The following supplement accompanies the article

Behavioral trade-offs and habitat associations of coral-dwelling damselfishes (family Pomacentridae)

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Table S1. Summary of research objectives, behaviors measured, sampling data design, research locations, and coral colony details. Additional information regarding specific sample sizes of damselfishes per coral species is listed with the Chi-square (χ^2) analysis in the Results. Aspects of mid- and offshore sites are either sheltered (lagoonal or western aspect sites) and exposed (eastern aspect sites) with generally low flow or medium low flow environments, respectively. Letters H (healthy) and B (bleached) signify the number of colonies per species per coral bleaching status. Fish numbers per coral species are listed in parenthesis next to coral species bleaching status

Research Approach	Specific Behaviors	Sampling	Data points	Locations	Coral colony details
(i) In situ diurnal observations of damselfishes on coral hosts					
In situ filming branching coral colonies (20-80 cm) for 20-40 min to determine species-specific behaviors *bleaching status of the colony was included as a co-factor for behaviors 1-6	(1) Average distance from host colony (cm)	Representative individual	10 observation points	Sand patch and slope/base habitats of Lizard Island (14°41'S, 145°27'E) and Ferguson reef sites (12°33'S, 143°49E)	Semi-isolated (non-bleached and bleached) branching corals (0-14 m, lowest astronomical tide (LAT)) hosting 1400 damselfishes. 34 exposed colonies and 38 sheltered colonies: *A. intermedia* (n = 11: 4H, 8B | Fish = 184) *A. spathulata* (n = 17; 4H, 11B | Fish = 550) *P. damicornis* (n = 27: 18H, 8B | Fish = 557) *S. hystrix* (n = 10: 1H, 9B | Fish = 68) *S. pistillata* (n = 9: 2H, 7B | Fish = 77) Multi-species group size range: 2-105 damselfishes Average group: 20 damselfishes Damselfish group size mode: 7 (0-20 fishes: 43 colonies | 21+ fishes: 29 colonies) Average damselfish diversity per colony: 2 species Colonies were healthy (n =29) and bleached (n = 43)
	(2) Maximum distance (above and side) from host colony	Maximum distance of any fishes	Once		
	(3) Colony visits	All fishes	All visits		
	(4) Within colony conspecific aggression	All fishes	All aggressions per fish species per conspecifics		
	(5) Heterospecific aggression	All fishes	All aggressions per fish species per other fish present		
	(6) Modal diurnal spatial position (above, under, or side)	Representative individual per species per colony	10 time-points (coral colonies pooled)		
	(7) Algae eating behavior	12 colonies	All bites, expressed as proportion of algae colonies		
Short-term reaction to startle stimulus response	(1) Refuge position in relation to host coral colonies (in colony, under, outside colony)	All fishes	All fishes' positions summed over 4 startle stimulus trials (coral colonies pooled)	Sand patch and slope/base habitats of Lizard Island (14°41'S, 145°27'E) and Ferguson reef sites (12°33'S, 143°49E)	43 Semi-isolated (non-bleached) branching corals (0-5 m LAT)), in sheltered locations, hosting 1023 damselfishes: *A. intermedia* (n = 7) *A. spathulata* (n = 12) *P. damicornis* (n = 13) *S. hystrix* (n = 5) *S. pistillata* (n = 6) Multi-species group size range: 1-111 damselfishes Average group size: 25 damselfishes Damselfish group size mode: 6, 9, 10 (0-20 fishes: 24 colonies | 21+ fishes: 16 colonies) Average damselfish diversity per colony: 2.5 species
(ii) In situ nocturnal observation of damselfishes on coral hosts					
Recording position of damselfishes on colonies *all colonies observed during the day (0800 - 1700) to record the number of resident fishes per species for nocturnal comparison	(1) Modal nocturnal sleeping ('roosting') position between 2000 – 2300 h	All fishes	Modal position	Sheltered and patch and slope/base habitats of Lizard Island (14°41'S, 145°27'E)	25 semi-isolated (healthy, non-bleached), small (~50 cm diameter) *P. damicornis* colonies (0-6 m LAT), hosting 311 damselfishes. Multi-species group size range: 3-36 damselfishes Average group size: 13 damselfishes Damselfish group size mode: 9 (0-20 fishes: 17 colonies | 21+ fishes: 9 colonies) Average diversity per colony: 2 species

Table S2. Person's Chi-squared (χ^2) test values for average modal diurnal fish position (top, side, under, in) and positions around healthy and bleached covered colonies (colony bleaching status). Significant p-values are in **bold**

Fish species	Analysis	χ^2 value	d.f.	p-value
C. viridis	Colony bleaching	29.08	3	**<0.001**
D. aruanus	Colony bleaching	41.06	3	**<0.001**
D. reticulatus	Colony bleaching	16.50	3	**<0.001**
P. amoboinensis	Colony bleaching	25.33	3	**<0.001**
P. moluccensis	Colony bleaching	23.98	3	**<0.001**

Table S3. Results of a zero-inflated generalized linear mixed model (GLMM) examining the *in situ* startle shelter response of five different species of damselfish around small branching host colonies. The most parsimonious model the best model included the number of fishes in each position (dependent variable), fish species and position (independent variables), colony number as a random factor and startle number nested within colony, and total fish per species on each colony as an offset. Significant p-values are in **bold**

Factor	z-value	p-value
(intercept) (*C. viridis*)	-0.635	0.5253
D. aruanus	-0.536	0.5918
D. reticulatus	-0.759	**0.4481**
P. amboinensis	-9.708	**<0.0001**
P. moluccensis	-5.842	**<0.0001**
Out position	-11.102	**<0.0001**
Under position	-10.572	**<0.0001**
D. aruanus: Out	4.174	**<0.0001**
D. reticulatus: Out	3.754	**0.0002**
P. amboinensis: Out	10.899	**<0.0001**
P. moluccensis: Out	8.899	**<0.0001**
D. aruanus: Under	4.103	**<0.0001**
D. reticulatus: Under	4.829	**<0.0001**
P. amboinensis: Under	11.030	**<0.0001**
P. moluccensis: Under	8.293	**<0.0001**

Table S4. *Post-hoc* test ('emmean') for multiple comparisons of startle shelter response (position) of five different species of damselfish around small branching host colonies. Values are based off the zero-inflated generalized linear mixed model (GLMM) that included the number of fishes in each position (dependent variable), fish species and position (independent variables), colony number as a random factor and startle number nested within colony, and total fish per species on each colony as an offset. Significant p-values are in **bold**

Contrast	t. ratio	p. value
Position: IN		
C. viridis – D. aruanus	1.045	0.9836
C. viridis - D. reticulatus	1.203	0.9423
C. viridis – P. amboinensis	10.554	**<0.001**
C. viridis - P. moluccensis	6.440	**<0.001**
D. aruanus - D. reticulatus	0.487	0.9957
D. aruanus - P. amboinensis	9.841	**<0.001**
D. aruanus – P. moluccensis	5.025	**<0.001**
D. reticulatus - P. amboinensis	8.767	**<0.001**
D. reticulatus - P. moluccensis	3.157	0.0035
P. amboinensis - P. moluccensis	-6.778	**<0.001**
Position: OUT		
C. viridis – D. aruanus	-3.525	**0.0004**
C. viridis - D. reticulatus	-3.383	**0.0022**
C. viridis – P. amboinensis	-13.228	**<0.0001**
C. viridis - P. moluccensis	-11.001	**<0.0001**
D. aruanus - D. reticulatus	-0.802	1.000
D. aruanus - P. amboinensis	-10.029	**<0.0001**
D. aruanus – P. moluccensis	-7.459	**<0.0001**
D. reticulatus - P. amboinensis	-5.391	**<0.0001**
D. reticulatus - P. moluccensis	-3.816	**0.0010**
P. amboinensis - P. moluccensis	-3.822	**0.0013**
Position: IN		
C. viridis – D. aruanus	-4.070	**0.0005**
C. viridis - D. reticulatus	-4.770	**<0.0001**
C. viridis – P. amboinensis	-9.074	**<0.0001**
C. viridis - P. moluccensis	-7.638	**<0.0001**
D. aruanus - D. reticulatus	-1.471	0.5817
D. aruanus - P. amboinensis	10.269	**<0.0001**
D. aruanus – P. moluccensis	-7.020	**<0.0001**
D. reticulatus - P. amboinensis	-6.421	**<0.0001**
D. reticulatus - P. moluccensis	-3.900	**0.0010**
P. amboinensis - P. moluccensis	4.953	**<0.0001**

Table S5. Results of a Poisson Generalized Linear Model (GLM) examining the *in situ* colony visits of five different species of damselfish around small branching host colonies. Values are based off of model selection practice using degrees of freedom and Akaike information criteria (AIC) scores; the best model included colony visits (dependent variable), fish species (independent variable), coral colony (random factor), and fish number per each species as an offset. Significant p-values are in **bold**

Factor	z-value	p-value
(intercept) (*C. viridis*)	11.87	**2×10^{-16}**
D. aruanus	11.86	**<0.001**
D. reticulatus	7.46	**<0.001**
P. amboinensis	-16.43	**<0.001**
P. moluccensis	-16.04	**<0.001**

Table S6. Results of a generalized linear model examining the *in situ* average distance (log + 1) of five different species of damselfish around small branching host colonies. Significant p-values are in **bold**

Factor	t-value	p-value
(intercept) (*C. viridis*)	13.807	**2×10^{-16}**
D. aruanus	-0.099	0.9209
D. reticulatus	-1.042	0.2992
P. amboinensis	-3.148	**0.0021**
P. moluccensis	-3.526	**0.0006**

Table S7. Results of a generalized linear model (GLM) examining the *in situ* maximum distance above (log + 1) the host coral colony of five different species of damselfish around small branching host colonies. Significant p-values are in **bold**

Factor	t-value	p-value
(intercept) (*C. viridis*)	15.355	**2×10^{-16}**
D. aruanus	-0.060	0.9520
D. reticulatus	-0.216	0.8290
P. amboinensis	-9.104	**<0.0001**
P. moluccensis	-4.633	**<0.0001**

Table S8. Results of a generalized linear model (GLM) examining the *in situ* maximum distance to the side (log + 1) the host coral colony of five different species of damselfish around small branching host colonies. Significant p-values are in **bold**

Factor	t-value	p-value
(intercept) (*C. viridis*)	9.188	**6.22×10^{-16}**
D. aruanus	2.175	**0.0315**
D. reticulatus	1.250	0.2138
P. amboinensis	-0.419	0.6761
P. moluccensis	-0.331	0.7411

Table S9. Results of a Generalized Linear Model (GLM) examining the *in situ* conspecific aggressions of five different species of damselfish around small branching host colonies. Values are based off of model selection practice using degrees of freedom and Akaike information criteria (AIC) scores; the best model included conspecific aggressions (dependent variable), fish species (independent variable), coral colony (random factor), and fish number per each species as an offset. Significant p-values are in **bold**

Factor	t-value	p-value
(intercept) (*C. viridis*)	0.8994	0.3731
D. aruanus	6.164	**<0.001**
D. reticulatus	2.749	**0.0077**
P. amboinensis	-0.209	0.8346
P. moluccensis	1.320	0.1913

Table S10. Results of a negative binomial Generalized Linear Model (GLM) examining the *in situ* heterospecific aggressions (log + 1) of five different species of damselfish around small branching host colonies. Values are based off of model selection practice using degrees of freedom and Akaike information criteria (AIC) scores; the best model included heterospecific aggressions (dependent variable), fish species (independent variable), coral colony (random factor), and fish number per each species and other fish on the colony as offsets. Significant p-values are in **bold**

Factor	t-value	p-value
(intercept) (*C. viridis*)	-0.0182	0.9855
D. aruanus	3.7775	**0.003**
D. reticulatus	2.5950	**0.0117**
P. amboinensis	0.8552	0.8552
P. moluccensis	0.5318	0.5967