



Bulked segregant analysis of the pirarucu (*Arapaima gigas*) genome for identification of sex-specific molecular markers

I.G. Almeida¹, P. Ianella², M.T. Faria³, S.R. Paiva⁴ and A.R. Caetano⁴

¹Programa de Pós-Graduação em Ciências Animais, Universidade de Brasília, Brasília, DF, Brasil

²Embrapa Sede, Departamento de Pesquisa e Desenvolvimento, Brasília, DF, Brasil

³Embrapa Amazônia Oriental, Belém, PA, Brasil

⁴Embrapa Recursos Genéticos e Biotecnologia, Parque Estação Biológica, Brasília, DF, Brasil

Corresponding author: A.R. Caetano

E-mail: alexandre.caetano@embrapa.br

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ABSTRACT. *Arapaima gigas* (Osteoglossidae) is one of the largest fish species in the Amazon Basin, attaining lengths of over 2.5 m and weights of over 100 kg. Its flesh is prized, and it has great potential for production in aquaculture systems. However, live pirarucu cannot be reliably sexed visually, even after sexual development, since this species does not have clear external sexual dimorphism. Simple and inexpensive methods for sexing immature pirarucu based on DNA markers would facilitate production of this species in commercial operations. We analyzed *A. gigas* male and female DNA pools with 566 RAPD primers, generating 2609 fragments, with an estimated 1341 segregating polymorphic markers, and an estimated average spacing of 714 kb, which corresponds to less than 0.1% of the species' genome. Two putative sex-specific fragments were initially identified in bulked

samples; but they were not confirmed in a study of individual male and female samples. We suggest that *A. gigas* has developed a non-chromosomal system of sex determination or, alternatively, that the species has undergone a recent loss of the chromosome carrying the sex-determining locus.

Key words: Neotropical fishes; RAPD; Sex determination; Bulk segregant analysis