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Species boundaries in carp gudgeons (Eleotrididae: *Hypseleotris*) from the River Murray, South Australia: evidence for multiple species and extensive hybridization.

Terry Bertozzi[A], Mark Adams[B*] and Keith F. Walker[A,C]

Allozyme profiles at 20 variable loci for the 55 *Hypseleotris* in the overview study.

Each individual has a binomial code including its site (1-5, Fig. 1) plus a unique number.

Individuals are grouped according to Fig. 2. Code for loci: 1=*Ada*, 2=*Ca*, 3=*Enol-1*, 4=*Enol-2*, 5=*Fdp-2*, 6=*Fum*, 7=*Got-1*, 8=*Got-2*, 9=*Gp-3*, 10=*Gpi-1*, 11=*Gpi-2*, 12=*Hbdh*, 13=*Idh-2*, 14=*Mdh-1*, 15=*Me*, 16=*Pepd-1*, 17=*Pepd-2*, 18=*Pgam* 19=*Pgm*, 20=*Tpi*.

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Fish	**Group**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
3.2	*HA*	b	ad	b	a	b	a	b	c	a	c	b	a	b	c	b	c	b	b	bc	a
3.3	*HA*	b	bd	b	a	b	a	b	cd	a	cd	b	a	b	c	b	c	b	b	b	a
3.12	*HA*	b	bd	b	a	b	a	b	c	a	cd	b	a	b	c	b	c	b	b	bc	ab
3.13	*HA*	b	bd	b	a	b	a	b	c	a	d	b	a	b	c	b	c	b	b	c	a
3.15	*HA*	b	bd	b	ab	b	a	b	c	a	c	b	a	b	c	b	c	ab	b	bc	a
2.2	*HB*	e	d	b	a	b	b	b	c	a	bd	d	a	b	c	b	b	d	b	c	a
2.3	*HB*	e	d	b	a	b	b	b	c	a	d	d	a	b	c	b	b	d	b	c	a
2.5	*HB*	e	d	b	a	b	b	b	c	a	d	d	a	b	c	b	b	d	-	c	a
2.7	*HB*	e	d	b	a	b	b	b	c	a	bd	d	a	b	c	b	b	d	b	bc	a
2.8	*HB*	e	d	b	a	b	b	b	c	a	c	d	a	b	c	b	b	d	b	c	a
2.9	*HB*	e	d	b	a	b	b	b	c	a	d	d	a	b	c	b	b	d	b	bc	a
2.10	*HB*	e	d	b	a	b	b	b	c	a	d	d	a	b	c	b	ab	d	b	c	a
2.11	*HB*	e	d	b	a	b	b	b	c	a	d	d	a	b	c	b	b	d	b	c	a
3.8	*HB*	e	d	b	a	b	b	b	c	a	cd	d	a	b	ac	b	b	d	b	bc	a
4.5	*HB*	e	d	ab	a	b	b	b	c	a	d	d	a	b	c	ab	b	d	b	c	a
4.7	*HB*	e	d	b	a	b	b	b	c	a	d	d	a	b	c	b	b	d	b	bc	a
4.8	*HB*	e	d	b	a	b	b	b	c	a	d	d	a	b	c	b	b	d	b	c	a
4.9	*HB*	e	d	ab	a	b	b	b	c	a	cd	d	a	b	c	b	b	d	b	bc	a
4.10	*HB*	e	d	ab	a	b	b	b	c	a	cd	d	a	b	c	b	b	d	b	c	a
4.11	*HB*	e	d	ac	a	b	b	b	c	a	cd	d	a	b	c	b	b	d	b	c	a
4.13	*HB*	e	d	b	a	b	b	b	c	a	d	d	a	b	c	b	b	d	b	c	a
4.14	*HB*	e	d	b	a	b	b	b	c	a	d	d	a	b	c	b	b	d	b	c	a
5.4	*HB*	e	d	ab	a	b	b	b	c	a	bd	d	a	b	c	b	b	d	b	c	a
5.8	*HB*	e	d	ab	a	b	b	b	c	a	d	d	a	b	c	b	b	de	b	c	a

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Fish	**Group**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
3.4	*HC*	dg	ab	b	a	b	a	b	bc	a	bc	c	ab	a	ac	b	b	ac	b	b	a
3.5	*HC*	d	ab	b	a	b	ab	b	bc	ab	b	c	ab	ab	ac	b	b	ab	b	b	a
3.6	*HC*	ad	be	b	a	b	b	b	ab	a	bc	c	ab	ab	bc	b	b	b	b	ab	-
3.9	*HC*	af	bc	ab	a	b	b	b	bc	a	b	c	ab	a	ac	b	b	ac	b	b	a
3.10	*HC*	d	be	b	a	b	ab	b	bc	a	b	c	b	b	c	b	b	bc	b	b	a
3.11	*HC*	d	e	b	ab	b	a	b	bc	a	b	c	ab	b	c	b	b	b	b	b	a
3.14	*HC*	ch	b	cd	-	b	ab	b	bc	a	b	c	b	b	ac	b	b	ac	b	b	a
4.1	*HC*	cd	ac	b	a	b	ab	b	b	a	b	c	b	ac	ac	b	b	ab	b	b	a
4.2	*HC*	d	ab	bd	a	b	ab	b	b	a	b	ce	ab	b	ac	b	b	ab	b	b	a
4.3	*HC*	ad	ab	bd	a	b	ab	b	ab	a	bc	c	ab	a	c	b	b	ac	b	b	a
4.4	*HC*	d	a	bd	a	b	ab	b	b	a	b	c	ab	ab	ac	b	ab	ab	b	b	a
4.12	*HC*	dh	be	b	a	b	a	b	c	a	bc	c	ab	a	ac	b	b	a	b	ab	a
5.9	*HC*	d	a	b	a	b	a	b	b	a	ac	c	ab	a	ac	b	b	ab	b	b	a
1.1	*HA×HB*	be	d	b	a	b	ab	b	c	a	cd	bd	a	b	c	b	bc	bd	b	bc	a
1.2	*HA×HB*	be	d	b	a	b	ab	b	c	a	cd	bd	a	b	c	b	bc	bd	b	bc	a
1.3	*HA×HB*	be	d	b	a	b	ab	b	cd	a	cd	bd	a	b	c	b	bc	bd	b	bc	a
1.4	*HA×HB*	be	d	b	a	b	ab	b	c	a	cd	bd	a	b	c	b	bc	ad	b	bc	a
1.5	*HA×HB*	be	d	b	a	b	ab	b	cd	a	cd	bd	a	b	c	b	bc	ad	b	bc	a
3.1	*HA×HX*	bc	a	b	a	bc	ab	ab	c	a	c	bd	a	b	c	ab	bc	bd	b	bc	a
3.7	*HA×HX*	bc	a	b	a	bc	ab	ab	c	a	c	bd	a	b	c	ab	b	bd	b	bc	-
2.1	*HB×HX*	ce	ad	b	a	bc	b	ab	c	a	cd	d	a	b	c	ab	ab	d	ab	cd	a
2.4	*HB×HX*	ce	ad	b	a	bc	b	ab	c	a	bc	d	a	b	c	ab	ab	d	ab	cd	a
2.6	*HB×HX*	ce	ad	-	a	bc	b	ab	c	a	cd	d	a	b	c	ab	ab	d	ab	cd	a
4.6	*HB×HX*	ce	ad	b	a	bc	b	ab	c	a	bc	d	a	b	c	ab	ab	d	ab	cd	a
5.1	*HB×HX*	ce	ad	b	a	bc	b	ab	c	a	cd	d	a	b	c	ab	ab	d	b	c	a
5.2	*HB×HX*	ce	ad	b	a	bc	b	ab	c	a	cd	d	a	b	cd	ab	ab	de	b	bc	a
5.3	*HB×HX*	ce	ad	b	a	bc	b	ab	c	a	c	d	a	b	c	ab	ab	d	b	c	a
5.5	*HB×HX*	ce	ad	b	a	bc	b	ab	c	a	cd	d	a	b	c	ab	ab	de	b	c	a
5.6	*HB×HX*	ce	ad	ab	a	bc	b	ab	c	a	cd	d	a	b	c	ab	ab	d	b	c	a
5.7	*HB×HX*	ce	ad	b	a	bc	b	ab	c	a	bc	d	a	b	c	ab	ab	d	b	c	a
5.10	*HB×HX*	ce	ad	b	a	bc	b	ab	c	a	cd	d	a	b	c	ab	ab	d	ab	bd	a