Deliverable 2.1

Compilation of existing physiological data on CWC response to different conditions of food supply and oceanographic change scenarios

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Compilation of existing physiological data on CWC response to different conditions of food supply and oceanographic change scenarios

A key ambition of WP2 of the ATLAS project is to link the metabolic activity and biomass of deep-water sponges and cold-water corals (CWCs) to the supply of organic matter sources from the water column using mathematical modelling. This requires the development of physiological models of sponges and CWCs as a function of food availability. In the last decade, the body of literature on sponge and coral physiology has grown substantially, but unfortunately these literature reports have not be collected into a coherent database (e.g. using standardised units). Therefore, this deliverable has the aim to assemble and review the existing literature on physiology of CWCs and sponges. This deliverable will support the physiological experimental and modelling efforts planned within ATLAS.

The deliverable contains information at two different levels:

(1) An inventory of existing relevant publications has been produced in Excel. Publications are listed in alphabetical order of the first author, and information also includes the publication year, journal/book title and keywords (**Table 1**). The corresponding PDFs (where available) are attached. This list contains (1) papers on CWCs and sponges, from which the data have been extracted, as well as (2) general papers containing information of the functioning of sponge grounds and CWC reefs and of cold-water ecophysiology (highlighted in grey).

(2) The publications from which data have been extracted were selected based on the following criteria:
(1) search terms (combined): cold-water coral, deep-water corals, deep sea sponges, deep sea, benthic organisms, Antarctic, physiology, ecophysiology, respiration oxygen consumption, feeding rates, capture rates, metabolism, growth, *Lophelia pertusa*, *Madrepora oculata, Desmophyllum dianthus, Dendrophyllia cornigera, Geodia barretti*;
(2) In addition to the literature on scleractinian CWC being selected, octocorals have also been included as well as sponges;
(3) Some Antarctic papers dealing with sponges and octocorals have also been processed, due to the similarities regarding cold-water temperatures and bathymetric range of many megabenthic Antarctic organisms;
(4) Literature on tropical and temperate organisms has not been included, with few exceptions. A paper dealing with a sea pen has been included despite the species being from shallow waters, because this is the only work we found regarding physiological studies on this group, which is important and abundant in deep-sea regions.

94 papers have been collected from the literature, from which 31 are general works. 47 papers deal with ecophysiology of scleractinian CWCs, 4 papers refer to physiological research with other cnidarians species and 13 deals with deep sea sponges.

The physiological data from the inventory of publications have been extracted for *Lophelia pertusa* and other CWC species, including *Desmophyllum dianthus*, *Dendrophyllia cornigera* and *Madrepora oculata*, Antarctic octorals (*Primnoisis Antarctica*, *Primnoella* sp. and Primnoella scotiae), a sea pen (*Pteroides griseum*), a CWC from the Pacific (*Primnoa pacifica*) and Red Sea corals (*Eguchipsammia* *fistula* and *Dendrophyllia* sp.). For deep-water sponges the following species are included: *Geodia barretti, Geodia atlantica, Geodia macandrewii, Stylocordila borealis, Cynachira antarctica, Mycale acerata, Mycale lingua, Isodyctia kerguelensis, Baikallospongia intermedia, Baikallospongia bacillifera, Phakellia ventilabrum, Antho dichotoma, Hymedesmia coriacea, Thenea muricata* and Porifera indet.

The data from the available literature have been included in the database for the following processes and standardised to the units indicated in brackets:

1. Food capture and ingestion (mmol C g DW^{-1} d^{-1})
2. Respiration (mmol C g DW^{-1} d^{-1})
3. DOC mucus excretion (mmol C g DW^{-1} d^{-1})
4. POC mucus excretion (mmol C g DW^{-1} d^{-1})
5. Calcification rate/growth rate (mmol C g DW-1 d-1)

Where mmol is micromole, C is carbon, g is gram, DW is dry weight and d is day. DOC stands for dissolved organic carbon and POC for particulate organic carbon.

The data have been stored in a database including relevant information as where the experiments/measurements have been developed (e.g. in situ/ex situ) and main experimental conditions/treatments. A reference of the data is also included in the Excel file, where the data are available. This database will be updated during the lifetime of ATLAS as new data will become available, but preliminary results from the literature survey are shown below.

The database contains 533 data entries for all five variables **(Table 2**). The highest data availability is on respiration and calcification/growth rates. Limited information is available on POC and DOC mucus excretion, which indicates a gap in our knowledge on physiological processes of CWC and sponges.

Figure 1 presents boxplots of the standardised respiration of ten species from the literature. Note that the octocoral *Pteroeides griseum* has a distinctively larger respiration rate than the other species. In addition, it is striking to see that *Desmophyllum dianthus* has a much higher respiration rate compared to *Lophelia pertusa* and *Madrepora oculata*. **Figure 2** presents a scatter plot of respiration rate versus partial CO_2 pressure (in ppm), of three CWC species. The graph shows a higher respiration for *D. dianthus* and indicates that atmospheric CO_2 concentration seem to have little effect on respiration. **Figure 3** shows boxplots of the standardised food capture rate for *L. pertusa*, *D. cornigera*, and *M. oculata* and their literature sources. Data were also collected for other species, but either one or two observations were available per species that had low or close-to-zero values and therefore these data are not plotted. DOC mucus excretion data is collected for two species: *L. pertusa* and *M. oculata*, but there were a low number of observations of which the units could not be standardise, so these are not shown. **Figure 4** shows the standardised growth rate for four species. This graph only displays a small proportion of the collected data because of difficulties in standardising the reported units (i.e. % d^{-1} to mmol C DW^{-1} d^{-1}). A graph for POC) mucus excretion is excluded since for this variable only one observation is collected.

In conclusion, the presented graphs are preliminary and do not comprise the entire database. In the database, the values that are unprocessed and need further standardization are marked in yellow. The database will be extended and further processed in the near-future and during the course of ATLAS.

Table 2: Number of data entries, literature articles, and species collected in the database per physiological variable.

Variable	Number of data entries	Number of papers	Number of species
Food capture	77	14	12
Respiration	244	28	16
DOC mucus	6	3	2
POC mucus	1	1	1
Calcification/growth rate	183	36	9

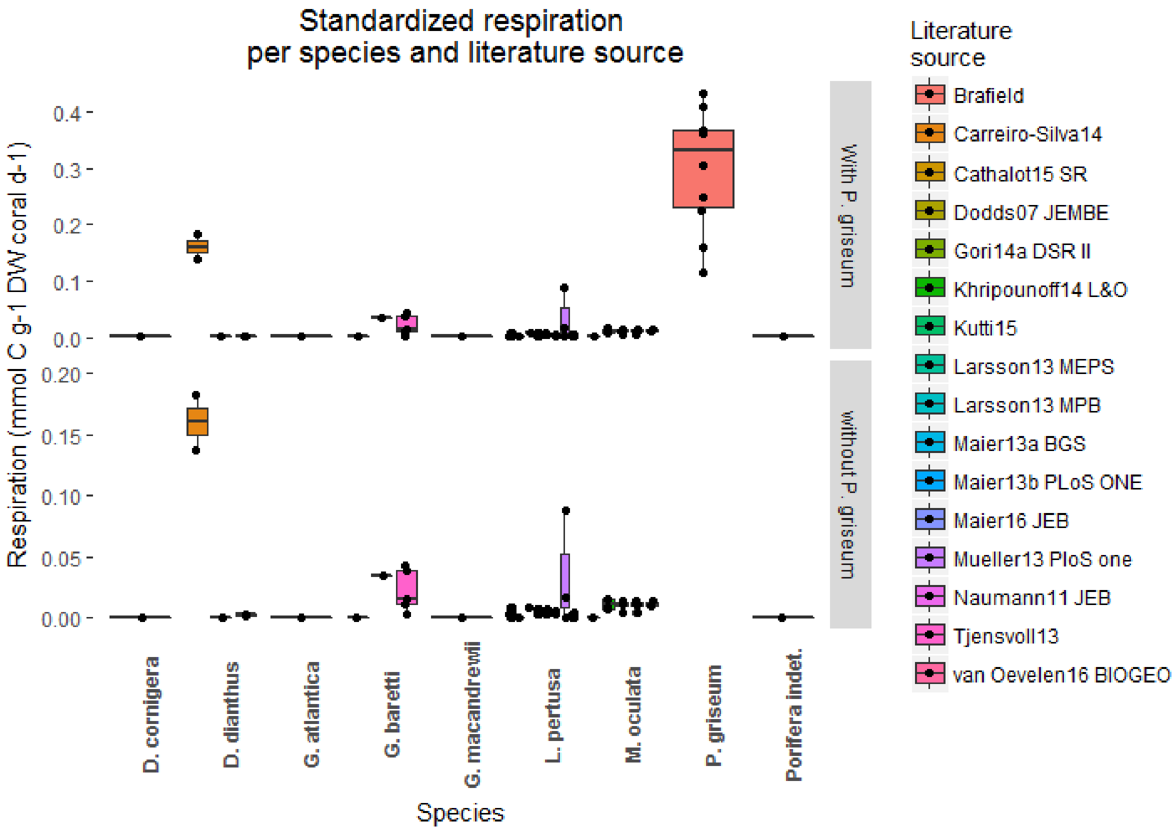

Figure 1: Boxplots of the standardised respiration per species and literature source. The upper part of the graph shows the respiration data with *P. griseum*, the lower part without *P. griseum*. Please note that not all species are CWC (e.g. *G. baretti, G. atlantica*).

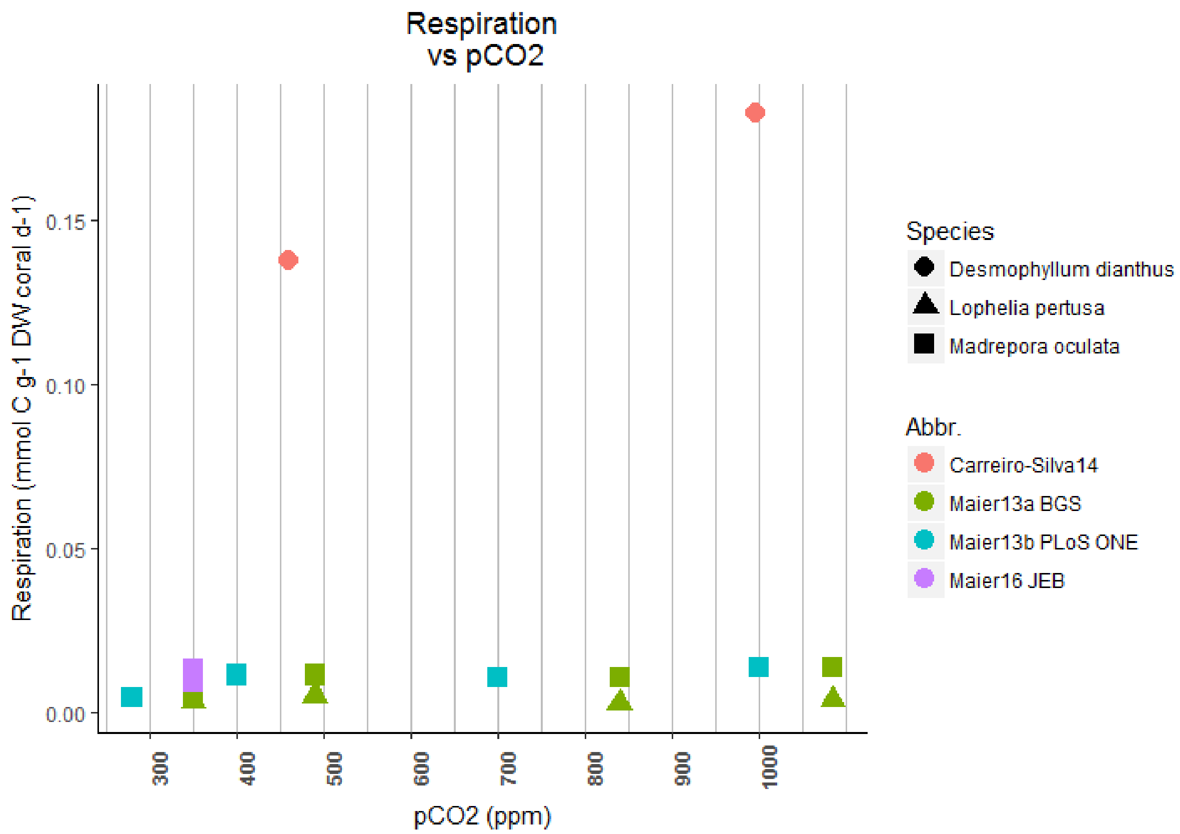

Figure 2: Scatterplot of the standardised respiration *vs* the pCO_2 in parts per million for three CWC species: *D. dianthus, L. pertusa,* and *M. oculata*.

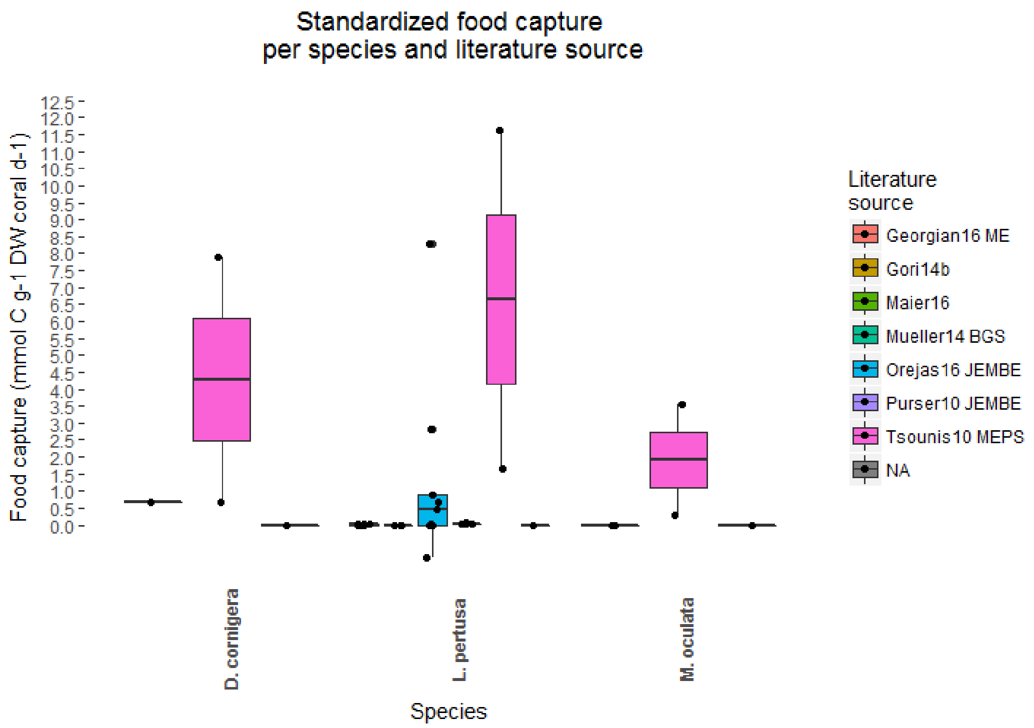

Figure 3: Boxplots of the standardised food capture rate per species and literature source.

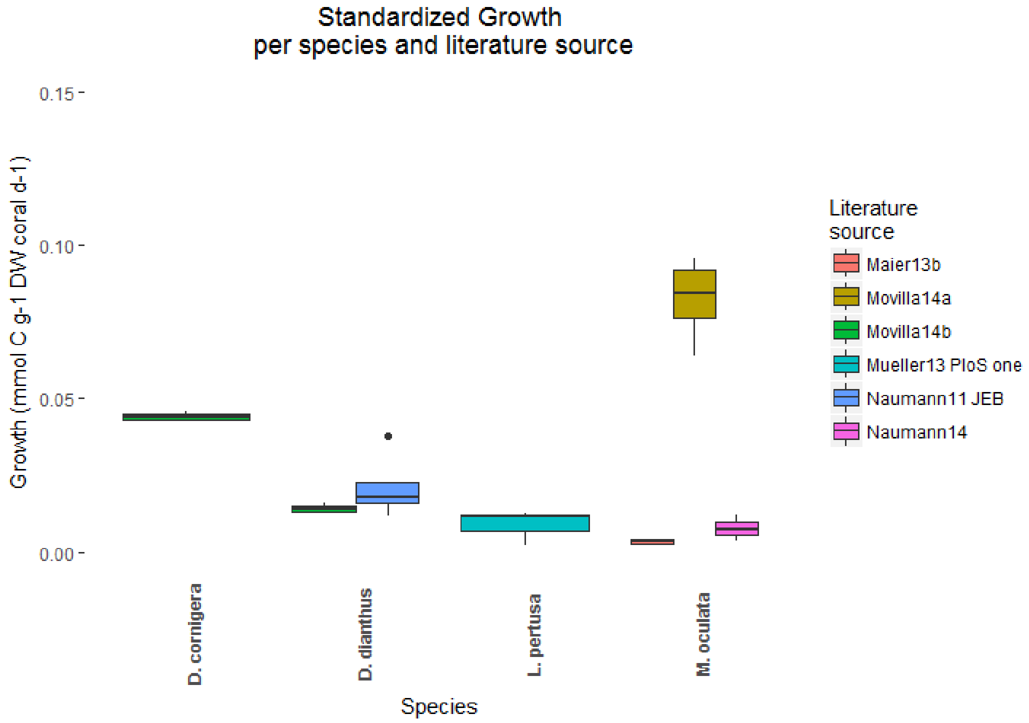

Figure 4: Boxplots of the standardised growth rate per species and literature source. This boxplot only shows data for CWC.

Table 1. Revised literature. Fields highlighted in grey included general papers (no data included in the Excel database).

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Brafield AE, Chapman G	1967	Journal of Experimental Biology		The respiration of *Pteroides griseum* (Bohadsch) a pennatulid coelenterate	*Pteroides griseum*, respiration, aquaria experiments	yes	Data included in the Database
Brooke S et al	2013	Deep-Sea Research Part II-Topical Studies in Oceanography		Temperature tolerance of the deep-sea coral *Lophelia pertusa* from the southeastern United States	*Lophelia pertusa*, temperature, growth, survival	yes	General paper
Brooke S, Young CM	2009	Marine Ecology Progress Series		In situ measurement of survival and growth of *Lophelia pertusa* in the northern Gulf of Mexico	*Lophelia pertusa*, Growth rates, Survival, Gulf of Mexico, Deep-water coral, In situ	yes	Data included in the Database
Carreiro-Silva M et al	2014	Coral Reefs		Molecular mechanisms underlying the physiological responses of the cold-water coral *Desmophyllum dianthus* to ocean acidification.	Acclimation, Calcification, Climate change, Cold-water corals, Gene expression, Metabolism, Ocean acidification	yes	Data included in the Database
Cathalot C et al	2015	Frontiers in Marine Science		Cold-water coral reefs and adjacent sponge grounds: hotspots of benthic respiration and organic carbon cycling in the deep sea	deep-sea ecosystems, cold-water corals, sponges, respiration, energyflow	yes	Data included in the Database
Clarke A	1987	Marine Ecology Progress Series		Temperature, latitude and reproductive effort		Yes	General paper
Clarke A	1982	International Journal of Invertebrate Reproduction		Temperature and embryonic development in polar marine invertebrates		no	General paper

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Cossins AR, Bowler K (eds)	1987		Temperature Biology of Animals	Temperature Biology of Animals		no	General paper
Dodds LA et al	2007	Journal of Experimental Marine Biology and Ecology		Metabolic tolerance of the cold-water coral *Lophelia pertusa* (Scleractinia) to temperature and dissolved oxygen change	Anoxia, Carbonate mound, Deep-sea coral, Hypoxia, *Lophelia pertusa*, Physiology, Respiration	yes	Data included in the Database
Fisher CR	1996	Biosystematics and Ecology Series		Ecophysiology of primary production at deep-sea vents and seeps		yes	General paper
Form A & Riesebell U	2012	Global Change Biology		Acclimation to ocean acidification during long-term CO2 exposure in the cold-water coral *Lophelia pertusa*	acclimation, calcification, climate change, CO_2, cold-water corals, long-term experiments, *Lophelia pertusa*, ocean acidification, short-term experiments	Yes	Data included in the Database
Gass S, Roberts JM	2006	Marine Pollution Bulletin		The occurrence of the cold-water coral *Lophelia pertusa* (Scleractinia) on oil and gas platforms in the North Sea: Colony growth, recruitment and environmental controls on distribution	Cold-water coral, *Lophelia pertusa,* North Sea, Environmental sensitivity, Oil and gas	yes	Data included in the Database
Gatti	2002	Berichte fuer Polar und Meeresforschung		The Role of Sponges in High-Antarctic Carbon and Silicon Cycling - a Modelling Approach		yes	General paper

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Gatti et al	2002	Marine Biology		Oxygen microoptodes: a new tool for oxygen measurements in aquatic animal ecology.	sponges, respiration	yes	Data included in the Database
Georgian SE et al	2016	Marine Ecology		Biogeographic variability in the physiological response of the cold-water coral *Lophelia pertusa* to ocean acidification	Calcification, cold-water coral, deep sea, energetics, ocean acidification, physiology	yes	Data included in the Database
Goreau TF, Goreau NI	1959	Biological Bulletin		The physiology of skeleton formation in Corals .II. Calcium deposition by hermatypic corals under various conditions in the reef		yes	General paper
Gori A et al	2014b	Coral Reefs		Physiological performance of the cold-water coral *Dendrophyllia cornigera* reveals its preference for temperate environments	Physiological ecology, Thermal tolerance, Coral calcification, Coral growth, Coral respiration, Organic carbon fluxes	yes	Data included in the Database
Gori A et al	2014a	Deep Sea Research Part II		Uptake of dissolved free amino acids by four cold-water coral species from the Mediterranean Sea	Cold-water corals, Dissolved free aminoacids, Dissolved organic matter, Trophic ecology, Mediterranean Sea, *Lophelia pertusa, Dendrophyllum cornigera, Desmophyllum dianthus, Madrepora oculata*	Yes	Data included in the Database
Gori A et al	2015	Journal of Experimental Biology		The influence of flow velocity and temperature on zooplankton capture rates by the cold-water coral *Dendrophyllia cornigera*	Cold-water coral, Feeding rate, Flow speed, Temperature	yes	Data included in the Database

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Gori A et al	2016	PEERJ		Physiological response of the cold-water coral *Desmophyllum dianthus* to thermal stress and ocean acidification	Cold-water corals, Thermal stress, Ocean acidification, Coral calcification, Coral respiration, Coral excretion	yes	Data included in the Database
Hennige SJ et al	2015	Proceedings Biological sciences / The Royal Society		Hidden impacts of ocean acidification to live and dead coral framework	Ocean acidification, cold-water corals, climate change, biomineralization, calcification, *Lophelia pertusa*	yes	Data included in the Database
Hennige SJ et al	2014	Deep Sea Research Part II: Topical Studies in Oceanography		Short-term metabolic and growth responses of the cold-water coral *Lophelia pertusa* to ocean acidification	Climate change, *Lophelia pertusa*, Deep-sea coral, Respiration, Growth, Calcification, Mingulay ReefComplex	yes	Data included in the Database
Hichachka PW et al. (eds)	1993		Surviving Hypoxia: Mechanisms of Control and Adaptation	Surviving Hypoxia: Mechanisms of Control and Adaptation		no	General paper
Hoffmann et al	2005a	Marine Biology Research		Oxygen dynamics in choanosomal sponge explants	*Geodia barretti*, microelectrodes, oxygen consumption, oxygen profiles, sponge cultivation	yes	Data included in the Database
Hoffmann et al	2005b	Geomicrobiology Journal		An Anaerobic World in Sponges	*Geodia barretti*, microelectrodes, oxygen profiles, Porifera, sponge associated microbes, sulfate reduction rates, SRR, symbiosis	yes (word text)	Data included in the Database

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Hoffmann et al	2009	Environmental Microbiology		Complex nitrogen cycling in the sponge *Geodia barretti*	*Geodia barretti*, Porifera, Nitrogen cycling	yes	Data included in the Database
Hurd CL et al	2011	Global Change Biology		Metabolic induced pH fluctuations by some coastal calcifiers exceed projected 22nd century ocean acidification: a mechanism for differential susceptibility?		no	General paper
Jantzen C et al	2013b	Marine and Freshwater Research		In situ short-term growth rates of a cold-water coral	buoyant-weight technique, *Desmophyllum dianthus*, fjords, in situ CaCO3 precipitation, mass increase, Patagonia, Scleractinia	yes	Data included in the Database
Johnston IA, Bennett AF (eds)	1996		Animals and temperature: phenotypic and evolutionary adaptation	Animals and temperature: phenotypic and evolutionary adaptation		no	General paper
Keller NB et al	2009	Doklady Earth Sciences		A new approach in determining the age of deep-water species of scleractinia using temperature ranges of their habitation		no	General paper
Khripounoff A et al.	2014	Limnology and Oceanography		Deep cold-water coral ecosystems in the Brittany submarine canyons (Northeast Atlantic): Hydrodynamics, particle supply, respiration, and carbon cycling	Cold-water corals, submarine canyons, respiration, carbon cycling	Yes	Data included in the Database

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Kowalke J	2002	Journal of Experimental Biology and Ecology		Ecology and energetics of two Antarctic sponges	Antarctica, Sponges, Retention efficiency, Pumping rate, Respiration rate	yes	Data included in the Database
Kurman MD et al	2016	Frontiers		Intra-specific variation may confer resistance to ocean acidification in a cold-water coral from the Gulf of Mexico	*Lophelia pertusa*, Climate Change, deep sea, enzyme activity, carbonic anhydrase, Carbonate saturation, dissolution	yes	Data included in the Database
Kutti T et al	2013	Continental Shelf Research		Community structure and ecological function of deep-water sponge grounds in the Traenadypet MPA-Northern Norwegian shelf	Sponge bed, Sponge aggregation, Respiration, Pumping rates, Vulnerable Marine Ecosystems(VME), *Geodia barretti*	yes	Data included in the Database
Kutti T et al	2015	Journal of Experimental Biology and Ecology		Metabolic responses of the deep-water sponge *Geodia barretti* to suspended bottom sediment, simulated mine tailings and drill cuttings	North East Atlantic, Porifera, Sedimentation	yes	Data included in the Database
Larsson AI et al	2013a	Marine Ecology Progress Series		Skeletal growth, respiration rate and fatty acid composition in the cold-water coral *Lophelia pertusa* under varying food conditions.	Cold-water corals, *Lophelia pertusa*, Coral physiology, Feeding, Growth, Respiration, Fatty acids	yes	Data included in the Database

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Larsson AI, Purser A	2011	Marine Pollution Bulletin		Sedimentation on the cold-water coral *Lophelia pertusa*: Cleaning efficiency from natural sediments and drill cuttings.	*Lophelia pertusa*, Cold-water corals, Sedimentation, Drill cuttings, Sediment rejection, Oil and gas exploration	yes	Data included in the Database
Larsson AI et al	2013b	Marine Pollution Bulletin		Tolerance to long-term exposure of suspended benthic sediments and drill cuttings in the cold-water coral *Lophelia pertusa*	Cold-water corals, *Lophelia pertusa*, Sediment exposure, Drill cuttings, Growth, Larval survival	yes	Data included in the Database
Lartaud F et al	2014	Deep-Sea Research II		Temporal changes in the growth of two Mediterranean cold-water coral species, in situ and in aquaria	*Lophelia pertusa, Madrepora oculata*, Mediterranean Sea, Lacaze-Duthiers canyon, In situ and aquaria growth experiments	yes	Data included in the Database
Lunden, JJ et al	2014	Frontiers in Marine Science		Acute survivorship of the deep-sea coral *Lophelia pertusa* from the Gulf of Mexico under acidification, warming, and deoxygenation	climate change,ocean acidification, *Lophelia pertusa*, survivorship,net calcification,Gulf of Mexico	yes	Calcification rates included, survivorship excluded
MacDonald AG	1971		Pressure physiology in marine animals	The role of high hydrostatic pressure in the physiology of marine animals		no	General paper

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Maier C et al	2013a	Biogeosciences		Respiration of Mediterranean cold-water corals is not affected by ocean acidification as projected for the end of the century	*Lophelia pertusa*, *Madrepora oculata*, temperature, metabolism, respiration, calcification, ocean acidification	yes	Data included in the Database
Maier C et al	2013b	Plos One		End of the Century pCO(2) Levels Do Not Impact Calcification in Mediterranean Cold-Water Corals.	*Madrepora oculata*, *Lophelia pertusa*, Mediterranean pCO2, ocean acidification	yes	Data included in the Database
Maier C et al	2011b	Proceedings of the Royal Society B-Biological Sciences		Calcification rates and the effect of ocean acidification on Mediterranean cold-water corals	cold-water coral, *Lophelia pertusa*, *Madrepora oculata*, *Desmophyllum dianthus*, calcification, ocean acidification	yes	Data included in the Database
Maier C et al	2011a	Biogeosciences		Dynamics of nutrients, total organic carbon, prokaryotes and viruses in onboard incubations of cold-water corals	nutrients, cold-water corals, prokaryots, on board incubations, *M. oculata, L. pertusa*	yes	Data included in the Database
Maier C et al	2009	Biogeosciences		Calcification of the cold-water coral *Lophelia pertusa* under ambient and reduced pH.	*Lophelia pertusa*, calcification, pH	yes	Calcification rates included
Maier C et al	2016	Journal of Experimental Biology		Effects of elevated pCO2 and feeding on net calcification and energy budget of the Mediterranean cold-water coral *Madrepora oculata*	*Madrepora oculata*, Ocean acidification	yes	Data included in the Database

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Marshall AT, Clode P	2004	Coral Reefs		Calcification rate and the effect of temperature in a zooxanthellate and an azooxanthellate Scleractinian reef coral	Corals, Calcification, Temperature, Zooxanthellate, Azooxanthellate, *Dendrophyllia*	yes	Data included in the Database
Matsumoto AK	2007	Bulletin of Marine Science		Effects of low water temperature on growth and magnesium carbonate concentrations in the cold-water gorgonian *Primnoa pacifica*	gorgonians, Pacific	yes	General paper
McCulloch M et al	2012	Geochimica et Cosmochimica Acta		Resilience of cold-water scleractinian corals to ocean acidification: Boron isotopic systematics of pH and saturation state up-regulation	cold-water scleractinians, ocean acidification, boron isotope	yes	General paper
McLusky DS, Berry AJ (eds)	1997		Physiology and Behaviour of Marine Organisms	Physiology and Behaviour of Marine Organisms		no	General paper
Menzies RJ, George RY	1972	Marine Biology		Temperature effects on behavior and survival of marine invertebrates exposed to variations in hydrostatic pressure		No	General paper
Miller MW	1995	Marine Ecology Progress Series		Growth of a temperate coral: effects of temperature, light, depth, and heterotrophy	Coral, Temperate, *Oculina arbuscula*, Feeding, Light, Temperature	yes	General paper

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Montagna P et al	2008	CIESM Workshop Monographs		High-resolution geochemical records from Mediterranean cold-water corals: proxies for paleoclimate and paleoenvironmental reconstructions and the role of coral physiology		yes	General paper
Movilla J et al	2014a	Water		Resistance of two Mediterranean cold-water coral species to low-pH conditions	ocean acidification, cold-water corals, *Lophelia pertusa, Madrepora oculata*, Mediterranean Sea, aquaria experiment, calcification rate, porosity, microdensity	yes	Data included in the Database
Movilla J et al	2014b	Coral Reefs		Differential response of two Mediterranean cold-water coral species to ocean acidification	Ocean acidification, Cold-water coral, Aquaria experiment, *Dendrophyllia cornigera, Desmophyllum dianthus*, Mediterranean Sea	yes	Data included in the Database
Mueller CE et al	2014	Biogeosciences		Opportunistic feeding on various organic food sources by the cold-water coral *Lophelia pertusa*	*Lophelia pertusa*, feeding	yes	Data included in the Database
Mueller CE et al	2013	Plos One		The Symbiosis between *Lophelia pertusa* and *Eunice norvegica* Stimulates Coral Calcification and Worm Assimilation	symbiosis, *Lophelia pertusa, Eunice norvegica*	yes	Carbon values included, ammonium excluded

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Naumann MS et al	2014	Deep Sea Research Part II: Topical Studies in Oceanography		Species-specific physiological response by the cold-water corals *Lophelia pertusa* and *Madrepora oculata* to variations within their natural temperature range	*Lophelia pertusa, Madrepora oculata*, temperature, metabolism, growth, respiration, calcification	yes	Data included in the Database
Naumann MS et al	2011	Journal of Experimental Biology		First evidence for zooplankton feeding sustaining key physiological processes in a Scleractinian cold-water coral	deep sea, cold-water coral, feeding ecology, respiration, calcification, organic matter release, carbon budget, *Desmophyllum dianthus*, Mediterranean	yes	Data included in the Database
Naumann MS et al	2013	Coral Reefs		High thermal tolerance of two Mediterranean cold-water coral species maintained in aquaria	*Desmophyllum dianthus, Dendrophyllia cornigera*, Temperature, Growth, Calcification, Scleractinia	yes	Data included in the Database
Naumann MS et al	2015	Coral Reefs		Trophic ecology of two cold-water coral species from the Mediterranean Sea revealed by lipid biomarkers and compound-specific isotope analyses	*Desmophyllum dianthus, Madrepora oculata*, Suspended particulate organic matter, Sediment, Fatty acids and alcohols Sterols	yes	General paper

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Neulinger Sc et al	2008	Applied and environmental microbiology		Phenotype-Specific bacterial communities in the cold-water coral *Lophelia pertusa* (Scleractinia) and their implications for the coral's nutrition, health, and distribution	Bacterial community, *Lophelia pertusa*, cold-water corals, nutrition, distribution	yes	General paper
Obinnaya CL	2011	University of Lagos Press		Ecophysiology of Marine life: a science or management tool?		yes	General paper
Orejas C et al	2003	Marine Ecology Progress Series		Role of small-plankton communities in the diet of two Antarctic octocorals (*Primnoisis antarctica* and *Primnoella* sp.)	Feeding ecology, Suspension feeders, Antarctic gorgonians, Small-plankton communities	yes	Data included in the Database
Orejas et al	2016	Journal of Experimental Marine Biology and Ecology		The effect of flow speed and food size on the capture efficiency and feeding behaviour of the cold-water coral *L. pertusa*	Trophic ecology, *Lophelia pertusa*, NE Atlantic, Flow speed, Feeding experiments, Behavioural experiments	Yes	Data included in the Database
Orejas et al	2011b	Marine Ecology Progress Series		Long-term growth rates of four Mediterranean cold-water coral species maintained in aquaria	*Madrepora oculata, Lophelia pertusa, Desmophyllum dianthus, Dendrophyllia cornigera*, Buoyant weight, Linear growth, Branching patterns, Mediterranean Sea	yes	Data included in the Database

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Orejas et al	2007	Coral Reefs		Growth rates of live *Lophelia pertusa* and *Madrepora oculata* from the Mediterranean Sea maintained in aquaria.	growth rates, aquaria, *Lophelia pertusa, Madrepora oculata*	yes	Data included in the Database
Orejas et al	2011a	Journal of Experimental Marine Biology and Ecology		Experimental comparison of skeletal growth rates in the cold-water coral *Madrepora oculata* Linnaeus, 1758 and three tropical scleractinian corals	Aquaria experiments, Buoyant weight, Cold-water corals (CWC), *Madrepora oculata,* Skeletal growth rates, Tropical corals	yes	Data included in the Database
Peck LS, Brockington S	2013	Deep-Sea Research II		Growth of the Antarctic octocoral *Primnoella scotiae* and predation by the anemone *Dactylanthus antarcticus*	Low temperature, Polar, Signy Island, Seasonality, Mark-recapture, Density, Coastal	yes	Data included in the Database
Pile A	1996	Marine Ecology Progress Series		In situ grazing on plankton <10 micron by the boreal sponge *Mycale lingua*	Ultraplankton Sponges ,Suspension feeding , Benthic-pelagic coupling , *Mycale lingua*, Gulf of Maine	yes	Data included in the Database
Pile A et al	1997	Limnology and Oceanography		Trophic effects of sponge feeding within Lake Baikal's littoral zone. 2. Sponge abundance, diet, feeding efficiency, and carbon flux	Sponges, ultraplankton, capture rates, Baikal lake	yes	Data included in the Database
Pörtner HO, Playle RC (eds)	2007		Cold ocean physiology	Cold ocean physiology		no	General paper

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Purser A et al	2010	Journal of Experimental Marine Biology and Ecology		The influence of flow velocity and food concentration on *Lophelia pertusa* (Scleractinia) zooplankton capture rates	Carbon storage, Cold-water coral, Feeding rate, Flume, *Lophelia pertusa*	yes	Food capture values included
Radax R et al	2012	Environ Microbiol		Ammonia-oxidizing archaea as main drivers of nitrification in cold-water sponges	Cold-water sponges, nitrification, amonium, nitrite, nitrate, *G. barretti, P. ventilabrum, A. dichotoma*	yes	Data included in the Database
Riisgard HU, Larsen PS	2015		Marine Animal Forests	Filter-Feeding Zoobenthos and Hydrodynamics	Grazing potential, Suspension feeding, Biomixing, Benthic boundary layer, Viscous sublayer, Modeling, Benthic-pelagic coupling, Grazing impact	yes	General paper
Rix L et al	2016	Scientific Reports		Coral mucus fuels the sponge loop in warm- and cold- water coral reef ecosystems	Coral reefs, Mucus excretion, Sponge loop, Cold water corals	Yes	Data included in the Database
Roder C et al	2013	Scientific reports		First biological measurements of deep-sea corals from the Red Sea	metabolism, deep-sea corals, respiration rates, calcification rates, oligrotrophic conditions, low oxygen, resilience	yes	Data included in the Database

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Rodolfo-Metalpa R et al	2015	Global Change Biology		Calcification is not the Achille's heel of cold-water corals in an acidifying ocean	Cold-water corals, ocean acidification, calcification and dissolution, *Desmophyllum dianthus, Caryophyllia smithii, Dendrophyllia cornigera*	yes	Data lacking (requested to author)
Roik A et al	2015	PEERJ		Captive rearing of the deep-sea coral *Eguchipsammia fistula* from the Red Sea demonstrates remarkable physiological plasticity	Coral reef, Red Sea, Coral rearing, Phenotypic plasticity, *Eguchipsammia fistula*, Deep-sea coral	yes	Data included in the Database
Rovelli L et al	2015	Marine Ecology Progress Series		Benthic O2 uptake of two cold-water coral communities estimated with the non-invasive eddy correlation technique	Eddy correlation, Cold-water coral, Community oxygen exchange, Mingulay Reef Complex, Stjernsund	yes	General paper
Sherwood OA et al	2008	Deep-Sea Research II		Stable C and N isotopic composition of cold-water corals from the Newfoundland and Labrador continental slope: Examination of trophic, depth and spatial effects	d13C, d15N, Cold-water corals, Trophic level, Continental slope, Newfoundland and Labrador	yes	General paper
Thiel H et al	1996		Deep Sea and extreme shallo-water habitats: affinities and adaptations	Marine life at low temperatures - a comparison of polar and deep-sea characteristics		yes	General paper

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
Tjensvoll et al	2013	Marine Ecology Progress Series		Rapid respiratory responses of the deep-water sponge *Geodia barretti* exposed to suspended sediments.	Continental shelf, Porifera, Turbidity, Bottom trawling, Fisheries	yes	Data included in the Database
Tsounis et al	2010	Marine Ecology Progress Series		Prey-capture rates in four Mediterranean cold-water corals	Cold water corals, grazing rates, colony size, trophic ecology, benthic-pelagic coupling	Yes	Data included in the Database
Tyler PA, Young CM	1998	Deep-Sea Research II		Temperature and pressure tolerances in dispersal stages of the genus Echinus (Echinodermata : Echinoidea): prerequisites for deep-sea invasion and speciation		yes	General paper
van Oevelen et al	2016	Biogeosciences		Food selectivity and processing by the cold-water coral *Lophelia pertusa*	*Lophelia pertusa*, feedings	Yes	Data included in the Database
van Oevelen et al	2009	Limnology and Oceanography		The cold-water coral community as a hot spot for carbon cycling on continental margins: A food-web analysis from Rockall-Bank (northeast Atlantic)	carbon cycling, food web, continental shelf, *Lophelia pertusa*, Rockall Bank	yes	Data included in the Database
Vernberg WB (ed)	1972		Environmental physiology of marine animals	Environmental physiology of marine animals		no	General paper
Wall M et al	2015	Biogeosciences		pH up-regulation as a potential mechanism for the cold-water coral *Lophelia pertusa* to sustain growth in aragonite undersaturated conditions	pH, *Lophelia pertusa*, growth	yes	General paper

Authors (first author et al.)	Year	Journal	Book	Title	Keywords	PDF available	Remarks
White M et al	2012	Marine Ecology Progress Series		Cold-water coral ecosystem (Tisler Reef, Norwegian Shelf) maybe a hotspot for carbon cycling	Benthic community respiration, Cold-water corals, *Lophelia pertusa*, Carbon cycling	yes	General paper
Wild C et al	2008	Marine Ecology Progress Series		Organic matter release by cold water corals and its implication for fauna-microbe interaction	Coral reefs, cold water corals, *Lophelia pertusa, Madrepora oculata*, organic matter release, microbial ecology, fuana-microbe interaction	Yes	Data lacking (requested to author)
Witte et al	1997	Marine Ecology Progress Series		Particle capture and deposition by deep sea sponges from the Norwegian-Greenland Sea.	Deep sea Sponge Suspension feeding Biodeposition Biogenic structure Flow regime	yes	Data included in the Database
Zetsche EM et al	2016	Plos One		Direct visualisation of mucus production by the cold-water coral *Lophelia pertusa* with Digital Holographic Microscopy	*Lophelia pertusa*, mucus production metabolism, feeding	yes	General paper

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