

Homeward Sound – Supporting Online Material

1. Reef design

Our patch reefs were made of dead coral rubble each measuring approximately 0.5 m-cubed. Each replicate came from three (sound-silent) or four (high-low-silent) reefs positioned at 5 m around a sound system (or similar, but silent rig) for each treatment (Fig. S1). Sets of reefs for each treatment within a site were 100 m apart. Replicate sites were >500 m apart, and >300 m from the nearest natural reefs.

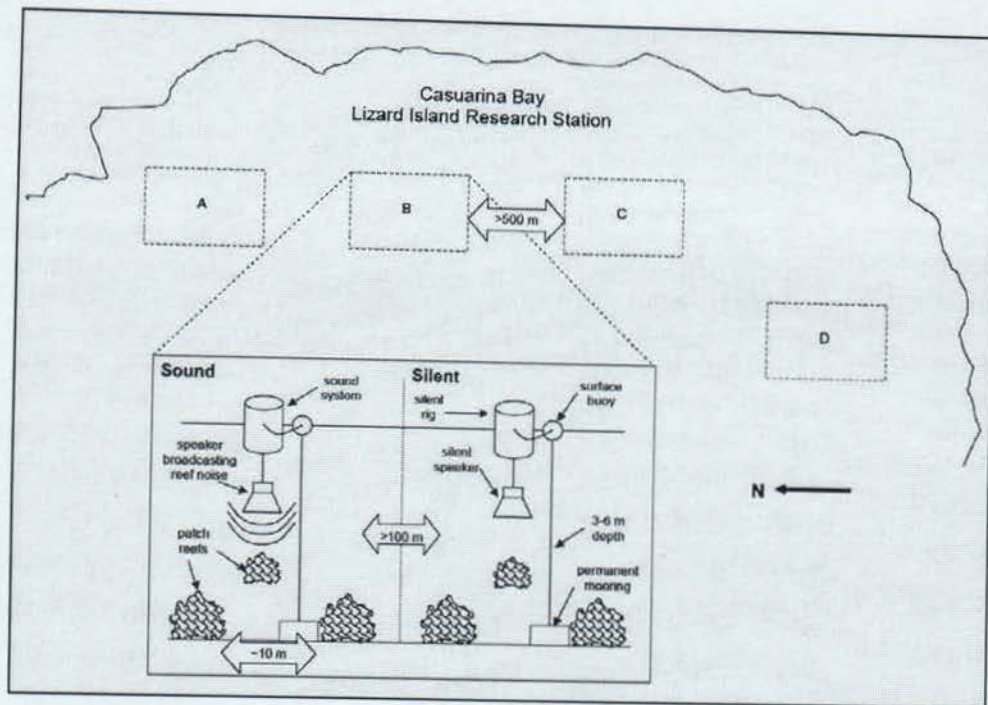


Figure S1: Spatial design of the experimental patch reefs, showing a paired set of reefs for two treatments, and four experimental sites in Casuarina Bay, Lizard Island, Great Barrier Reef.

2. Sound levels

Sound treatments were broadcast at 156 dB re 1 μ Pa at 1m. This level was chosen to replicate the highest natural sounds recorded from reefs in a previous study (R. D. McCauley, D. H. Cato, *Philos. Trans. R. Soc. London Ser. B* 355, 1289 (2000)), and is greater than the ambient offshore noises around Lizard Island (around 92 dB re 1 μ Pa at 1m, Rob McCauley unpublished data).

3. Raw data, including the influence of one atypical sample in the sound-silent study

In our analyses, we used two approaches. Avoiding parametric assumptions of the data, we used Chi-squared analyses for the apogonids and pomacentrids to test the probability of finding the final observed ratios by chance. For the rarer taxa (not apogonids or pomacentrids), we used non-parametric Wilcoxon's matched pairs tests to test the probability of the relative taxonomic richness at each treatment occurring by chance throughout each study.

Table S1 shows the raw data from the sound-silent study. These data summarise collections from four sites over six nights (sites A-D, Fig. S1). In the second half of the table, the influence of one atypical sample on the final results is demonstrated, where following a stormy night, one site was covered in loose algal clumps which had attracted many apogonid recruits. At this site, we collected more apogonids around the silent patch reefs than from the reefs with sound, but based on the majority of results we do not believe that this was in response to our treatments. This strongly influenced the results towards the null model for the apogonids, and should perhaps be discounted. For transparency, we included this sample in the figure in the main text.

Table S1: Raw data for comparisons of settlement by fishes to patch reefs with and without broadcast reef sounds. Apogonids and pomacentrids were removed from the family and species level comparisons to examine effects in rarer taxa. The data are shown both including and excluding an atypical sample which strongly influenced the data for the apogonids towards the null model (effect in **bold**). P-values are: ** = $p < 0.01$, * = $p < 0.05$, ms = $p < 0.1$.

	Taxa	n	Total	Sound	Silent	Test	p-value
Including atypical sample	Apogonidae	22	690	367	323	Chi-squared	ms
	Pomacentridae	22	131	91	40	Chi-squared	**
	Families	22	11	9	8	Wilcoxon's	ns
	Species	22	13	9	9	Wilcoxon's	ns
Excluding atypical sample	Apogonidae	21	307	238	69	Chi-squared	**
	Pomacentridae	21	126	87	39	Chi-squared	**
	Families	21	11	9	7	Wilcoxon's	ns
	Species	21	12	9	8	Wilcoxon's	ns

Table S2 shows the raw data from our high-low-silent study. These data summarise collections from two sites over eight nights (sites A & D, Fig. S1).

Table S2: Raw data for comparisons of settlement by fishes to patch reefs with high or low frequency broadcast reef sounds or silence. Again, apogonids and pomacentrids were removed from the family and species level comparisons to examine effects in rarer taxa. The statistical tests are pairwise, and include a Bonferroni correction, so the p-values are: ** = $p < 0.0033$, * = $p < 0.017$, ms = $p < 0.033$, ns = not significant. H = high, L = low and S = silent.

Taxa	n	Total	High	Low	Silent	Test	p-value		
							H-L	H-S	L-S
Apogonidae	13	2499	972	1011	516	Chi-squared	ns	**	**
Pomacentridae	13	517	216	160	141	Chi-squared	*	**	ns
Families	13	14	11	13	8	Wilcoxon's	ns	*	ms
Species	13	28	17	16	8	Wilcoxon's	ns	*	*

4. Species inventory, identification notes, and some specimen photos

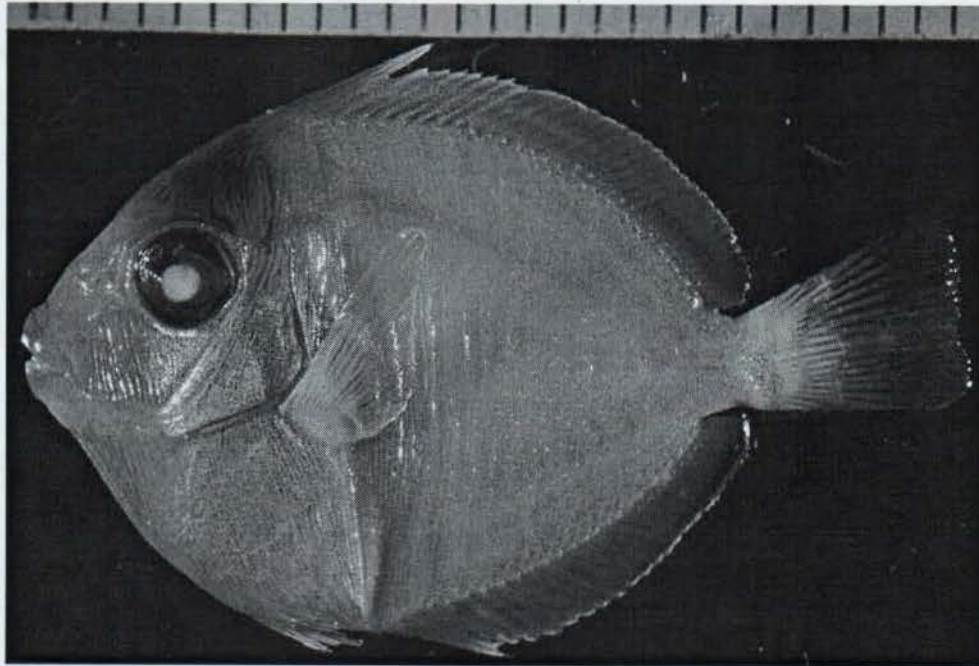
Table S3 shows the total species list, divided by family. Although many of the species are not identified to binomial scientific nomenclature, each species was clearly distinguishable by markings and body shape. Also shown is the study/studies in which each species appeared.

Table S3: List of species and identification notes for fish collected from patch reefs during two studies of the effect of sounds on settlement (S-S: sound-silent, H-L-S: high-low-silent).

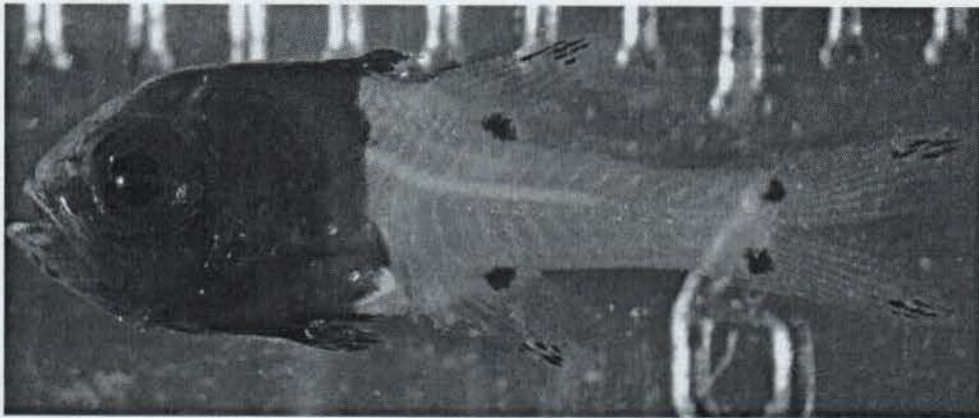
Family	Species	Name	Description	S-S	H-L-S
Acanthuridae	Aca1		Brown tang	y	y
Apogonidae	Apo1		Dark red stripe	y	y
	Apo2		Stripes on head, dot on tail	y	y
	Apo3		No stripes on head but dot on tail, lower margin	y	y
	Apo4		Body stripes	y	y
	Apo5		Red stripe and dark margin	y	y
	Apo6		Red stripe no black marks	y	y
	Apo7		No colour	y	y
	Apo8		Black head	y	y
	Apo9	<i>Apogon trimaculatus</i>	Black spots dorsal/ventral	y	
	Apo10	<i>Fowleria vaiulae</i>	Eye stripes radiating	y	y
	Apo11		Black dorsal spine		y
	Apo12		Black decoration		y
	Apo13		Fat head		y
	Apo14		Yellow body		y
	Apo15		Orange body		y
	Apo16		Brown, large head		y
Balistidae	Ball	<i>Rhinecanthus aculeatus</i>	Picasso triggerfish		y
Blenniidae	Blen1	<i>Petroscirtes mitratus</i>	Black head and stripes	y	y
	Blen2		Orange head, blunt head		y
	Blen3		Black lower margin		y
	Blen4		Black head		y
Caesionidae	Caes1	<i>Pterocaesio pisang</i>	Rose belly, shiny	y	
Chaetodontidae	Chaet1		Three bars		y
Eleotridae	Ele1		Orange head	y	y
Gobiidae	Gob1		Small pink/white	y	y
Labridae	Lab1	<i>Anampses geographicus</i>	Orange/green/black dots on tail	y	y
	Lab2		Orange colour		y
	Lab3		Intermittent dark stripes		y
	Lab4		Black dot on tail		y
	Lab5		Mottled, dots on dorsal		y
Lutjanidae	Lut1		Olive patterned	y	y
Platycephalidae	Plat1		Flat head	y	y
Pomacentridae	Pom1	<i>Pomacentrus amboinensis</i>	Yellow, black ocellus	y	y
	Pom2	<i>Dischistodus prosopotaenia</i>	Two black bars	y	y

Family	Species	Name	Description	S-S	H-L-S
	Pom3	<i>Pomacentrus nagaskiensis</i>	Ink blue, black ocellus	y	y
	Pom4	<i>Neopomacentrus cyanomos</i>	Black with yellow tail	y	y
	Pom5	<i>Neopomacentrus pristotis</i>	Long snout		y
	Pom6	<i>Pomacentrus brachialis</i>	Dark pomacentrid		y
	Pom7		Orange fish		y
	Pom8	<i>Pomacentrus wardi</i>	Blue lines on head		Y
Serranidae	Ser1		Blue grouper dorsal spine	y	
	Ser2	<i>Epinephelus maculatus</i>	Green and white, red on tail	y	
	Ser3		Chocolate colour		y
Siganidae	Sig1	<i>Siganus sp.</i>	Olive marbling	y	
Solenostomidae	Sol1		Tiny pipefish		y
Syngnathidae	Syng1		Brown pipefish		y
	Syng2		Long pipefish		y
	Syng3		Brown, stockier pipefish		y
Tetraodontidae	Tet1	<i>Canthigaster benneti</i>	Blue lines on eye	y	y
	Tet2	<i>Canthigaster valentini</i>	Black saddles	y	
Unknown	UnID1		Eel?		y
	UnID2				y
	UnID3				y
	UnID4		Eel?		y
	UnID5	Leptocephalus larva	Cream, featureless		y
	UnID6		Three stripes		y

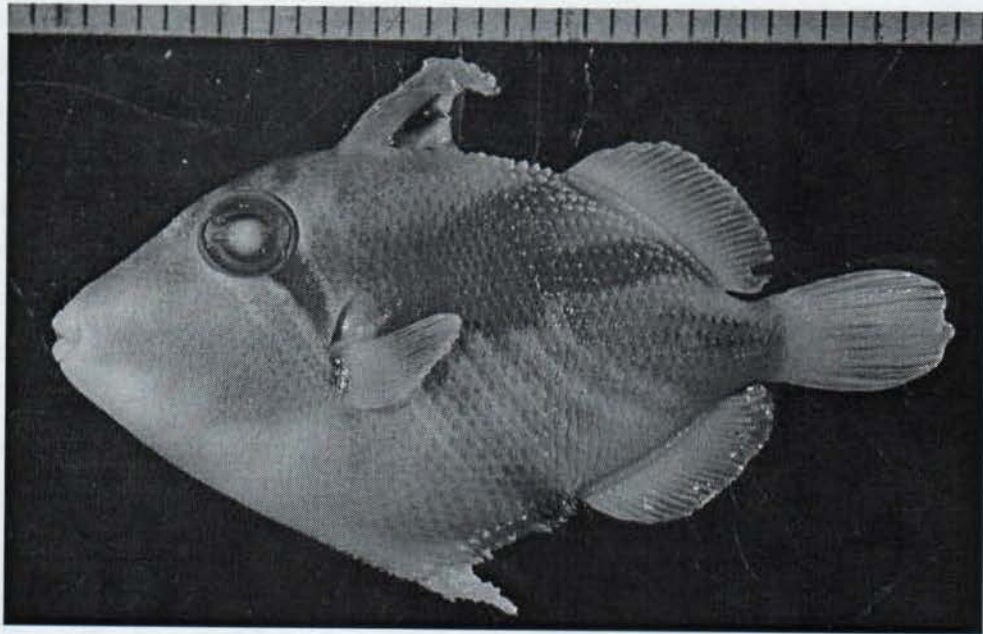
Specimen photos (all scale bars are millimetres)



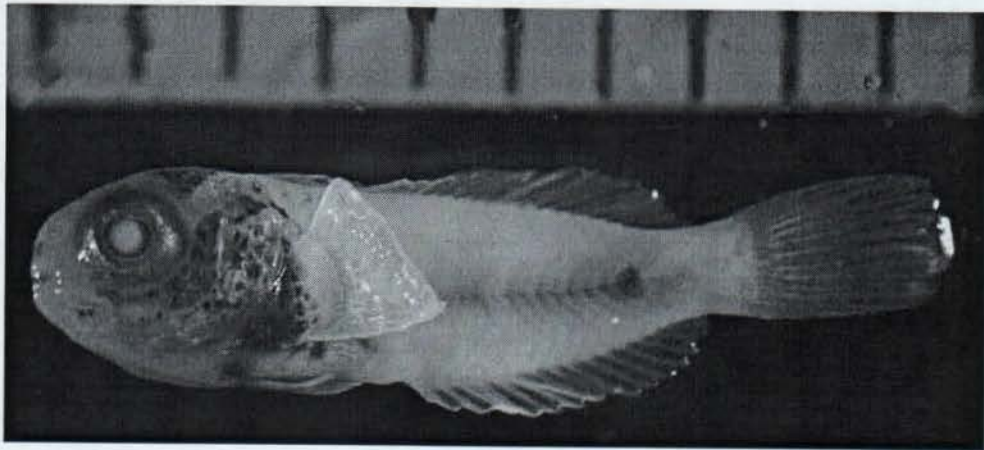
Acanthuridae (Aca1) – brown tang



Apogonidae (Apo8) – black head



Balistidae (Ball) – Picasso triggerfish (*Rhinecanthus aculeatus*)



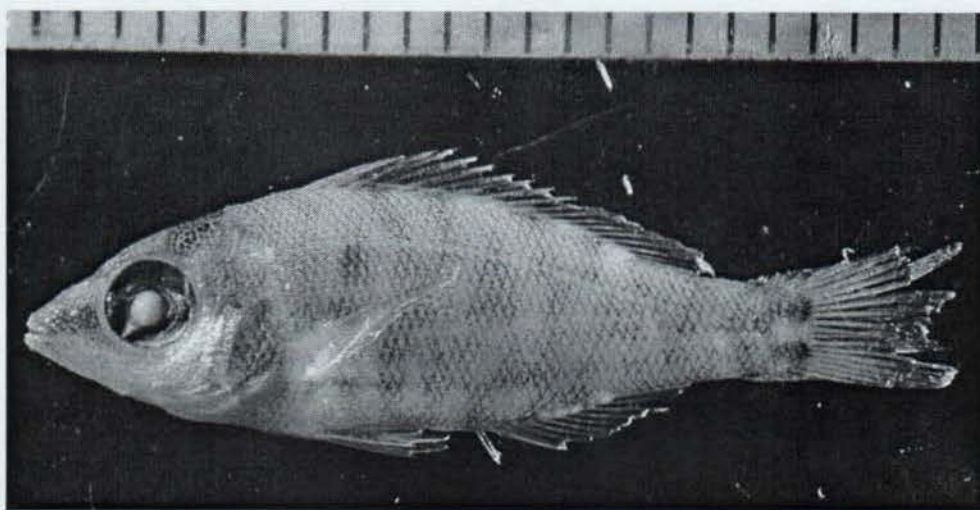
Blenniidae (Blen1) – Black head and stripes (*Petroscirtes mitratus*)



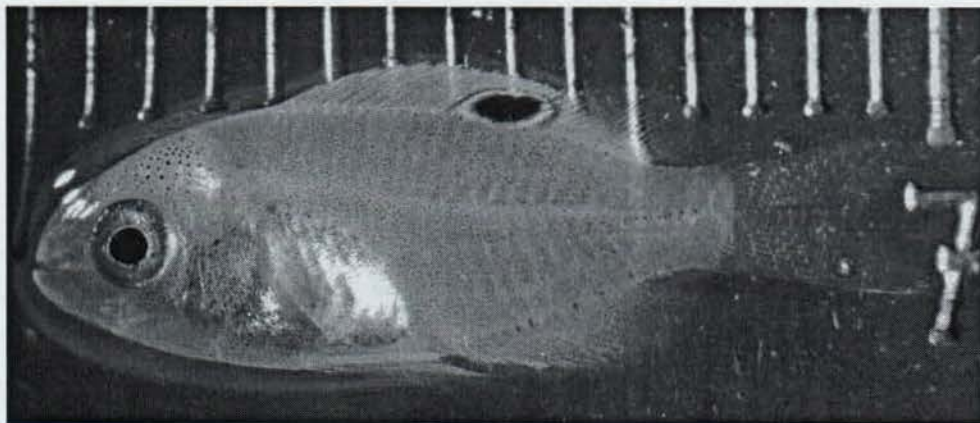
Caesionidae (Caes1) – Rose belly, shiny (*Pterocaesio pisang*)



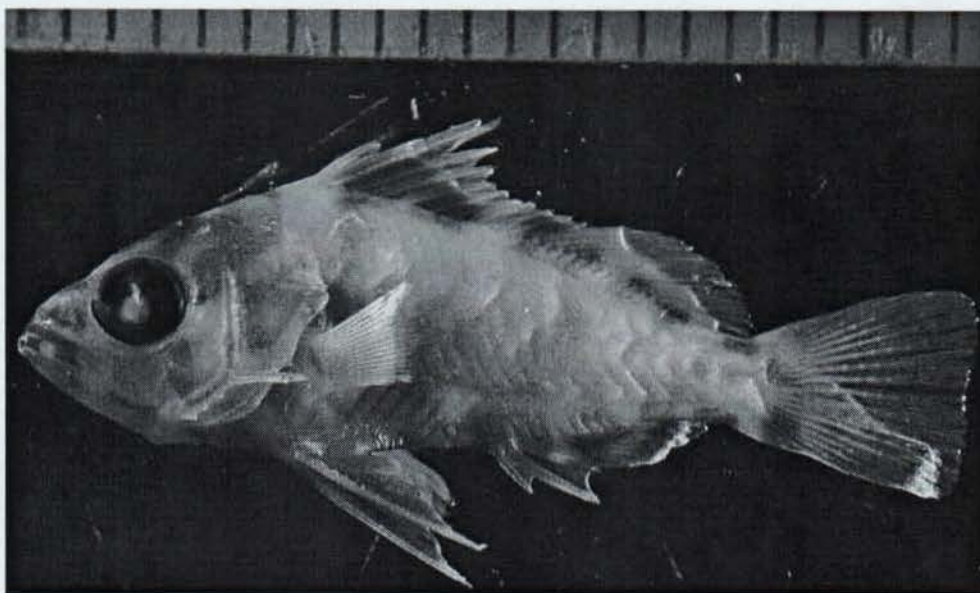
Labridae (Lab1) – Orange/green, black dots on tail (*Anampses geographicus*)



Lutjanidae (Lut1) – Olive, patterned



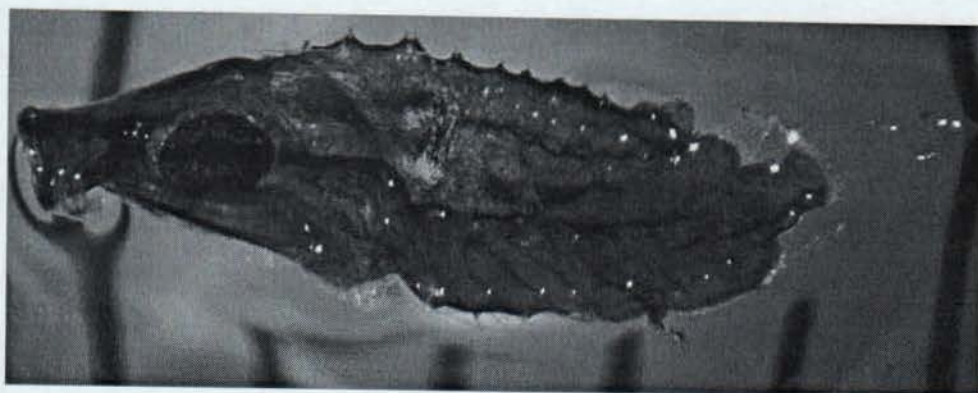
Pomacentridae (Pom1) – Yellow, black ocellus (*Pomacentrus amboinensis*)



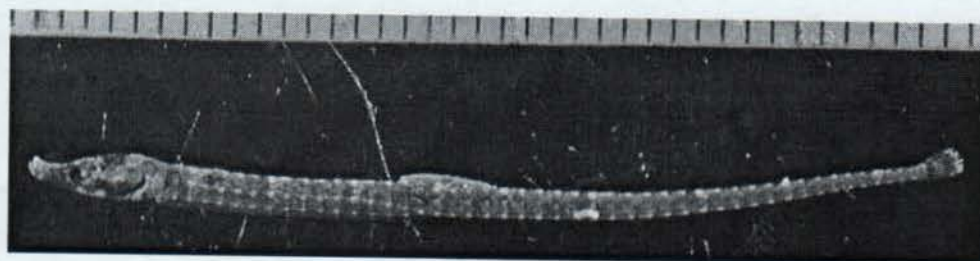
Serranidae (Ser3) – Green and white, red on tail (*Epinephelus maculatus*)



Siganidae (Sig1) – Olive, marbling (*Siganus sp.*)



Solenostomidae (Sol1) – Tiny pipefish



Syngnathidae (Syng3) – Brown, stockier pipefish



Tetraodontidae (Tet2) – Black saddles (*Canthigaster valentini*)