

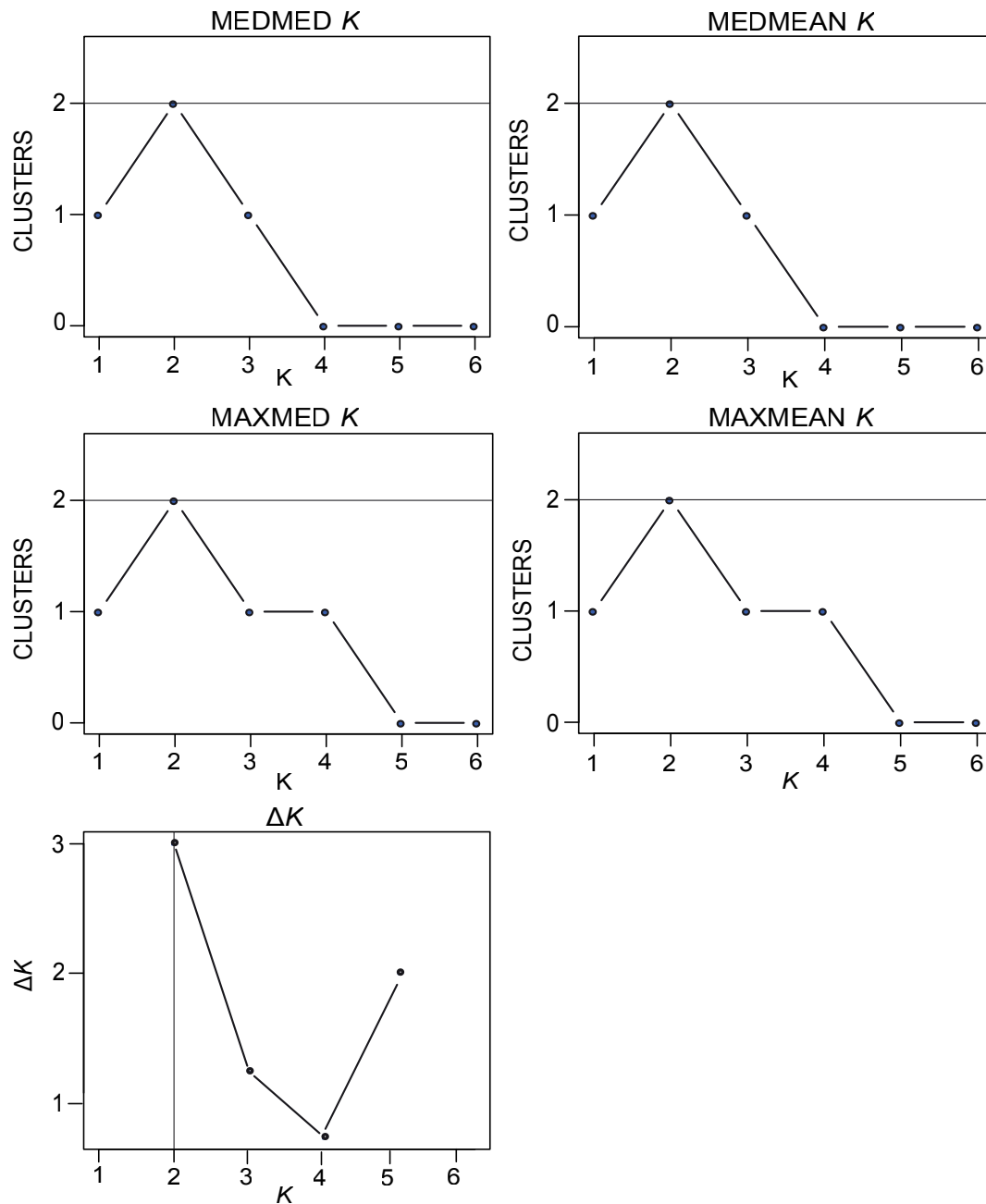
Supplementary Information

Genetic diversity and population connectivity of the sea urchin *Tripneustes gratilla* along the South African coast

M Brink, R Dale Kuys, C Rhode, BM Macey, KW Christison and R Roodt-Wilding

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Supplementary Figure S1: Most likely number of genetic clusters present in the *Tripneustes gratilla* populations from the east coast of South Africa, according to Puechmaille (MedMed K, MedMean K, MaxMed K and MaxMean K) and Evanno (ΔK) methods

Supplementary Table S1: Markers grouped into six multiplex (MP) assays, where repeat motifs, fluorescent dyes, expected fragment sizes in base pairs (bp), annealing temperature (T_a), and primer sources are indicated

MP	Marker	Repeat motif	Dye	Size range (bp)	T_a	Reference
1	Tgr-A11	(GT) ₁₈	FAM	223–356	55	Carlson and Lippé (2007)
	TG01	(TTGAA) ₁₀	NED	122–172		Wainwright et al. (2012)
	TG07	(TCA) ₁₀	PET	72–99		Wainwright et al. (2012)
	TG66	(CA) ₇	VIC	174–224		Wainwright et al. (2012)
	TG52	(GA) ₇	FAM	107–163		Wainwright et al. (2012)
	TG11	(GGT) ₇	VIC	139–169		Wainwright et al. (2012)
2	Tgr-C11	(CCAT) ₃ (TCAT)(CCAT) ₅	FAM	254–298	55	Carlson and Lippé (2007)
	TG51	(GA) ₈	PET	112–166		Wainwright et al. (2012)
	Tgr-B11	(CT) ₄ (TCCTCTC)(CT) ₆ (CTT) ₈	NED	134–196		Carlson and Lippé (2007)
	TG02	(CTATT) ₈	NED	71–116		Wainwright et al. (2012)
3	TG20	(ACT) ₁₂	FAM	129–180	55	Wainwright et al. (2012)
	TG26	(TG) ₁₂	NED	112–186		Wainwright et al. (2012)
	TG61	(CA) ₁₂	VIC	137–187		Wainwright et al. (2012)
	TG60	(CA) ₈	PET	102–136		Wainwright et al. (2012)
	TG55	(CT) ₉	VIC	85–145		Wainwright et al. (2012)
	Tgr-D134	(GATA) ₇ (AATA)(GATA) ₆ (AATA) ₂ (GATA) ₅	PET	195–315		Carlson and Lippé (2007)
4	TG28	(TG) ₁₀	VIC	97–155	55	Wainwright et al. (2012)
	TG42	(GT) ₈	NED	178–220		Wainwright et al. (2012)
	TG39	(GT) ₁₁	PET	136–166		Wainwright et al. (2012)
5	Tgr-B119	(CTTT) ₆	NED	162–202	60	Carlson and Lippé (2007)
	Tgr-C117	(CCAT) ₈	FAM	252–316		Carlson and Lippé (2007)
	Tgr-D103	(TC) ₄ (TA)(TC) ₃ (TATC) ₆ (TATT)(TATC) ₁₆	VIC	220–354		Carlson and Lippé (2007)
6	Tgr-D128	(GATA) ₉ (AGTA)(GATA) ₃	PET	288–332	65	Carlson and Lippé (2007)
	Tgr-24	(GATA) ₁₅	VIC	307–379		Carlson and Lippé (2007)

References

- Carlson DB, Lippé C. 2007. Eleven new microsatellite markers for the tropical sea urchin *Tripneustes gratilla* and cross-amplification in *Tripneustes ventricosa*. *Molecular Ecology Resources* 7: 1002–1004.
- Wainwright BJ, Arlyza IS, Karl SA. 2012. Isolation and characterization of nineteen microsatellite loci for the collector sea urchin, *Tripneustes gratilla*. *Conservation Genetic Resources* 4: 963–965.

Supplementary Table S2: Basic genetic diversity statistics (per microsatellite marker) for *Tripneustes gratilla* populations at five locations along the east coast of South Africa. These include: polymorphic information content (PIC); number of alleles (A_n); effective number of alleles (A_e); Shannon's information index (I); observed heterozygosity (H_o); unbiased expected heterozygosity (uH_e); fixation index (F) and null allele frequencies ($Fr_{(Null)}$), as well as the standard error (SE) for the mean estimates. An asterisk (*) indicates departure from Hardy–Weinberg equilibrium ($p < 0.001$)

Population	Locus	PIC	A_n	A_e	I	H_o	uH_e	F	$Fr_{(Null)}$
Haga Haga	Tgr-A11	0.84	8.00	6.90	2.00	0.30	0.90	0.65*	0.30
	TG01	0.84	7.74	7.02	2.00	0.50	0.89	0.42	0.19
	TG07	0.75	5.20	4.50	1.62	1.00	0.81	-0.29	-0.13
	TG66	0.77	6.64	5.05	1.74	0.50	0.84	0.38*	0.17
	TG52	0.34	3.79	1.56	0.73	0.08	0.37	0.77	0.20
	TG11	0.21	2.81	1.29	0.46	0.25	0.24	-0.11	-0.020
	Tgr-C11	0.79	6.79	5.43	1.80	0.83	0.85	-0.02	-0.01
	TG51	0.89	11.77	9.60	2.41	0.42	0.93	0.53*	0.25
	TG02	0.57	4.64	2.77	1.20	0.58	0.67	0.09	0.03
	Tgr-24	0.65	4.82	3.36	1.34	0.45	0.74	0.35	0.33
	TG20	0.78	6.79	5.14	1.77	0.17	0.84	0.79*	0.15
	TG26	0.89	10.53	9.60	2.33	0.58	0.93	0.35*	0.17
	TG61	0.76	7.31	4.72	1.75	1.00	0.82	-0.27	-0.12
	TG60	0.79	7.62	5.33	1.86	0.67	0.85	0.18*	0.08
	TG55	0.77	8.14	4.88	1.84	0.67	0.83	0.16	0.07
	Tgr-D134	0.84	7.79	7.02	2.00	0.33	0.89	0.61*	0.28
	TG28	0.89	11.22	9.93	2.38	0.42	0.94	0.54*	0.25
	TG42	0.66	5.00	3.33	1.37	0.20	0.74	0.71*	0.29
	TG39	0.87	10.26	8.73	2.27	1.00	0.92	-0.13	-0.06
	Tgr-B119	0.43	4.81	1.82	0.95	0.18	0.47	0.60	0.19
	Tgr-C117	0.78	6.81	5.26	1.77	0.82	0.85	-0.01	-0.01
	Tgr-D103	0.87	11.36	8.34	2.30	0.45	0.92	0.48*	0.23
Mean (SE)		0.73	7.27 (0.59)	5.53 (0.56)	1.72 (0.17)	0.52 (0.04)	0.78 (0.04)	0.31 (0.07)	0.13
Coffee Bay	Tgr-A11	0.93	12.64	14.25	2.79	0.39	0.95	0.58*	0.28
	TG01	0.83	7.75	6.70	2.05	0.38	0.87	0.55*	0.25
	TG07	0.74	5.20	4.37	1.58	0.72	0.78	0.06	0.03
	TG66	0.72	7.18	3.81	1.78	0.52	0.75	0.30	0.13
	TG52	0.39	4.38	1.70	0.94	0.28	0.42	0.33	0.10
	TG11	0.37	3.62	1.67	0.82	0.45	0.41	-0.12	-0.03
	Tgr-C11	0.78	6.42	5.03	1.78	0.73	0.82	0.09	0.04
	TG51	0.88	9.92	9.33	2.39	0.46	0.91	0.48*	0.23
	TG02	0.80	6.96	5.67	1.89	0.70	0.84	0.15	0.07
	Tgr-24	0.78	7.46	4.93	1.90	0.38	0.81	0.52*	0.32
	TG20	0.85	8.62	7.48	2.16	0.45	0.88	0.48*	0.23
	TG26	0.92	12.56	13.35	2.78	0.48	0.94	0.48*	0.23
	TG61	0.84	8.67	6.76	2.15	0.66	0.87	0.23*	0.11

	TG60	0.82	7.87	6.12	2.02	0.76	0.85	0.09	0.04
	TG55	0.81	7.87	5.96	2.02	0.59	0.85	0.30*	0.13
	Tgr-D134	0.90	11.25	11.14	2.60	0.76	0.93	0.17*	0.08
	TG28	0.92	11.86	13.14	2.68	0.66	0.94	0.29	0.14
	TG42	0.83	8.03	6.40	2.06	0.21	0.86	0.75*	0.35
	TG39	0.85	8.51	7.58	2.18	0.86	0.88	0.01	0.00
	Tgr-B119	0.65	5.68	3.10	1.48	0.24	0.69	0.64*	0.26
	Tgr-C117	0.78	7.12	5.04	1.87	0.76	0.82	0.05	0.02
	Tgr-D103	0.91	12.06	11.52	2.72	0.72	0.93	0.21*	0.10
Mean (SE)		0.79	8.26 (0.97)	7.05 (0.78)	2.03 (0.11)	0.55 (0.04)	0.82 (0.03)	0.30 (0.05)	0.14
Hibberdene	Tgr-A11	0.92	12.05	13.43	2.73	0.43	0.94	0.53*	0.26
	TG01	0.79	7.26	5.31	1.91	0.44	0.82	0.46*	0.21
	TG07	0.79	7.22	5.40	1.92	0.65	0.83	0.21	0.09
	TG66	0.69	6.55	3.56	1.67	0.85	0.73	-0.19	-0.08
	TG52	0.55	5.08	2.36	1.26	0.42	0.58	0.26*	0.10
	TG11	0.43	4.99	1.81	1.07	0.47	0.45	-0.05	-0.02
	Tgr-C11	0.81	6.84	5.82	1.90	0.75	0.84	0.09	0.04
	TG51	0.88	9.93	8.94	2.39	0.42	0.90	0.53*	0.25
	TG02	0.77	6.51	5.03	1.81	0.73	0.81	0.09	0.04
	Tgr-24	0.85	8.56	7.28	2.19	0.55	0.88	0.37*	0.38
	TG20	0.89	10.14	9.64	2.44	0.64	0.91	0.29*	0.17
	TG26	0.93	12.50	14.73	2.81	0.65	0.95	0.31*	0.15
	TG61	0.85	8.47	7.39	2.16	0.85	0.88	0.01	0.01
	TG60	0.83	8.41	6.64	2.15	0.71	0.86	0.17	0.08
	TG55	0.86	8.74	7.63	2.21	0.65	0.88	0.26	0.12
	Tgr-D134	0.90	10.96	11.22	2.58	0.71	0.92	0.23*	0.11
	TG28	0.89	10.12	10.01	2.45	0.47	0.91	0.48*	0.23
	TG42	0.81	8.55	5.86	2.10	0.45	0.84	0.46*	0.21
	TG39	0.83	9.00	6.45	2.01	0.90	0.89	-0.07	-0.03
	Tgr-B119	0.64	4.73	3.14	1.36	0.34	0.69	0.49*	0.20
	Tgr-C117	0.76	7.03	4.68	1.86	0.69	0.80	0.13	0.06
	Tgr-D103	0.93	12.07	15.75	3.01	0.68	0.95	0.28*	0.13
Mean (SE)		0.80	8.44 (0.81)	7.37 (0.81)	2.09 (0.11)	0.61 (0.03)	0.83 (0.03)	0.24 (0.04)	0.12
Ballito Bay	Tgr-A11	0.84	9.66	6.92	2.19	0.38	0.88	0.56*	0.26
	TG01	0.83	7.26	6.55	1.95	0.78	0.87	0.08	0.04
	TG07	0.67	5.72	3.48	1.50	0.67	0.73	0.06	0.03
	TG66	0.65	4.83	3.27	1.38	0.50	0.71	0.28	0.12
	TG52	0.21	3.01	1.28	0.48	0.12	0.22	0.46	0.08
	TG11	0.33	4.29	1.52	0.79	0.33	0.35	0.03	0.07
	Tgr-C11	0.78	6.71	5.08	1.80	0.58	0.83	0.28	0.12
	TG51	0.87	9.53	8.17	2.22	0.43	0.91	0.51*	0.24
	TG02	0.68	5.21	3.65	1.47	0.79	0.75	-0.09	-0.04
	Tgr-24	0.87	9.84	8.30	2.30	0.47	0.90	0.46*	0.34
	TG20	0.82	8.07	6.40	2.01	0.38	0.87	0.56*	0.22

	TG26	0.87	9.49	8.20	2.25	0.50	0.90	0.43*	0.20
	TG61	0.84	8.82	6.94	2.14	0.84	0.88	0.02	0.01
	TG60	0.67	5.60	3.41	1.48	0.63	0.73	0.11	0.04
	TG55	0.82	7.73	6.07	1.97	0.68	0.86	0.18	0.08
	Tgr-D134	0.88	10.53	9.26	2.40	0.47	0.92	0.47*	0.22
	TG28	0.82	8.80	6.29	2.09	0.61	0.87	0.27	0.13
	TG42	0.38	2.94	1.73	0.75	0.06	0.43	0.86*	0.26
	TG39	0.72	5.10	4.21	1.53	0.61	0.78	0.20	0.09
	Tgr-B119	0.57	5.10	2.55	1.26	0.50	0.63	0.18	0.07
	Tgr-C117	0.76	5.86	4.81	1.68	0.74	0.81	0.07	0.03
	Tgr-D103	0.93	13.51	14.73	2.78	0.61	0.96	0.34*	0.17
Mean (SE)		0.72	7.16 (0.78)	5.58 (0.67)	1.75 (0.12)	0.53 (0.04)	0.76 (0.04)	0.29 (0.05)	0.12
Sodwana Bay	Tgr-A11	0.92	12.44	14.13	2.75	0.29	0.95	0.69*	0.33
	TG01	0.88	9.05	9.04	2.27	0.66	0.91	0.26*	0.12
	TG07	0.76	6.11	4.67	1.72	0.83	0.80	-0.05	-0.02
	TG66	0.65	6.18	3.12	1.56	0.45	0.69	0.34	0.14
	TG52	0.27	3.32	1.39	0.63	0.10	0.28	0.63*	0.14
	TG11	0.41	5.04	1.71	1.05	0.45	0.42	-0.08	-0.02
	Tgr-C11	0.79	7.39	5.43	1.93	0.69	0.83	0.15	0.07
	TG51	0.89	10.51	10.25	2.47	0.56	0.92	0.38*	0.18
	TG02	0.75	6.27	4.54	1.71	0.85	0.79	-0.09	-0.04
	Tgr-24	0.81	7.38	5.79	2.01	0.54	0.84	0.35*	0.28
	TG20	0.83	8.13	6.62	2.09	0.38	0.86	0.55*	0.16
	TG26	0.92	12.38	13.56	2.77	0.45	0.94	0.52*	0.25
	TG61	0.87	9.21	8.49	2.28	0.86	0.90	0.02	0.01
	TG60	0.79	7.38	5.43	1.94	0.69	0.83	0.15	0.07
	TG55	0.84	9.09	7.04	2.23	0.69	0.87	0.20	0.09
	Tgr-D134	0.91	11.26	11.44	2.59	0.69	0.93	0.24*	0.12
	TG28	0.92	12.45	14.13	2.77	0.55	0.95	0.41*	0.20
	TG42	0.69	7.15	3.48	1.71	0.21	0.72	0.71*	0.30
	TG39	0.84	7.74	6.98	2.06	0.79	0.87	0.07	0.03
	Tgr-B119	0.61	4.50	2.86	1.28	0.21	0.66	0.68*	0.27
	Tgr-C117	0.82	7.88	6.05	2.04	0.90	0.85	-0.07	-0.03
	Tgr-D103	0.93	12.79	14.50	2.82	0.52	0.95	0.44*	0.21
Mean (SE)		0.78	8.35 (0.88)	7.30 (0.92)	2.03 (0.12)	0.56 (0.05)	0.81 (0.04)	0.30 (0.05)	0.13
Overall mean (SE)		0.76	7.89 (0.43)	6.57 (0.34)	1.92 (0.05)	0.55 (0.02)	0.80 (0.02)	0.29 (0.02)	0.13