

ORL-B&G-01**Effects of Sex-ratio on Reproductive Performance and Genetic Variation in the Giant Freshwater Prawn *Macrobrachium rosenbergii***

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To assess the effects of sex-ratio on reproductive performance and genetic variation in the Giant freshwater prawn *Macrobrachium rosenbergii* we conducted an experiment in indoor conditions. A total of 72 adult male and gravid female prawns were stocked into three circular fiberglass tank (2000 L) at three different sex ratios such as 1:1 (12 Male: 12 Female), 1:3 (6 Male: 18 Female) and 1:5 (4 Male: 20 Female). The prawn were fed with a commercial feed containing 35% protein and supplemented with organic spirulina, vitamin-mix, probiotics (1x10⁹ cfu/kg), fish oil and growth gel at the rate of 3 g/kg, 3 g/kg, 2.5 g/kg, and 3 capsules /kg feed respectively. Feed was provided twice daily at 5% of the body weight. Larvae were collected from the three groups and counted to assess the hatching rates. For assessing genetic variations in progeny of the three experimental groups 20 larvae of each group were genotyped for four microsatellite markers (Mbr-3, Mbr-5, Mbr-7 and Mbr-8).

We found significant variations in the gonad maturation time and hatching rates among the prawn stocked in the three different sex ratios. The four microsatellite markers were found to be polymorphic. The loci Mbr-3, Mbr-5, Mbr-7 and Mbr-8 had 6, 11, 8, and 6 alleles respectively. The average number of alleles in the three experimental groups was almost the same (5.25-5.50). The observed heterozygosity values for 1:1 and 1:3 sex ratios were higher than that of 1:5 sex ratio.

The test for fit to H-W expectation revealed that the 1:5 sex ratio group deviated in all four loci while the 1:1 and 1:3 sex ratio groups deviated in three loci (Table). Except at two loci in the 1:1 sex ratio group and one locus in the 1:3 sex ratio group, all the deviations from H-W expectations were due to the lower observed heterozygosity compared to the corresponding expected heterozygosity values. The 1:5 sex ratio group showed the highest level of inbreeding value followed by the 1:3 and 1:1 sex ratio group respectively. We suggest a maximum of three female per one male during the maturational rearing of the prawn.

Table: Allelic variation at microsatellite loci in the offspring of *M. rosenbergii* produced from three different sex ratios. (Na- Number of Alleles, Ho- Heterozygosity Observed, He- Heterozygosity Expected, and deviation from Hardy-Weinberg expectations (chi-square values). *indicates significant

Microsatellite locus	Parameters	Sex-ratio		
		1:1	1:3	1:5
Mbr3	Na	6.000	5.000	4.000
	Ho	0.600	0.650	0.300
	He	0.750	0.728	0.775
	H-W test	52.88*	37.15*	60.71*
Mbr5	Na	7.000	8.000	8.000
	Ho	0.950	0.950	0.632
	He	0.828	0.821	0.837
	H-W test	26.99ns	55.5*	41.82*
Mbr7	Na	5.000	4.000	4.00
	Ho	0.700	0.100	0.150
	He	0.691	0.623	0.629
	H-W test	25.34*	31.06*	41.06*
Mbr8	Na	3.000	5.000	4.00
	Ho	0.000	0.500	0.000
	He	0.635	0.661	0.693
	H-W test	40.00*	18.0ns	57.00*