Aquatic Sciences

Supplementary Tables and Figures

Asymmetric competition for habitats between the temperate Japanese eel *A. japonica* and the tropical Indo-Pacific eel *Anguilla marmorata*

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Table S1 Collection river and date of the eight *Anguilla japonica* and *A. marmorata* individuals used in the behavioral experiments. The year of collection is 2023 for all individuals.

Tank	*A. japonica*		*A. marmorata*	
No.	River	Date	River	Date
1	Wakino	July 8th	Kawawaki	July 9th
2	Kawawaki	July 8th	Kawawaki	July 9th
3	Kawawaki	July 8th	Kawawaki	July 8th
4	Kawawaki	July 8th	Kawawaki	July 8th
5	Wakino	July 8th	Kawawaki	July 8th
6	Wakino	July 8th	Kawawaki	July 9th
7	Tagiri	July 8th	Tagiri	July 8th
8	Wakino	July 8th	Tagiri	July 8th

Table S2 Results of the generalized linear models (GLMs) examining the differences in the mean shelter use index (SUI; see Fig. 2) between the solitary (Experiment 1) and competitive (Experiment 2) conditions during the daytime and nighttime of *Anguilla japonica* and *A. marmorata*.

Species	Model	Term	Estimate ± SE	t-value	*P* value
A. japonica	Daytime	Intercept	0.130 ± 0.261	0.497	0.627
		Condition	2.528 ± 1.143	2.213	0.044
	Nighttime	Intercept	0.270 ± 0.283	0.954	0.356
		Condition	1.366 ± 0.547	2.496	0.026
A. marmorata	Daytime	Intercept	0.929 ± 0.438	2.121	0.052
		Condition	0.492 ± 0.702	0.702	0.495
	Nighttime	Intercept	-0.326 ± 0.328	-0.993	0.338
		Condition	0.121 ± 0.462	0.263	0.797

Table S3 Results of generalized linear models (GLMs) showing the relationship between the exposure times to agonistic behaviors and the changes in the shelter use index (SUI; see Fig. 2) between the solitary (Experiment 1) and competitive (Experiment 2) conditions.

Model	Term	Estimate ± SE	t-value	*P* value
First-daytime	Intercept	-0.432 ± 0.329	-1.312	0.237
	n_{Butt}	-0.197 ± 0.658	-0.300	0.775
Nighttime	Intercept	0.118 ± 0.101	1.173	0.294
	n_{Bite}	-0.031 ± 0.002	-14.213	<0.001
	n_{Butt}	-0.106 ± 0.016	-6.417	0.001
Second-daytime	Intercept	-0.062 ± 0.110	-0.562	0.604
	$n_{\text{Bite, Night}}$	-0.026 ± 0.004	-5.774	0.004
	$n_{\text{Butt, Night}}$	-0.185 ± 0.018	-10.509	<0.001
	$n_{\text{Bite, Day}}$	-0.728 ± 0.054	-13.408	<0.001

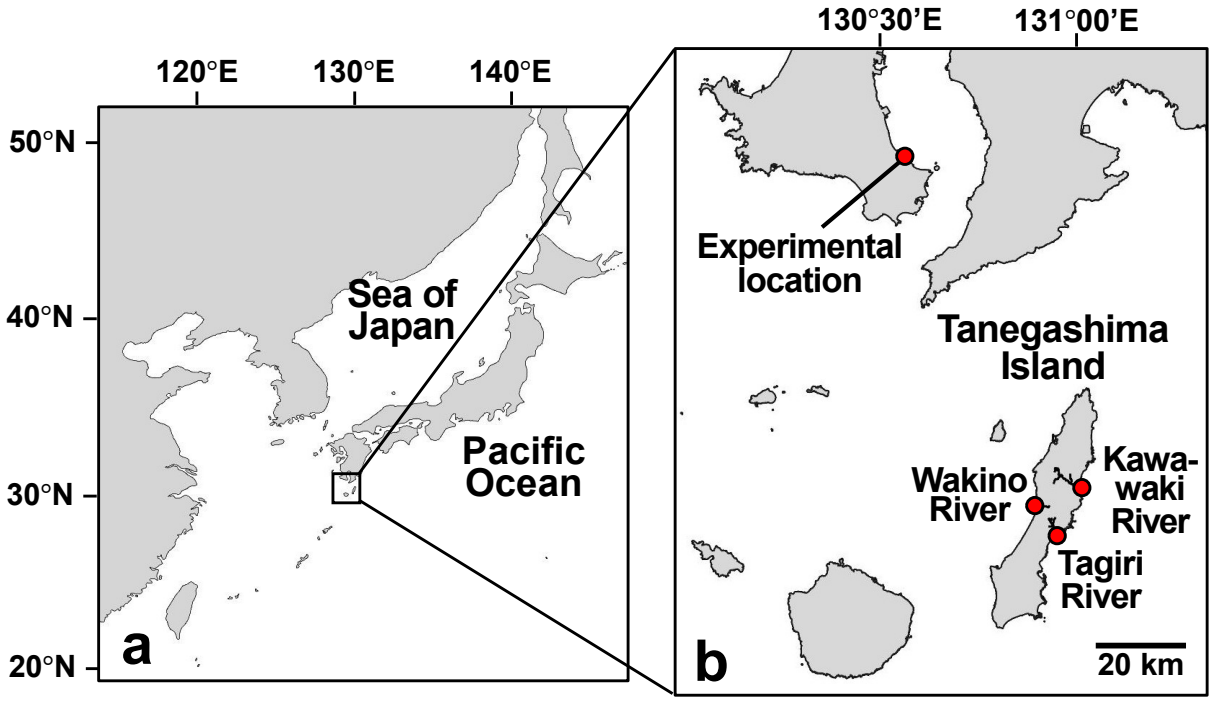

Fig. S1 Maps of the study location. (a) Location of the study area in the Pacific Ocean. (b) Location of the collection rivers on Tanegashima Island and Kagoshima Prefectural Fisheries and Technology Development Center, where behavioral experiments were conducted.

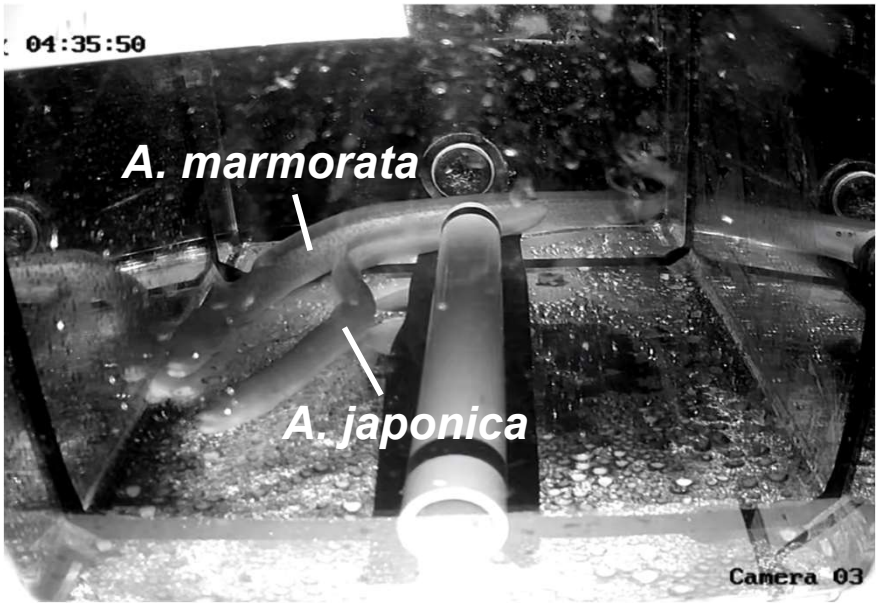

Fig. S2 Snapshot of the recorded videos from Experiment 2. The individual in the front with a plain skin color and a slender body is the Japanese eel *Anguilla japonica*, while the individual in the back with a mottled skin color and a plump body is the Indo-Pacific eel *A. marmorata*.