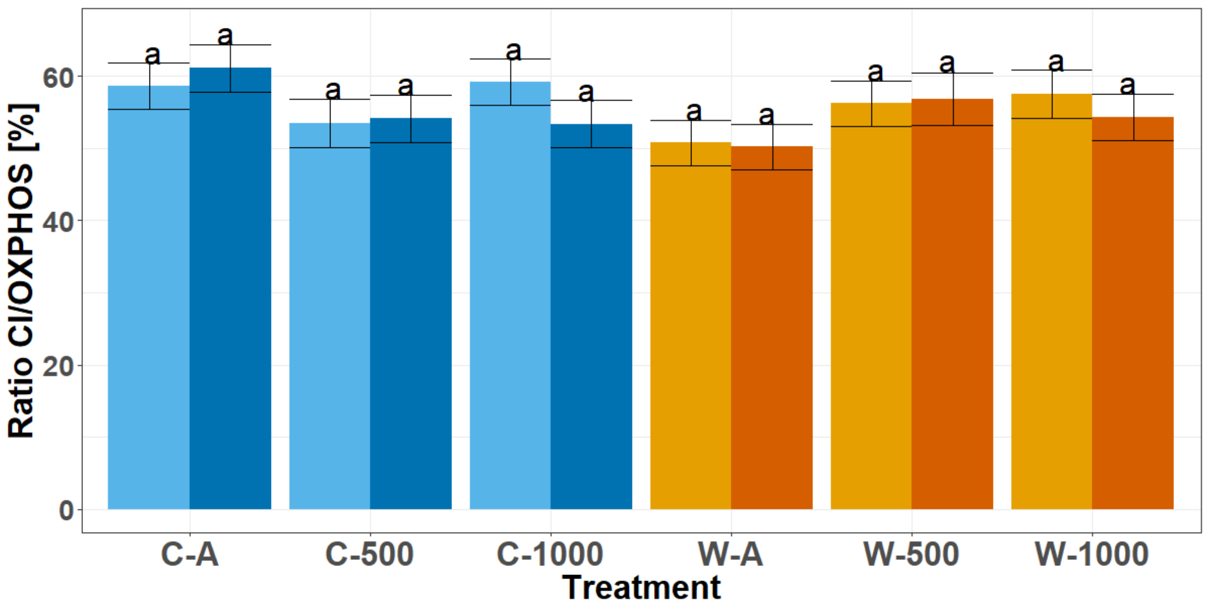

Figure S1 Ratio of CI respiration over OXPHOS respiration of permeabilized heart ventricle fibers of European seabass (expressed as percentage). Shown are lsmeans ± s.e.m. Different letters indicate significant differences (LME, $p<0.05$); blue: cold life conditioned fish (C), orange: warm life conditioned fish (W), light color: cold assay temperature, dark color: warm assay temperature, A: Ambient *P*CO_2, 500: ambient + 500 µatm CO_2, 1000: ambient + 1000 µatm CO_2; n_{C-A}=16/14, n_{C-500}=14/16, n_{C-1000}=16/15, n_{W-A}=16/14, n_{W-500}=17/10, n_{W-1000}=13/14, for cold/warm assay temperature respectively.

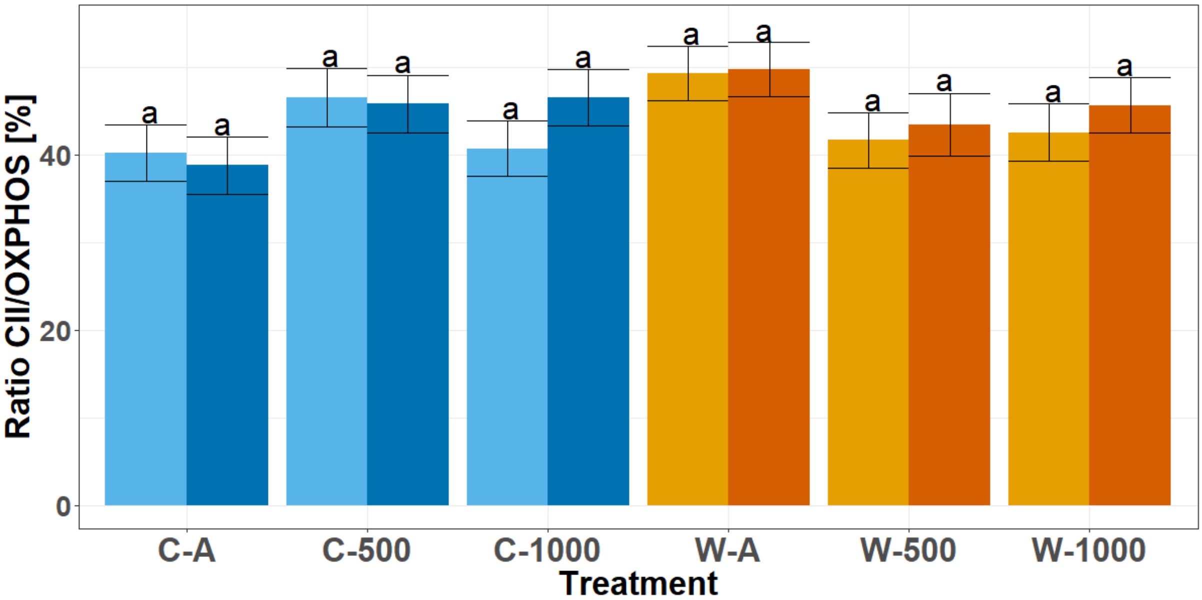

Figure S2 Ratio of CII respiration over OXPHOS respiration of permeabilized heart ventricle fibers of European seabass (expressed as percentage). Shown are lsmeans ± s.e.m. Different letters indicate significant differences (LME, $p<0.05$); blue: cold life conditioned fish (C), orange: warm life conditioned fish (W), light color: cold assay temperature, dark color: warm assay temperature, A: Ambient PCO_2, 500: ambient + 500 µatm CO_2, 1000: ambient + 1000 µatm CO_2; $n_{C\text{-}A}$=15/14, $n_{C\text{-}500}$=14/16, $n_{C\text{-}1000}$=16/15, $n_{W\text{-}A}$=15/14, $n_{W\text{-}500}$=16/10, $n_{W\text{-}1000}$=13/14, for cold/warm assay temperature respectively.

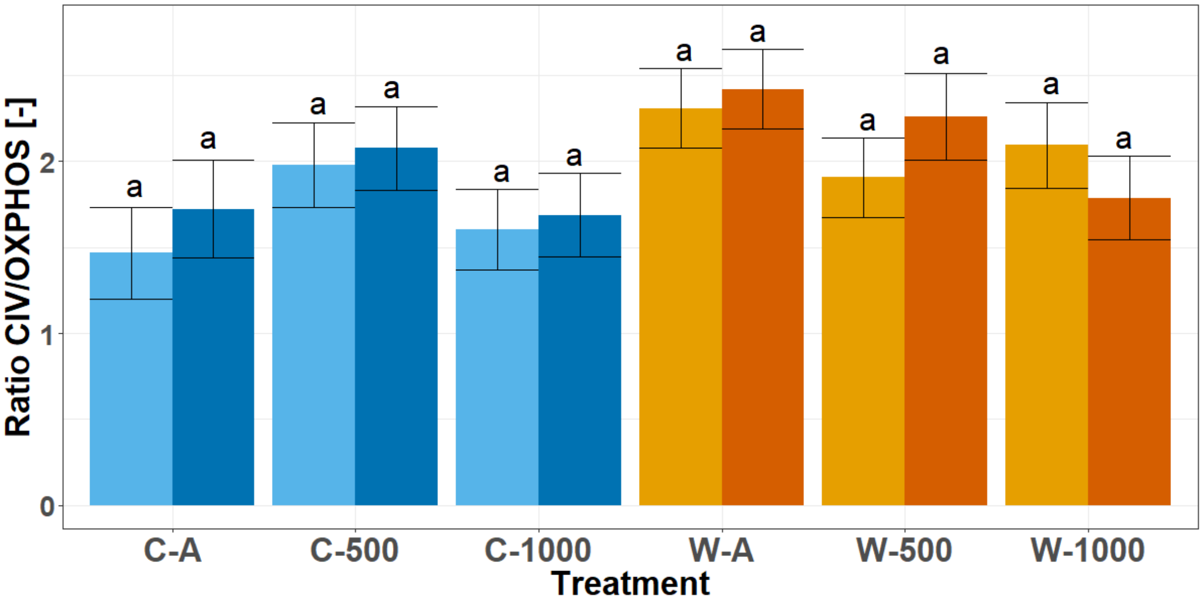

Figure S3 Ratio of CIV capacities over OXPHOS respiration of permeabilized heart ventricle fibers of European seabass (expressed as percentage). Shown are lsmeans ± s.e.m. Different letters indicate significant differences (LME, $p<0.05$); blue: cold life conditioned fish (C), orange: warm life conditioned fish (W), light color: cold assay temperature, dark color: warm assay temperature, A: Ambient PCO_2, 500: ambient + 500 µatm CO_2, 1000: ambient + 1000 µatm CO_2; $n_{C\text{-}A}$=11/10, $n_{C\text{-}500}$=14/16, $n_{C\text{-}1000}$=15/15, $n_{W\text{-}A}$=15/13, $n_{W\text{-}500}$=17/11, $n_{W\text{-}1000}$=11/13, for cold/warm assay temperature respectively.

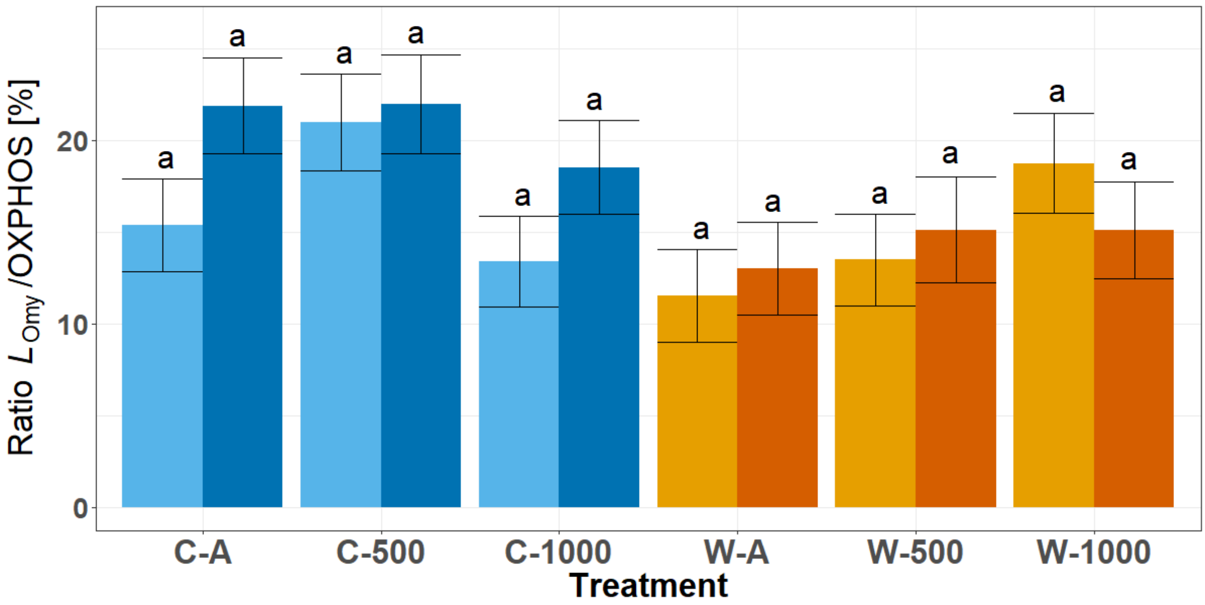

Figure S4 Ratio of L_{Omy} respiration over OXPHOS respiration (L_{Omy} -fraction) of permeabilized heart ventricle fibers of European seabass (expressed as percentage). Shown are lsmeans ± s.e.m. Different letters indicate significant differences (LME, $p<0.05$); blue: cold life conditioned fish (C), orange: warm life conditioned fish (W), light color: cold assay temperature, dark color: warm assay temperature, A: Ambient PCO_2, 500: ambient + 500 µatm CO_2, 1000: ambient + 1000 µatm CO_2; $n_{C\text{-}A}$=15/14, $n_{C\text{-}500}$=15/15, $n_{C\text{-}1000}$=16/16, $n_{W\text{-}A}$=16/15, $n_{W\text{-}500}$=17/11, $n_{W\text{-}1000}$=13/14, for cold/warm assay temperature respectively.

Table S1 Light intensity during larval phase

Age [d]	2	7	9	12	16	20	27	31	36	44
Light intensity [lux]	0	0-1	1	2	5	7	10	31	59	96

Table S2 Larval mortality in % in the different larval rearing tanks (n=3); A – Ambient PCO_2, Δ500 – ambient + 500 µatm CO_2, Δ1000 – ambient + 1000 µatm CO_2, T – temperature, Rep 1-3 – replicate tank 1-3.

	A			Δ500			Δ1000		
T [°C]	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3
15	31.5	37.3	25.9	78.6	21.9	33.3	35.6	11.3	16.8
20	43.5	29.4	30.5	46.6	33.6	34.9	39.6	26.7	35.7

Table S3 Juvenile mortality in % in the different tanks (n=1); A: Ambient *P* CO_2, Δ500: ambient + 500 µatm CO2, Δ1000: ambient + 1000 µatm CO_2, T: temperature

T [°C]	A	Δ500	Δ1000
15	24.8	43.4	29.7
20	35.2	41.7	38.2

Table S4 Biometrical data of fish used for mitochondrial respiration: AT: assay temperature, Treatments: C: cold life condition (up to 18°C), W: warm life condition (up to 23°C), A: ambient PCO_2, Δ500: ambient PCO_2 + 500 µatm, Δ1000: ambient PCO_2 + 1000 µatm, HSI: hepatosomatic index, K: condition factor, values are means ± standard error.

Treatment	AT [°C]	n	Ventricle weight [g]	Carcass weight [g]	Body length [mm]	HSI [-]	K [-]
C – A	15	16	0.0114±0.0008	10.04±0.78	87.21±1.96	1.44±0.10	1.46±0.05
C – Δ500	15	15	0.0101±0.0006	10.59±0.67	88.83±2.14	1.37±0.09	1.50±0.05
C – Δ1000	15	16	0.0102±0.0007	9.92±0.62	86.12±1.88	1.45±0.12	1.53±0.03
C – A	20	16	0.0108±0.0009	9.97±0.84	85.22±2.46	1.41±0.06	1.56±0.03
C – Δ500	20	16	0.0104±0.0009	10.32±0.85	88.28±2.39	2.00±0.42	1.46±0.04
C – Δ1000	20	16	0.0102±0.0007	10.28±0.81	87.69±2.01	1.82±0.17	1.49±0.04
W – A	15	17	0.0122±0.0007	13.75±0.86	97.58±1.81	2.39±0.13	1.46±0.02
W – Δ500	15	18	0.0147±0.0011	14.99±1.12	98.37±2.31	2.35±0.12	1.53±0.02
W – Δ1000	15	13	0.0123±0.0007	13.46±0.88	96.14±2.25	2.53±0.11	1.49±0.02
W – A	20	16	0.0104±0.0007	11.32±0.71	91.88±1.85	2.28±0.13	1.43±0.02
W – Δ500	20	11	0.0125±0.0009	13.23±0.82	95.13±1.80	2.49±0.10	1.52±0.03
W – Δ1000	20	16	0.0129±0.0013	13.83±1.17	97.00±2.59	2.44±0.09	1.46±0.02