

Supporting Information

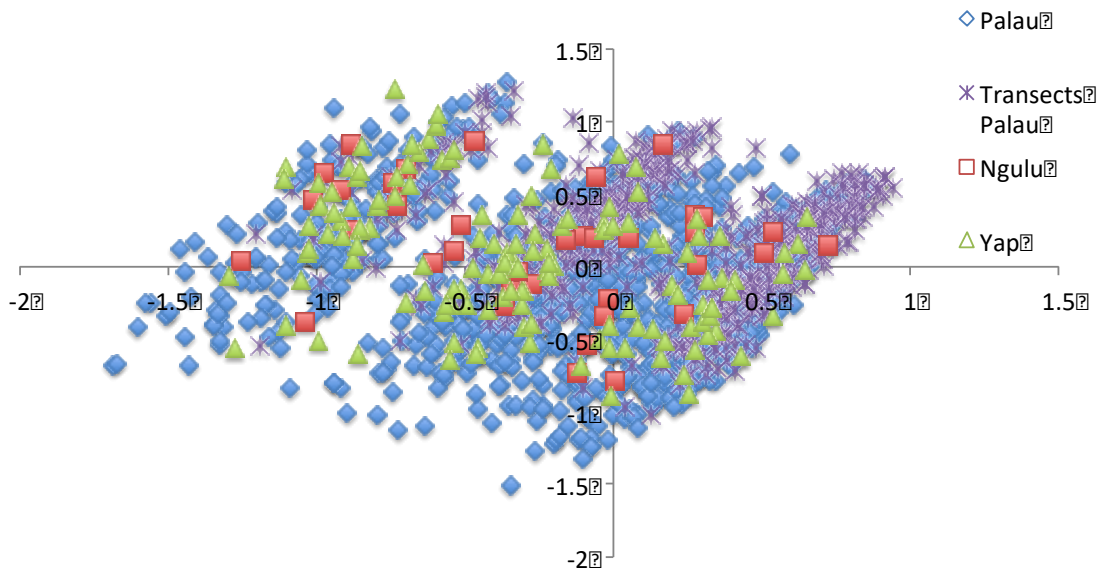


Figure S1. Principal component analysis of the pairwise allele frequency between each individual coral colony using a covariance matrix. There is no significant partitioning of the data. Blue diamond symbols represent colonies in Palau, purple stars represent colonies from belt transects in Palau, red squares represent colonies around Yap and green triangles represent colonies from around Ngulu.

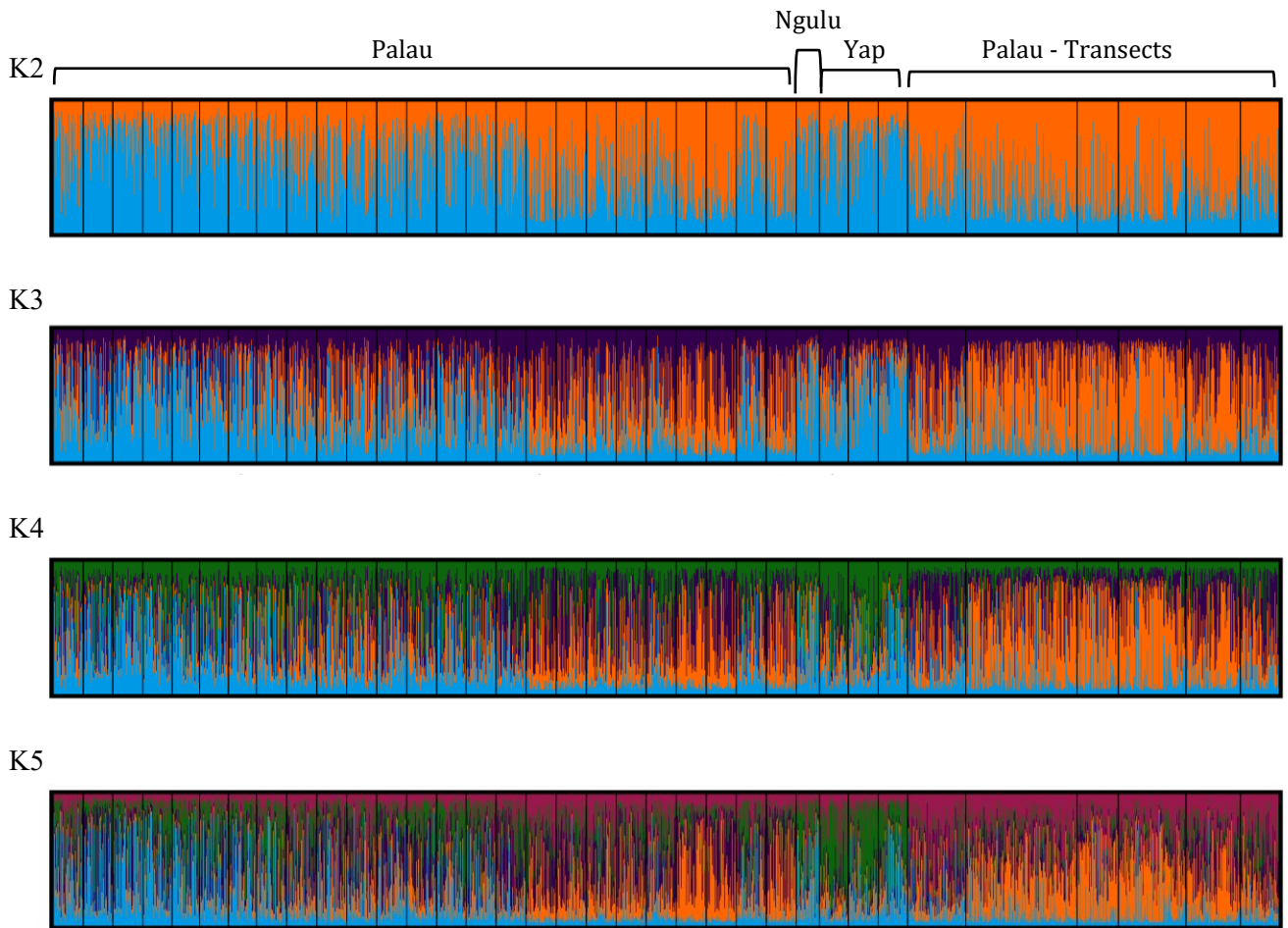


Figure S2. CLUMPAK summary of K values ran in STRUCTURE using an admixture model, without location as a prior, independent allele frequencies among populations and with a burn-in of 10,000 chains followed by 10,000 MCMC replications.

Table S1. List of 18 primers, modified from Wang, Zhang & Matz (2009). “Primer #”: primer number as labeled in our dataset; “Locus”: name of the locus as per Wang, Zhang & Matz (2009); “Repeat motif”: short tandem repeats; “Size”: size range of the microsatellite found by the authors; “Allele #”: number of allele found by the authors; “N”: number of individuals sequenced, “ H_o ”: observed heterozygosity; “ H_E ”: expected heterozygosity; “p”: p value from exact tests of HWE.

Primer #	Locus	Repeat motif	Size (bp)	Allele #	N	H_o	H_E	p	Accession #
1	EST007	(TTTC)5	99-107	3	24	0.38	0.47	0.2025	DY587595
2	EST014	(TCT)13	143-173	10	24	0.92	0.88	0.6926	DY586774
3	EST016	(AAC)7	97-122	7	24	0.67	0.69	0.1383	DY586537
4	EST032	(TTA)21	138-187	15	24	0.96	0.94	0.7274	DY585386
5	EST062	(GAT)9	110-126	5	24	0.67	0.71	0.1437	DY58448
6	EST097	(TGA)7	123-135	5	24	0.71	0.69	0.0923	DY583334
7	EST098	(TG)12	98-118	8	24	0.58	0.68	0.0362	DY583314
8	EST181	(ATG)10	145-157	2	24	0.25	0.22	1	DY580714
9	EST196	(TAA)9	117-145	9	24	0.79	0.85	0.0926	DY580091
10	EST254	(CA)10	86-100	8	24	0.75	0.82	0.2802	DY577596
11	WGS051	(GATA)8	151-216	12	24	0.61	0.86	0.0004	714184394
12	WGS092	(ATT)12	166-184	18	24	0.79	0.93	0.1645	745002572
13	WGS112	(AAT)9	166-184	6	24	0.79	0.73	0.9619	745001340
14	WGS134	(GATA)6	105-133	7	24	0.58	0.67	0.3767	745001492
15	WGS152	(AT)9	98-118	7	24	0.54	0.76	0.0241	714180564
16	WGS153	(AATC)7	106-126	5	24	0.63	0.64	0.9458	714176682
17	WGS189	(ATCT)7	158-194	9	24	0.58	0.75	0.0420	714180544
18	WGS211	(TAA)8	181-199	5	24	0.75	0.61	0.4021	714178565

Table S2. Example of tags added to the forward primers as a colony ID #1 through #5 for Primer 1, locus EST007.

Primer #	Locus	Microsat	Tag + Primer Sequence	Tag
1	EST007	(TTTC)5	AACACCTGCAATGGTTCTGTTGCAGTCA	AACACC
1	EST007	(TTTC)5	GTTAGGTGCAATGGTTCTGTTGCAGTCA	GTTAGG
1	EST007	(TTTC)5	AACGGATGCAATGGTTCTGTTGCAGTCA	AACGGA
1	EST007	(TTTC)5	AAGAGGTGCAATGGTTCTGTTGCAGTCA	AAGAGG
1	EST007	(TTTC)5	GTTCCATGCAATGGTTCTGTTGCAGTCA	GTTCCA

Table S3. Pairwise F'_{ST} comparison for 25 sites in Palau (S1 through S25), 3 sites in Yap (S27, S29, S30) and 1 site in Ngulu (S28) (top diagonal) and permutation p values (lower diagonal). Values highlighted in yellow represent non-significant F'_{ST} values.

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23	S24	S25	S27	S29	S30	S28
S1	--	0.08	0.02	0.04	0.04	0.04	0.02	0.01	0.05	0.05	0.05	0.10	0.05	0.02	0.03	0.06	0.15	0.11	0.07	0.07	0.05	0.13	0.15	0.02	0.11	0.05	0.06	0.07	0.14
S2	0.00	--	0.09	0.12	0.11	0.09	0.09	0.11	0.15	0.13	0.15	0.19	0.11	0.08	0.09	0.14	0.22	0.20	0.16	0.16	0.12	0.22	0.20	0.11	0.17	0.18	0.16	0.19	0.23
S3	0.09	0.00	--	0.01	0.06	0.09	0.03	0.07	0.10	0.11	0.11	0.16	0.12	0.09	0.07	0.08	0.22	0.17	0.15	0.16	0.12	0.20	0.24	0.10	0.20	0.10	0.10	0.08	0.21
S4	0.02	0.00	0.19	--	0.03	0.06	0.02	0.07	0.08	0.10	0.10	0.18	0.11	0.06	0.09	0.08	0.21	0.14	0.13	0.13	0.12	0.19	0.23	0.08	0.18	0.10	0.07	0.06	0.18
S5	0.01	0.00	0.00	0.03	--	0.05	0.02	0.08	0.09	0.09	0.11	0.14	0.14	0.05	0.12	0.11	0.19	0.18	0.13	0.12	0.11	0.19	0.19	0.09	0.15	0.10	0.09	0.09	0.20
S6	0.00	0.00	0.00	0.00	0.00	--	0.05	0.04	0.08	0.08	0.08	0.11	0.08	0.02	0.07	0.09	0.16	0.14	0.07	0.09	0.06	0.15	0.14	0.03	0.12	0.12	0.10	0.15	0.18
S7	0.09	0.00	0.05	0.13	0.14	0.01	--	0.03	0.07	0.09	0.09	0.14	0.08	0.05	0.05	0.06	0.18	0.12	0.09	0.11	0.07	0.15	0.19	0.05	0.15	0.08	0.03	0.06	0.16
S8	0.14	0.00	0.00	0.00	0.00	0.01	0.03	--	0.05	0.03	0.05	0.10	0.03	0.02	0.01	0.04	0.15	0.09	0.03	0.05	0.04	0.11	0.14	0.00	0.10	0.04	0.04	0.08	0.09
S9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.05	-0.02	0.09	0.09	0.06	0.05	0.04	0.07	0.02	0.01	0.02	0.02	0.07	0.10	0.07	0.07	0.06	0.08	0.09	0.10
S10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	--	0.05	0.07	0.07	0.05	0.05	0.06	0.11	0.08	0.02	0.04	0.04	0.05	0.08	0.06	0.06	0.08	0.09	0.11	0.14
S11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	--	0.07	0.09	0.05	0.05	0.04	0.07	0.04	0.02	0.04	0.01	0.08	0.09	0.07	0.07	0.07	0.10	0.12	0.12
S12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.11	0.12	0.08	0.11	0.09	0.11	0.05	0.08	0.06	0.11	0.11	0.12	0.10	0.15	0.16	0.20	0.22	
S13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.04	0.03	0.07	0.16	0.11	0.05	0.06	0.05	0.10	0.11	0.02	0.07	0.12	0.07	0.14	0.14	
S14	0.09	0.00	0.00	0.00	0.00	0.11	0.00	0.06	0.00	0.00	0.00	0.00	--	0.06	0.07	0.14	0.11	0.05	0.05	0.04	0.12	0.11	-0.01	0.07	0.09	0.06	0.11	0.13	
S15	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.01	0.00	--	0.02	0.13	0.08	0.04	0.07	0.04	0.11	0.14	0.04	0.12	0.07	0.07	0.12	0.10
S16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	--	0.09	0.05	0.06	0.05	0.03	0.11	0.12	0.06	0.09	0.11	0.10	0.12	0.13
S17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.04	0.05	0.06	0.04	0.08	0.06	0.15	0.05	0.20	0.17	0.23	0.18
S18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.01	0.03	0.02	0.05	0.10	0.11	0.06	0.12	0.11	0.13	0.10
S19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.24	0.09	0.07	0.00	0.00	0.01	0.02	0.00	0.00	0.16	--	0.00	-0.02	0.04	0.07	0.04	0.04	0.07	0.10	0.09	
S20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.53	--	0.00	0.04	0.04	0.04	0.02	0.10	0.09	0.12	0.11
S21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.03	1.00	0.54	--	0.04	0.05	0.04	0.03	0.08	0.07	0.12	0.10
S22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.03	0.11	0.02	0.16	0.13	0.19	0.19
S23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.12	0.00	0.21	0.19	0.25	0.22
S24	0.04	0.00	0.00	0.00	0.00	0.03	0.00	0.53	0.00	0.00	0.00	0.00	0.04	0.73	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	--	0.08	0.08	0.06	0.11	0.12
S25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.58	0.00	--	0.17	0.14	0.19	0.18
S27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.04	0.02	0.07
S29	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.04	0.00
S30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	--	0.00
S28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--

Table S4. Matrix of geographic distances in kilometers between sites following the contour of the barrier reef for 25 sites in Palau (S1 through S25) in Palau, 3 sites in Yap (S27, S29, S30) and 1 site in Ngulu (S28).

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S20	S21	S22	S23	S24	S25	S27	S29	S30	S28
S1	0	151	127	99	55	101	93	6	21	28	101	95	79	72	55	46	29	64	115	36	131	20	142	136	480	541	484	348
S2	151	0	25	46	96	61	53	157	149	123	69	75	91	98	114	124	141	81	55	115	39	131	10	33	468	531	474	343
S3	127	25	0	22	72	86	28	133	147	99	93	100	115	123	139	148	156	57	80	90	63	107	15	58	487	550	493	360
S4	99	46	22	0	44	108	6	105	119	71	115	122	137	144	154	145	128	35	101	62	85	79	37	80	504	567	510	376
S5	55	96	72	44	0	158	38	61	75	27	164	149	134	127	110	101	84	9	151	19	135	35	87	130	523	583	527	388
S6	101	61	86	108	158	0	114	95	80	129	6	6	21	29	45	54	72	143	6	137	23	121	71	28	423	488	430	310
S7	93	53	28	6	38	114	0	99	113	64	121	128	143	150	148	139	122	29	108	56	91	73	43	86	508	571	514	379
S8	6	157	133	105	61	95	99	0	14	34	95	88	73	66	49	40	23	70	109	43	125	26	148	130	477	538	482	345
S9	21	149	147	119	75	80	113	14	0	49	81	74	59	51	35	26	8	84	94	57	110	40	159	116	464	526	469	333
S10	28	123	99	71	27	129	64	34	49	0	129	123	107	100	83	74	57	36	143	8	159	8	114	157	503	564	507	369
S11	101	69	93	115	164	6	121	95	81	129	0	7	22	29	46	55	72	150	14	137	30	121	78	35	428	493	435	314
S12	95	75	100	122	149	6	128	88	74	123	7	0	15	23	39	48	66	156	20	131	36	114	85	42	423	489	431	309
S13	79	91	115	137	134	21	143	73	59	107	22	15	0	7	24	33	50	172	35	116	52	99	100	57	431	495	438	313
S14	72	98	123	144	127	29	150	66	51	100	29	23	7	0	17	26	43	136	43	108	59	92	107	64	436	500	442	316
S15	55	114	139	154	110	45	148	49	35	83	46	39	24	17	0	9	26	119	59	92	76	75	124	81	445	508	450	321
S16	46	124	148	145	101	54	139	40	26	74	55	48	33	26	9	0	17	110	69	83	85	66	133	90	449	512	455	323
S17	29	141	156	128	84	72	122	23	8	57	72	66	50	43	26	17	0	93	86	65	102	49	150	107	458	520	463	328
S18	64	81	57	35	9	143	29	70	84	36	150	156	172	136	119	110	93	0	136	28	120	44	72	115	515	576	519	381
S20	115	55	80	101	151	6	108	109	94	143	14	20	35	43	59	69	86	136	0	151	16	135	65	22	450	514	456	328
S21	36	115	90	62	19	137	56	43	57	8	137	131	116	108	92	83	65	28	151	0	154	16	105	148	440	505	447	327
S22	131	39	63	85	135	23	91	125	110	159	30	36	52	59	76	85	102	120	16	154	0	151	48	5	511	571	515	376
S23	20	131	107	79	35	121	73	26	40	8	121	114	99	92	75	66	49	44	135	16	151	0	122	156	449	514	456	332
S24	142	10	15	37	87	71	43	148	159	114	78	85	100	107	124	133	150	72	65	105	48	122	0	43	496	556	500	362
S25	136	33	58	80	130	28	86	130	116	157	35	42	57	64	81	90	107	115	22	148	5	156	43	0	476	539	482	351
S27	480	468	487	504	523	423	508	477	464	503	428	423	431	436	445	458	515	450	440	511	449	496	476	452	0	71	21	161
S29	541	531	550	567	583	488	571	538	526	564	493	489	495	500	508	520	576	514	505	571	514	556	539	516	71	0	59	205
S30	484	474	493	510	527	430	514	482	469	507	435	431	438	442	450	463	519	456	447	515	456	500	482	458	21	59	0	156
S28	348	343	360	376	388	310	379	345	333	369	314	309	313	316	321	328	381	328	327	376	332	362	351	333	161	205	156	0

Table S5. Approximative (Monte Carlo) multivariate Kruskal-Wallis test in R (package Coin v. 1.3-1) between paired F'_{ST} values with scale. We used a Monte Carlo permutation for distribution (10,000 permutations).

All islands

```
independence_test(Fst ~ Scale, data = Fst.pair, teststat = "quadratic",  
distribution = approximate(nresample = 10000), ytrafo = function(data)  
trafo (data, numeric_trafo = rank_trafo))
```

Scale (Medium, Large, Reference)

chi-squared = 4.9168, p-value = 0.0813

Table S6. Approximative Kruskal-Wallis Test (package Coin v. 1.3-1) between paired kinship values and scale. * indicates significant p-values.

```
kruskal_test(kinship~scale, data=mydf,distribution=approximate(nresample=10000))
```

Scale (fine, small, medium, large, reference)

chi-squared = 2578.9

p-value < 1e-04*

Table S7: Dunn *post hoc* test displaying the pairwise comparison of difference of mean pairwise kinship coefficients by scale. The p-values below each comparison are adjusted with the Holm method. * indicates significant p-values.

	fine	small	medium	large
small	-12.049 0.0000*			
medium	22.458 0.0000*	-38.232 0.0000*		
large	26.982 0.0000*	-41.970 0.0000*	-13.276 0.0000*	
reference	27.835 0.0000*	-42.735 0.0000*	15.215 0.0000*	1.874 0.0305

Table S8. Approximative Kruskal-Wallis Test (package Coin v. 1.3-1) between paired kinship values and sub-scale. *indicates significant p-values.

```
kruskal_test(kinship~site, data=mydf,distribution=approximate(nresample = 10000))
```

Site (w/in Trans, w/in Ngulu, w/in Yap, w/in Palau, btwn Yap, btwn Palau, YN, PN, PY, PYN)

chi-squared = 2762.4

p-value < 1e-04

Table S9: Dunn *post hoc* test displaying the pairwise comparison of difference of mean pairwise kinship coefficients by sub-scale. The p-values below each comparison are adjusted with the Holm method as outlined in the text. w/in Tra: within transects; w/in Ngu: within Ngulu; w/in Yap: within Yap; w/in Pal: within Palau; btwn Yap: between Yap; btwn Pal: between Palau; YN: between Yap and Ngulu; PN: between Palau and Ngulu; PY: between Palau and Yap. In green, non significant p-values. * indicates significant p-values.

	w/in Tra	w/in Ngu	w/in Yap	w/in Pal	btwn Yap	btwn Pal	YN	PN	PY
w/in Ngu	-4.036 <i>0.0000*</i>								
w/in Yap	2.898 <i>0.0025*</i>	-1.960 <i>0.031</i>							
w/in Pal	14.586 <i>0.0000*</i>	-7.766 <i>0.0000*</i>	8.921 <i>0.0000*</i>						
btwn Yap	-10.656 <i>0.0000*</i>	-0.726 <i>0.257</i>	-4.186 <i>0.0000*</i>	-18.681 <i>0.0000*</i>					
btwn Pal	-22.414 <i>0.0000*</i>	0.063 <i>0.475</i>	-3.697 <i>0.0002*</i>	-39.751 <i>0.0000*</i>	2.002 <i>0.029</i>				
YN	16.661 <i>0.0000*</i>	3.122 <i>0.0012*</i>	7.776 <i>0.0000*</i>	24.756 <i>0.0000*</i>	4.379 <i>0.0000*</i>	8.297 <i>0.0000*</i>			
PN	-20.597 <i>0.0000*</i>	-0.495 <i>0.317</i>	-4.525 <i>0.0000*</i>	-35.416 <i>0.0000*</i>	-0.649 <i>0.270</i>	3.932 <i>0.0001*</i>	6.614 <i>0.0000*</i>		
PY	-26.727 <i>0.0000*</i>	-1.073 <i>0.168</i>	-5.553 <i>0.0000*</i>	-42.821 <i>0.0000*</i>	0.668 <i>0.270</i>	12.637 <i>0.0000*</i>	5.470 <i>0.0000*</i>	3.609 <i>0.0002*</i>	
PYN	-27.834 <i>0.0000*</i>	-1.179 <i>0.145</i>	-5.739 <i>0.0000*</i>	-44.080 <i>0.0000*</i>	0.916 <i>0.202</i>	15.289 <i>0.0000*</i>	5.242 <i>0.0000*</i>	4.400 <i>0.0000*</i>	0.975 <i>0.190</i>

Table S10a. Number of related ($k \geq 0.0937$) and unrelated ($k < 0.0937$) colonies per sub-scale and the percent related colonies. w/in Transect: colonies within transects on Palau. w/in Ngulu: colonies within site in Ngulu. w/in Yap: colonies within sites in Yap. w/in Palau: colonies within sites in Palau. btwn Yap: colonies between sites in Yap. btwn Palau: colonies between sites in Palau. YN: Yap-Ngulu. PN: Palau-Ngulu. PY: Palau-Yap.

Sub-scale	unrelated %	related %
w/in Ngulu	78.8	21.2
w/in Yap	75.8	24.2
w/in Palau	69.3	30.7
btwn Yap	78	22
btwn Palau	78.3	21.7
YN	81.8	18.2
PN	79.1	20.9
PY	78.8	21.2

Table S10b. Number of related ($k \geq 0.0937$) and unrelated ($k < 0.0937$) colonies per island and the percent related colonies.

Island	%related	%unrelated
Ngulu	21.2	78.8
Yap	22.7	77.3
Palau	22.1	77.9