

The following supplement accompanies the article

Population structure and long-term decline in three species of heart urchins (*Abatus* spp.) near-shore in the Vestfold Hills region, East Antarctica

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Table S1. Cross-species amplification success in two additional *Abatus* species.

Locus	<i>Abatus ingens</i>			<i>Abatus shackletoni</i>			<i>Abatus philippii</i>		
	<i>N</i> _{ind.}	<i>Na</i>	Size range	<i>N</i> _{ind.}	<i>Na</i>	Size range	<i>N</i> _{ind.}	<i>Na</i>	Size range
Ab_07	104	14	201-315	93	7	195-216	43	5	201-303
Ab_15	108	3	150-156	77	4	132-156	44	2	153-156
Ab_16	107	8	66-105	93	6	90-105	44	5	78-102
Ab_17	108	3	154-157	92	16	157-259	44	4	157-229
Ab_18	108	3	195-207	93	7	195-216	44	5	189-207
Ab_29	108	1	234	93	4	228-243	44	1	234
Ab_31	108	5	223-235	93	3	229-235	43	2	229-232

Table S2. Sampling sizes and results for three *Abatus* species by locus and site for: Allelic richness (AR), HWE exact-tests, and Fis values.

Locus	<i>A. ingens</i>					<i>A. shackletoni</i>					<i>A. philippii</i>		
	OF1	OF2	OF4	OF	OF3	OF1	OF2	OF4	OF	OF3	OF4	OF	OF3
07	NA	OK	OK	NA	NA	OK	OK	OK	OK	OK	OK	OK	NA
N	35	14	19	21	16	31	7	18	17	19	16	12	15
AR	7.71	3.00	7.53	6.73	7.73	3.970	4.00	2.63	2.89	2.97	3.00	3.00	4.6
HWE	0.00*	0.02	0.02	0.00	0.01	0.71	0.66	0.11	0.20	0.03	0.24	1.00	0.02
Fis	0.20	0.44	-0.01	0.2	0.3	0.03	0.00	0.37	0.28	0.33	0.14	-0.08	0.39
15	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	NA	OK	OK
N	35	15	19	22	17	30	7	16	17	16	17	12	15
AR	2.04	1.00	1.00	1.00	1.00	3.03	3.00	2.00	2.65	2.00	2.00	2.00	2.00
HWE	1.00	-	-	-	-	0.31	0.63	0.31	0.05	0.1	0.01	0.03	0.00*
Fis	-0.02	-	-	-	-	0.05	-0.25	-0.35	0.23	-0.5	0.66	0.68	0.87
16	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
N	34	15	19	22	17	31	7	18	17	19	17	12	15
AR	5.48	4.93	7.12	4.69	5.47	3.81	4.00	3.35	3.35	3.71	3.64	3.91	2.99
HWE	0.57	3.93	0.76	1.00	0.70	0.12	0.44	0.09	0.93	0.50	1.00	0.26	0.86
Fis	-0.32	-0.16	-0.26	-0.16	-0.17	-0.31	-0.31	-0.09	0.07	-0.08	0.66	0.68	0.87
17	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
N	35	15	19	22	17	31	7	17	17	18	17	12	14
AR	2.00	2.00	2.73	2.64	2.97	6.97	4.00	6.81	5.92	6.76	3.57	3.92	2.99
HWE	0.00	0.00	0.03	0.03	0.10	0.88	0.63	0.37	0.23	0.33	0.36	0.83	0.27
Fis	-0.51	-0.86	-0.26	-0.23	-0.15	-0.12	-0.1	0.05	0.1	0.08	-0.06	0.21	-0.08
18	OK	NA	OK	NA	OK	NA	OK	NA	NA	NA	OK	OK	OK
N	35	15	19	22	17	31	7	18	17	19	17	11	15
AR	3.00	3.00	3.00	3.00	3.00	4.71	4.00	4.70	4.75	3.22	3.85	3.00	2.94
HWE	0.02	0.02	0.40	0.00*	0.76	0.00*	0.51	0.00*	0.00*	0.00*	0.47	1.00	0.55
Fis	0.14	0.51	0.15	0.47	0.13	0.6	0.05	0.5	0.69	0.65	0.19	-0.05	-0.02
29	OK	OK	OK	OK	OK	OK	OK	NA	OK	OK	OK	OK	OK
N	35	15	19	22	17	31	7	18	17	19	17	12	15
AR	1.00	1.00	1.00	1.00	1.00	2.93	4.00	2.99	2.99	2.95	1.00	1.00	1.00
HWE	-	-	-	-	-	0.46	0.44	0.00*	0.00*	0.06	-	-	-
Fis	-	-	-	-	-	-0.15	0.18	0.43	0.23	0.01	-	-	-
31	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
N	35	15	19	22	17	31	7	18	17	19	17	12	14
AR	3.77	2.99	3.73	2.87	2.82	1.45	2.00	1.00	1.00	1.00	2.00	2.00	2.00
HWE	0.15	0.03	1.00	0.12	0.14	1.00	-	-	-	-	1.00	0.59	0.14
Fis	-0.20	-0.42	-0.02	0.35	-0.36	-0.01	-	-	-	-	-0.1	0.04	0.45

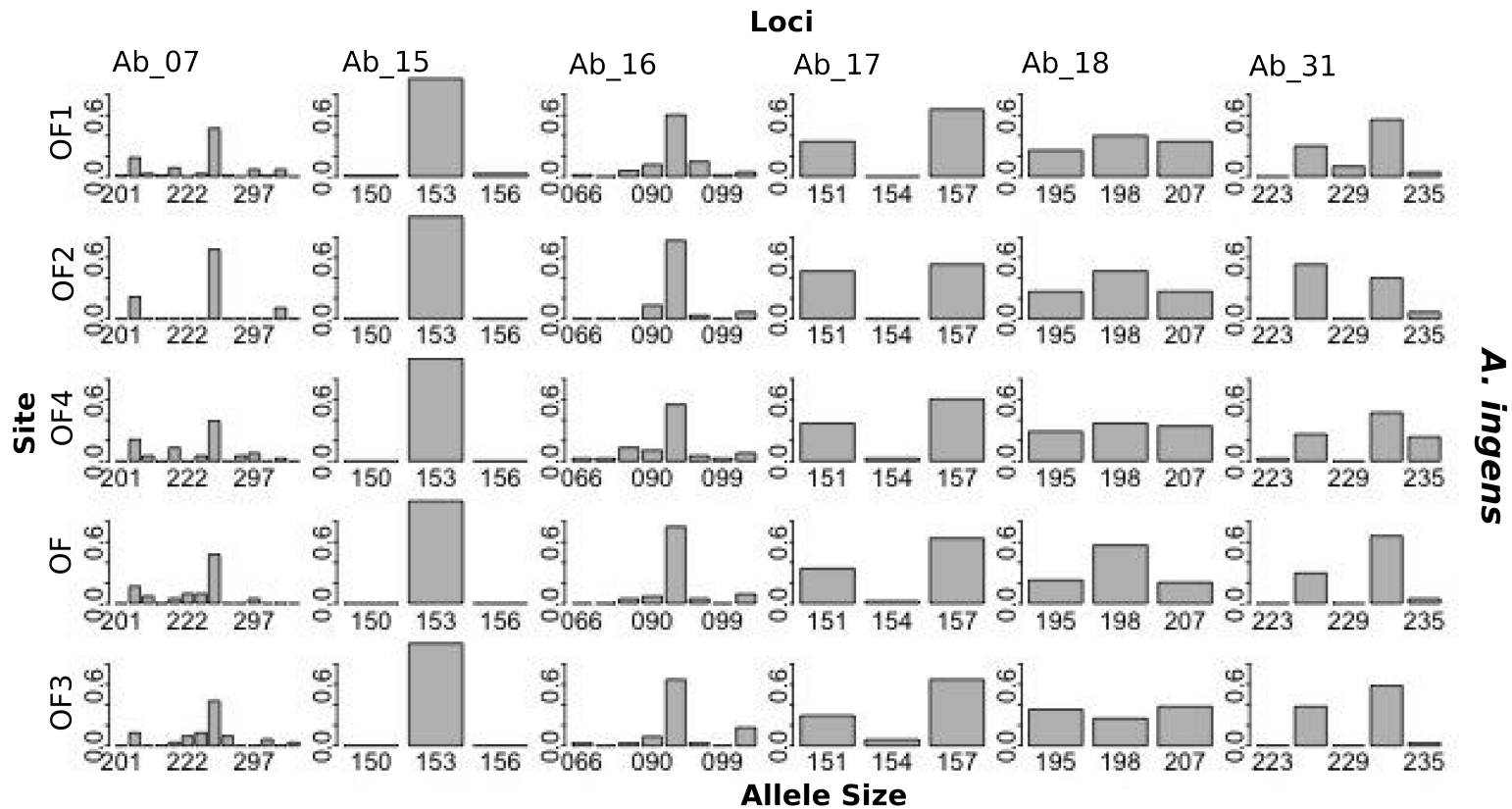
OK/NA = No evidence /evidence of null alleles detected by Microchecker, **AR** = Allelic richness (FSTAT) rarefaction (adjusts to sample size differences), **N**= sample size, **HWE** = P-value for H-W Exact test (Guo and Thompson, 1992) implemented in Genepop, * indicate significant P-values after Bonferroni correction. **Fis**= Weir & Cockerham's (1984) inbreeding coefficient.

Table S3. Biased corrected mean and 95% confidence intervals for the diversity partitioning and differentiation statistics: G_{ST} (Nei, 1973) and G'_{ST} (Hedrick, 2005) and D_{est} (Jost, 2008) calculated in R with the package DiverSity (Keenan et al., 2013).

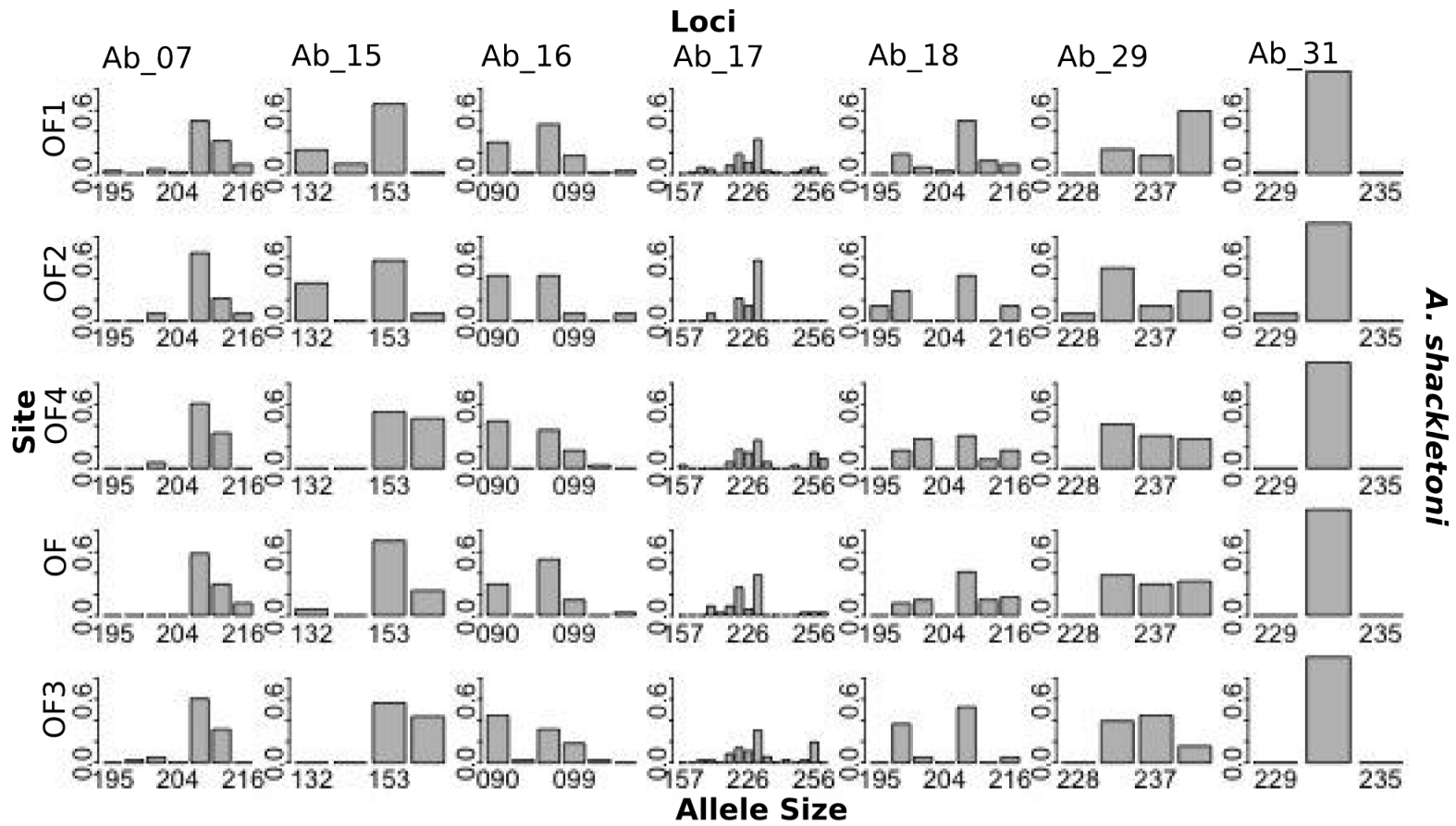
Site Pair	<i>Abatus</i> species	G_{ST}	L95%CI	U95%CI	G'_{ST}	L95%CI	U95%CI	D_{EST}	L95%CI	U95%CI
OF1 vs. OF2	<i>A.ingens</i>	0.008	-0.008	0.033	0.020	-0.017	0.075	0.003	-0.009	0.025
OF1 vs. OF4	<i>A.ingens</i>	-0.002	-0.011	0.012	-0.007	-0.03	0.027	0.000	-0.005	0.013
OF1 vs. OF	<i>A.ingens</i>	0.002	-0.009	0.020	0.005	-0.022	0.047	0.000	-0.007	0.014
OF1 vs. OF3	<i>A.ingens</i>	0.000	-0.011	0.017	0.000	-0.027	0.044	0.000	-0.008	0.017
OF2 vs. OF4	<i>A.ingens</i>	0.012	-0.009	0.044	0.029	-0.019	0.102	0.005	-0.011	0.036
OF2 vs. OF	<i>A.ingens</i>	0.009	-0.013	0.043	0.021	-0.027	0.091	0.002	-0.009	0.024
OF2 vs. OF3	<i>A.ingens</i>	0.011	-0.012	0.047	0.027	-0.026	0.104	0.008	-0.008	0.038
OF4 vs. OF	<i>A.ingens</i>	0.006	-0.010	0.031	0.014	-0.025	0.073	0.002	-0.011	0.024
OF4 vs. OF3	<i>A.ingens</i>	0.000	-0.012	0.019	0.002	-0.031	0.049	0	-0.011	0.024
OF vs. OF3	<i>A.ingens</i>	0.004	-0.015	0.034	0.01	-0.035	0.075	0.000	-0.008	0.019
OF1 vs. OF2	<i>A. shackletoni</i>	0.004	-0.019	0.042	0.015	-0.062	0.122	0.000	-0.021	0.053
OF1 vs. OF4	<i>A. shackletoni</i>	0.027	0.006	0.055	0.098	0.028	0.187	0.024	-0.015	0.081
OF1 vs. OF	<i>A. shackletoni</i>	0.006	-0.008	0.026	0.019	-0.027	0.086	0.000	-0.018	0.033
OF1 vs. OF3	<i>A. shackletoni</i>	0.032	0.013	0.054	0.113	0.051	0.185	0.022	-0.012	0.071
OF2 vs. OF4	<i>A. shackletoni</i>	0.015	-0.008	0.054	0.056	-0.019	0.167	0.008	-0.032	0.081
OF2 vs. OF	<i>A. shackletoni</i>	0.000	-0.023	0.035	-0.002	-0.074	0.104	0.000	-0.023	0.059
OF2 vs. OF3	<i>A. shackletoni</i>	0.015	-0.009	0.052	0.053	-0.024	0.171	0.007	-0.033	0.081
OF4 vs. OF	<i>A. shackletoni</i>	0.002	-0.016	0.028	0.007	-0.052	0.088	0	-0.024	0.047
OF4 vs. OF3	<i>A. shackletoni</i>	0.000	-0.016	0.023	0.000	-0.053	0.073	0	-0.012	0.03
OF vs. OF3	<i>A. shackletoni</i>	0.011	-0.010	0.041	0.038	-0.031	0.129	0.015	-0.020	0.076
OF4 vs. OF	<i>A. philippi</i>	0.044	0.004	0.094	0.115	0.018	0.225	0.009	-0.009	0.041
OF4 vs. OF3	<i>A. philippi</i>	0.016	-0.014	0.057	0.043	-0.033	0.138	0.002	-0.013	0.034
OF vs. OF3	<i>A. philippi</i>	0.011	-0.017	0.052	0.03	-0.041	0.126	0.005	-0.014	0.045

Fig. S1. Allele frequencies per site and per locus for three *Abatus* species A) *A. ingens* B) *A. shackletoni*, and C) *A. philippii*

A)



B)



c)

