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ABSTRACTS

Advances into the captive reproduction of the amazon pirarucu (*Osteoglossidae: Arapaima*)

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The Pirarucu (*A. gigas*) is a distinctive candidate species for aquaculture development in South America. In natural environments, it can reach up to 3 m in total length with a growth potential of over 250 Kg. The meat is highly appreciated locally and overseas because it lacks intramuscular spines, has no off flavour and is firmly tasty. Being an air breather species, *A. gigas* is also suitable to different systems such as cages, tanks and ponds. Studies so far have demonstrated growth rates of 10 kg over the first rearing year, but the industry expansion is limited by the lack of spawning control and broodstock management issues.

Reproduction of the species starts with formation of couples but factors that influence mate choice are unknown. Sexual maturation occurs after the third or fourth year, when farmers try to induce mating of couples in earth pounds. Rainfall and flooding appear to be crucial in triggering mating and spawning. Couples build nests for egg deposition and the newly hatched larvae develop under intense parental care. After the consumption of the yolk sac, the larvae start air breathing and actively feeding on zooplankton. At this time, fingerlings shoal above the male's head, and a whitish secretion is released from several canals and pockets present on its head. This secretion is suggested to play critical roles in mate selection (pheromone) and parental care but its biochemical composition is still unknown.

Captive reproduction relies on the development of tools for sex identification as the species lacks reliable external sexual dimorphisms and no information is available on the species sex determinism. As adults cannot be cannulated due to unusual morphology, so sex and reproductive condition can not be easily assessed, which reduces spawning success on farms. In addition, the role(s) of the cephalic secretion is not yet described but may be central in mate choice and parental care for fingerling growth and survival.

This communication will present preliminary findings on the development of tools to improve captive reproduction of *A. gigas*. A method for ovary inspection through gonoductoscopy was developed to overcome the cannulation issue and allowing non-invasive ovary observation. This technique allowed confirming sex and determining stage of oogenesis in female broodstock. This is an important breakthrough as couple selection can now be based on informed decision. Then, Restriction site Associated DNA (RAD) sequencing was used to provide basic information on *Arapaima* genome size and polymorphism level, identify and map SNPs corresponding to traits of interest to aquaculture development, and develop microsatellite/SNP panels and assays for parentage assignment to be used in broodstock management and population genetic studies. Finally, a full screening of the cephalic secretion for proteins, peptides and steroids was performed through a range of techniques including CE-MS, in-gel tryptic digestion for LC-MS/MS analysis and radioimmunoassay. All the above advanced knowledge of the biology of the species and will be presented. This project is funded by Embrapa, Sebrae, MPA-CNPq, DNOCS. Experiments were conducted in DNOCS and analyses were done in the University of Stirling as part of a PhD project.