Science Advances
AAAS

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Supplementary Materials for

Oxygen supersaturation protects coastal marine fauna from ocean warming

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Published 4 September 2019, *Sci. Adv.* **5**, eaax1814 (2019)
DOI: 10.1126/sciadv.aax1814

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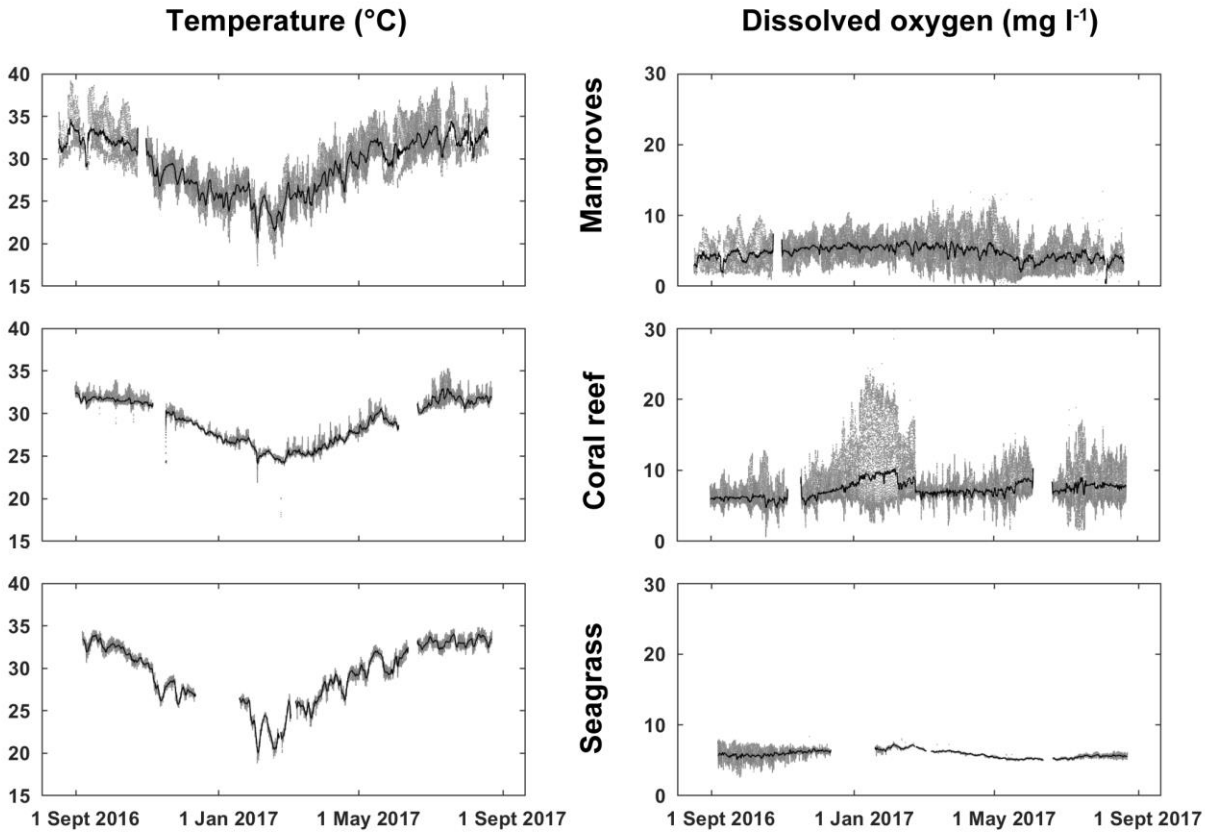

Fig. S1. High-frequency monitoring dataset of dissolved oxygen and water temperature in the three dominant coastal habitats of the Red Sea between August–September 2016 and August 2017. Grey represents the original records collected at 5-10 minute interval while the black line represents the inter-daily trend (24-hours central moving average).

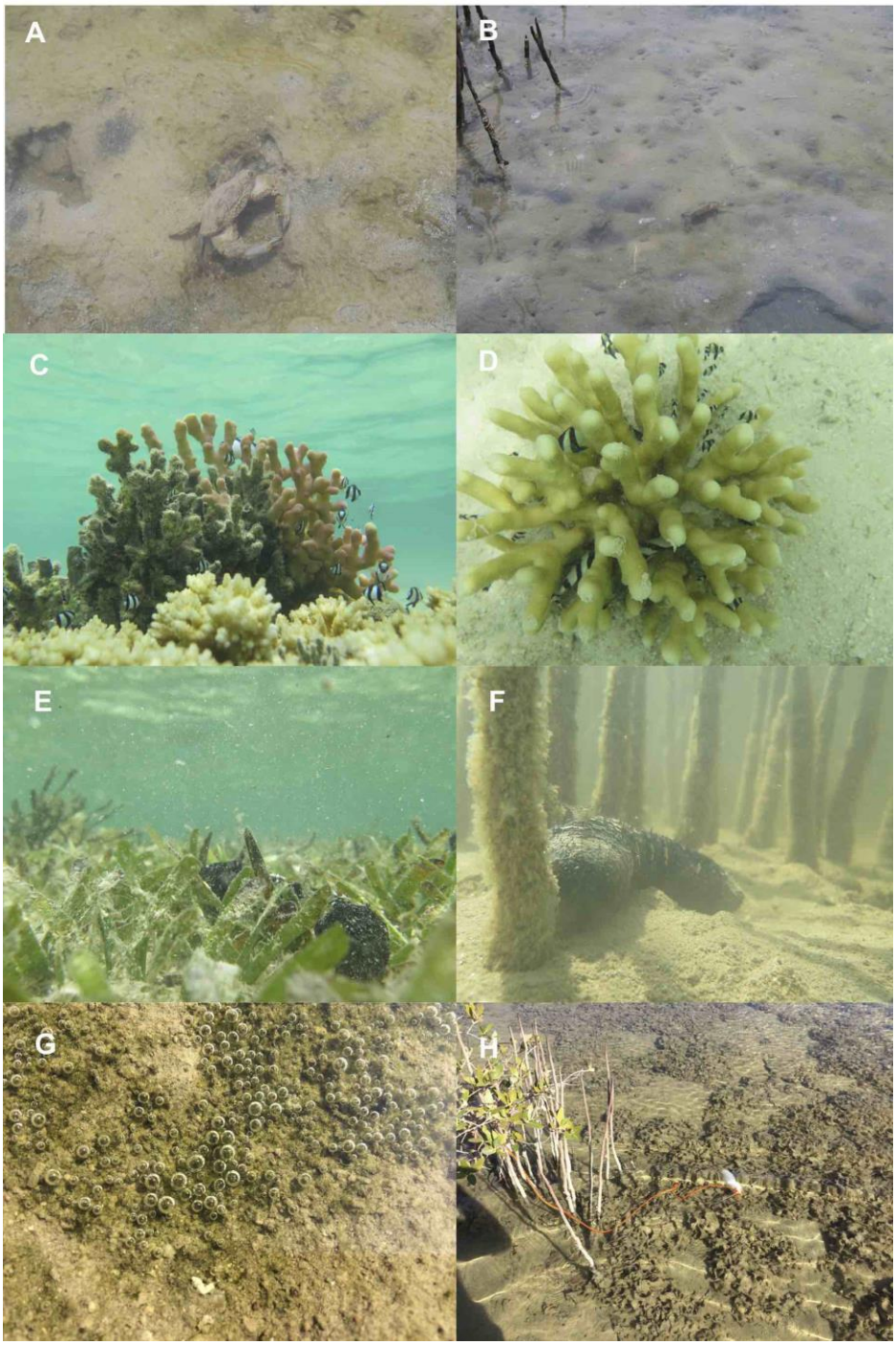

Fig. S2. This picture shows some of the study species that were active during the middle of the day. A and B show *Thalamita crenata* actively hunting in very shallow water at 14:00 when the water temperature was more than 37°C in the mangrove stand. C and D show the group of fishes *Dascyllus* sp. in their habitat within the coral, being exposed to the hyperoxia generated by the photosynthetic activity of the coral symbionts during the day. E shows the studied sea cucumber *Holoturia atra*, foraging in the middle of the seagrass meadows, and F shows it foraging nearby the mangrove pneumatophores during the middle of the day.
In G the photosynthetic activity of the microphytobenthos layer is shown, producing bubbling of oxygen that covers the marine sediment in shallow water (see Fig. 1). In H a miniDOT logger can be seen, used for temperature - oxygen monitoring (see Fig. 1B and Fig. S3), close to a patch of a marine primary producer such as the algae *Padina* sp. (photo credit: Marco Fusi, KAUST)

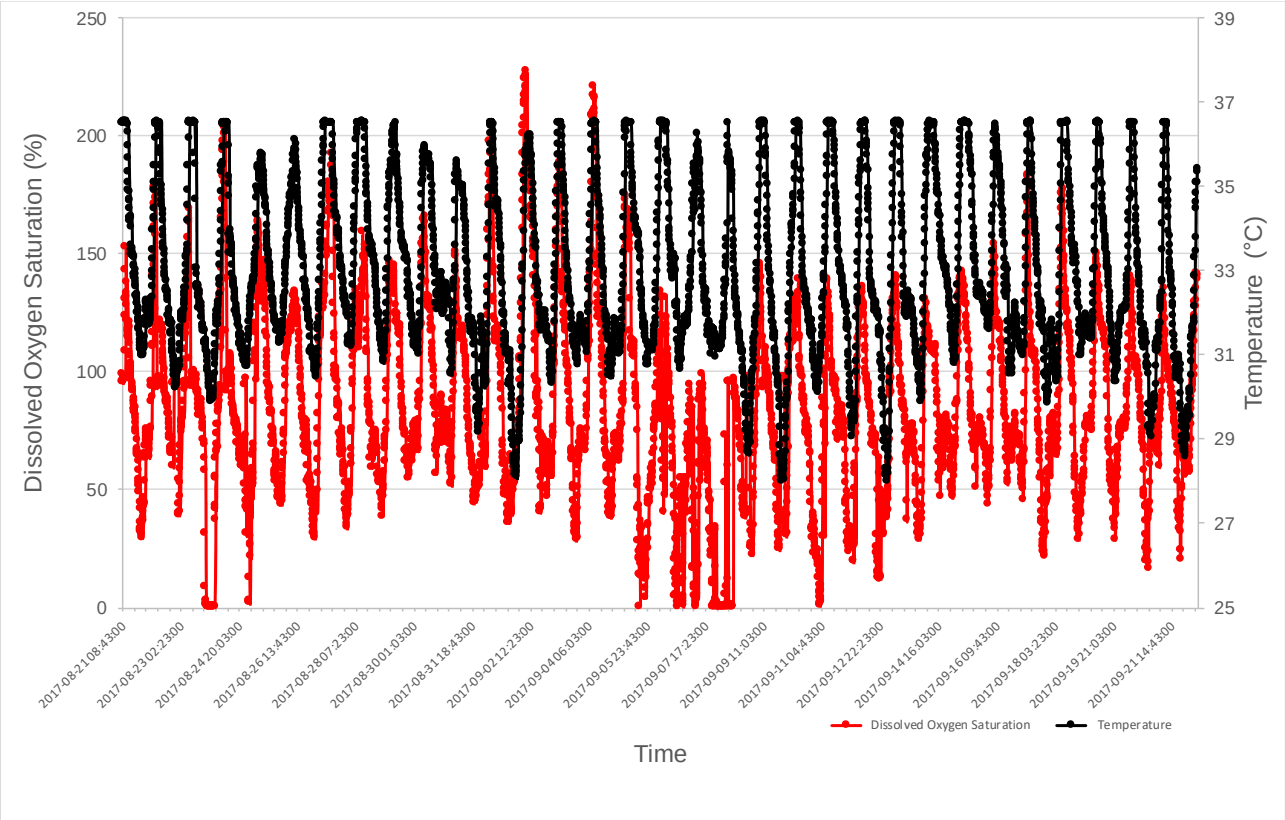

Fig. S3. Diel seawater temperature and dissolved oxygen fluctuations measured with the miniDOT loggers nearby the boundary layer of the seagrass habitat where several animals live, including *H. atra* and *T. crenata* among the other species. This data was collected on the seafloor of seagrass meadows from the 21st of August 2017 to the 22nd of September 2017, one of the hottest periods of the year. The red and black lines indicate dissolved oxygen saturation and temperature, respectively.

Table S1. Number of valid observations of dissolved oxygen concentration and water temperature during night or day, over temperature intervals of 1°C. For example, 3831 observations were available for the coral reef at night for water temperatures between 24 and 25°C.

	Mangroves		Coral reef		Seagrass	
Lower temperature of the 1°C-interval (°C)	**Night**	**Day**	**Night**	**Day**	**Night**	**Day**
17	6	0	0	1	0	0
18	115	0	0	2	2	0
19	126	2	0	1	220	7
20	450	33	1	1	616	556
21	660	139	5	0	983	756
22	1561	502	44	0	895	1053
23	2577	1014	114	0	1144	776
24	3960	1982	3831	1874	1651	1627
25	5134	2949	5151	5403	2810	1835
26	3621	4316	5989	5104	3547	3808
27	3956	3755	4459	5763	3173	3214
28	3414	4263	4501	4476	3358	3568
29	3193	3631	3551	4434	2533	3520
30	4765	3274	5744	4118	3169	3396
31	3494	3825	11113	9853	4617	3822
32	1286	3667	682	5933	7998	6340
33	138	2821	82	1482	3384	8044
34	17	2306	0	441	60	2411
35	1	1631	0	65	0	0
36	0	778	0	0	0	0
37	0	405	0	0	0	0
38	0	181	0	0	0	0
39	0	14	0	0	0	0
total	38474	41488	45267	48951	40160	44733