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Supplementary Material for

A Three-Stage Symbiosis Forms the Foundation of Seagrass Ecosystems

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Materials and Methods.

Meta-analysis.

To test the seagrass-lucinid association, we performed an extensive, worldwide meta-analysis that covered the entire climatic distribution of seagrasses. Criteria for including a study were: (1) seagrasses were present at the site, and (2) when Lucinidae were present, they were found inside the seagrass bed. In total, we analyzed 84 studies that sampled the fauna of seagrass beds in a total of 83 areas (temperature range = 1 to 33 ºC, mean = 22 ºC). Overall, 36 sites were from tropical areas, 31 from subtropical and 16 from temperate areas; quantitative data were available for 46 out of 83 sites. Apart from the geographical location of each site, and the seagrass and lucinid families found, we also report the annual seawater temperature range. These were obtained from freely available satellite imagery of the long-term monthly means (1971 – 2000) of the sea surface temperature (*29*).

Field study.

We conducted a field survey at Banc d'Arguin (Mauritania) to test the strength of the relation between seagrass biomass and lucinid density. Banc d'Arguin consists of about 500 km^2 of intertidal flat dominated by mixed meadows of *Zostera noltii*, *Halodule wrightii* and *Cymodocea nodosa* that are inhabited by the lucinid bivalve *Loripes lacteus* (*30*). In total, we sampled 110 stations across seven intertidal flats. *Loripes* was sampled up to a depth of 20 cm using a cylindrical 15-cm diameter PVC core sampler and seagrass was sampled with a 7-cm diameter corer. Each sample was sieved over a 1-mm mesh sieve. Next, *Loripes* was counted and seagrass biomass was determined after drying for 24-h at 70 ºC. Prior to linear regression analysis, *Loripes* counts and seagrass dry weight from the cores were transformed with the Box-Cox procedure to achieve normality and homoscedasticity (*31*).

Laboratory experiment.

Organisms and sediment for the experiment were collected in Arcachon Bay (southwest France) and transported at 15 ºC to the laboratory, where both species were separately acclimatized for three weeks in 100-L polyethylene tanks. *Zostera* units contained 15 cm of sediment and 20 cm of surface water; *Loripes* tanks contained 30 cm of sediment and 5 cm of surface water. We used artificial seawater (33-35 PSU Tropic Marin at 20 ºC) throughout the acclimatization period and during the experiment; pH was kept at 8.1 to 8.3 by CO_2 aeration. Light period was 16 h day^{-1}; intensity at the leaf surface was 300 $\mu mol\ m^{-2}\ s^{-1}$, similar to growing season conditions in the field (*32*). During this three-week period, we did not observe any bivalve mortality, and seagrasses exhibited healthy vegetative growth.

Experimental setup. The lower 6-cm tall sections of 40 two-compartment PVC columns (diameter 8.4 cm) were filled with anaerobic seawater (Fig. S3). These 330-ml sections contained an injection tube and were separated from their upper compartments through a porous 0.1-mm membrane. Sediment was passed through a 1-mm sieve and transferred to the upper 12-cm tall sections (surface area: 0.0055 m^2). Depending on the treatment, each unit then received either 1) *Loripes*, 2) *Zostera*, 3) both *Zostera* and *Loripes*, or 4) no further treatment. Nine *Loripes* specimens were added to each *Loripes* treatment (~1600 ind. m^{-2}; mean shell length ~9 mm) and 5 seagrass ramets with 2 or 3 shoots (12 shoots in total) were planted in each unit containing *Zostera* (~2200 sh. m^{-2}; ~0.12 g shoot, ~0.06 g rhizome and ~0.03 g DW root biomass per column). Each ramet contained one apical shoot to allow vegetative growth. Pilot experiments showed that this approach ensured consistent colonization of the units within the two-week adjustment period, with no detectable mortality of the plants. Densities of both species were well within reported ranges of densities in the field (up to 23000 sh. m^{-2} for *Zostera* and 3700 ind. m^{-2} for *Loripes*) (*33-35*).

A full factorial experiment was designed with eight treatments and five replicates per treatment. The columns were randomly placed in a 40-cm high 250-L polyethylene basin where water flow and oxygen saturation (measured with a 556 Multi Parameter Sampler, Yellow Springs Instruments) were maintained by two aquarium water pumps, and pH was kept constant (8.1-8.3) by CO_2 aeration. After setup, the units were allowed to adjust for two weeks. During this period, sulfide levels in the treatments containing *Loripes* stabilized at ~7 μM, while sulfide in treatments without *Loripes* increased to ~233 μM. Following the adjustment period, the experiment was performed for five weeks. Sulfide levels in the lower compartments of the sulfide addition treatments were increased twice a week by 3.3-ml injections of 100 mM Na_2S solution with pH adjusted to sediment conditions (pH 7.5) with HCl, while control treatments were injected with anaerobic water. Before each injection, we used 5 cm Rhizon samplers to extract 3 ml of pore water from the main root zone (top 6 cm) of each upper compartment into vacuumized 30 ml flasks containing 3 ml Sulfide Anti-Oxidation Buffer (SAOB). After each sampling, columns were re-randomized in the basin to minimize possible differences in light levels and water flow velocities between units. Sulfide concentrations were determined immediately with an ion selective silver/sulfide electrode (Thermo Scientific (USA), Orion 9416 BN; reference electrode: Orion 900200). Oxygen detection depth was measured after five weeks with an oxygen-sensitive microelectrode (Microscale Measurements, 1-mm tip). Ammonium, nitrate and total dissolved phosphorus in the sediment pore water were also measured after five weeks. We used 5 cm Rhizon samplers to extract 10 ml of pore water from the main root zone (top 6 cm) of each upper compartment into vacuumized 30 ml flasks. Ammonium and nitrate concentrations were determined colorimetrically. Ammonium was measured with salicylate (*36*) and nitrate was determined by sulfanilamide after reduction of nitrate to nitrite in a cadmium column (*37*). Dissolved phosphorus was measured on an Inductively Coupled Plasma emission spectrophotometer (ICP; Spectroflame, Spectro). Total nitrogen concentration in *Zostera* leaves was measured in freeze-dried tissues by a CNS analyzer (type NA1500; Carlo Erba Instruments, Milan, Italy) (*36*). Total phosphorus was measured by ICP after digestion with nitric acid (*36*). *Zostera* shoot, root and rhizome biomass and *Loripes* flesh were measured as dry weight after 24 h of freeze-drying. *Loripes* shell weight was measured after drying for 24 h at 70 ºC. *Loripes* condition was expressed as flesh/shell dry weight ratio, which is a commonly used size-and-age independent measure of fitness in bivalves (*38*). Sulfur contents in the *Loripes* tissues were measured on ICP, following nitric acid digestion.

Statistical analyses. Data were tested for normality prior to analysis. Sulfide data were analyzed with Repeated-Measures three-factor ANOVA. All other variables were analyzed by two- or three-factor ANOVA. All relevant and/or significant effects and interactions are mentioned in the figure legends or supporting text. A complete overview of the statistical output for Figures 2, 3 and S4 is provided in Table S2.

Supplementary Text

Both *Zostera* and *Loripes* significantly lowered dissolved ammonium and phosphorus in the sediment pore water, while sulfide addition increased their availability (Fig. S4). Nitrate concentrations were 0.8 ±0.9 μM (mean ±SD) on average with no significant differences between treatments. Mean leaf nitrogen and phosphorus content were 1.78 ±0.26 and 0.15 ±0.02 % dry weight respectively, which is around reported median values from the field for both (1.8 and 0.2 % DW respectively) (*39*). None of the treatments had any significant effect on leaf nitrogen. Leaf phosphorus content was unaffected by *Loripes*, but decreased significantly in the sulfide addition and sulfide addition with *Loripes* treatments (from 0.17 ±0.01 to 0.13 ±0.01 % DW; ANOVA: $F_{1,16}$=29.0, p<0.001). Apparently, high sulfide levels impaired phosphorus uptake by *Zostera* in the sulfide addition treatment, leading to decreased leaf phosphorus content, despite high dissolved phosphorus availability in the pore water (Fig. S4). Our pulsed sulfide addition also seemed to impair phosphorus uptake in the sulfide addition with *Loripes* treatment, which, by interacting with the reduced dissolved phosphorus pool may have limited growth of *Zostera* under our conditions (Fig. 3).

Sulfide addition resulted in a significant increase in the relative (ANOVA: $F_{1,16}$=13.8, p=0.002) and absolute sulfur content (ANOVA: $F_{1,16}$=24.1, p<0.001) in the flesh of the bivalves. Relative sulfur content was 2.0 ±0.2 % (g:g) in the control treatments and 3.0 ±0.9 % in the sulfide addition treatments. The total amount of sulfur stored in *Loripes* tissues per unit was 1.3 ±0.2 mg in the control treatments and 3.0 ±1.1 mg in the sulfide addition treatments. These results suggest that the increased sulfide availability led to increased storage of sulfur in the tissues of the bivalves, for instance as sulfur granules in the gills (*19*). We found no significant effects of *Zostera* on *Loripes* sulfur content.

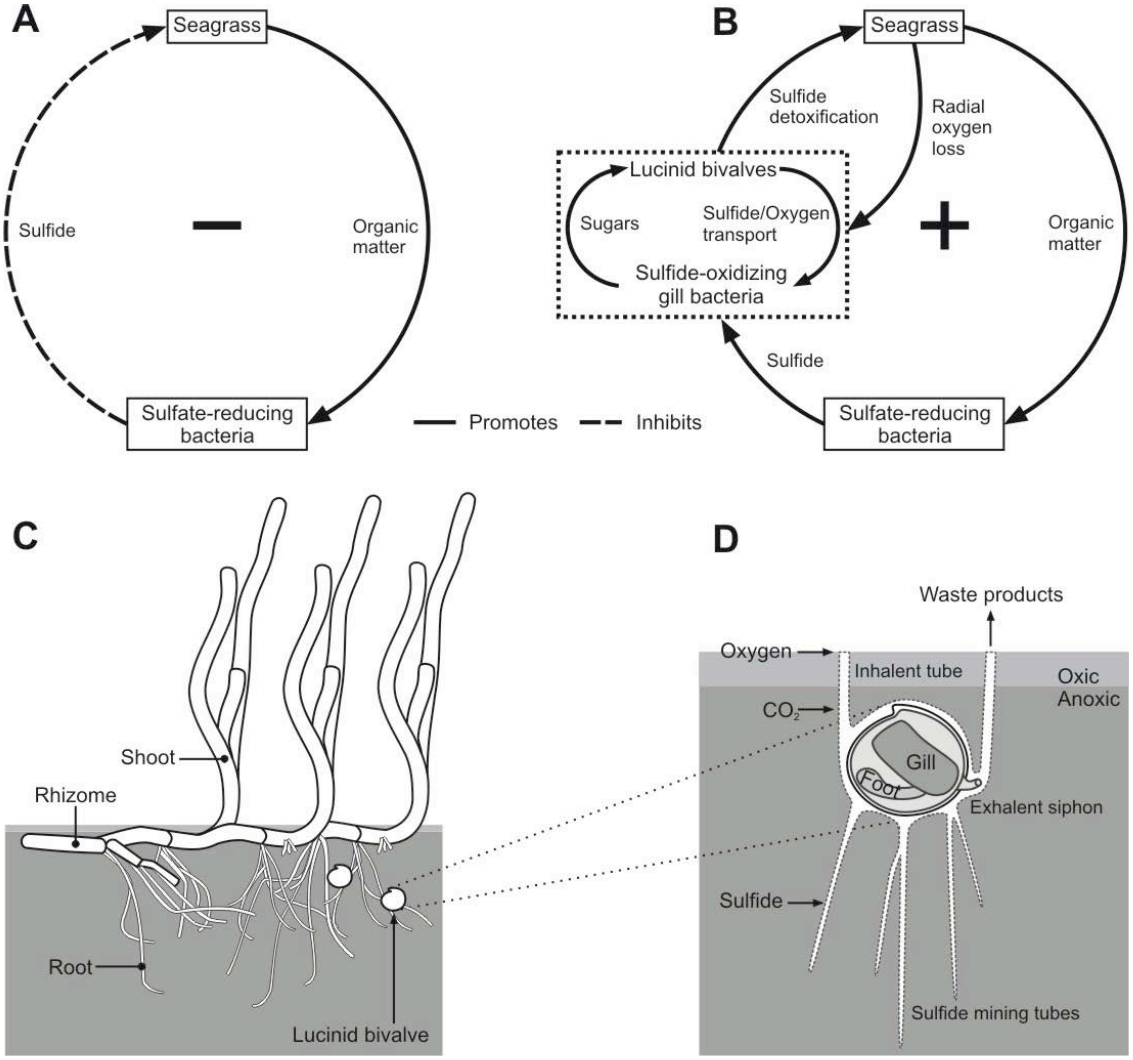

Figure S1. (**A**) Seagrasses generally create a negative feedback on their own growth through organic matter accumulation, which stimulates production of toxic sulfide by heterotrophic sulfate-reducing bacteria. (**B**) We propose in this study that the presence of lucinid bivalves and their sulfide-oxidizing gill-symbionts breaks the negative feedback, resulting in a network of positive interactions. (**C**) The bivalves are found in high abundances in the root zones of seagrass meadows in warmer, mild temperate to tropical regions where sulfide production rates are high. (**D**) They occur in the anoxic zone of the sediment and use their highly extensile foot to create tubes for sulfide mining, export of waste products and import of oxygen and CO_2 from the sediment pore water and surface water (*18, 19*). Both sulfide and oxygen are transported to the gills where chemoautotrophic bacteria oxidize sulfide for synthesizing sugars that fuel growth of both the bacteria and the bivalve (*16-19*).

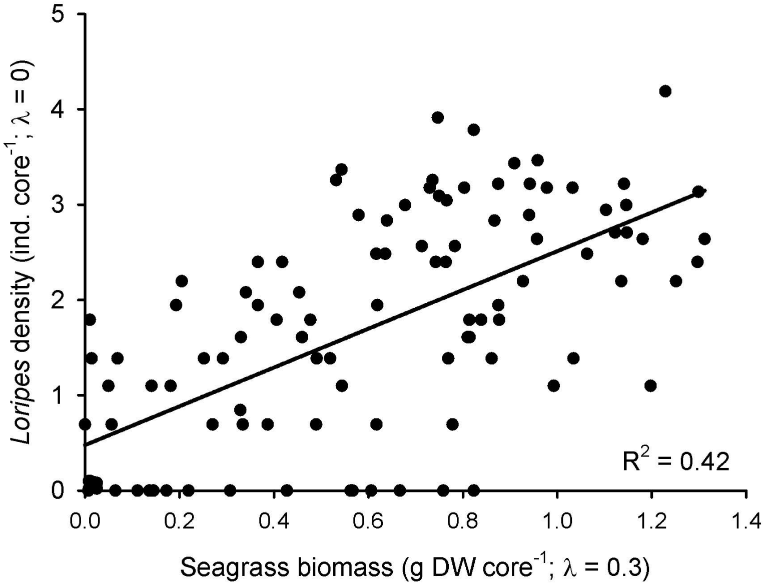

Fig. S2. Positive correlation (Pearson's r = 0.65) between seagrass biomass and *Loripes* density on Banc d'Arguin. *Loripes* counts and seagrass dry weight from the cores were transformed using the Box-Cox procedure prior to plotting and the regression analysis (see Materials and Methods).

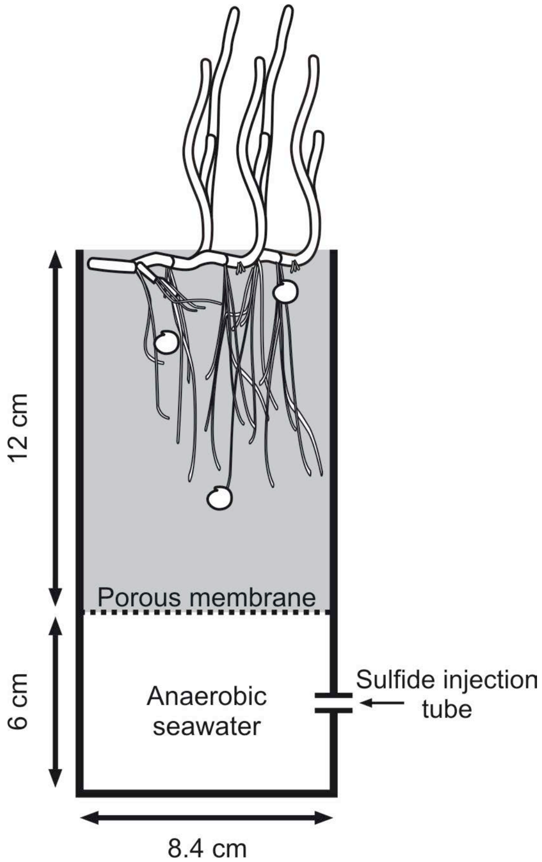

Fig. S3. Schematic drawing of the setup of an experimental unit. The dimensions of the top section were chosen to fit the organisms and to resemble field conditions. The lower section was kept large enough to allow rapid mixing and upward diffusion. Sulfide was injected twice a week in the sulfide addition treatments and allowed to diffuse from the lower compartment into the upper section through a 0.1-mm porous membrane.

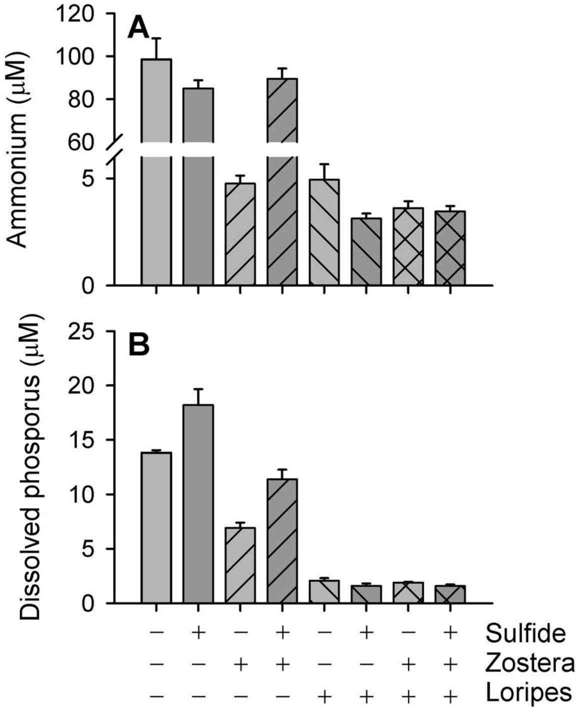

Fig. S4. Pore water ammonium and dissolved phosphorus contents after five weeks; error bars represent SEM (n=5). Ammonium (**A**) was lowered significantly by *Zostera* (ANOVA: $F_{1,32}=59.7$, $p<0.001$) and *Loripes* ($F_{1,32}=505.9$, $p<0.001$), while sulfide addition caused an increase ($F_{1,32}=35.2$, $p<0.001$). We found significant interactions between all treatments (*Z*L*: $F_{1,32}=57.1$, $p<0.001$; *Z*S*: $F_{1,32}=73.3$, $p<0.001$; *L*S*: $F_{1,32}=39.3$, $p<0.001$; *Z*L*S*: $F_{1,32}=68.5$, $p<0.001$). The treatment effects on dissolved phosphorus (**B**) were similar to ammonium, with significant effects of *Zostera* ($F_{1,32}=58.2$, $p<0.001$), *Loripes* ($F_{1,32}=562.1$, $p<0.001$) and sulfide addition ($F_{1,32}=19.6$, $p<0.001$). We found significant interactions of *Zostera* and *Loripes* ($F_{1,32}=55.1$, $p<0.001$), and *Loripes* and sulfide addition ($F_{1,32}=28.2$, $p<0.001$).

Table S1. Lucinid bivalve densities found in seagrass beds. These data provide a basic indication of the association between seagrasses and lucinids worldwide.

Area (source)	**Temp.**	**Clim.**	**Seagrass genus**	**Lucinid genus**	**Density**
North America					
Alaska (*40, 41*)	5 – 13	Temp.	*Zostera*	Lucinidae	p
Boston Harbor (*42*)	3 – 18	Temp.	*Zostera*		0
Chesapeake Bay (*43*)	1 – 23	Temp.	*Zostera*		0
Apalachee Bay, Florida (*44*)	18 – 29	Subtr.	*Syringodium, Thalassia*	*Codakia*	+
Biscayne Bay, Florida (*45*)	24 – 30	Subtr.	*Halodule, Syringodium, Thalassia*	*Anodontia, Codakia, Lucina*	++/+++
Florida Bay, Florida (*18*)	24 – 30	Subtr.	*Halodule, Syringodium, Thalassia*	*Anodontia, Codakia, Lucinesca*	++/+++
Indian River lag., Florida (*46*)	23 – 29	Subtr.	*Thalassia*	*Lucina*	p
St. Joseph's Bay, Florida (*47*)	18 – 29	Subtr.	*Thalassia*	*Lucina*	++/+++
Pensacola Bay, Florida (*48*)	18 – 29	Subtr.	*Halodule*		0
Redfish Bay, Texas (*49*)	19 – 29	Subtr.	*Halodule, Thalassia*	*Anodontia, Lucina, Phacoides*	p
Gulf of California, Mexico (*50*)	19 – 30	Subtr.	*Zostera, Halodule, Ruppia*	*Codakia, Divalinga*	p
Bahia de Chetumal, Mexico (*51*)	27 – 29	Trop.	*Syringodium, Thalassia*	*Codakia, Lucina*	p
Turneffe Islands, Belize, Mexico (*52*)	27 – 29	Trop.	*Thalassia*	*Codakia, Parvilucina*	p
Bocas del Toro, Panama (*53*)	27 – 29	Trop.	*Halodule, Syringodium, Thalassia*	*Codakia, Diplodonta Lucina, Phacoides*	p
Bahama's (*54*)	24 – 29	Trop.	*Thalassia*	*Codakia*	p
Jamaica (*55, 56*)	27 – 29	Trop.	*Thalassia*	*Anodontia, Codakia, Ctena, Divaricella, Lucina, Parvilucina*	+++/++++
St Croix, Virgin Islands (*57*)	26 – 29	Trop.	*Halodule, Syringodium, Thalassia*	*Codakia, Divalinga, Lucina, Parvilucina*	p
Guadeloupe (*58*)	26 – 29	Trop.	*Thalassia*	*Anodontia, Codakia*	p
Martinique (*54*)	26 – 29	Trop.	*Thalassia*	*Lucina*	p
Bermuda (*59, 60*)	19 – 28	Subtr.	*Thalassia*	*Codakia, Ctena*	++/+++
South America					
Bahia de Neguange, Columbia (*61*)	26 – 29	Trop.	*Thalassia, Syringodium*	*Codakia, Lucina, Anodontia*	p
Santiago de Tolú, Columbia (*62*)	27 – 29	Trop.	*Thalassia*	*Lucina*	p
Morrocoy, Venezuela (*63*)	26 – 28	Trop.	*Thalassia*	*Codakia*	+
Mochima Bay, Venezuela (*64*)	25 – 28	Trop.	*Thalassia*	*Codakia*	+++
Parracho de Maracajaú, Brazil (*65*)	26 – 28	Trop.	*Halophila, Halodule*	*Codakia, Divaricella*	p
Abrolhos Bank, Bahia Brazil (*66*)	25 – 28	Trop.	*Halodule, Halophila*	*Codakia, Ctena, Parvilucina*	p
Ilha do Japonês, Brazil (*67, 68*)	23 – 27	Trop.	*Halodule*	*Codakia, Divaricella*	++++

Table S1 (continued)

Ilha do Mel, Paranaguá, Brazil (*69*)	18 – 26	Trop.	*Halodule*	*Lucina*	p
Europe					
Western Atlantic, Norway (*70*)	6 – 13	Temp.	*Zostera*		0
Skagerrak, Atlantic, Norway (*70*)	4 – 17	Temp.	*Zostera*		0
Baltic, Finland (*71*)	1 – 16	Temp.	*Zostera*		0
Sylt, Wadden Sea (*72*)	4 – 18	Temp.	*Zostera*		0
South England (*73*)	8 – 17	Temp.	*Zostera*	*Lucinoma*	+
South Ireland (*74*)	9 – 17	Temp.	*Zostera*	*Lucinoma*	+++
Brittany, France (*75, 76*)	10 – 17	Temp.	*Zostera*	*Loripes, Lucinoma, Lucinella*	+++/++++
Arcachon, France (*77*)	12 – 21	Temp.	*Zostera*	*Loripes*	++
Eo estuary, Atlantic coast, Spain (*78*)	13 – 19	Temp.	*Zostera*	*Loripes*	++/+++
Mediterranean, Spain (*79*)	15 – 23	Subtr.	*Zostera*	*Lucinella*	+++
Mallorca, Spain (*80*)	14 – 25	Subtr.	*Posidonia*	*Ctena, Loripes, Lucinella*	p
Corsica, France (*34*)	13 – 24	Subtr.	*Cymodocea*	*Loripes*	+++/++++
Prelo Bay, Ligurian Sea (*81*)	13 – 23	Subtr.	*Posidonia*	*Lucinella*	++/+++
Venice lag., Italy (*82, 83*)	10 – 26	Subtr.	*Cymodocea, Zostera*	*Loripes*	+++/++++
Izmir Bay, Turkey (*84*)	15 – 23	Subtr.	*Zostera*	*Loripes*	++
Cyprus (*85*)	17 – 28	Subtr.	*Posidonia*	*Loripes, Myrtea*	+
Black Sea, Romania (*86*)	6 – 24	Temp.	*Zostera*	*Loripes, Lucinella*	p
Africa					
Banc d'Arguin, Mauritania (*35*)	18 – 26	Subtr.	*Cymodocea, Halodule, Zostera*	*Loripes*	+++/++++
Baia da Corimba, Angola (*87*)	22 – 29	Trop.	*Halodule*	*Loripes*	p
Kismayo, Somalia (*88*)	25 - 29	Trop.	*Halodule, Thalassia*	*Codakia, Lucina*	p
Zanzibar, Tanzania (*89*)	25 – 29	Trop.	*Cymodocea, Thalassia, Enhalus, Thalassodendron*	Lucinidae	++/++++
Mahé, Seychelles (*90*)	26 – 30	Trop.	*Thalassia*	*Anodontia, Codakia, Ctena,*	++
Inhaca, Mozambique (*91*)	23 – 27	Trop.	*Cymodocea, Halodule, Zostera*	*Anodontia, Cardiolucina, Loripes, Lucina, Pillucina*	++
Langebaan lag., South-Africa (*92*)	15 – 19	Subtr.	*Zostera*		0
Swartvlei estuary, South-Africa (*93*)	17– 22	Subtr.	*Zostera*	*Loripes*	p

Table S1 (continued)

Asia/Pacific					
Jordan, Red Sea (*94*)	21 – 28	Subtr.	*Halodule, Halophila*	*Rasta*	p
Egypt, Red Sea (*95*)	22 – 29	Subtr.	*Cymodocea, Halodule, Halophila*	*Cardiolucina, Divaricella, Pillucina, Wallucina*	++++
United Arab Emirates (*96*)	21 – 33	Subtr.	*Halodule, Halophila*	*Anodontia, Pillucina*	++++
Oman (this study)	25 – 28	Trop.	*Halodule, Halophila*	*Pillucina*	++++
Palk Bay, India (*97*)	27 – 30	Trop.	*Cymodocea, Halodule, Syringodium, Thalassodendron*	*Codakia, Lucina*	p
Posyet Bay, Sea of Japan (*98*)	2 – 21	Temp.	*Zostera*	*Pillucina*	+++
Tokyo, Bay of Japan (*99*)	16 – 26	Subtr.	*Zostera*	Lucinidae	p
Okinawa, Japan (*100*)	22 – 29	Subtr.	*Cymodocea, Enhalus, Halodule, Halophila, Thalassia*	*Codakia, Epicodakia*	p
Guangxi, China (*101*)	20 – 29	Trop.	*Halodule, Halophila, Zostera*		0
Guangdong, China (*101*)	21 – 29	Trop.	*Halodule, Halophila*	*Pillucina*	p
Hainan, China (*101*)	22 – 29	Trop.	*Cymodocea, Enhalus, Halodule, Thalassia*	*Pillucina*	p
Tubbataha Reefs, Philipines (*100*)	27 – 30	Trop.	*Halodule, Halophila, Thalassia*	*Epicodakia*	p
Kungkrabaen Bay, Thailand (*102*)	28 – 30	Trop.	*Halodule*	*Anodontia, Indoaustriella, Pillucina*	++++
Had Chao Mai, Thailand (*103*)	28 – 30	Trop.	*Cymodocea, Enhalus, Halodule, Halophila, Thalassia*	*Pillucina*	++++
Pulau Semakau, Singapore (*104*)	28 – 29	Trop.	*Cymodocea, Enhalus, Halodule, Halophila, Syringodium, Thalassia*	*Anodontia*	p
Bone Batang, Indonesia (*105*)	28 – 30	Trop.	*Cymodocea, Enhalus, Halodule, Halophila, Thalassia,*	Lucinidae	+++
Banten Bay, Indonesia (*106*)	28 – 30	Trop.	*Cymodocea, Enhalus, Halodule, Halophila, Syringodium, Thalassia*	*Anodontia, Codakia*	p
Tongapatu, Tonga (*100*)	23 – 27	Trop.	*Halodule*	*Codakia, Epicodakia*	p
Tarawa Atoll (*107*)	28 – 29	Trop.	*Thalassia*	*Codakia, Wallucina*	++/+++

Table S1 (continued)

Oceania					
Roebuck Bay, Australia (*108*, this study)	25 – 30	Trop.	*Halodule, Halophila*	*Anodontia, Ctena, Divaricella*	+++
Lizard Island, Australia (*109*)	25 – 29	Trop.	*Halophila*	*Anodontia, Chaviana, Wallucina*	p
Moreton Bay, Australia (*109*)	21 – 26	Subtr.	*Cymodocea, Halodule, Halophila, Zostera*	*Anodontia, Pillucina*	p
Rottnest Island, Australia (*110*)	19 – 23	Subtr.	*Posidonia*	*Wallucina*	+++/++++
South-West Australia (*111*)	16 – 20	Subtr.	*Amphibolis, Posidonia,*	*Anodontia*	p
New South-Wales, Australia (*112*)	19 – 24	Subtr.	*Halophila*	*Wallucina*	p
New South-Wales, Australia (*113*)	17 – 23	Subtr.	*Halophila, Zostera*		0
Western Port, Victoria, Australia (*114, 115*)	13 – 18	Temp.	*Halophila, Zostera*		0
Tasmania (*116, 117*)	12 – 16	Temp.	*Heterozostera. Ruppia, Zostera*	*Wallucina*	++/+++
New Caledonia (*118*)	24 – 28	Subtr.	*Cymodocea, Halodule, Thalassia*	*Anodontia, Codakia, Ctena*	p
Slipper Island, New Zealand (*119*)	15 – 21	Subtr.	*Zostera*	*Divaricella*	p

Temp. depicts the mean annual temperature range based on the sea surface temperature (ºC);
Clim. indicates type of climate (tropical, subtropical or temperate);
Lucinid density (spatial average): + = 1-10; ++ = 11-100; +++ = 101-1000; ++++ = >1000 ind/m^2
p = present (no abundance data); u = uncertain; 0 = absent.

Table S2. Overview of the statistical output from the analyses of the data presented in Figures 2, 3, and S4.

Treatment	df	F	p
Sulfide measurements (Fig. 2A; repeated measures ANOVA)			
Zostera	1	6.8	0.014
Loripes	1	268.8	<0.001
Sulfide	1	109.7	<0.001
Zostera * Loripes	1	7.8	0.009
Zostera * Sulfide	1	2.2	0.150
Loripes * Sulfide	1	102.7	<0.001
Zostera * Loripes * Sulfide	1	2.4	0.127
Error	32		
Oxygen measurements (Fig. 2B; ANOVA)			
Zostera	1	39.3	<0.001
Loripes	1	125.0	<0.001
Sulfide	1	8.9	0.006
Zostera * Loripes	1	48.3	<0.001
Zostera * Sulfide	1	0.0	0.862
Loripes * Sulfide	1	0.3	0.578
Zostera * Loripes * Sulfide	1	0.5	0.505
Error	32		
Zostera shoot biomass (Fig. 3A; ANOVA)			
Loripes	1	61.3	<0.001
Sulfide	1	72.6	<0.001
Loripes * Sulfide	1	0.9	0.348
Error	16		
Zostera root biomass (Fig. 3B; ANOVA)			
Loripes	1	50.2	<0.001
Sulfide	1	12.0	0.003
Loripes * Sulfide	1	1.7	0.211
Error	16		
Loripes fitness (Fig. 3C; ANOVA)			
Sulfide	1	37.3	<0.001
Zostera	1	9.0	0.008
Sulfide * Zostera	1	5.4	0.034
Error	16		
Ammonium (Fig. S4A; ANOVA)			
Zostera	1	59.7	<0.001
Loripes	1	505.9	<0.001
Sulfide	1	35.2	<0.001
Zostera * Loripes	1	57.1	<0.001
Zostera * Sulfide	1	73.3	<0.001
Loripes * Sulfide	1	39.3	<0.001
Zostera * Loripes * Sulfide	1	68.5	<0.001
Error	32		
Phosphorus (Fig. S4B; ANOVA)			
Zostera	1	58.2	<0.001
Loripes	1	562.1	<0.001
Sulfide	1	19.6	<0.001
Zostera * Loripes	1	55.1	<0.001
Zostera * Sulfide	1	0.0	0.888
Loripes * Sulfide	1	28.2	0.000
Zostera * Loripes * Sulfide	1	0.0	0.965
Error	32		

References and Notes

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