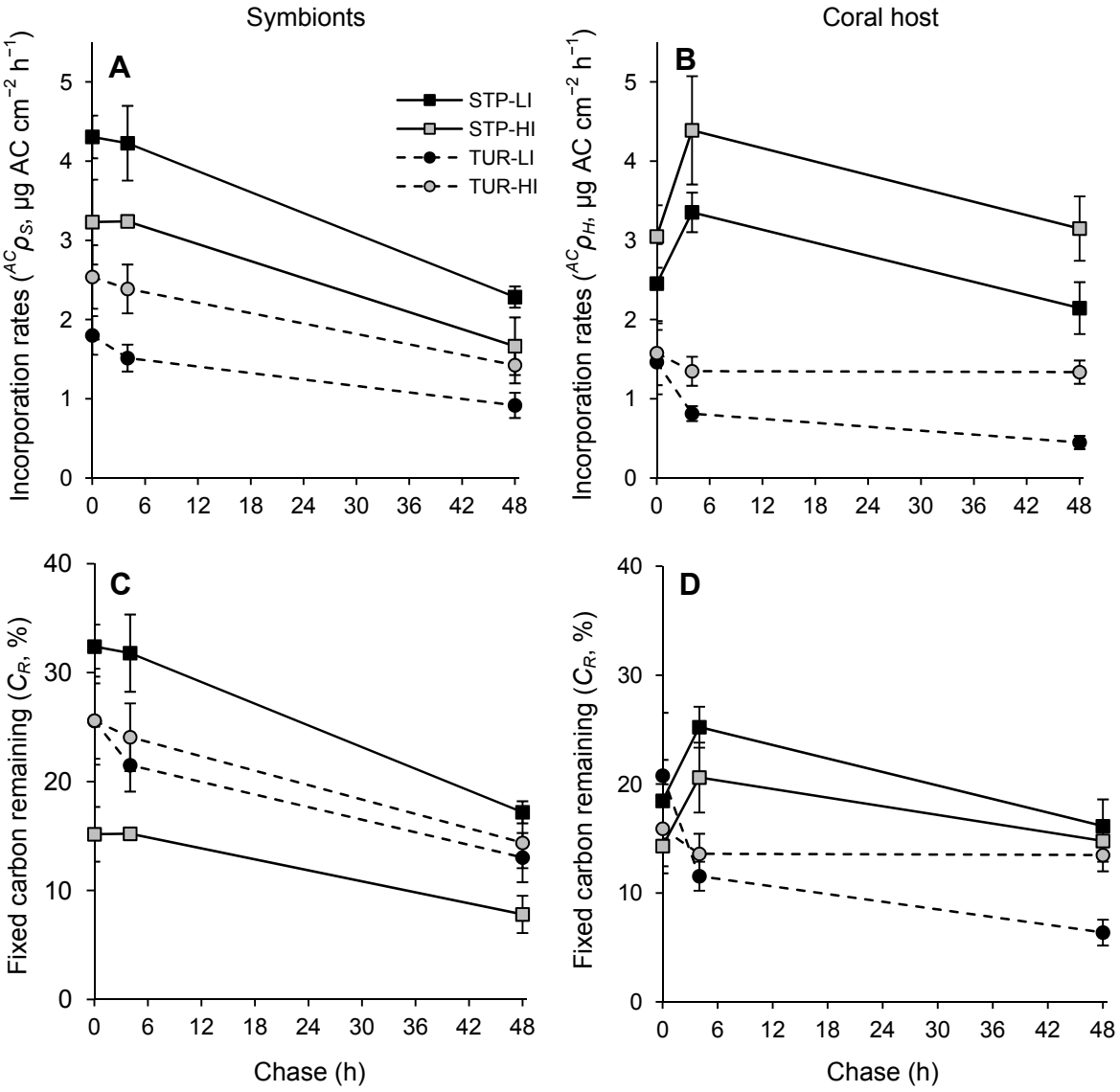

Fig. S1. Effect of species and irradiance on the autotrophic carbon (AC) incorporation rates ($^{AC}\rho$) and percentage of fixed AC that remained (C_R) in symbiosis. $^{AC}\rho$ in (A) symbionts ($^{AC}\rho_S$), and (B) coral host ($^{AC}\rho_H$). C_R in (C) symbionts, and (D) coral host, for *Stylophora pistillata* (STP) and *Turbinaria reniformis* (TUR) maintained at low (LI) and high (HI) irradiance. Data are means ± standard errors of the mean of n = 3 measurements.

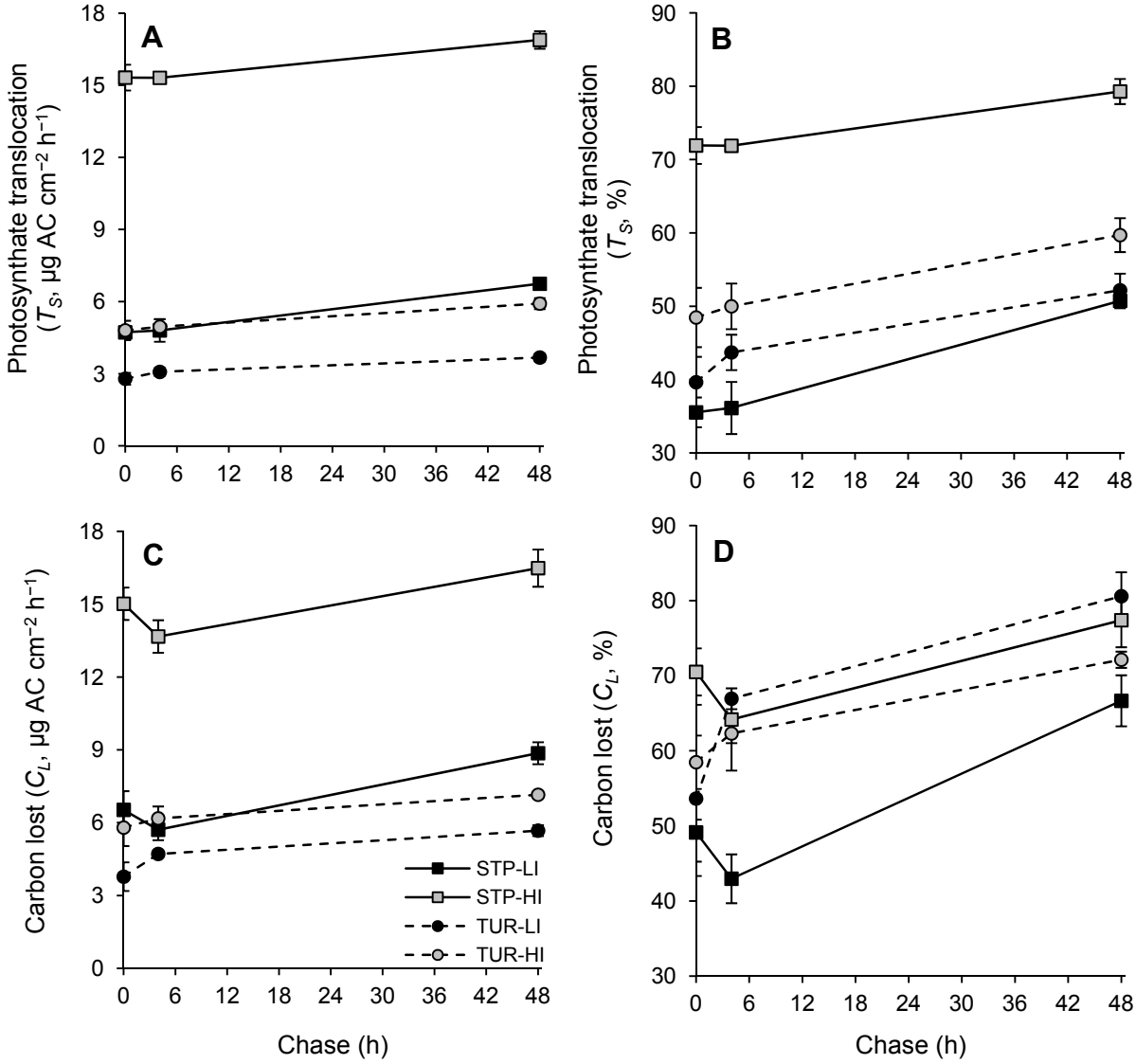

Fig. S2. Effect of species and irradiance on the autotrophic carbon (AC) translocated to the host by symbionts (T_S), and lost by the holobiont (C_L). (A) Amount and (B) percentage of T_S, and (C) amount and (D) percentage of C_L for *Stylophora pistillata* (STP) and *Turbinaria reniformis* (TUR) maintained at low (LI) and high (HI) irradiance. Data are means ± standard errors of the mean of n = 3 measurements.

Table S1. Results of the factorial analysis of variance (ANOVA) for symbiont, chlorophyll and protein concentrations as well as calcification, photosynthesis and respiration rates, with two factors (species, and irradiance)

Factor	d.f.	*P*	*F*
Symbiont concentration			
Species	1	**<0.0001**	206.60
Irradiance	1	**<0.0001**	73.17
Species × Irradiance	1	**<0.0001**	25.57
Error	20	-	-
Chlorophyll concentration			
Species	1	**<0.0001**	76.14
Irradiance	1	**<0.0001**	73.30
Species × Irradiance	1	**0.0013**	14.10
Error	20	-	-
Calcification rate (C_C)			
Species	1	**0.0007**	16.15
Irradiance	1	**0.0261**	5.77
Species × Irradiance	1	0.6554	0.21
Error	20	-	-
Gross photosynthesis (P_C)			
Species	1	**<0.0001**	102.96
Irradiance	1	**<0.0001**	39.18
Species × Irradiance	1	**0.0078**	8.73
Error	20	-	-
Host respiration (R_H)			
Species	1	**<0.0001**	50.32
Irradiance	1	**0.0047**	10.10
Species × Irradiance	1	0.9943	0.00
Error	20	-	-
Symbiont respiration (R_S)			
Species	1	**0.0003**	19.16
Irradiance	1	**0.0062**	9.27
Species × Irradiance	1	**0.0018**	12.89
Error	20	-	-
Protein concentration			
Species	1	**<0.0001**	63.70
Irradiance	1	0.9244	0.01
Species × Irradiance	1	0.6074	0.27
Error	20	-	-

N=6 replicates; significant *P*-values are in bold.

Table S2. Results of the factorial analysis of variance (ANOVA) for chlorophyll concentraion, gross photosynthesis, symbiont respiration, heterotrophic carbon, heterotrophic nitrogen and autotrophic carbon incorporation rates in symbionts as well as autotrophic carbon translocation normalised per symbiont cell, with two factors (species, and irradiance)

Factor	d.f.	*P*	*F*
Chlorophyll concentration			
Species	1	0.2507	1.40
Irradiance	1	**0.0001**	22.84
Species × Irradiance	1	0.0982	3.01
Error	20	-	-
Gross photosynthesis (P_C)			
Species	1	**0.0002**	19.81
Irradiance	1	**<0.0001**	124.20
Species × Irradiance	1	0.4772	0.52
Error	20	-	-
Symbiont respiration (R_S)			
Species	1	**0.0016**	17.33
Irradiance	1	**0.0330**	5.94
Species × Irradiance	1	0.1108	3.01
Error	11	-	-
HC incorporation ($^{HC}\rho_S$)			
Species	1	0.2068	1.89
Irradiance	1	**0.0118**	10.51
Species × Irradiance	1	0.0622	4.69
Error	8	-	-
HN incorporation ($^{HN}\rho_S$)			
Species	1	0.1906	2.04
Irradiance	1	0.3987	0.80
Species × Irradiance	1	**0.0738**	4.28
Error	8	-	-
AC incorporation ($^{AC}\rho_S$)			
Species	1	**0.0066**	13.24
Irradiance	1	**0.0048**	14.96
Species × Irradiance	1	**0.0296**	6.98
Error	8	-	-
AC translocation (T_S)			
Species	1	**0.0022**	19.56
Irradiance	1	**<0.0001**	907.63
Species × Irradiance	1	**0.0357**	6.36
Error	8	-	-

N=3-6 replicates; significant *P*-values are in bold.

Table S3. Percentage of heterotrophic carbon or nitrogen in coral host and symbionts for *Stylophora pistillata* (STP) and *Turbinaria reniformis* (TUR) maintained under low (LI) and high (HI) irradiance

	Short-term experiment						Long-term experiment		
	After 4 h			After 48 h					
	mean	±	s.e.m.	mean	±	s.e.m.	mean	±	s.e.m.
Percentage of heterotrophic carbon (HC) in coral host									
STP-LI	77	±	4%	86	±	2%	88	±	1%
STP-HI	68	±	3%	69	±	2%	84	±	1%
TUR-LI	77	±	2%	74	±	9%	67	±	1%
TUR-HI	60	±	5%	51	±	7%	59	±	6%
Percentage of heterotrophic carbon (HC) in symbionts									
STP-LI	23	±	4%	14	±	2%	12	±	1%
STP-HI	32	±	3%	31	±	2%	16	±	1%
TUR-LI	23	±	2%	26	±	9%	33	±	1%
TUR-HI	40	±	5%	49	±	7%	41	±	6%
Percentage of heterotrophic nitrogen (HN) in coral host									
STP-LI	62	±	5%	63	±	2%	76	±	4%
STP-HI	64	±	4%	70	±	3%	81	±	1%
TUR-LI	64	±	3%	49	±	1%	62	±	6%
TUR-HI	57	±	5%	55	±	6%	56	±	9%
Percentage of heterotrophic nitrogen (HN) in symbionts									
STP-LI	38	±	5%	37	±	2%	24	±	4%
STP-HI	36	±	4%	30	±	3%	19	±	1%
TUR-LI	36	±	3%	51	±	1%	38	±	6%
TUR-HI	43	±	5%	45	±	6%	44	±	9%

N=3 replicates.