

**Supplementary material**

**Contrasting population structures of freshwater atyid shrimps in Hong Kong and their conservation implications**

*Ka Yan Ma<sup>A,B</sup>, Lai Him Chow<sup>B</sup>, Ling Ming Tsang<sup>B</sup>, Sammy De Grave<sup>C</sup> and Ka Hou Chu<sup>B,D</sup>*

<sup>A</sup>School of Ecology, Sun Yat-Sen University, Shenzhen, PR China.

<sup>B</sup>Simon F. S. Li Marine Science Laboratory, School of Life Sciences,  
The Chinese University of Hong Kong, Hong Kong SAR, PR China.

<sup>C</sup>Oxford University Museum of Natural History, University of Oxford, Oxford, UK.

<sup>D</sup>Corresponding author. Email: kahouchu@cuhk.edu.hk

**Table S1. Sampling localities of *C. cantonensis*, abbreviations, sample sizes (*n*), and genetic diversity of mitochondrial *COI*, including number of haplotypes (*Na*), haplotype diversity (*h*), nucleotide diversity ( $\pi$ ), Tajima's *D* and Fu's *F<sub>s</sub>* for each population**

\*,  $P < 0.05$  ( $P < 0.02$  for Fu's *F<sub>s</sub>*); \*\*,  $P < 0.01$ ; \*\*\*,  $P < 0.001$

Sampling localities	Abbreviation	<i>n</i>	<i>Na</i>	<i>h</i>	$\pi$	Tajima's <i>D</i>	Fu's <i>F<sub>s</sub></i>
Total		735	85	0.9044 ± 0.0060	0.008690 ± 0.004939	-2.00778***	-25.30194***
Northeastern New Territories							
Fung Wong Wat, Plover Cove Country Park	NFW	5	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000
Ha Miu Tin, Plover Cove Country Park <sup>A</sup>	NHMT	30	5	0.3080 ± 0.1075	0.001167 ± 0.001187	-1.42765	-2.81424**
Kuk Po, Plover Cove Country Park <sup>B</sup>	NKP	22	7	0.5931 ± 0.1167	0.007474 ± 0.004559	-0.16903	0.08546
Luk Keng, Plover Cove Country Park <sup>A</sup>	NLG	26	3	0.4954 ± 0.0766	0.001354 ± 0.001308	-0.01682	0.04503
Nam Chung Lo Uk, Nam Chung	NLU	4	2	0.5000 ± 0.2652	0.011719 ± 0.008686	-0.82943	3.77706
Pat Sin Leng Country Park	NWN	15	2	0.4190 ± 0.1132	0.004365 ± 0.003038	1.16228	4.14433
Wu Kau Tang, Plover Cove Country Park <sup>A</sup>	NWKT	27	4	0.6895 ± 0.0483	0.002656 ± 0.002044	0.75321	0.34994
Eastern New Territories							
Cheung Sheung, Sai Kung West Country Park <sup>B</sup>	NCS	20	4	0.6000 ± 0.0771	0.003152 ± 0.002342	0.21323	0.44232
Hau Tong Kai, Sai Kung West Country Park <sup>A</sup>	NHTK	17	5	0.8162 ± 0.0455	0.005744 ± 0.003734	0.81475	0.67917
Keng Pang Ha, Ma On Shan Country Park	NPH	19	3	0.2924 ± 0.1274	0.000792 ± 0.000959	-1.11995	-1.15212
Ko Tong, Sai Kung West Country Park	NKT	4	2	0.5000 ± 0.2652	0.001302 ± 0.001614	-0.61237	0.17185
Mui Tsz Lam, Ma On Shan Country Park	NMT	5	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000
Pak Sha O, Sai Kung West Country Park <sup>B</sup>	NPS	17	7	0.6618 ± 0.1258	0.006204 ± 0.003972	-1.23403	-1.04260
Sai Wan, Sai Kung East Country Park	NSW	2	2	1.0000 ± 0.5000	0.007812 ± 0.009021	0.00000	1.09861
Sham Chung, Sai Kung West Country Park <sup>A</sup>	NSC	10	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000
Shek Hang, Sai Kung West Country Park <sup>A</sup>	NSH	10	3	0.6000 ± 0.1305	0.001736 ± 0.001638	-0.18393	-0.27178
Southeastern New Territories							
Clear Water Bay Second Beach, Clear Water Bay	TSW	23	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000
Lung Ha Wan, Clear Water Bay	TLH	22	6	0.6840 ± 0.0691	0.003799 ± 0.002673	-0.35219	-0.99534
Central New Territories							
Kwun Yam Shan Tsuen, Ma On Shan Country Park	NKY	2	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000
Ng Tung Chai, Tai Mo Shan Country Park	NNT	12	3	0.3182 ± 0.1637	0.001302 ± 0.001338	-1.62929*	-0.61396
Peak of Tai Mo Shan, Tai Mo Shan Country Park <sup>A</sup>	NMS	41	3	0.0963 ± 0.0624	0.000635 ± 0.000821	-2.00227**	-1.10668
Po Min, Ma Liu Shui <sup>A</sup>	NPM	6	2	0.3333 ± 0.2152	0.003472 ± 0.002870	-1.29503	2.13853
Rotary Park, Tai Mo Shan Country Park <sup>A</sup>	NFL	12	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000
Sha Tin Pass, Lion Rock Country Park	NSP	10	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000
Tai Mo Shan (3), Tai Mo Shan Country Park	MSE	15	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000
Tai Po Kau Nature Reserve (1) <sup>A</sup>	NTP	9	3	0.5556 ± 0.1653	0.004630 ± 0.003343	-0.14254	1.52039
Tai Po Kau Nature Reserve (2)	NTC	26	11	0.7477 ± 0.0882	0.004479 ± 0.003006	-1.34039	-5.68718*
Tsung Tsai Yuen, Tai Po Kau <sup>A</sup>	NCY	30	4	0.4943 ± 0.1005	0.002407 ± 0.001901	-0.21753	0.21116
Western New Territories							
Tai Lam Forest Track Tsing Fai Tong Section, Tai Lam Country Park	NTLt	15	6	0.5714 ± 0.1489	0.004241 ± 0.002972	-0.87696	-1.37928
Fu Tei Ha Tsuen, Tuen Mun	NFT	6	3	0.6000 ± 0.2152	0.016667 ± 0.010623	-1.17014	3.58281
Kat Hing Bridge, Tai Lam Country Park <sup>B</sup>	NGB	16	8	0.8417 ± 0.0748	0.010916 ± 0.006409	-0.51531	-0.47314
Lung Kwu Tan, Tuen Mun <sup>A</sup>	NLK	8	3	0.7500 ± 0.0965	0.010603 ± 0.006730	1.54544	3.38507
So Kwun Wat, Tuen Mun <sup>A</sup>	NSK	22	2	0.3117 ± 0.1065	0.000812 ± 0.000966	0.23682	0.64783
Tai Lam Chung Reservoir, Tai Lam Country Park <sup>A</sup>	NTL	14	3	0.2747 ± 0.1484	0.001116 ± 0.001201	-1.67053*	-0.76111
Tai Tong, Tai Lam Country Park	NDT	22	2	0.4545 ± 0.0777	0.002367 ± 0.001903	1.48848	2.78393
Tsing Fai Tong, Tai Lam Country Park <sup>A</sup>	NTF	7	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000
Hong Kong Island							
Repulse Bay <sup>B</sup>	HRB	36	3	0.3667 ± 0.0851	0.004485 ± 0.002975	0.05734	3.61244
Shek O Country Park	HSO	11	3	0.6182 ± 0.1038	0.003314 ± 0.002539	0.83031	1.08459
Tai Tam Reservoir Road, Tai Tam Country Park	HTTII	2	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000

Tung Ah, Shek O Country Park	HTA	17	6	0.7868 ± 0.0751	0.008464 ± 0.005133	-1.52762	0.77846
Lantau Island							
Chi Ma Wan <sup>B</sup>	ICM	24	4	0.3696 ± 0.1173	0.002831 ± 0.002148	-1.79942*	0.38410
Mong Tung Hang <sup>A</sup>	IDL	18	3	0.5686 ± 0.0707	0.001651 ± 0.001512	0.22041	0.16078
Mui Wo <sup>B</sup>	IWD	9	2	0.2222 ± 0.1662	0.002315 ± 0.002012	-1.60974*	1.84369
Pui O <sup>A</sup>	IBO	39	5	0.6140 ± 0.0739	0.002601 ± 0.001990	-0.39815	-0.35911
San Tau <sup>A</sup>	IST	5	2	0.4000 ± 0.2373	0.003125 ± 0.002766	-1.04849	1.68758
Shek Mun Kap <sup>A</sup>	ISG	15	2	0.1333 ± 0.1123	0.000347 ± 0.000613	-1.15945	-0.64899
Wong Lung Hang	IWLb	8	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000

<sup>A</sup>Samples from Tsang *et al.* (2017).

<sup>B</sup>Include samples from Tsang *et al.* (2017).

**Table S2. Sampling localities of *C. cantonensis*, abbreviations, sample sizes (*n*) and genetic variability at six microsatellite loci, including number of alleles (*Na*), number of effective alleles (*Ne*), observed heterozygosity (*H<sub>O</sub>*), expected heterozygosity (*H<sub>E</sub>*), probability of deviation from HWE (sequential-Bonferroni adjusted *P*-value; *P<sub>HW</sub>*), and fixation index (*F*)**

\*, *P<sub>HW</sub>* < 0.01

Sampling localities	Abbreviations		Locus						
			mean	N15	C8	C20	N9	C1	N11
Total									
Northeastern New Territories									
Fung Wong Wat, Plover Cove Country Park	NFW	<i>n</i>	29.500	30.000	29.000	29.000	30.000	29.000	30.000
		<i>Na</i>	7.667	5.000	12.000	5.000	9.000	5.000	10.000
		<i>Ne</i>	4.468	1.933	8.806	1.972	6.498	1.239	6.360
		<i>H<sub>O</sub></i>	0.693	0.600	0.828	0.690	0.933	0.207	0.900
		<i>H<sub>E</sub></i>	0.624	0.483	0.886	0.493	0.846	0.193	0.843
		<i>P<sub>HW</sub></i>		1.000	1.000	1.000	1.000	1.000	1.000
		<i>F</i>	-0.136	-0.243	0.066	-0.399	-0.103	-0.071	-0.068
Ha Miu Tin, Plover Cove Country Park	NHMT	<i>n</i>	27.000	25.000	28.000	28.000	28.000	26.000	27.000
		<i>Na</i>	7.000	5.000	10.000	5.000	10.000	6.000	6.000
		<i>Ne</i>	3.587	1.453	5.426	1.960	6.730	1.574	4.378
		<i>H<sub>O</sub></i>	0.641	0.360	0.893	0.679	0.786	0.423	0.704
		<i>H<sub>E</sub></i>	0.601	0.312	0.816	0.490	0.851	0.365	0.772
		<i>P<sub>HW</sub></i>		1.000	1.000	1.000	1.000	1.000	0.729
		<i>F</i>	-0.105	-0.154	-0.095	-0.385	0.077	-0.160	0.088
Luk Keng, Plover Cove Country Park	NLG	<i>n</i>	18.333	14.000	21.000	16.000	21.000	17.000	21.000
		<i>Na</i>	8.167	6.000	10.000	11.000	10.000	2.000	10.000
		<i>Ne</i>	5.038	3.843	6.891	4.785	6.891	1.940	5.880
		<i>H<sub>O</sub></i>	0.882	0.929	0.857	0.875	0.952	0.824	0.857
		<i>H<sub>E</sub></i>	0.759	0.740	0.855	0.791	0.855	0.484	0.830
		<i>P<sub>HW</sub></i>		1.000	0.859	1.000	0.241	0.021	0.000*
		<i>F</i>	-0.202	-0.255	-0.003	-0.106	-0.114	-0.700	-0.033
Nam Chung Lo Uk, Nam Chung	NLU	<i>n</i>	21.500	22.000	23.000	14.000	23.000	24.000	23.000
		<i>Na</i>	7.667	4.000	10.000	6.000	12.000	2.000	12.000
		<i>Ne</i>	4.794	1.328	6.187	2.925	8.015	1.704	8.602
		<i>H<sub>O</sub></i>	0.689	0.273	0.696	0.714	0.870	0.583	1.000
		<i>H<sub>E</sub></i>	0.653	0.247	0.838	0.658	0.875	0.413	0.884

Sampling localities	Abbreviations	Locus							
		mean	N15	C8	C20	N9	C1	N11	
Total		$P_{HW}$	1.000	1.000	1.000	1.000	0.615	0.163	1.000
		$F$	-0.093	-0.105	0.170	-0.085	0.006	-0.412	-0.132
Pat Sin Leng Country Park	NWN	$n$	23.000	23.000	24.000	22.000	21.000	24.000	24.000
		$Na$	5.333	6.000	10.000	3.000	6.000	2.000	5.000
		$Ne$	2.740	2.087	6.508	1.322	3.600	1.043	1.882
		$H_O$	0.382	0.696	0.625	0.273	0.238	0.042	0.417
		$H_E$	0.474	0.521	0.846	0.244	0.722	0.041	0.469
		$P_{HW}$		1.000	0.384	1.000	0.000*	1.000	0.216
		$F$	0.095	-0.336	0.262	-0.119	0.670	-0.021	0.111
Wu Kau Tang, Plover Cove Country Park	NWKT	$n$	21.167	21.000	22.000	23.000	15.000	23.000	23.000
		$Na$	7.833	6.000	14.000	4.000	6.000	6.000	11.000
		$Ne$	4.076	2.423	9.584	1.938	4.091	1.840	4.580
		$H_O$	0.636	0.857	0.864	0.478	0.267	0.565	0.783
		$H_E$	0.660	0.587	0.896	0.484	0.756	0.457	0.782
		$P_{HW}$		1.000	0.779	0.319	0.000*	1.000	1.000
		$F$	-0.001	-0.459	0.036	0.012	0.647	-0.238	-0.001
Northern New Territories Hok Tau, Pat Sin Leng Country Park	NHD	$n$	23.333	23.000	23.000	23.000	24.000	24.000	23.000
		$Na$	8.667	3.000	9.000	6.000	19.000	3.000	12.000
		$Ne$	4.725	1.772	7.297	1.316	10.667	1.184	6.116
		$H_O$	0.536	0.478	0.870	0.261	0.917	0.167	0.522
		$H_E$	0.573	0.436	0.863	0.240	0.906	0.155	0.836
		$P_{HW}$		0.784	1.000	1.000	0.498	1.000	0.007*
		$F$	0.017	-0.098	-0.008	-0.087	-0.011	-0.073	0.376
Eastern New Territories Cheung Sheung, Sai Kung West Country Park	NCS	$n$	23.833	24.000	24.000	23.000	24.000	24.000	24.000
		$Na$	6.167	3.000	10.000	6.000	9.000	4.000	5.000
		$Ne$	2.941	1.510	5.236	2.362	4.414	1.354	2.769
		$H_O$	0.483	0.417	0.500	0.609	0.625	0.292	0.458
		$H_E$	0.566	0.338	0.809	0.577	0.773	0.261	0.639
		$P_{HW}$		1.000	0.373	0.721	0.384	1.000	0.007*
		$F$	0.075	-0.234	0.382	-0.056	0.192	-0.116	0.283
Ko Tong, Sai Kung West Country Park	NKT	$n$	23.667	24.000	24.000	22.000	24.000	24.000	24.000
		$Na$	6.667	5.000	10.000	7.000	10.000	2.000	6.000
		$Ne$	3.419	2.102	5.097	3.293	6.095	1.546	2.380
		$H_O$	0.685	0.625	0.708	0.818	0.958	0.458	0.542
		$H_E$	0.632	0.524	0.804	0.696	0.836	0.353	0.580
		$P_{HW}$		0.007*	0.959	0.052	0.746	0.389	0.511
		$F$	-0.104	-0.192	0.119	-0.175	-0.146	-0.297	0.066
Mui Tsz Lam, Ma On Shan Country Park	NMT	$n$	19.833	20.000	19.000	20.000	20.000	20.000	20.000
		$Na$	6.667	3.000	10.000	4.000	12.000	2.000	9.000
		$Ne$	4.129	2.477	5.918	1.656	7.273	1.051	6.400
		$H_O$	0.613	0.950	0.526	0.500	0.750	0.050	0.900
		$H_E$	0.596	0.596	0.831	0.396	0.863	0.049	0.844
		$P_{HW}$		0.007*	0.844	1.000	1.000	1.000	0.488
		$F$	-0.075	-0.593	0.367	-0.262	0.130	-0.026	-0.067
Pak Sha O, Sai Kung West Country Park	NPS	$n$	23.333	21.000	24.000	24.000	24.000	23.000	24.000
		$Na$	8.000	4.000	10.000	9.000	12.000	2.000	11.000
		$Ne$	4.356	1.487	6.472	2.137	6.400	1.910	7.732
		$H_O$	0.638	0.381	0.792	0.500	0.792	0.783	0.583
		$H_E$	0.649	0.328	0.845	0.532	0.844	0.476	0.871
		$P_{HW}$		1.000	1.000	1.000	0.007*	0.012	0.000*

Sampling localities	Abbreviations		Locus						
			mean	N15	C8	C20	N9	C1	N11
Total		<i>F</i>	-0.048	-0.163	0.064	0.060	0.062	-0.643	0.330
		<i>n</i>	23.833	24.000	24.000	23.000	24.000	24.000	24.000
		<i>Na</i>	10.167	6.000	14.000	10.000	16.000	5.000	10.000
		<i>Ne</i>	5.163	1.553	9.521	2.256	11.077	1.563	5.009
		<i>H<sub>O</sub></i>	0.636	0.417	0.833	0.609	0.792	0.417	0.750
		<i>H<sub>E</sub></i>	0.646	0.356	0.895	0.557	0.910	0.360	0.800
		<i>P<sub>HW</sub></i>		1.000	0.401	1.000	0.636	1.000	1.000
		<i>F</i>	-0.027	-0.171	0.069	-0.093	0.130	-0.157	0.063
Southeastern New Territories									
Clear Water Bay Second Beach, Clear Water Bay	TSW	<i>n</i>	18.833	19.000	23.000	12.000	13.000	23.000	23.000
		<i>Na</i>	5.333	6.000	5.000	4.000	7.000	3.000	7.000
		<i>Ne</i>	2.711	3.252	3.599	1.419	3.130	2.054	2.814
		<i>H<sub>O</sub></i>	0.622	0.842	0.565	0.250	0.769	0.696	0.609
		<i>H<sub>E</sub></i>	0.591	0.693	0.722	0.295	0.680	0.513	0.645
		<i>P<sub>HW</sub></i>		0.076	0.373	0.000*	0.012	0.267	1.000
		<i>F</i>	-0.046	-0.216	0.217	0.153	-0.130	-0.355	0.056
Lung Ha Wan, Clear Water Bay	TLH	<i>n</i>	21.500	23.000	23.000	22.000	23.000	14.000	24.000
		<i>Na</i>	5.833	4.000	8.000	5.000	5.000	1.000	12.000
		<i>Ne</i>	2.979	1.308	4.560	1.267	2.713	1.000	7.024
		<i>H<sub>O</sub></i>	0.423	0.261	0.478	0.227	0.739	0.000	0.833
		<i>H<sub>E</sub></i>	0.453	0.235	0.781	0.211	0.631	0.000	0.858
		<i>P<sub>HW</sub></i>		1.000	0.034	1.000	0.000*	NA	0.746
		<i>F</i>	0.012	-0.108	0.387	-0.078	-0.171	NA	0.028
Central New Territories									
Ng Tung Chai, Tai Mo Shan Country Park	NNT	<i>n</i>	19.833	21.000	18.000	18.000	20.000	21.000	21.000
		<i>Na</i>	10.500	8.000	12.000	5.000	20.000	5.000	13.000
		<i>Ne</i>	6.263	1.601	8.416	1.424	16.327	1.490	8.321
		<i>H<sub>O</sub></i>	0.554	0.381	0.667	0.278	0.950	0.333	0.714
		<i>H<sub>E</sub></i>	0.617	0.375	0.881	0.298	0.939	0.329	0.880
		<i>P<sub>HW</sub></i>		0.135	0.192	0.195	1.000	0.000*	0.007*
		<i>F</i>	0.076	-0.015	0.243	0.067	-0.012	-0.014	0.188
Peak of Tai Mo Shan, Tai Mo Shan Country Park	NMS	<i>n</i>	21.667	23.000	22.000	22.000	22.000	23.000	18.000
		<i>Na</i>	5.333	3.000	10.000	4.000	9.000	2.000	4.000
		<i>Ne</i>	3.000	1.434	6.453	1.265	3.826	1.830	3.192
		<i>H<sub>O</sub></i>	0.542	0.348	0.909	0.227	0.682	0.696	0.389
		<i>H<sub>E</sub></i>	0.539	0.302	0.845	0.210	0.739	0.454	0.687
		<i>P<sub>HW</sub></i>		1.000	1.000	1.000	1.000	0.048	0.007*
		<i>F</i>	-0.055	-0.150	-0.076	-0.084	0.077	-0.533	0.434
Tai Mo Shan (1), Tai Mo Shan Country Park	MSA	<i>n</i>	19.000	20.000	17.000	20.000	20.000	18.000	19.000
		<i>Na</i>	9.000	7.000	13.000	9.000	15.000	3.000	7.000
		<i>Ne</i>	5.172	2.036	8.500	2.417	11.765	1.119	5.194
		<i>H<sub>O</sub></i>	0.537	0.450	0.882	0.600	0.600	0.111	0.579
		<i>H<sub>E</sub></i>	0.634	0.509	0.882	0.586	0.915	0.106	0.807
		<i>P<sub>HW</sub></i>		1.000	0.192	1.000	0.192	1.000	0.007*
		<i>F</i>	0.113	0.115	0.000	-0.023	0.344	-0.043	0.283
Tai Mo Shan (3), Tai Mo Shan Country Park	MSE	<i>n</i>	22.667	20.000	24.000	24.000	24.000	24.000	20.000
		<i>Na</i>	5.833	3.000	9.000	4.000	10.000	3.000	6.000
		<i>Ne</i>	3.361	1.681	6.737	1.475	4.129	1.892	4.255
		<i>H<sub>O</sub></i>	0.560	0.500	0.750	0.250	0.750	0.708	0.400
		<i>H<sub>E</sub></i>	0.595	0.405	0.852	0.322	0.758	0.471	0.765
		<i>P<sub>HW</sub></i>		0.977	0.832	0.000*	1.000	0.207	0.021
		<i>F</i>	0.016	-0.235	0.119	0.224	0.010	-0.503	0.477

Sampling localities	Abbreviations		Locus						
			mean	N15	C8	C20	N9	C1	N11
Total									
Tsung Tsai Yuen, Tai Po Kau	NCY	<i>n</i>	21.833	21.000	16.000	24.000	24.000	22.000	24.000
		<i>Na</i>	7.500	2.000	13.000	4.000	9.000	4.000	13.000
		<i>Ne</i>	3.978	1.049	8.000	1.770	5.009	1.264	6.776
		<i>H<sub>O</sub></i>	0.459	0.048	0.438	0.375	0.833	0.227	0.833
		<i>H<sub>E</sub></i>	0.536	0.046	0.875	0.435	0.800	0.209	0.852
		<i>P<sub>HW</sub></i>		1.000	0.034	1.000	1.000	1.000	1.000
		<i>F</i>	0.084	-0.024	0.500	0.138	-0.041	-0.089	0.022
Western New Territories									
Tai Lam Forest Track Tsing Fai Tong Section, Tai Lam Country Park	NTLt	<i>n</i>	23.333	24.000	22.000	22.000	24.000	24.000	24.000
		<i>Na</i>	9.000	5.000	14.000	8.000	14.000	3.000	10.000
		<i>Ne</i>	4.322	1.355	10.756	1.649	5.408	1.646	5.120
		<i>H<sub>O</sub></i>	0.569	0.292	0.682	0.273	0.958	0.500	0.708
		<i>H<sub>E</sub></i>	0.596	0.262	0.907	0.394	0.815	0.392	0.805
		<i>P<sub>HW</sub></i>		1.000	0.921	0.000*	1.000	0.859	0.498
		<i>F</i>	0.019	-0.113	0.248	0.307	-0.176	-0.274	0.120
Fu Tei Ha Tsuen, Tuen Mun	NFT	<i>n</i>	20.000	16.000	16.000	20.000	22.000	23.000	23.000
		<i>Na</i>	6.167	4.000	4.000	11.000	9.000	4.000	5.000
		<i>Ne</i>	2.729	2.438	2.359	2.759	5.319	1.252	2.246
		<i>H<sub>O</sub></i>	0.543	0.938	0.063	0.700	0.773	0.217	0.565
		<i>H<sub>E</sub></i>	0.562	0.590	0.576	0.638	0.812	0.201	0.555
		<i>P<sub>HW</sub></i>		0.189	0.000*	1.000	0.048	1.000	0.034
		<i>F</i>	0.026	-0.589	0.892	-0.098	0.048	-0.080	-0.019
Kat Hing Bridge, Tai Lam Country Park	NGB	<i>n</i>	17.333	19.000	17.000	15.000	20.000	16.000	17.000
		<i>Na</i>	10.500	4.000	15.000	16.000	14.000	4.000	10.000
		<i>Ne</i>	5.594	1.462	9.966	5.294	7.477	2.048	7.316
		<i>H<sub>O</sub></i>	0.566	0.368	0.529	0.733	0.800	0.438	0.529
		<i>H<sub>E</sub></i>	0.711	0.316	0.900	0.811	0.866	0.512	0.863
		<i>P<sub>HW</sub></i>		1.000	0.012	0.000*	0.987	1.000	0.007*
		<i>F</i>	0.158	-0.167	0.412	0.096	0.076	0.145	0.387
So Kwun Wat, Tuen Mun	NSK	<i>n</i>	18.500	20.000	19.000	19.000	19.000	14.000	20.000
		<i>Na</i>	7.833	6.000	12.000	4.000	16.000	2.000	7.000
		<i>Ne</i>	4.848	1.455	9.256	1.176	10.939	1.912	4.348
		<i>H<sub>O</sub></i>	0.559	0.350	0.474	0.158	0.737	0.786	0.850
		<i>H<sub>E</sub></i>	0.585	0.313	0.892	0.150	0.909	0.477	0.770
		<i>P<sub>HW</sub></i>		1.000	0.178	1.000	0.446	0.062	0.511
		<i>F</i>	-0.045	-0.120	0.469	-0.056	0.189	-0.647	-0.104
Hong Kong Island									
Shek O Country Park	HSO	<i>n</i>	20.833	23.000	21.000	18.000	20.000	22.000	21.000
		<i>Na</i>	8.333	5.000	8.000	5.000	14.000	3.000	15.000
		<i>Ne</i>	4.742	1.837	4.927	1.261	10.000	1.605	8.820
		<i>H<sub>O</sub></i>	0.561	0.565	0.619	0.222	0.600	0.455	0.905
		<i>H<sub>E</sub></i>	0.604	0.456	0.797	0.207	0.900	0.377	0.887
		<i>P<sub>HW</sub></i>		1.000	0.419	1.000	0.059	1.000	0.566
		<i>F</i>	0.003	-0.241	0.223	-0.075	0.333	-0.205	-0.020
Tai Tam Reservoir Road, Tai Tam Country Park	HTTII	<i>n</i>	13.167	12.000	11.000	14.000	14.000	14.000	14.000
		<i>Na</i>	6.333	6.000	7.000	3.000	12.000	4.000	6.000
		<i>Ne</i>	3.676	2.880	4.321	1.840	7.396	2.119	3.500
		<i>H<sub>O</sub></i>	0.703	1.000	0.364	0.643	1.000	0.714	0.500
		<i>H<sub>E</sub></i>	0.664	0.653	0.769	0.457	0.865	0.528	0.714
		<i>P<sub>HW</sub></i>		1.000	0.047	0.761	1.000	1.000	0.012
		<i>F</i>	-0.104	-0.532	0.527	-0.408	-0.156	-0.353	0.300
Tung Ah, Shek O Country Park	HTA	<i>n</i>	21.833	23.000	22.000	21.000	17.000	24.000	24.000

Sampling localities	Abbreviations	Locus							
		mean	N15	C8	C20	N9	C1	N11	
Total		<i>Na</i>	8.833	4.000	8.000	10.000	9.000	5.000	17.000
		<i>Ne</i>	4.567	1.941	4.632	2.244	5.352	1.358	11.876
		<i>H<sub>O</sub></i>	0.501	0.609	0.500	0.571	0.412	0.292	0.625
		<i>H<sub>E</sub></i>	0.636	0.485	0.784	0.554	0.813	0.264	0.916
		<i>P<sub>HW</sub></i>		1.000	0.401	1.000	0.017	1.000	0.007*
		<i>F</i>	0.130	-0.255	0.362	-0.031	0.494	-0.105	0.318
Lantau Island									
Chi Ma Wan	ICM	<i>n</i>	21.167	19.000	22.000	17.000	23.000	23.000	23.000
		<i>Na</i>	6.833	5.000	8.000	7.000	9.000	3.000	9.000
		<i>Ne</i>	3.620	2.983	5.378	2.604	3.661	1.246	5.845
		<i>H<sub>O</sub></i>	0.605	0.947	0.500	0.529	0.652	0.217	0.783
		<i>H<sub>E</sub></i>	0.641	0.665	0.814	0.616	0.727	0.198	0.829
		<i>P<sub>HW</sub></i>		0.582	0.000*	0.021	0.007*	1.000	1.000
		<i>F</i>	0.027	-0.425	0.386	0.140	0.103	-0.100	0.056
Pui O	IBO	<i>n</i>	22.000	24.000	25.000	17.000	27.000	16.000	23.000
		<i>Na</i>	7.500	4.000	11.000	7.000	11.000	7.000	5.000
		<i>Ne</i>	3.744	2.636	6.649	2.408	5.544	3.141	2.087
		<i>H<sub>O</sub></i>	0.629	0.875	0.760	0.706	0.778	0.438	0.217
		<i>H<sub>E</sub></i>	0.680	0.621	0.850	0.585	0.820	0.682	0.521
		<i>P<sub>HW</sub></i>		0.376	0.373	0.048	0.192	0.000*	0.000*
		<i>F</i>	0.080	-0.410	0.105	-0.207	0.051	0.358	0.583
Tai O	ITO	<i>n</i>	23.000	23.000	23.000	22.000	23.000	23.000	24.000
		<i>Na</i>	8.667	5.000	14.000	6.000	13.000	3.000	11.000
		<i>Ne</i>	4.376	1.591	9.446	1.630	6.782	1.496	5.309
		<i>H<sub>O</sub></i>	0.621	0.435	0.870	0.455	0.826	0.391	0.750
		<i>H<sub>E</sub></i>	0.608	0.371	0.894	0.386	0.853	0.332	0.812
		<i>P<sub>HW</sub></i>		1.000	0.151	1.000	0.135	1.000	0.007*
		<i>F</i>	-0.065	-0.170	0.027	-0.176	0.031	-0.179	0.076
Tong Fuk	ITF0	<i>n</i>	30.167	31.000	32.000	23.000	31.000	32.000	32.000
		<i>Na</i>	9.333	5.000	11.000	8.000	14.000	7.000	11.000
		<i>Ne</i>	3.907	1.870	5.159	1.610	7.845	1.541	5.418
		<i>H<sub>O</sub></i>	0.644	0.645	0.656	0.348	0.903	0.406	0.906
		<i>H<sub>E</sub></i>	0.615	0.465	0.806	0.379	0.873	0.351	0.815
		<i>P<sub>HW</sub></i>		1.000	0.710	0.000*	1.000	1.000	1.000
		<i>F</i>	-0.070	-0.387	0.186	0.082	-0.035	-0.157	-0.111
Wong Lung Hang	IWLb	<i>n</i>	19.333	19.000	20.000	17.000	20.000	20.000	20.000
		<i>Na</i>	10.167	5.000	11.000	11.000	16.000	9.000	9.000
		<i>Ne</i>	4.858	2.344	7.692	3.568	8.791	1.961	4.790
		<i>H<sub>O</sub></i>	0.767	0.789	0.750	0.765	0.900	0.550	0.850
		<i>H<sub>E</sub></i>	0.722	0.573	0.870	0.720	0.886	0.490	0.791
		<i>P<sub>HW</sub></i>		1.000	0.955	0.498	1.000	0.498	1.000
		<i>F</i>	-0.086	-0.377	0.138	-0.063	-0.016	-0.122	-0.074
Grand mean		<i>Na</i>	7.704						
		<i>Ne</i>	4.125						
		<i>H<sub>O</sub></i>	0.596						
		<i>H<sub>E</sub></i>	0.614						
		<i>F</i>	-0.011						

**Table S3. Sampling localities of *C. serrata*, abbreviations, sample sizes (*n*) and genetic diversity of mitochondrial *COI*, including number of haplotypes (*Na*), haplotype diversity (*h*), nucleotide diversity ( $\pi$ ), Tajima's *D* and Fu's *F<sub>S</sub>* for each population**

Locality details are not disclosed so as to protect the rare shrimp. \*,  $P < 0.05$  ( $P < 0.02$  for Fu's *F<sub>S</sub>*); \*\*,  $P < 0.01$ ; \*\*\*,  $P < 0.001$

Sampling localities	Abbreviation	<i>n</i>	<i>Na</i>	<i>h</i>	$\pi$	Tajima's <i>D</i>	Fu's <i>F<sub>S</sub></i>
Total		123	15	0.7872 ± 0.0215	0.022235 ± 0.011410	-1.02768	5.75381
Hong Kong Island (1)	HLF	7	4	0.8095 ± 0.1298	0.037440 ± 0.021874	-1.63191*	4.63774
Hong Kong Island (2)	HLF2	18	3	0.2157 ± 0.1241	0.009523 ± 0.005607	-2.45952***	5.83633
Hong Kong Island (3)	HPF	32	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0	0
Lantau Island (1)	IFLW	7	5	0.8571 ± 0.1371	0.040950 ± 0.023837	0.95536	2.76934
Lantau Island (2)	ILT	12	5	0.7273 ± 0.1133	0.041620 ± 0.022449	1.2702	7.30856
Lantau Island (3)	ITF	3	2	0.6667 ± 0.3143	0.083538 ± 0.063355	0	6.44413
Lantau Island (4)	ITF2	24	3	0.2355 ± 0.1093	0.000596 ± 0.000786	-1.20229	-1.40740
Lantau Island (5)	ITO	20	3	0.4158 ± 0.1157	0.027557 ± 0.014588	0.67267	14.31676

**Table S4. Sampling localities of *C. serrata*, abbreviations, sample sizes (*n*) and genetic variability at five microsatellite loci, including number of alleles (*Na*), number of effective alleles (*Ne*), observed heterozygosity (*H<sub>O</sub>*), expected heterozygosity (*H<sub>E</sub>*), probability of deviation from HWE (sequential-Bonferroni adjusted *P*-value; *P<sub>HW</sub>*), and fixation index (*F*)**

\*,  $P_{HW} < 0.01$

Sampling localities	Abbreviation		Locus					
			Mean	O17	N9	C8	N11	N19
Hong Kong Island (2)	HLF2	<i>n</i>	21	23	24	24	10	24
		<i>Na</i>	4.600	4.000	6.000	5.000	5.000	3.000
		<i>Ne</i>	2.491	1.682	3.523	2.237	3.390	1.625
		<i>H<sub>O</sub></i>	0.608	0.522	0.750	0.667	0.600	0.500
		<i>H<sub>E</sub></i>	0.553	0.405	0.716	0.553	0.705	0.385
		<i>P<sub>HW</sub></i>		0.180	0.183	0.006*	0.998	0.180
		<i>F</i>	-0.138	-0.287	-0.047	-0.206	0.149	-0.300
Hong Kong Island (3)	HPF	<i>n</i>	29.6	30	30	31	25	32
		<i>Na</i>	4.200	2.000	6.000	6.000	4.000	3.000
		<i>Ne</i>	2.050	1.965	2.635	2.202	1.279	2.169
		<i>H<sub>O</sub></i>	0.503	0.667	0.533	0.355	0.240	0.719
		<i>H<sub>E</sub></i>	0.483	0.491	0.621	0.546	0.218	0.539
		<i>P<sub>HW</sub></i>		0.180	0.183	0.006*	0.998	0.180
		<i>F</i>	-0.060	-0.357	0.141	0.350	-0.099	-0.333
Lantau Island (1)	IFLW	<i>n</i>	13.8	12	15	15	12	15
		<i>Na</i>	7.200	4.000	10.000	13.000	5.000	4.000
		<i>Ne</i>	5.412	2.014	8.333	10.000	3.789	2.922
		<i>H<sub>O</sub></i>	0.727	0.500	0.933	0.933	0.333	0.933
		<i>H<sub>E</sub></i>	0.735	0.503	0.880	0.900	0.736	0.658
		<i>P<sub>HW</sub></i>		0.969	0.918	0.150	0.180	0.180
		<i>F</i>	0.008	0.007	-0.061	-0.037	0.547	-0.419
Lantau Island (2)	ILT	<i>n</i>	19	19	23	22	8	23
		<i>Na</i>	6.000	4.000	7.000	9.000	5.000	5.000
		<i>Ne</i>	2.576	1.699	2.699	3.903	3.200	1.378



Sampling localities	Abbreviation	Locus								
		Mean	O17	N9	C8	N11	N19			
Lantau Island (4)	ITF2	$H_O$	0.407	0.368	0.565	0.591	0.250	0.261		
		$H_E$	0.549	0.411	0.629	0.744	0.688	0.274		
		$P_{HW}$		0.916	0.793	0.918	0.201	0.918		
		$F$	0.219	0.104	0.102	0.206	0.636	0.048		
		$n$	27.2	25	28	28	27	28		
		$Na$	8.400	4.000	12.000	12.000	9.000	5.000		
		$Ne$	4.590	1.950	6.969	6.222	4.765	3.045		
		$H_O$	0.653	0.360	0.893	0.786	0.370	0.857		
		$H_E$	0.729	0.487	0.857	0.839	0.790	0.672		
		$P_{HW}$		0.916	0.918	0.836	0.000*	0.006*		
Lantau Island (5)	ITO	$F$	0.107	0.261	-0.042	0.064	0.531	-0.276		
		$n$	24.6	17	28	28	22	28		
		$Na$	7.800	4.000	9.000	15.000	6.000	5.000		
		$Ne$	4.400	2.418	4.795	8.859	3.113	2.815		
		$H_O$	0.701	0.647	0.821	0.893	0.182	0.964		
		$H_E$	0.718	0.587	0.791	0.887	0.679	0.645		
		$P_{HW}$		0.020	0.946	0.916	0.000*	0.000*		
		$F$	0.018	-0.103	-0.038	-0.006	0.732	-0.496		
		Grand mean		$Na$	6.367					
				$Ne$	3.587					
$H_O$	0.600									
$H_E$	0.628									
$F$	0.026									

**Table S5. Sampling localities of *C. trifasciata*, abbreviations, sample sizes ( $n$ ) and genetic diversity of mitochondrial *COI*, including number of haplotypes ( $Na$ ), haplotype diversity ( $h$ ), nucleotide diversity ( $\pi$ ), Tajima's  $D$  and Fu's  $F_s$  for each population**

Locality details are not disclosed so as to protect the rare shrimp. \*,  $P < 0.05$  ( $P < 0.02$  for Fu's  $F_s$ ); \*\*,  $P < 0.01$ ; \*\*\*,  $P < 0.001$

Sampling localities	Abbreviation	$n$	$Na$	$h$	$\pi$	Tajima's $D$	Fu's $F_s$
Total		105	12	$0.8004 \pm 0.0174$	$0.007827 \pm 0.004482$	0.68056	0.3061
Eastern New Territories (1)	NBK	24	2	$0.2899 \pm 0.1028$	$0.000677 \pm 0.000827$	0.13869	0.57790
Eastern New Territories (2)	NJW	24	3	$0.2355 \pm 0.1093$	$0.000567 \pm 0.000747$	-1.20229	-1.40740
Eastern New Territories (3)	NPA	31	5	$0.3505 \pm 0.1073$	$0.001015 \pm 0.001043$	-1.44095	-2.87001**
Eastern New Territories (4)	NSY	2	2	$1.0000 \pm 0.5000$	$0.018692 \pm 0.019825$	0.00000	2.07944
Eastern New Territories (5)	NPL	24	4	$0.5688 \pm 0.0741$	$0.001473 \pm 0.001332$	-0.54143	-0.87648

**Table S6. Sampling localities of *C. trifasciata*, abbreviations, sample sizes (*n*) and genetic variability at six microsatellite loci, including number of alleles (*Na*), number of effective alleles (*Ne*), observed heterozygosity (*H<sub>O</sub>*), expected heterozygosity (*H<sub>E</sub>*), probability of deviation from HWE (sequential-Bonferroni adjusted *P*-value; *P<sub>HW</sub>*), and fixation index (*F*)**

\*, *P<sub>HW</sub>* < 0.01

Sampling localities	Abbreviation								
			Mean	O17	N9	C8	C20	N11	N19
Eastern New Territories (1)	NBK	<i>n</i>	24	24	24	24	24	24	24
		<i>Na</i>	7.167	7.000	12.000	6.000	7.000	8.000	3.000
		<i>Ne</i>	4.141	2.446	8.862	3.388	2.583	5.486	2.083
		<i>H<sub>O</sub></i>	0.792	0.583	0.792	0.833	0.875	0.667	1.000
		<i>H<sub>E</sub></i>	0.689	0.591	0.887	0.705	0.613	0.818	0.520
		<i>P<sub>HW</sub></i>		0.000*	0.240	0.697	0.016	0.109	0.000*
		<i>F</i>	-0.205	0.013	0.108	-0.182	-0.428	0.185	-0.923
Eastern New Territories (2)	NJW	<i>n</i>	23.5	22	24	24	23	24	24
		<i>Na</i>	5.333	2.000	9.000	7.000	2.000	9.000	3.000
		<i>Ne</i>	4.009	1.963	6.940	5.408	1.091	6.857	1.792
		<i>H<sub>O</sub></i>	0.631	0.864	0.750	0.750	0.087	0.708	0.625
		<i>H<sub>E</sub></i>	0.590	0.491	0.856	0.815	0.083	0.854	0.442
		<i>P<sub>HW</sub></i>		0.000*	0.560	0.697	0.902	0.445	0.280
		<i>F</i>	-0.141	-0.760	0.124	0.080	-0.045	0.171	-0.415
Eastern New Territories (3)	NPA	<i>n</i>	21.167	9	28	21	20	28	21
		<i>Na</i>	13.000	7.000	18.000	9.000	12.000	17.000	15.000
		<i>Ne</i>	6.830	4.263	9.987	4.667	4.848	9.800	7.412
		<i>H<sub>O</sub></i>	0.627	0.556	0.714	0.571	0.550	0.750	0.619
		<i>H<sub>E</sub></i>	0.835	0.765	0.900	0.786	0.794	0.898	0.865
		<i>P<sub>HW</sub></i>		0.540	0.109	0.222	0.000*	0.006*	0.000*
		<i>F</i>	0.252	0.274	0.206	0.273	0.307	0.165	0.284
Eastern New Territories (5)	NPL	<i>n</i>	24	24	24	24	24	24	24
		<i>Na</i>	6.167	3.000	6.000	12.000	3.000	11.000	2.000
		<i>Ne</i>	4.583	1.351	4.645	8.348	1.792	9.366	1.997
		<i>H<sub>O</sub></i>	0.646	0.292	0.375	0.917	0.625	0.708	0.958
		<i>H<sub>E</sub></i>	0.626	0.260	0.785	0.880	0.442	0.893	0.499
		<i>P<sub>HW</sub></i>		0.911	0.003	0.978	0.280	0.390	0.000*
		<i>F</i>	-0.128	-0.124	0.522	-0.041	-0.415	0.207	-0.920
Grand mean		<i>Na</i>	7.917						
		<i>Ne</i>	4.891						
		<i>H<sub>O</sub></i>	0.674						
		<i>H<sub>E</sub></i>	0.685						
		<i>F</i>	-0.056						

**Table S7. Sampling localities of *C. elongapoda*, abbreviations, sample sizes (*n*) and genetic diversity of mitochondrial *COI*, including number of haplotypes (*Na*), haplotype diversity (*h*), nucleotide diversity ( $\pi$ ), Tajima's *D* and Fu's *F<sub>s</sub>* for each population**

\*,  $P < 0.05$  ( $P < 0.02$  for Fu's *F<sub>s</sub>*); \*\*,  $P < 0.01$ ; \*\*\*,  $P < 0.001$

Sampling localities	Abbreviation	<i>n</i>	<i>Na</i>	<i>h</i>	$\pi$	Tajima's <i>D</i>	Fu's <i>F<sub>s</sub></i>
Total		183	56	0.8902 ± 0.0180	0.004162 ± 0.002577	-2.29558***	-27.13286***
Northern New Territories							
Sha Lo Tung, Pat Sin Leng Country Park	NSL	4	4	1.000 ± 0.1768	0.005229 ± 0.004164	-0.21249	-1.41422
Northeastern New Territories							
Kuk Po (1), Plover Cove Country Park	NKP	3	3	1.0000 ± 0.2722	0.011765 ± 0.009606	0	0.58779
Kuk Po (2), Plover Cove Country Park	NKP2	14	11	0.9341 ± 0.0611	0.004266 ± 0.002820	-1.68614*	-8.23708***
Lai Chi Wo, Plover Cove Country Park	NLC	2	2	1.0000 ± 0.5000	0.007843 ± 0.008769	0	1.38629
Eastern New Territories							
Ham Tin, Sai Kung West Country Park	NHT	14	11	0.9341 ± 0.0611	0.004913 ± 0.003159	-2.05959**	-7.37733**
Hau Tong Kai, Sai Kung West Country Park	NHTK	2	2	1.0000 ± 0.5000	0.001961 ± 0.002773	0	0
Pak Sha O, Sai Kung West Country Park	NPS	3	3	1.0000 ± 0.2722	0.002614 ± 0.002686	0	-1.21640
Sai Wan, Sai Kung East Country Park	NSW	10	9	0.9778 ± 0.0540	0.005795 ± 0.003742	-1.84469*	-5.59534**
Tai Tan, Sai Kung West Country Park	NTAI	19	11	0.9298 ± 0.0361	0.004908 ± 0.003092	-1.20241	-5.10078**
Hong Kong Island							
Tai Tam Tuk Reservoir, Tai Tam Country Park	HTR	45	18	0.8737 ± 0.0368	0.003684 ± 0.002382	-1.64185*	-12.96707***
Lantau Island							
Mui Wo (1)	IMW	9	3	0.6389 ± 0.1258	0.001416 ± 0.001316	-0.06382	-0.23928
Mui Wo (2)	IWD	32	10	0.8085 ± 0.0584	0.003016 ± 0.002063	-1.55717*	-4.25050**
Shui Lo Cho	ISL	26	16	0.9169 ± 0.0412	0.004633 ± 0.002906	-1.87384*	-11.67623***

**Table S8. Sampling localities of *C. elongapoda*, abbreviations, sample sizes (*n*) and genetic variability at four microsatellite loci, including number of alleles (*Na*), number of effective alleles (*Ne*), observed heterozygosity (*H<sub>O</sub>*), expected heterozygosity (*H<sub>E</sub>*), probability of deviation from HWE (sequential-Bonferroni adjusted *P*-value; *P<sub>HW</sub>*), and fixation index (*F*)**

\*,  $P_{HW} < 0.01$

Sampling localities	Abbreviation		Locus				
			Mean	C8	C20	N11	C1
Northeastern New Territories							
Kuk Po (2), Plover Cove Country Park	NKP2	<i>n</i>	12.75	14	9	14	14
		<i>Na</i>	5.750	5.000	8.000	6.000	4.000
		<i>Ne</i>	2.995	1.858	5.786	2.761	1.574
		<i>H<sub>O</sub></i>	0.341	0.429	0.222	0.500	0.214
		<i>H<sub>E</sub></i>	0.573	0.462	0.827	0.638	0.365
		<i>P<sub>HW</sub></i>		0.230	0.006*	0.321	0.041
		<i>F</i>	0.358	0.072	0.731	0.216	0.413
Eastern New Territories							
Ham Tin, Sai Kung West Country Park	NHT	<i>n</i>	11	13	8	11	12
		<i>Na</i>	5.750	4.000	7.000	7.000	5.000
		<i>Ne</i>	2.662	1.380	2.844	4.321	2.102
		<i>H<sub>O</sub></i>	0.402	0.231	0.500	0.545	0.333
		<i>H<sub>E</sub></i>	0.554	0.275	0.648	0.769	0.524

Sampling localities	Abbreviation		Locus						
			Mean	C8	C20	N11	C1		
Sai Wan, Sai Kung East Country Park	NSW	$P_{HW}$		0.114	0.114	0.274	0.232		
		$F$	0.261	0.161	0.229	0.290	0.364		
		$n$	8.5	9	7	10	8		
		$Na$	4.500	3.000	6.000	5.000	4.000		
		$Ne$	2.354	1.906	3.161	2.410	1.939		
		$H_O$	0.417	0.222	0.571	0.500	0.375		
		$H_E$	0.557	0.475	0.684	0.585	0.484		
		$P_{HW}$		0.274	0.383	0.232	0.846		
		$F$	0.267	0.532	0.164	0.145	0.226		
Tai Tan, Sai Kung West Country Park	NTAI	$n$	13.25	12	6	17	18		
		$Na$	7.500	3.000	7.000	12.000	8.000		
		$Ne$	3.869	1.646	5.143	6.215	2.473		
		$H_O$	0.453	0.333	0.500	0.588	0.389		
		$H_E$	0.658	0.392	0.806	0.839	0.596		
		$P_{HW}$		0.852	0.316	0.000*	0.000*		
		$F$	0.294	0.150	0.379	0.299	0.347		
		Hong Kong Island Tai Tam Tuk Reservoir, Tai Tam Country Park	HTR	$n$	27.5	30	23	27	30
				$Na$	11.250	3.000	23.000	15.000	4.000
$Ne$	6.779			1.144	19.236	4.959	1.777		
$H_O$	0.328			0.133	0.391	0.556	0.233		
$H_E$	0.577			0.126	0.948	0.798	0.437		
$P_{HW}$				0.985	0.000*	0.000*	0.000*		
$F$	0.325			-0.057	0.587	0.304	0.466		
Lantau Island Mui Wo (2)	IWD			$n$	16.75	17	16	16	18
				$Na$	5.250	4.000	6.000	7.000	4.000
		$Ne$	2.069	1.449	2.573	2.510	1.747		
		$H_O$	0.234	0.235	0.125	0.188	0.389		
		$H_E$	0.488	0.310	0.611	0.602	0.427		
		$P_{HW}$		0.383	0.000*	0.004*	0.791		
		$F$	0.454	0.240	0.796	0.688	0.090		
		Shui Lo Cho	ISL	$n$	22.25	23	15	26	25
				$Na$	7.750	5.000	15.000	7.000	4.000
$Ne$	4.885			1.752	11.842	4.048	1.900		
$H_O$	0.326			0.217	0.267	0.462	0.360		
$H_E$	0.643			0.429	0.916	0.753	0.474		
$P_{HW}$				0.014	0.000*	0.114	0.846		
$F$	0.457			0.493	0.709	0.387	0.240		
Grand mean				$Na$	6.821				
				$Ne$	3.659				
		$H_O$	0.357						
		$H_E$	0.579						
		$F$	0.345						

**Table S9. Sampling localities of *C. typus*, abbreviations, sample sizes (*n*) and genetic diversity of mitochondrial *COI*, including number of haplotypes (*Na*), haplotype diversity (*h*), nucleotide diversity ( $\pi$ ), Tajima's *D* and Fu's *F<sub>s</sub>* for each population**

\*,  $P < 0.05$  ( $P < 0.02$  for Fu's *F<sub>s</sub>*); \*\*,  $P < 0.01$ ; \*\*\*,  $P < 0.001$

Sampling localities	Abbreviation	<i>n</i>	<i>Na</i>	<i>h</i>	$\pi$	Tajima's <i>D</i>	Fu's <i>F<sub>s</sub></i>
Total		58	10	0.39817 ± 0.0818	0.001172 ± 0.001093	-2.09043**	-9.02749***
Eastern New Territories							
Tung Sum Kei, Sai Kung East Country Park	NTSK	23	6	0.3953 ± 0.1279	0.001487 ± 0.001309	-2.02158**	-3.25348**
Lantau Island							
Fan Lau	IFLW2	33	5	0.4223 ± 0.1035	0.001013 ± 0.001011	-1.32030	-2.60013**
Other islands							
Sunshine Island	ISI	2	1	0.0000 ± 0.0000	0.000000 ± 0.000000	0.00000	0.00000

**Table S10. Sampling localities of *C. typus*, abbreviations, sample sizes (*n*) and genetic variability at four microsatellite loci, including number of alleles (*Na*), number of effective alleles (*Ne*), observed heterozygosity (*H<sub>O</sub>*), expected heterozygosity (*H<sub>E</sub>*), probability of deviation from HWE (sequential-Bonferroni adjusted *P*-value; *P<sub>HW</sub>*), and fixation index (*F*)**

\*,  $P_{HW} < 0.01$

Sampling localities	Abbreviation		Locus				
			Mean	C8	C20	N19	N11
Eastern New Territories							
Tung Sum Kei, Sai Kung East Country Park	NTSK	<i>n</i>	22.875	21	20	21	21
		<i>Na</i>	5.375	6.000	3.000	4.000	2.000
		<i>Ne</i>	2.565	3.753	2.606	1.278	1.569
		<i>H<sub>O</sub></i>	0.634	0.714	0.950	0.238	0.476
		<i>H<sub>E</sub></i>	0.547	0.734	0.616	0.218	0.363
		<i>P<sub>HW</sub></i>		0.005*	0.018	0.999	0.203
		<i>F</i>	-0.149	0.026	-0.542	-0.094	-0.313
Lantau Island							
Fan Lau	IFLW2	<i>n</i>	25	21	16	31	32
		<i>Na</i>	7.000	7.000	8.000	8.000	5.000
		<i>Ne</i>	2.828	4.027	3.084	2.452	1.749
		<i>H<sub>O</sub></i>	0.674	0.857	0.750	0.806	0.281
		<i>H<sub>E</sub></i>	0.612	0.752	0.676	0.592	0.428
		<i>P<sub>HW</sub></i>		0.533	0.082	0.000*	0.000*
		<i>F</i>	-0.067	-0.140	-0.110	-0.362	0.343
Overall							
		<i>Na</i>	5.375				
		<i>Ne</i>	2.565				
		<i>H<sub>O</sub></i>	0.634				
		<i>H<sub>E</sub></i>	0.547				
		<i>F</i>	-0.149				

**Table S11. Primers and PCR protocol used in the amplification of mitochondrial *COI* and *16S* markers**

Locus	Primer sequences (5' to 3')	PCR condition	PCR profile
<i>COI</i>	• COI-CC-for F: ATTCGAGCAGAATTAGGGCA	1× PCR reaction buffer, 0.5 mM of MgCl <sub>2</sub> ,	Initial denaturation: 95°C; 3 min 33 cycles of
	• shrimp Cys F: CTAGAATTGCAGTCTAGCGTC		
	F	0.2 μM of each primer, 200 μM of dNTPs, 1.5 U of Taq polymerase (TaKaRa), 1.25 μL of template DNA, MilliQ H <sub>2</sub> O to 25 μL	denaturation: 95°C; 30 s annealing: 54°C; 30 s extension: 72°C; 90 s Final extension: 72°C; 3 min
	• dgH2198 R: TAAACTTCAGGGTGACCAAAARAAYCA		
	• COI-R1 R: AATCCTAAAACCTCAAATTGCTATTA		
<i>16S</i>	• 16S AR F: CGCCTGTTTATCAAAAACAT	1× PCR reaction buffer, 0.5 mM of MgCl <sub>2</sub> , 0.2 μM of each primer, 200 μM of dNTPs, 1.5 U of Taq polymerase (TaKaRa), 1.25 μL of template DNA, MilliQ H <sub>2</sub> O to 25 μL	Initial denaturation: 95°C; 3 min 33 cycles of denaturation: 95°C; 30 s annealing: 50°C; 30 s extension: 72°C; 90 s Final extension: 72°C; 3 min
	• 16S SF F: GACCGTGCTAAGGTAGCATAATC		
	• 16S SR R: CCGGTCTGAACTCAAATCGTG		
	• 16S BR R: CCGGTCTGAACTCAGATCACGT		
	• 16S 1472 R: AGATAGAAACCAACCTGG		
PCR product purification:	Millipore Montage PCR96 Cleanup Kit (Merck Millipore, Billerica, USA) or the FavorPrep GEL/ PCR Purification Kit (Favorgen Biotech Corp, Ping-Tung, Taiwan)		
Sanger sequencing:	Sequences were generated using the forward primer on an Applied Biosystems (ABI) 3700 automated sequencer using the ABI Big-dye Ready-Reaction Mix Kit (Life Technologies, Carlsbad, CA, USA), following the standard cycle sequencing protocol.		

**Table S12. Primers and PCR protocol used in the amplification of microsatellites**

Multiplex	Locus	Fluorescent dye	Primer sequences (5' to 3')	PCR condition	PCR profile
A	O17	ROX	F: AGGTAGCTGAGCGATGACC	2× Type-it multiplex PCR master mix, 0.2 μM of each ROX-labeled and FAM-labeled primer, 0.4 μM of each HEX-labeled primer, 0.5 μM of each TAMRA-labelled primer, 200 μM of dNTPs, 0.9 μL of template DNA, MilliQ H <sub>2</sub> O to 6.25 μL	Initial denaturation: 95°C; 5 min 30 cycles of denaturation: 95°C; 30 s Annealing: 54°C; 90 s Extension: 72°C; 30 s Final extension: 60°C; 30 min
			R: CTGCCTTCGCTGTTTCAGT		
	N15	FAM	F: ACGCATGATGGAAAGGCAA		
B	N9	ROX	R: TCACAAAGTCACGACTAAGAT		
			F: TGTGTTGGCAGATTTCGTCT		
	C8	FAM	R: GGCATGCTTAAACACATCCT		
			F: GGCACAGTAAACAATGCGCT		
C	C20	HEX	R: TAACAGCCGGTTGAGAGGC		
			F: AGAGGCGATGGTTGGCATA		
	N11	ROX	F: TTCAGTCAGCCAAACGACC		
C1	FAM		R: TGTGCTAAGTGTGCCTATTCT		
			F: TCATCCCAGCCGTCCTTTC		
	N19	HEX	F: GTGTGCTTCTCCTGGCAC		
			R: CTGGAGCTCTCTCAGCCA		
PCR reaction mix:			Type-it Microsatellite PCR Kit (QIAGEN, Hilden, Germany)		
Genotyping:			The fluorescent-labelled PCR products were pooled and genotyped using ABI3730 Genetic Analyser		

**Table S13. Detection of null alleles for microsatellite markers in each *C. cantonensis* population by MICRO-CHECKER**

+, possible presence of null alleles

Population	Locus					
	N15	C8	C20	N9	C1	N11
NFW	-	-	-	-	-	-
NHMT	-	-	-	-	-	-
NLG	-	-	-	-	-	-
NLU	-	-	-	-	-	-
NWN	-	+	-	+	-	-
NWKT	-	-	-	+	-	-
NHD	-	-	-	-	-	+
NCS	-	+	-	+	-	+
NKT	-	-	-	-	-	-
NMT	-	+	-	-	-	-
NPS	-	-	-	-	-	+
NPT	-	-	-	+	-	-
TSW	-	-	-	-	-	-
TLH	-	+	-	-	-	-
NNT	-	+	-	-	-	+
NMS	-	-	-	-	-	+
MSA	-	-	-	+	-	+
MSE	-	-	-	-	-	+
NCY	-	+	-	-	-	-
NTL <sub>t</sub>	-	+	+	-	-	-
NFT	-	+	-	-	-	-
NGB	-	+	-	-	-	+
NSK	-	+	-	+	-	-
HSO	-	+	-	+	-	-
HTTII	-	+	-	-	-	-
HTA	-	+	-	+	-	+
ICM	-	+	-	-	-	-
IBO	-	-	-	-	+	+
ITO	-	-	-	-	-	-
ITF1	-	+	-	-	-	-
IWL <sub>b</sub>	-	-	-	-	-	-

**Table S14. Detection of null alleles for microsatellite markers in each *C. serrata* population by MICRO-CHECKER**

+, possible presence of null alleles

Population	Locus					
	O17	N9	C8	N11	N19	
HLF2	-	-	-	-	-	-
HPF	-	-	+	-	-	-
IFLW	-	-	-	+	-	-
ILT	-	-	+	+	-	-
ITF2	-	-	-	+	-	-
ITO	-	-	-	+	-	-

**Table S15. Detection of null alleles for microsatellite markers in each *C. trifasciata* population by MICRO-CHECKER**

+, possible presence of null alleles

Population	Locus					
	O17	N9	C8	C20	N11	N19
NBK	-	-	-	-	-	-
NJW	-	-	-	-	+	-
NPA	-	+	+	+	+	+
NPL	-	+	-	-	+	-



**Table S16. Detection of null alleles for microsatellite markers in each *C. elongapoda* population by MICRO-CHECKER**

+, possible presence of null alleles

Population	Locus			
	C8	C20	N11	C1
NKP2	-	+	-	-
NHT	-	-	-	-
NSW	-	-	-	-
NTAI	-	+	+	+
HTR	-	+	+	+
IWD	-	+	+	-
ISL	+	+	+	-

**Table S17. Detection of null alleles for microsatellite markers in each *C. typus* population by MICRO-CHECKER**

+, possible presence of null alleles

Population	Locus			
	C8	C20	N19	N11
NTSK	-	-	-	+
IFLW2	-	-	-	-

**Table 18. AMOVA results of *C. serrata* based on (a) mitochondrial *COI* data, and (b) microsatellite data (locus by locus)**

\*,  $P < 0.001$

(a)			
Source of variation	Variance components	Percentage of variation (%)	Statistics
Among groups (Lantau Island and Hong Kong Island)	0.07572	2.77	$\Phi_{CT} = 0.02766$
Among populations within groups	1.5328	31.66	$\Phi_{SC} = 0.32556^*$
Within populations	3.17537	65.58	$\Phi_{ST} = 0.34422^*$
Total	4.8421		
(b)			
Source of variation	Variance components	Percentage of variation (%)	Statistics
Among groups (Lantau Island and Hong Kong Island)	0.0879	4.46455	$F_{CT} = 0.04465^*$
Among populations within groups	0.30213	15.34551	$F_{SC} = 0.16063^*$
Within populations	1.57882	80.18994	$F_{ST} = 0.19810$
Total	1.96884		

**Table S19. Results of one tail Wilcoxon heterozygosity excess test (*P*-values) and mode-shift indicator test of *C. cantonensis***

SMM, stepwise mutation model; TPM, two-phase model. \*, population-mutational model pair with significant heterozygosity excess

Population	Wilcoxon test		Mode-shift test
	SMM	TPM	
NFW	0.92188	0.92188	No
NHMT	0.97656	0.94531	No
NLG	0.57813	0.34375	No
NLU	0.71875	0.57813	No
NWN	0.99219	0.97656	No
NWKT	0.97656	0.97656	No
NHD	0.97656	0.96094	No
NCS	1.00000	1.00000	No
NKT	0.98438	0.97656	No
NMT	0.94531	0.78125	No
NPS	0.78125	0.78125	No
NPT	0.97656	0.97656	No
TSW	0.97656	0.94531	No
TLH	1.00000	1.00000	No
NNT	0.96094	0.92188	No
NMS	0.92188	0.78125	No
MSA	0.94531	0.94531	No
MSE	0.92188	0.71875	No
NCY	1.00000	1.00000	No
NTLt	0.98438	0.97656	No
NFT	1.00000	1.00000	No
NGB	0.98438	0.98438	No
NSK	0.78125	0.57813	No
HSO	0.98438	0.94531	No
HTTII	1.00000	1.00000	No
HTA	0.99219	0.97656	No
ICM	0.97656	0.94531	No
IBO	0.99219	0.97656	No
ITO	0.99219	0.99219	No
ITF1	1.00000	1.00000	No
IWLb	0.99219	0.99219	No

**Table S20. Results of one tail Wilcoxon heterozygosity excess test (*P*-values) and mode-shift indicator test of *C. serrata***

SMM, stepwise mutation model; TPM, two-phase model. \*, population-mutational model pair with significant heterozygosity excess

Population	Wilcoxon test		Mode-shift test
	SMM	TPM	
HLF2	0.98438	0.95313	No
HPF	0.95313	0.92188	No
IFLW	0.31250	0.10938	No
ILT	1.00000	1.00000	No
ITF2	0.98438	0.96875	No
ITO	1.00000	1.00000	No

**Table S21. Results of one tail Wilcoxon heterozygosity excess test (*P*-values) and mode-shift indicator test of *C. trifasciata***

SMM, stepwise mutation model; TPM, two-phase model. \*, population-mutational model pair with significant heterozygosity excess

Population	Wilcoxon test		Mode-shift test
	SMM	TPM	
NBK	0.78125	0.65625	No
NJW	0.21875	0.05469	No
NPA	1.00000	1.00000	No
NPL	0.28125	0.07813	No

**Table S22. Results of one tail Wilcoxon heterozygosity excess test (*P*-values) and mode-shift indicator test of *C. elongapoda***

SMM, stepwise mutation model; TPM, two-phase model. \*, population-mutational model pair with significant heterozygosity excess

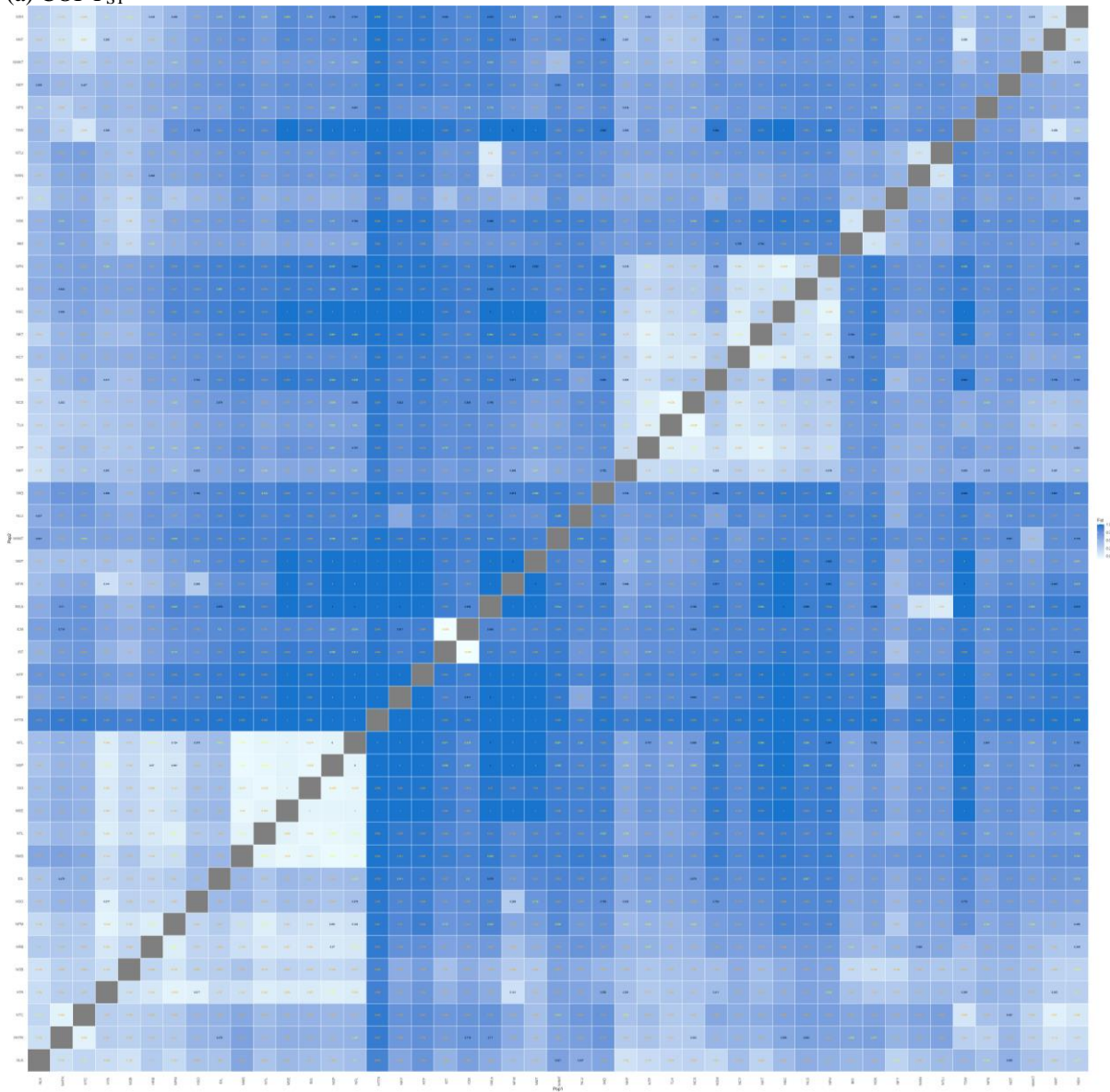
Population	Wilcoxon test		Mode-shift test
	SMM	TPM	
NKP2	0.96875	0.96875	No
NHT	1.00000	1.00000	No
NSW	1.00000	1.00000	No
NTAI	1.00000	1.00000	No
HTR	0.96875	0.93750	No
IWD	1.00000	1.00000	No
ISL	0.93750	0.93750	No

**Table S23. Results of one tail Wilcoxon heterozygosity excess test (*P*-values) and mode-shift indicator test of *C. typus***

SMM, stepwise mutation model; TPM, two-phase model. \*, population-mutational model pair with significant heterozygosity excess

Population	Wilcoxon test		Mode-shift test
	SMM	TPM	
NTSK	0.40625	0.31250	No
IFLW2	1.00000	1.00000	No

(a) COI  $\Phi_{ST}$



**Fig. S1.** Pairwise  $\Phi_{ST}$  based on mitochondrial *COI* data (a), and pairwise Wright's  $F_{ST}$  (b), Weir's  $F_{ST}$  without and with ENA correction for null alleles based on microsatellite data (c, d) of *C. cantonensis*. Darker shades of blue indicate higher value, numbers represent  $\Phi_{ST}$  or  $F_{ST}$  values with colour indicating statistical significance of sequential-Bonferroni-adjusted  $P$ -value, yellow  $< 0.05$ , orange  $< 0.01$ .

(b) Microsatellite Wright's  $F_{ST}$

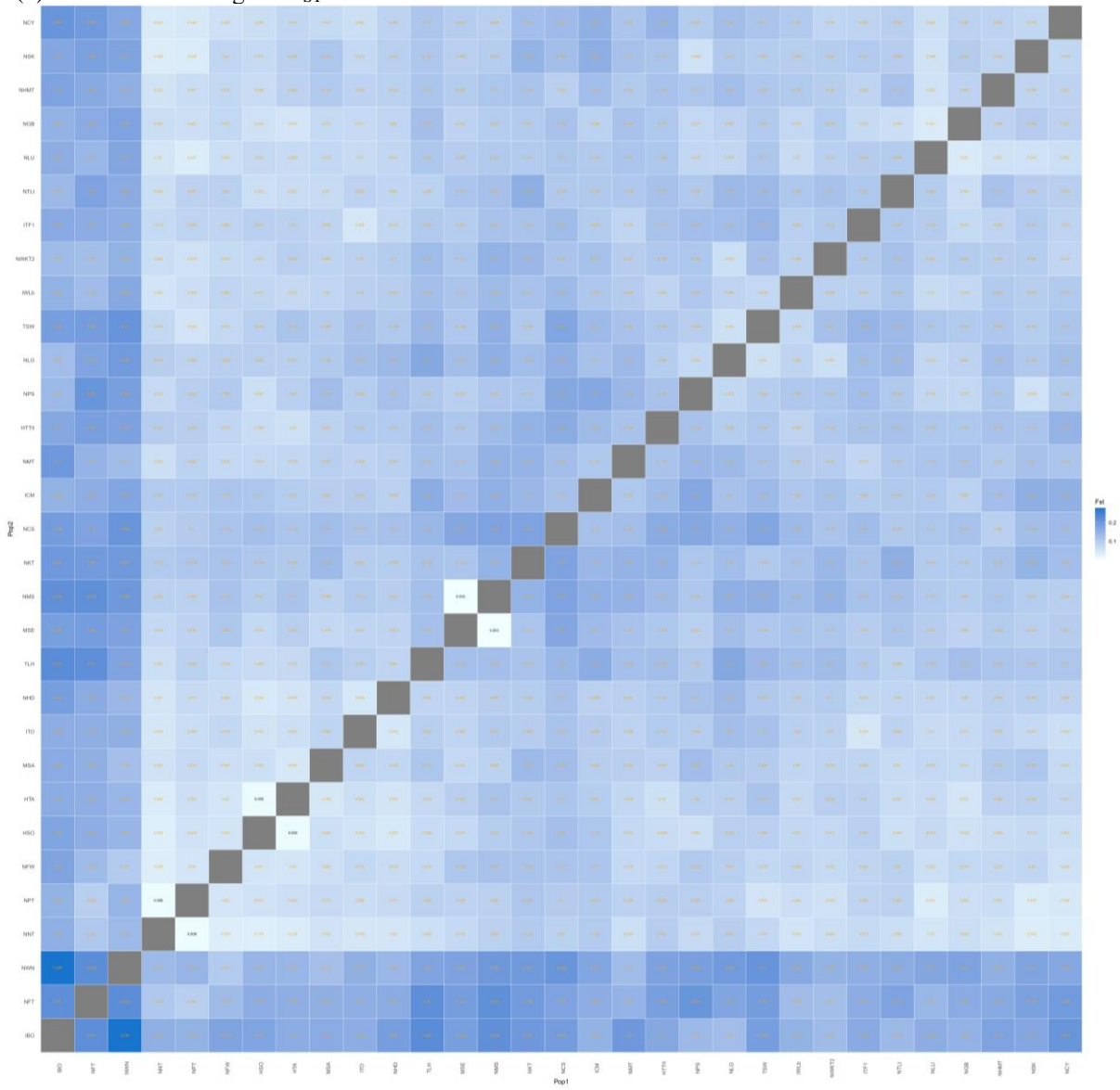


Fig. S1. (Cont.)

(c) Microsatellite Weir’s  $F_{ST}$  without ENA correction

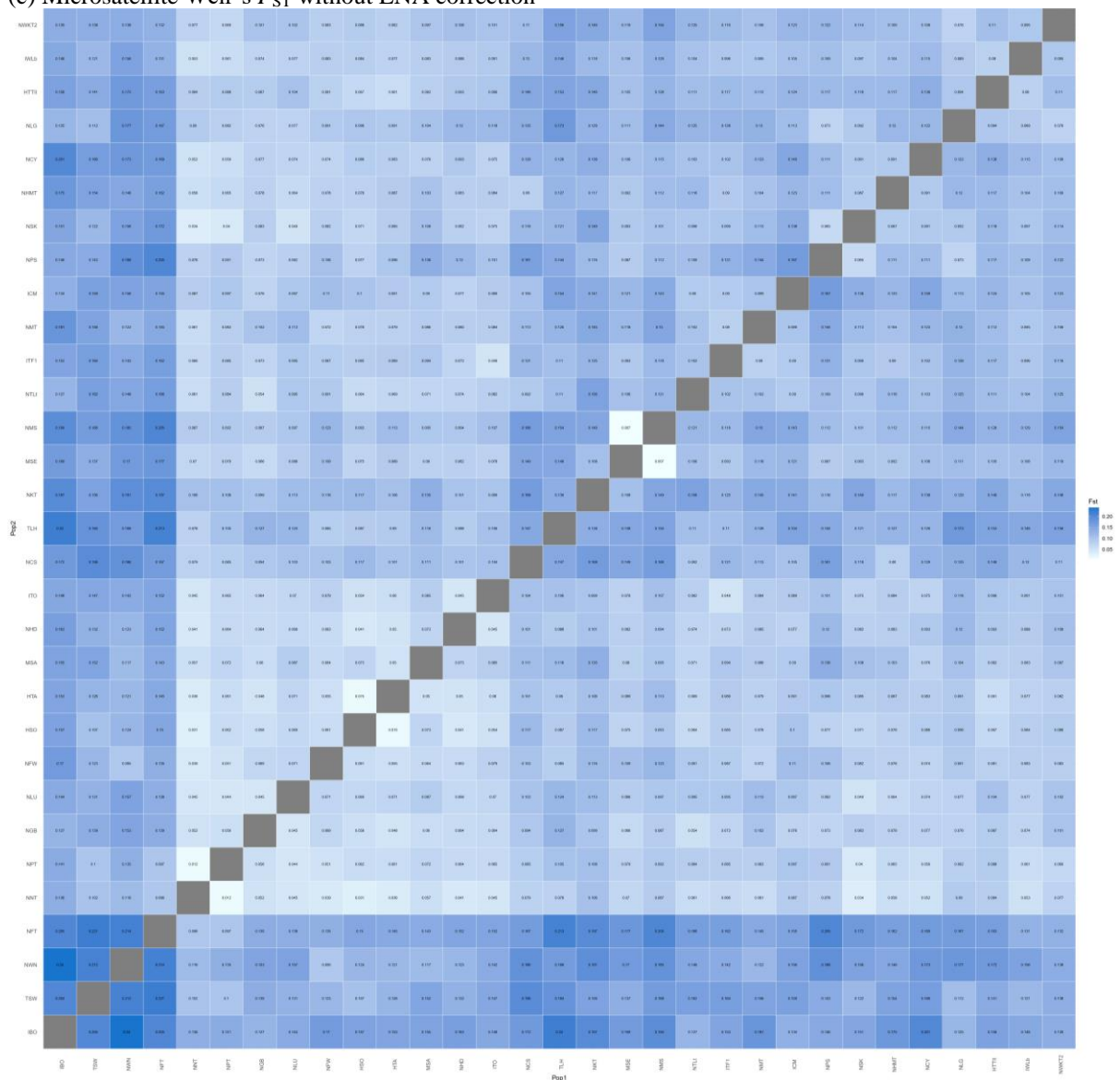


Fig. S1. (Cont.)



(d) Microsatellite Weir's  $F_{ST}$  with ENA correction

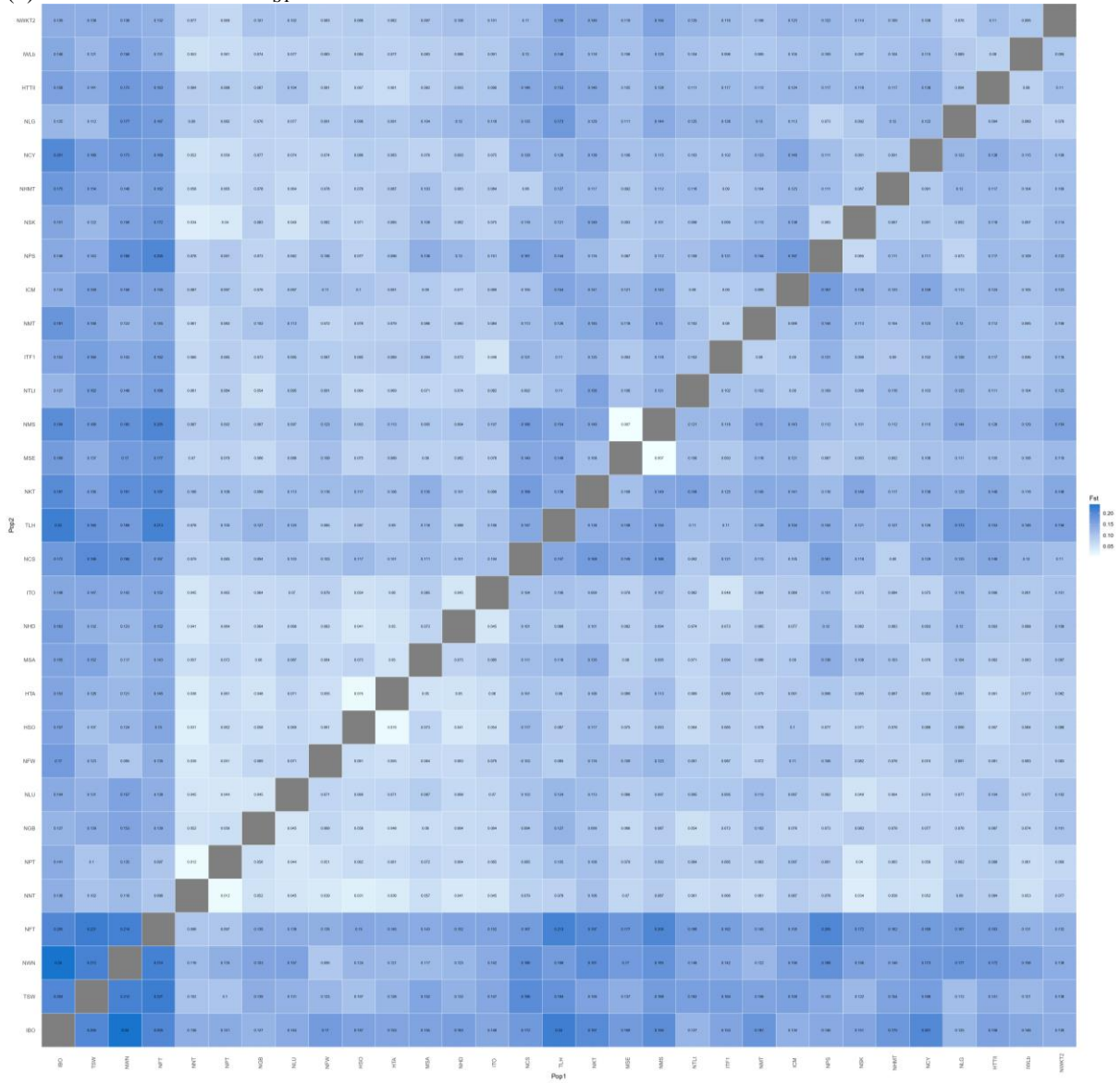
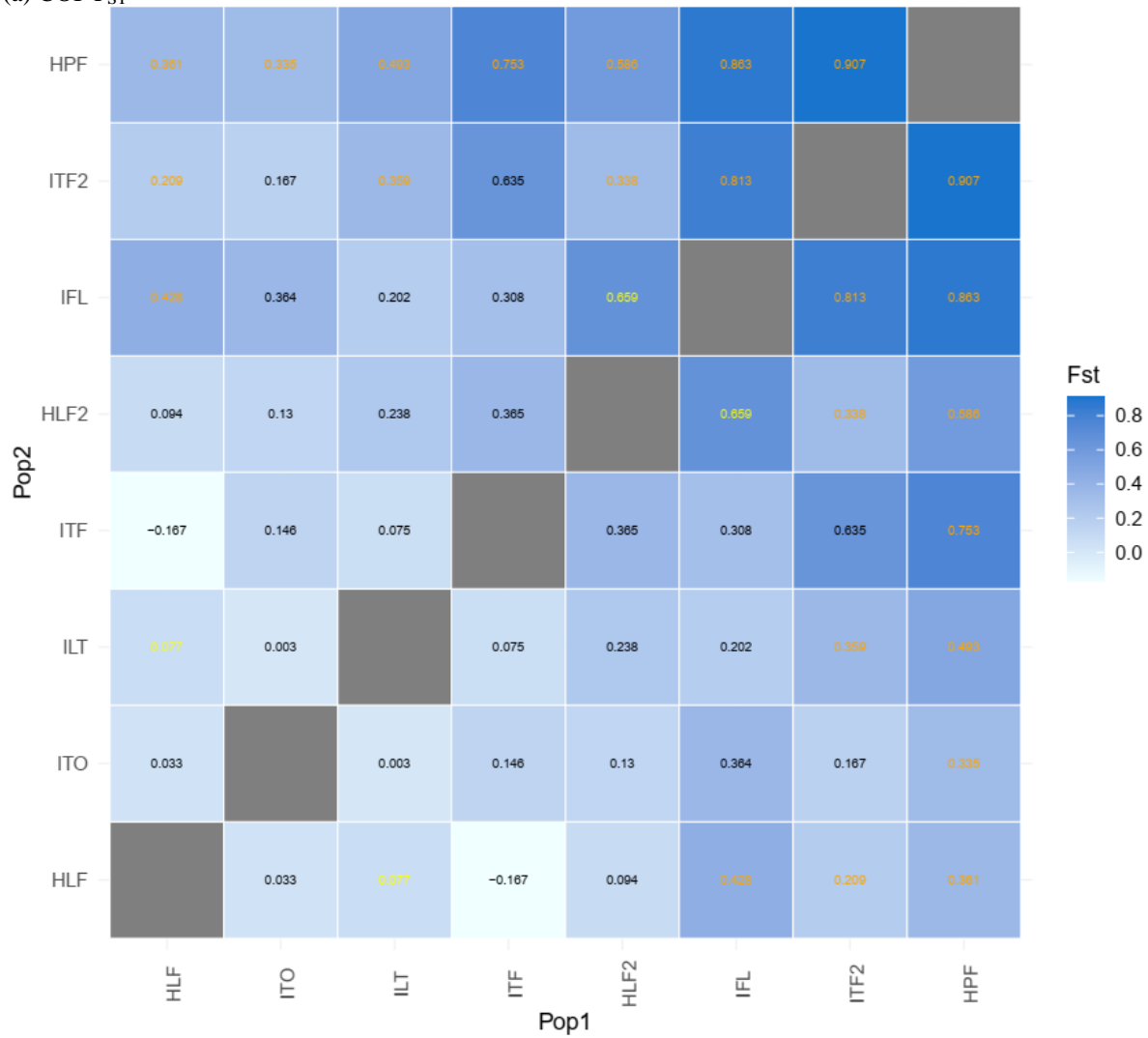


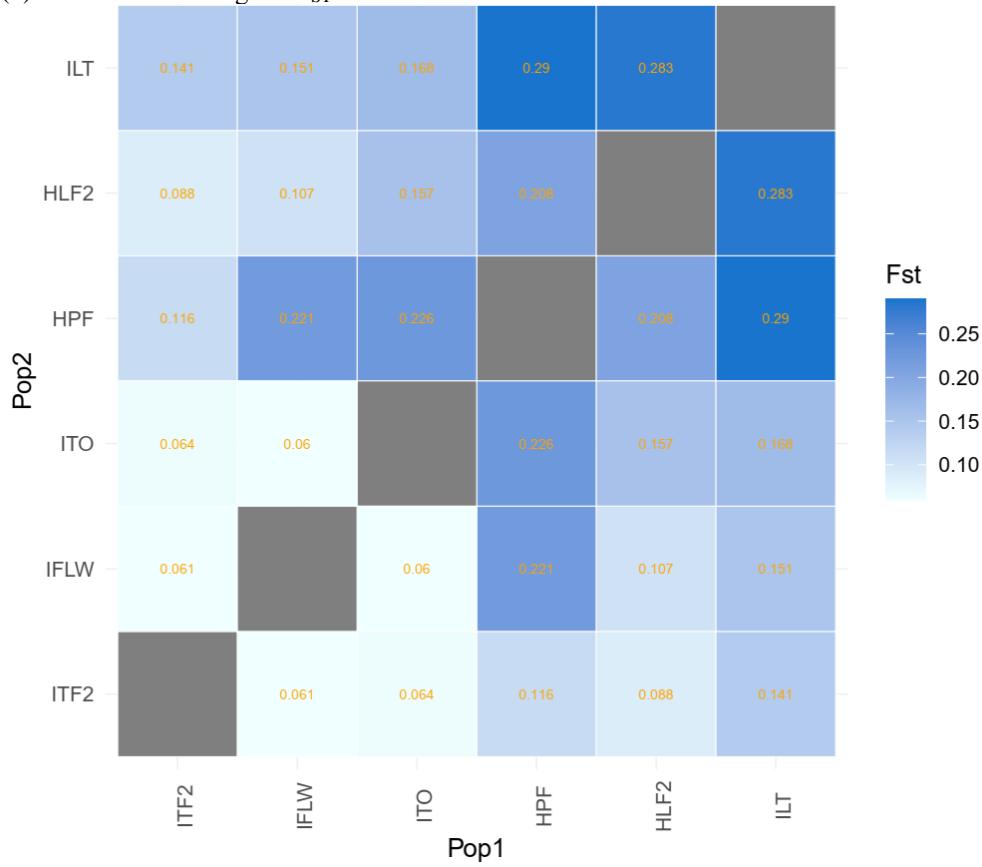
Fig. S1. (Cont.)

(a) COI  $\Phi_{ST}$



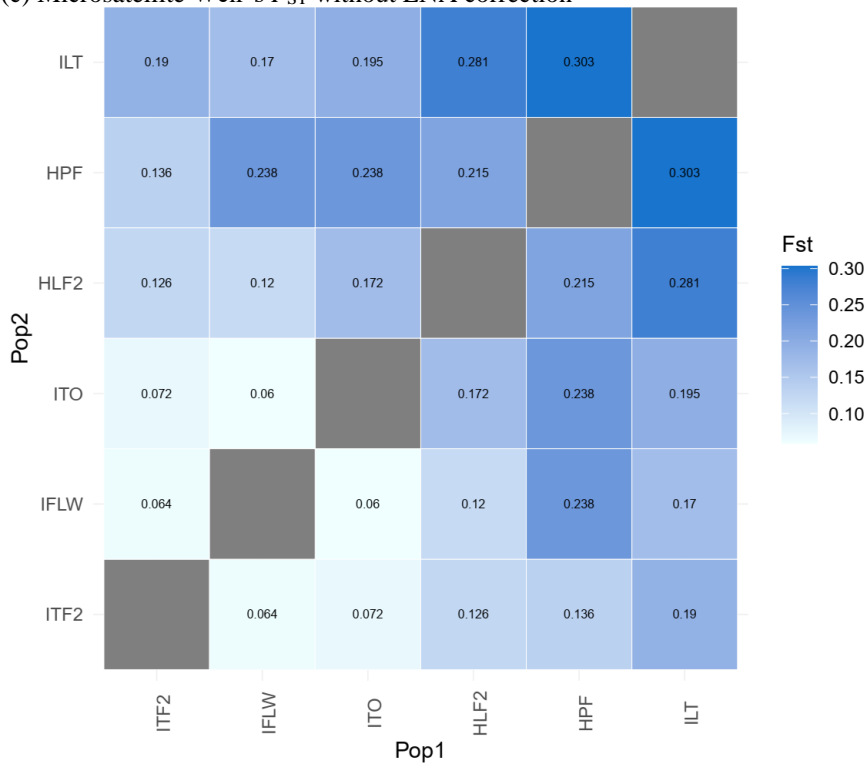
**Fig. S2.** Pairwise  $\Phi_{ST}$  based on mitochondrial *COI* data (a), and pairwise Wright's  $F_{ST}$  (b), Weir's  $F_{ST}$  without and with ENA correction for null alleles based on microsatellite data (c, d) of *C. serrata*. Darker shades of blue indicate higher value, numbers represent  $\Phi_{ST}$  or  $F_{ST}$  values with colour indicating statistical significance of sequential-Bonferroni-adjusted  $P$ -value, yellow  $< 0.05$ , orange  $< 0.01$ .

(b) Microsatellite Wright's  $F_{ST}$

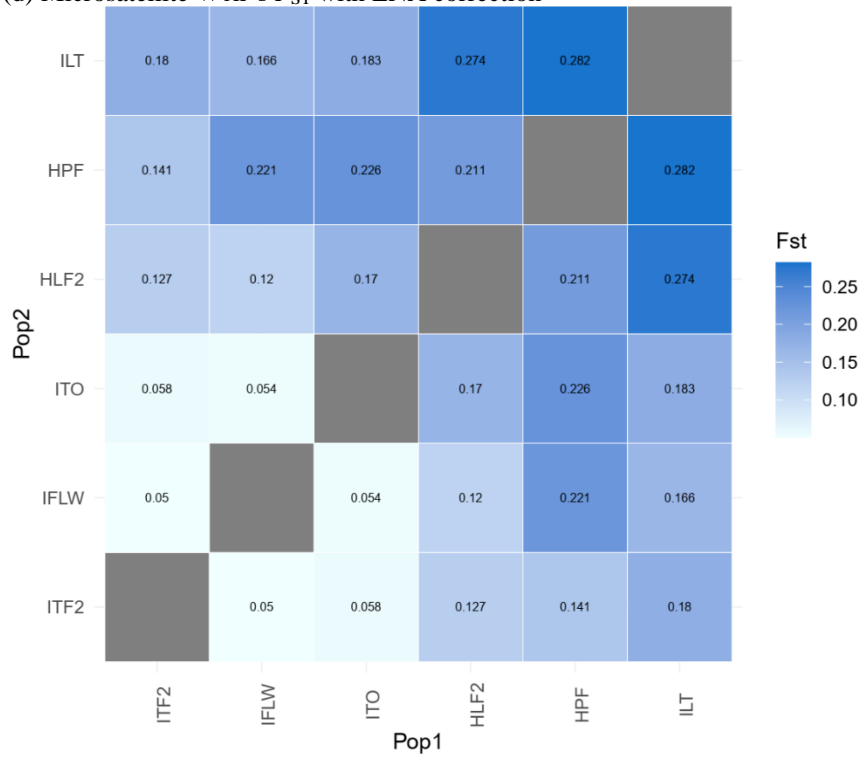


**Fig. S2.** (Cont.)

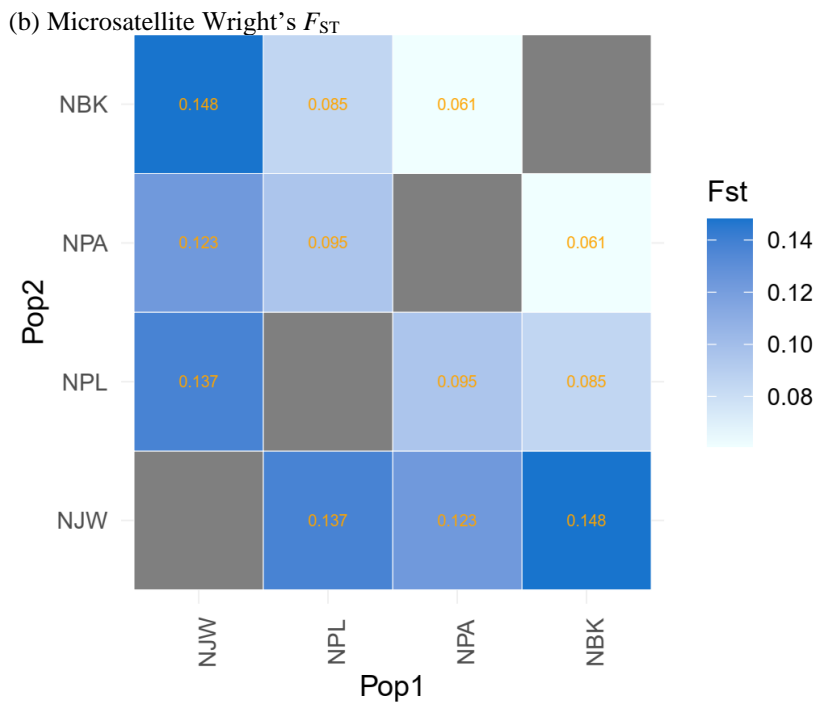
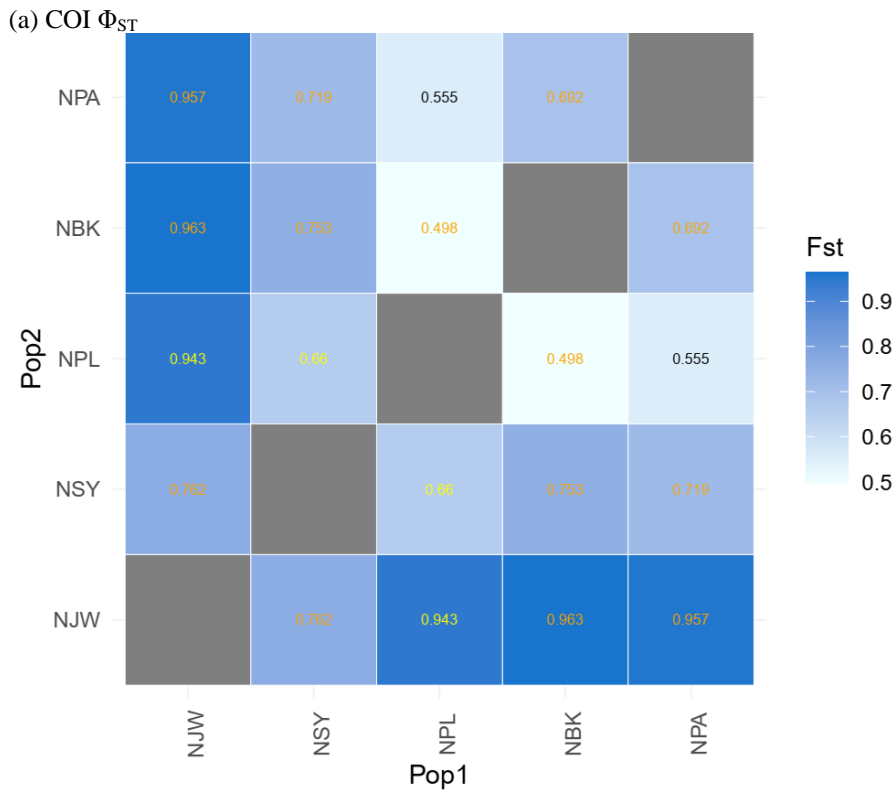
(c) Microsatellite Weir's  $F_{ST}$  without ENA correction



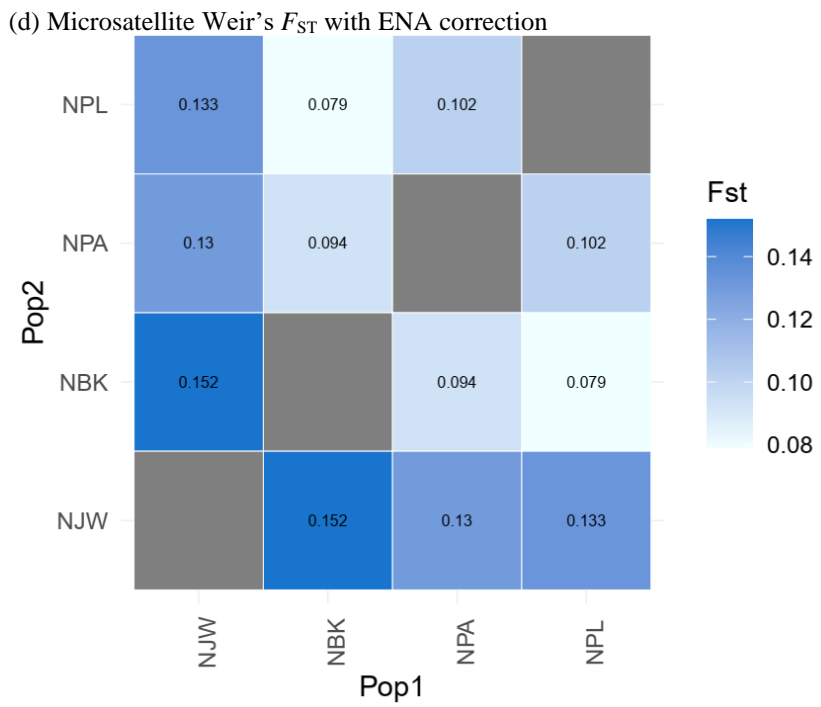
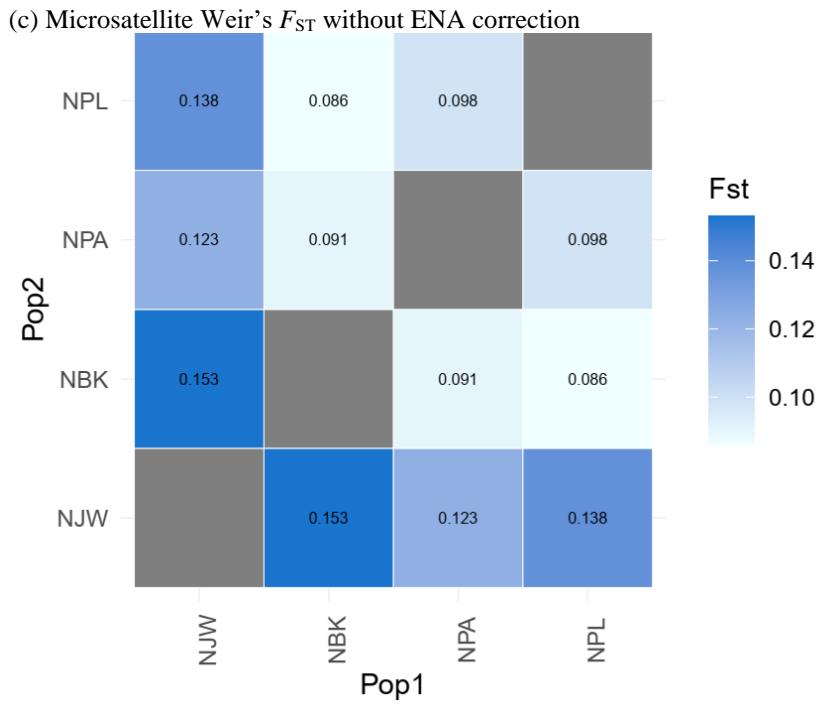
(d) Microsatellite Weir's  $F_{ST}$  with ENA correction



**Fig. S2.** (Cont.)

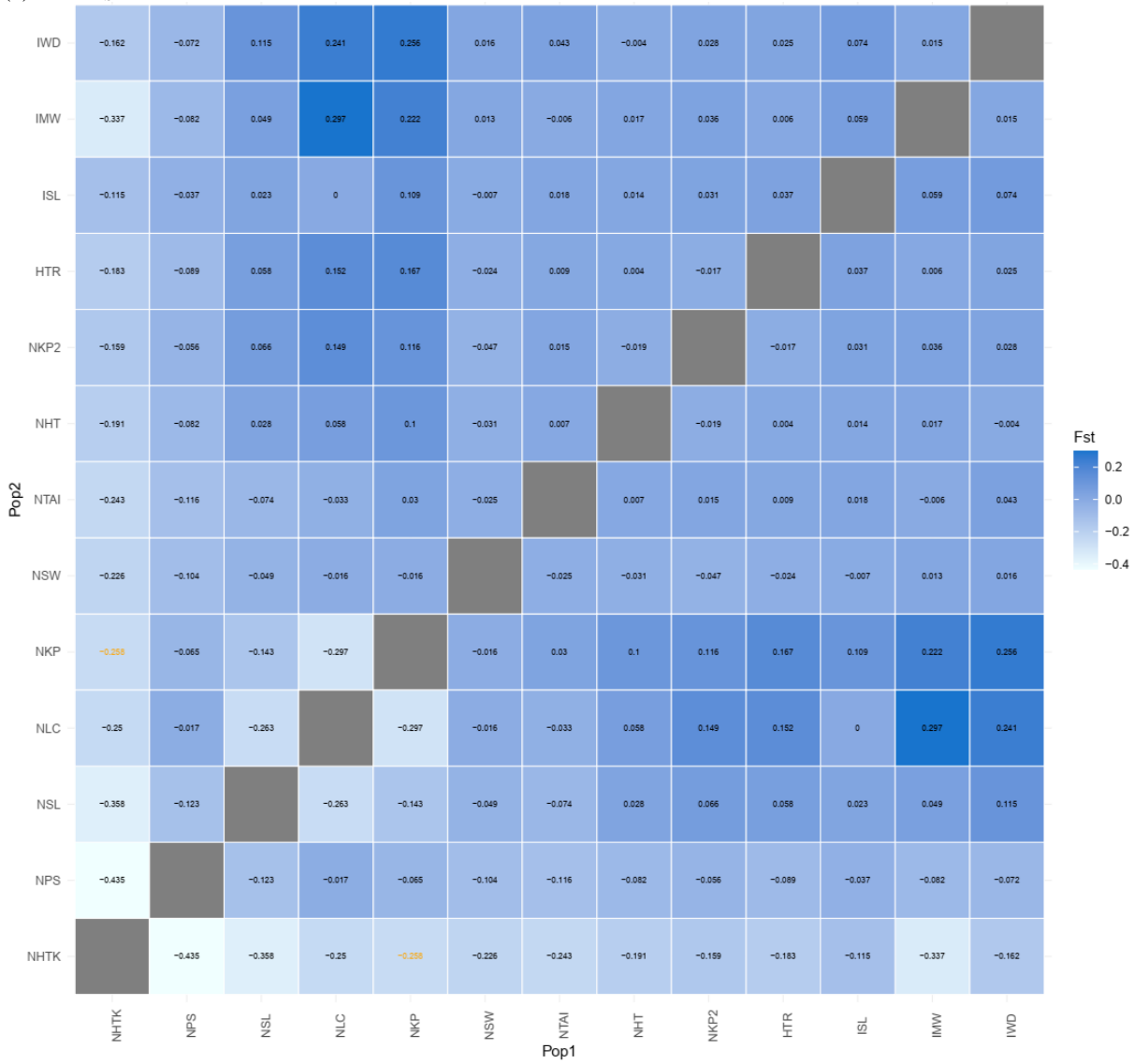


**Fig. S3.** Pairwise  $\Phi_{ST}$  based on mitochondrial *COI* data (a), and pairwise Wright's  $F_{ST}$  (b), Weir's  $F_{ST}$  without and with ENA correction for null alleles based on microsatellite data (c, d) of *C. trifasciata*. Darker shades of blue indicate higher value, numbers represent  $\Phi_{ST}$  or  $F_{ST}$  values with colour indicating statistical significance of sequential-Bonferroni-adjusted  $P$ -value, yellow < 0.05, orange < 0.01.



**Fig. S3.** (Cont.)

(a) COI  $\Phi_{ST}$



**Fig. S4.** Pairwise  $\Phi_{ST}$  based on mitochondrial *COI* data (a), and pairwise Wright's  $F_{ST}$  (b), Weir's  $F_{ST}$  without and with ENA correction for null alleles based on microsatellite data (c, d) of *C. elongapoda*. Darker shades of blue indicate higher value, numbers represent  $\Phi_{ST}$  or  $F_{ST}$  values with colour indicating statistical significance of sequential-Bonferroni-adjusted  $P$ -value, yellow  $< 0.05$ , orange  $< 0.01$ .

(b) Microsatellite Wright's  $F_{ST}$

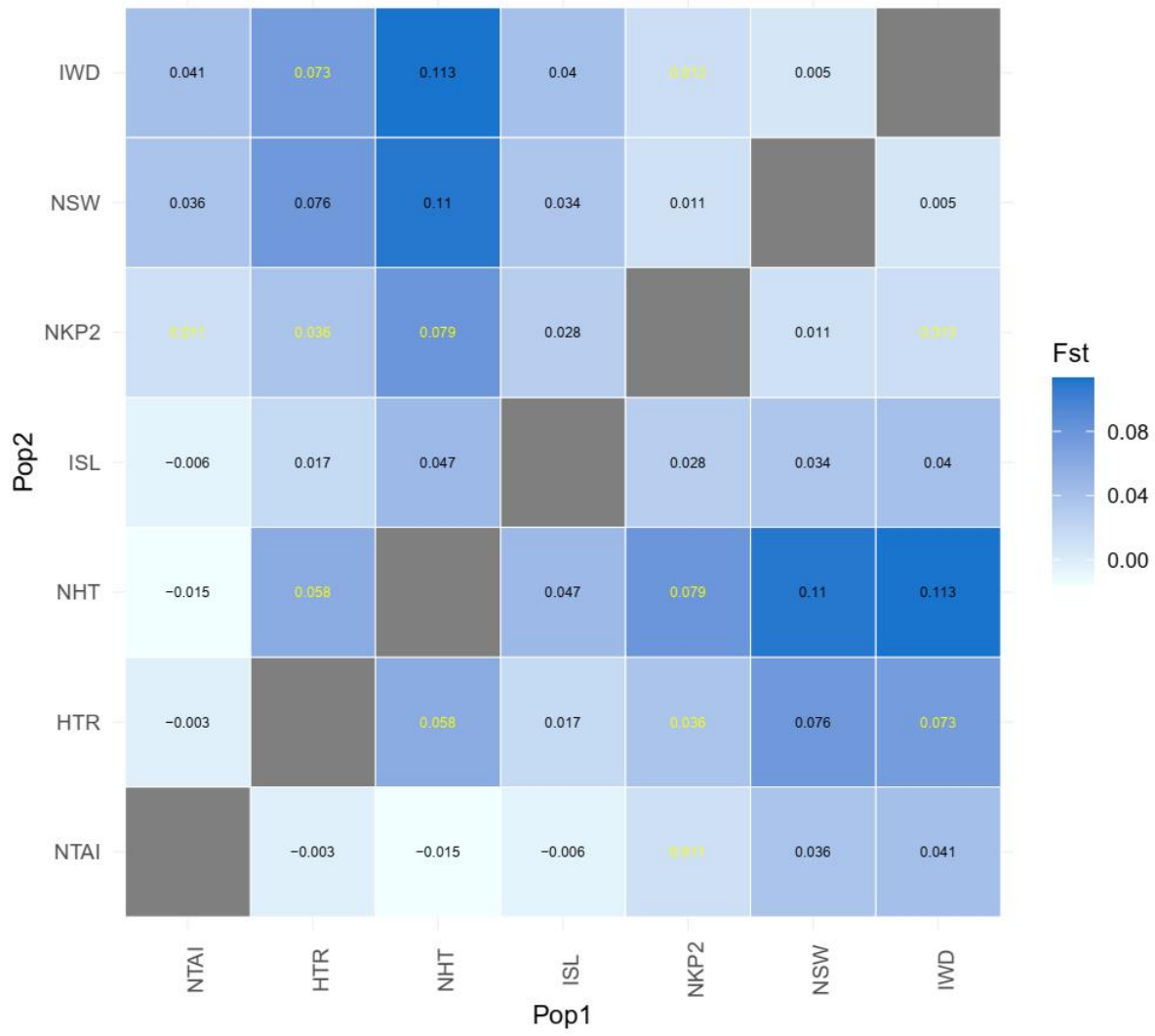


Fig. S4. (Cont.)



(c) Microsatellite Weir's  $F_{ST}$  without ENA correction

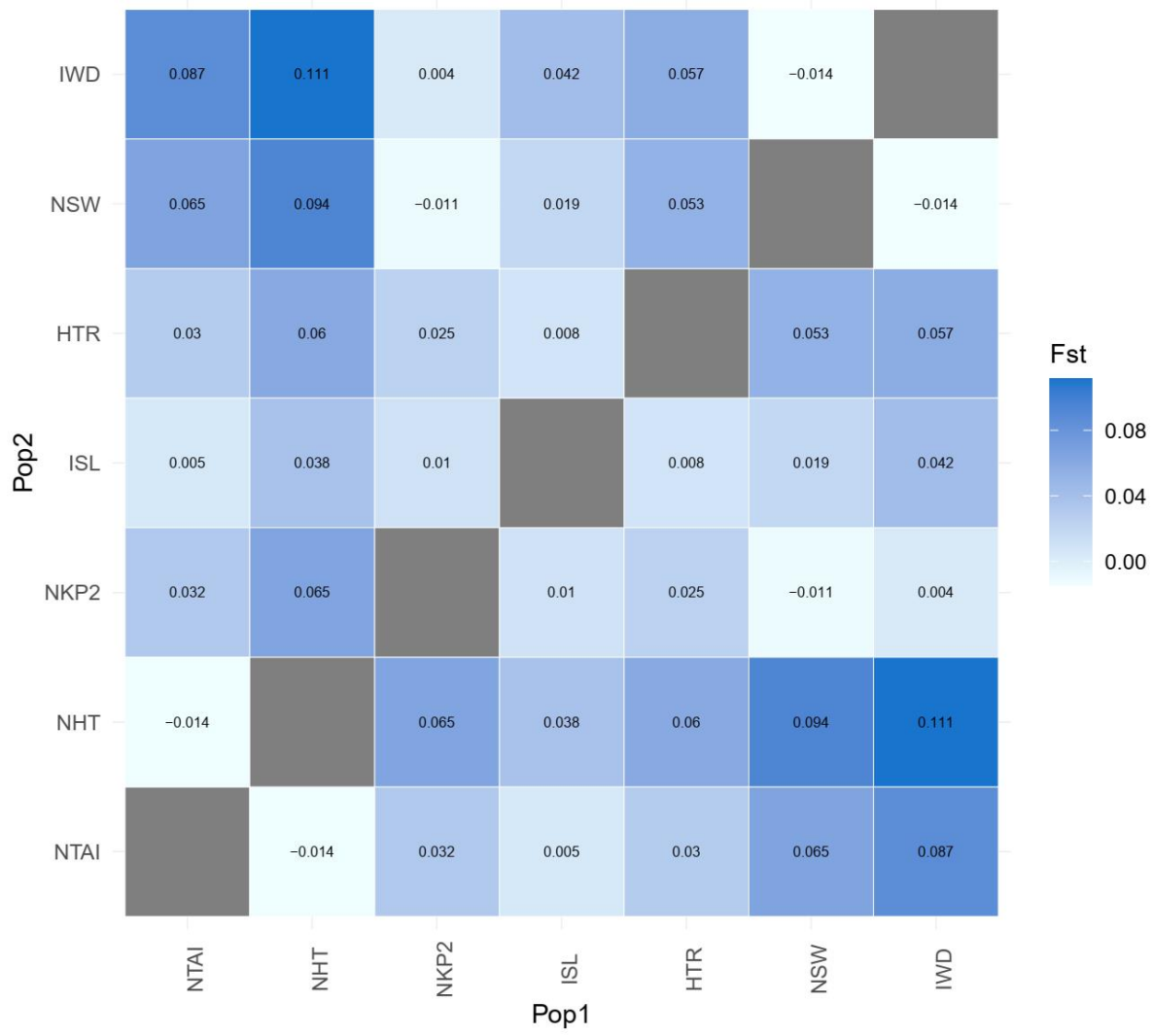


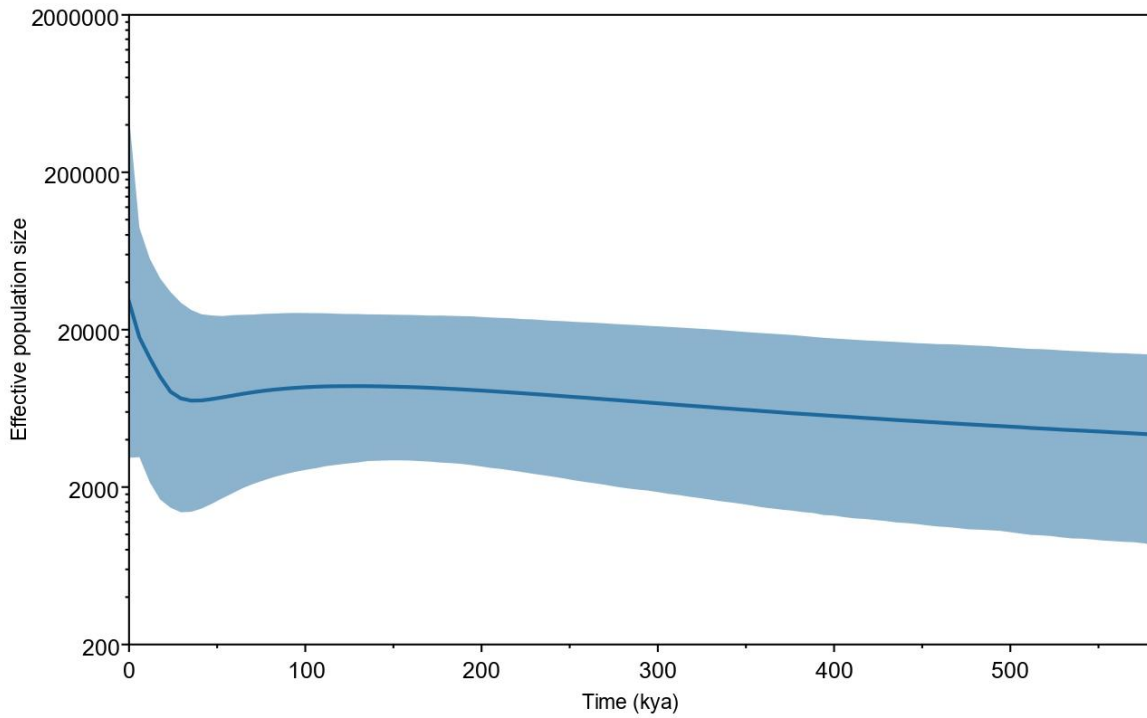
Fig. S4. (Cont.)

(d) Microsatellite Weir's  $F_{ST}$  with ENA correction

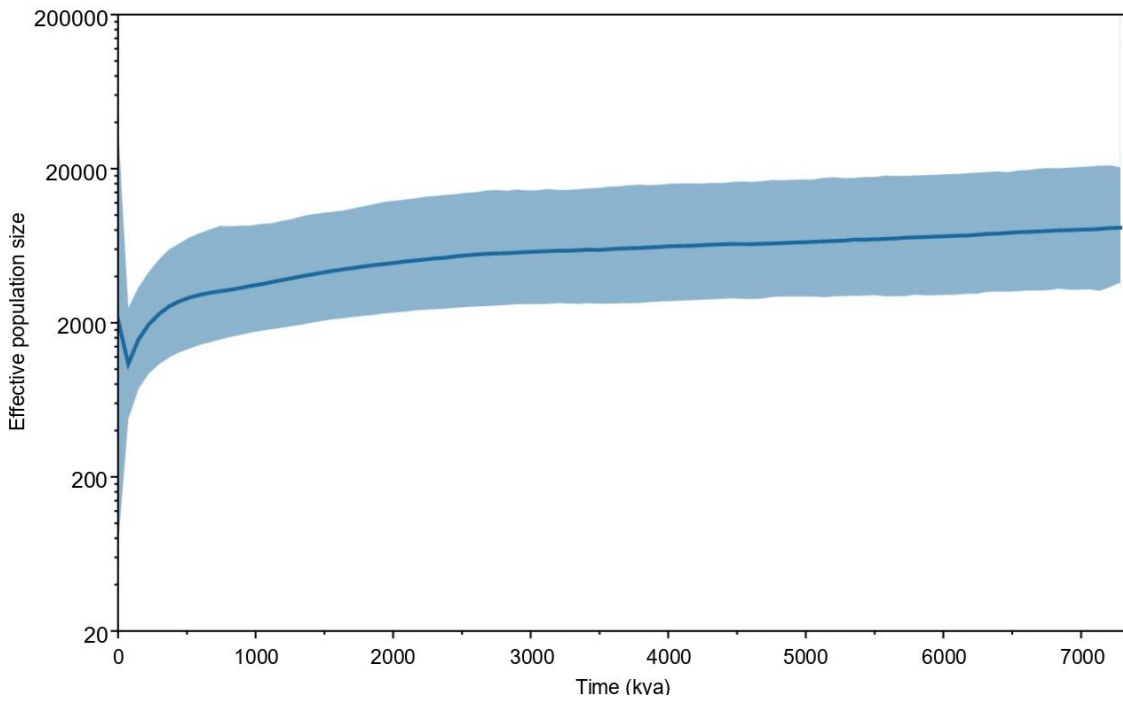
(a)				(b)	
	NTSK	IFLW 2	ISI		NTSK – IFWL2
NTS K				Wright's $F_{ST}$	-0.0039
IFLW 2	0.011			Weir's $F_{ST}$ without ENA	0.039
ISI	-0.316	-0.296		Weir's $F_{ST}$ with ENA	0.045

**Fig. S4.** (Cont.)

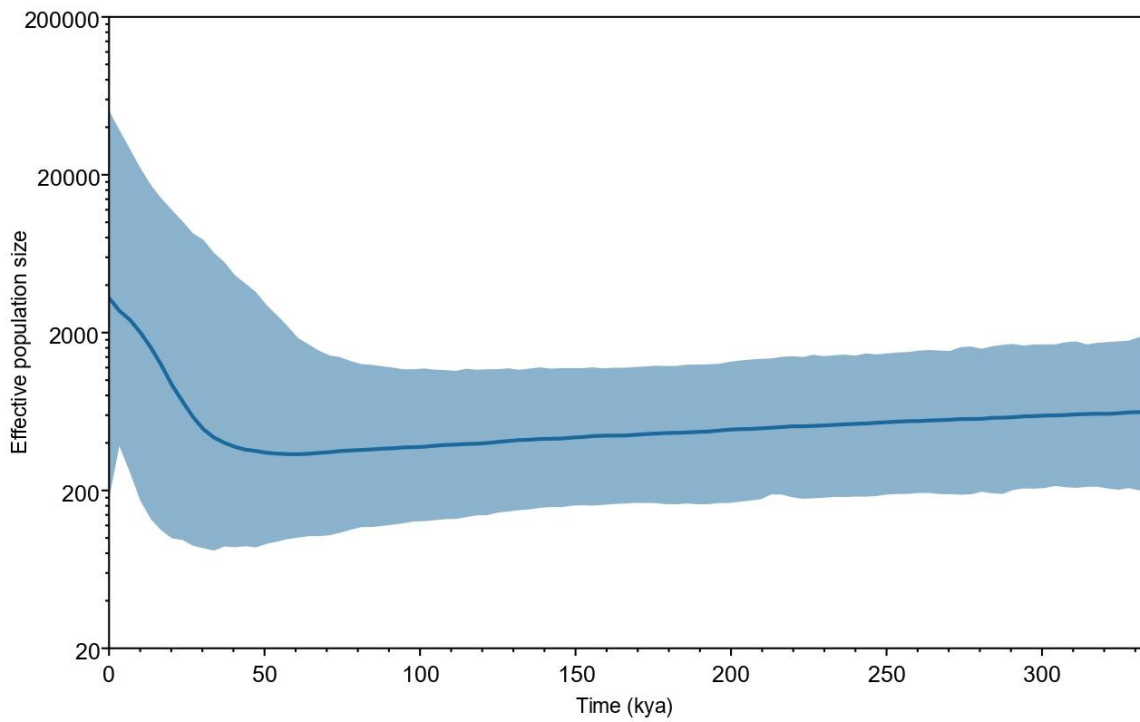
**Fig. S5.** Pairwise  $\Phi_{ST}$  based on mitochondrial *COI* data (a), and pairwise Wright's  $F_{ST}$ , Weir's  $F_{ST}$  without and with ENA correction for null alleles based on microsatellite data (b) of *C. typus*. All estimates are statistically insignificant ( $P$  or sequentially Bonferroni-adjusted  $P > 0.05$ ).



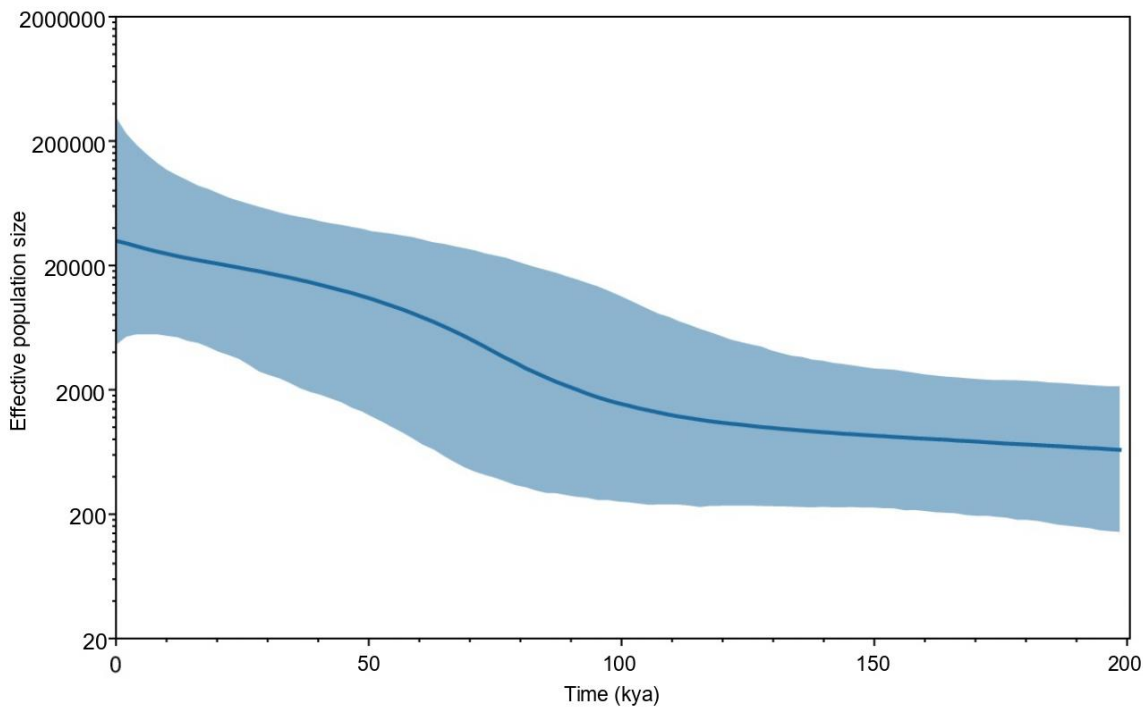
**Fig. S6.** Bayesian skyline plot of *C. cantonensis* based on *COI* data. Line represents the median estimates, while the interval represents the 95% HPD interval.



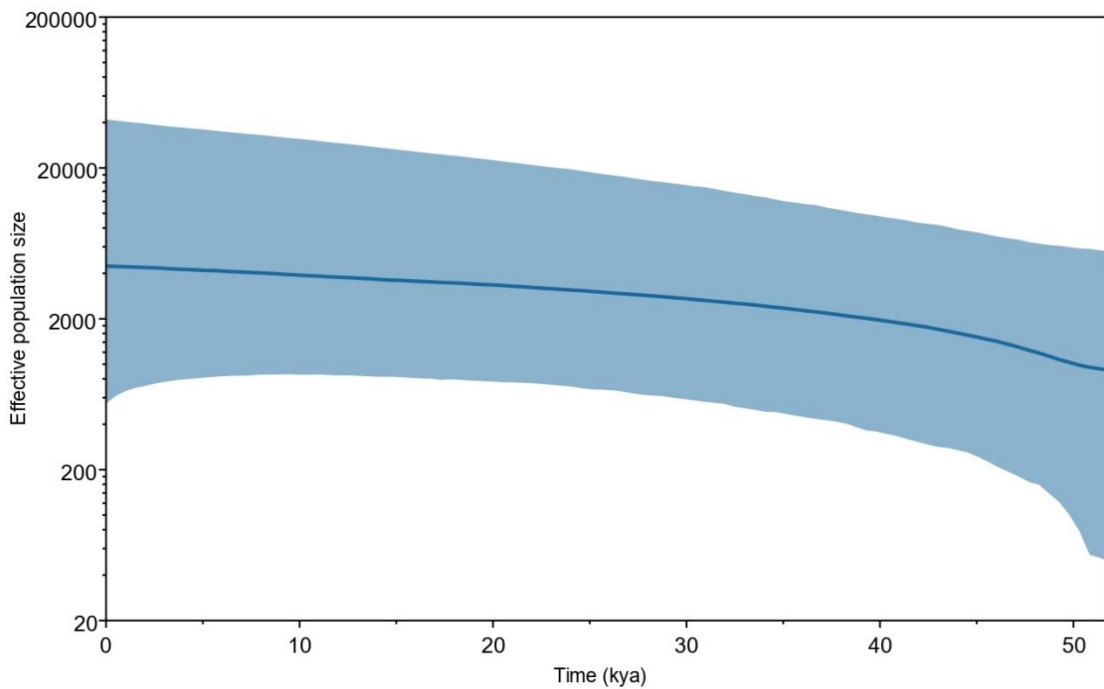
**Fig. S7.** Bayesian skyline plot of *C. serrata* based on *COI* data. Line represents the median estimates, while the interval represents the 95% HPD interval.



**Fig. S8.** Bayesian skyline plot of *C. trifasciata* based on *COI* data. Line represents the median estimates, while the interval represents the 95% HPD interval.



**Fig. S9.** Bayesian skyline plot of *C. elongapoda* based on *COI* data. Line represents the median estimates, while the interval represents the 95% HPD interval.



**Fig. S10.** Bayesian skyline plot of *C. typus* based on *COI* data. Line represents the median estimates, while the interval represents the 95% HPD interval.

## Reference

Tsang, L. M., Tsoi, K. H., Chan, S. K.-F., Chan, T. K.-T., and Chu, K. H. (2017). Strong genetic differentiation among populations of the freshwater shrimp *Caridina cantonensis* in Hong Kong: implications for conservation of freshwater fauna in urban areas. *Marine and Freshwater Research* **68**, 187–188. [doi:10.1071/MF15377](https://doi.org/10.1071/MF15377)