

RESEARCH ARTICLE

Fiord populations of *Astrobrachion constrictum* (Ophiuroidea: Asterocheimataceae) show little genetic differentiation for mitochondrial DNA

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(The fiords of southwestern New Zealand may promote the existence of genetically divergent populations as a result of geological and ecological isolation. The ophiuroid *Astrobrachion constrictum*

A. constrictum COI AMOVA



4 DJ Steel

Table 1 S r COI SSCP
I , r D S (E P , T_r C , O , G_r C H).

H	N	D					C	P _r
		EP	TC	O	CH			
A	17	23	13	3	14	5	9	
B							1	
C		1	1					
D		3	3	1	2	1	5	
E		2			1			
F	1				1			
G	1		1		1	1		
H		1			2			
n	3	5	4	2	6	3	3	
n	19	30	18	4	21	7	15	

CH, G_r C H ; EP, E P ; TC, T_r C .

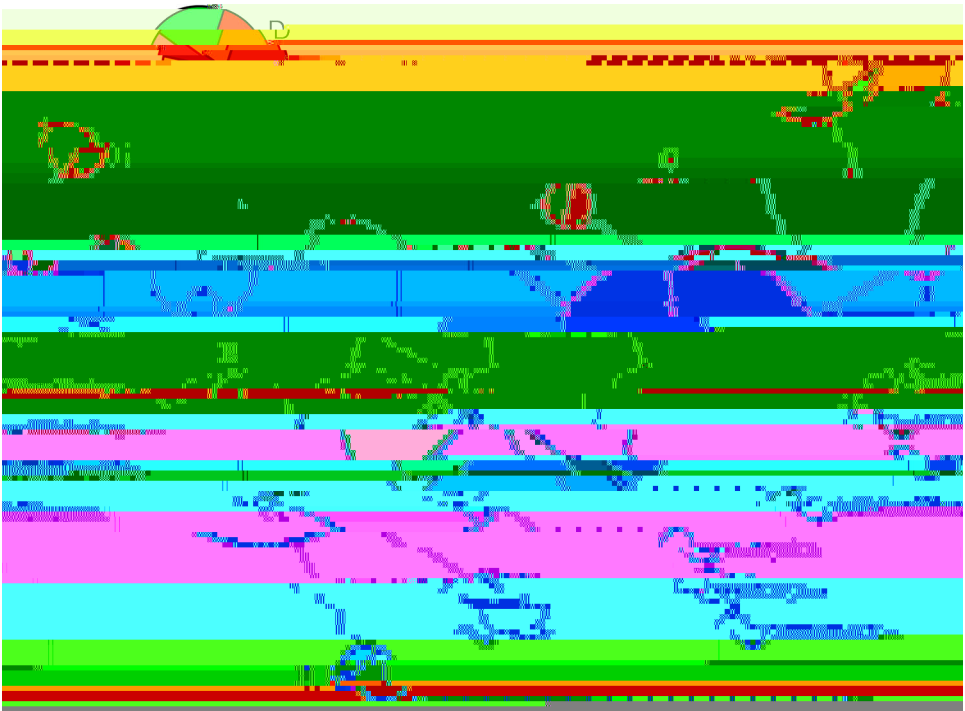


Figure 2 M C D r r r COI (A H; T. l) (r r SSCP)

Discussion

A

Astrobrachion constrictum

S
r (P > 0.9). T
C (G
N
A
10,000 18,000
(P
1992)
110 120

(*Evechinus chloroticus*),
. *Evechinus*

chloroticus

(Dx 1969; W 1984), (Dx 1970). T
A. constrictum.
COI
(M . 2006;
R . 2007)
(B & L 1994; D .
2004; R . 2007; C . 2008;
H & H 2008). I (F . 3)
(
. A
(
)
. F

2J0-1 7()-554()19r()-55703

. M_r E P_r r S_r 343: S RR, R FJ 1981. B r . 2 ♀ ♀ .

229 237. S F_r , WH F_r & C . 859 .

M K_r IC, S JM 1982. F r ♀ ♀ . I : S JM, S BR 1978. H r C . N

S r MJ ♀ ♀ . L r N ♀ ♀ . 2 ♀ S r . I : G GP ♀ ♀ . F r ♀ ♀ : C

. A ♀ ♀ , L P . P . 505 515. ♀ N S ♀ ♀ , N ♀ ♀ . N ♀

M_r KJ 1997. G r r r r E - O r I M r . W ,

N ♀ ♀ . M_r E DSIR. P . 73 82.

P_r r S_r 161: 123 132. S BR 1986. W r r r

M ♀ ♀ PV, A RM, W GP 1997. G N ♀ ♀ r N ♀ J r

♀ r ♀ ♀ . N ♀ ♀ r ♀ ♀ . S M_r ♀ ♀ F_r r R r 20: 299 314.

Evechinus chloroticus (E ♀ ♀ r : E ♀ ♀). S BR, P r ♀ ♀ GL 1981. P r

N ♀ ♀ J r M_r ♀ ♀ F_r r I M r . W , DSIR: 88. 37 .

R r 31: 261 269. S BR, P r ♀ ♀ GL 1982. P r

M D, D D, G F, J D 2006. S N ♀ ♀ r ♀ ♀ . I : F_r ♀ ♀ HJ, F_r r DM,

I r ♀ ♀ . Acrocrida brachiata L CD ♀ ♀ . F r ♀ ♀ r . N r ,

(E ♀ ♀ r : O r ♀ ♀) N_r P P_r . P . 329 332.

A M r E 15: 3303 3318. S DJ, T_r SA, W GP 2000. H r

P BM, M LM 2004. H r r ♀ ♀ - ♀ r DNA r ♀ Astrobrachion

r r (D r S ♀ ♀ , N ♀ ♀). N r S r B 1995. T r r r

J r M_r ♀ ♀ F_r r R r 38: S Astrobrachion constrictum (E ♀ ♀ r : O r

729 741. ♀ ♀ , U r ♀ ♀ P D . D ♀ ♀ , N ♀ ♀ , U r O .

P_{rr} C, W SR, R MS 2004. E ♀ ♀ r - S r B, M ♀ P 1993. A r r ♀ ♀

r r r Coscinasterias muricata (E ♀ ♀ r : ♀ ♀ r Astrobrachion constrictum. I : D ♀ ♀ B, G A,

A r r) N ♀ ♀ r ♀ ♀ . M r F_r JP, R ♀ M ♀ ♀ . E ♀ ♀ r :

E 13: 2183 2195. P_r RA, F r JM, M G MS 1992. L - P_r ♀ ♀ 8 I r E ♀ ♀ r

r r r I , N ♀ ♀ . Q r r C r r , D , F_r . R r ♀ ♀ , B

R_r B, P_r WA, S MJ, S JM 1992. T S r BG, M ♀ PV 1997. P r r r ,

♂ ♂ N ♀ ♀ ♀ ♀ . I : r Astrobrachion constrictum (E ♀ ♀ r :

S JM, S MJ ♀ ♀ . L r N ♀ ♀) D S ♀ ♀ , F r ♀ ♀ ♀ , N

♂ ♀ . 2 ♀ ♀ . A ♀ ♀ , L P ♀ ♀ . M_r B 127: 687 697.

P . 31 62. P r MF, R r SS 1987. P

R r VP, T JD, S MJ, S MS 2007. S_r E ♀ ♀ r , O r ♀ ♀ . I : S_r

G ♀ ♀ r F r ♀ ♀ r : MF ♀ ♀ . R r ♀ ♀ r ♀ ♀ r

r r r r P . D r ♀

r r r r ♀ ♀ , r , ♀ ♀ . S , U r W P_r . P . 556 573.

S C, F_r F, B , A, G_r B, L H, F T_r SA, W GP, M_r -R r ♀ ♀ M 2000.

P 1994. E ♀ ♀ , ♀ ♀ ♀ ♀ ♀ P r r r r P

r ♀ ♀ ♀ ♀ r r ♀ ♀ (Q -

r , A ♀ ♀). M r E 9:

r r . A ♀ ♀ E S 657 666.

S M, W SR, M PV 2003. G ♀ ♀ - T_r C, C_r GR, M_r J 1998. M r

r r r r r r ♀ ♀ . harengus) A -S ♀ rr (Clupea

M_r E P_r r r r S_r 250: 163 174. ♀ ♀ r DNA r r . J r M_r

S F 2001. H r r B A UK 78: 269 283.

r r r r r . E 82: V J 1997. S ♀ ♀ :

792 801. r r r r ♀ ♀ . Astrobrachion constrictum ♀ ♀

Antipathes fiordensis. U ♀ ♀ MARI 480

r .D ,N ,U r O . W A, M r RR 2012. H , , r r
 39 . C r r ? DNA. r
 W r MM 1984. L r , r P , r r
 r r Evechinus chloroticus (V). Achelia assimilis (H , 1885). S r
 N J r M r F r B r 10: 361 374.
 R r 18: 393 397. W P 1996. A 230 r r
 W GP, T SA 2009. N r - r A r r C , F r , N r
 : . M r . N r J r G
 E 18: 3548 3580. G 39: 225 241.