i>		1.042±5.168		5.459±11.9	0.123±0.588	0.018±0.099	I

<i>Laminaria hyperborea</i>	175.850±198.644	14.738±58.998					II
<i>Laminaria ochroleuca</i>				7.582±29.136			II
<i>Phyllariopsis brevipes</i>		5.209±6.799	0.045±0.149		0.004±0.015	13.493±32.891	I
<i>Saccorhiza polyschides</i>	21.612±56.062	164.673±187.443	0.026±0.142	0.743±1.828			II
<i>Sargassum muticum</i>		0.344±1.885		0.875±4.792		0.35±1.404	I
