AquaVitae project (H2020) CS10 – Freshwater finfish: Hormonal induction in the pirarucu Arapaima gigas: effects in oocyte development, colour pattern and sex steroids

Autor(es):
Lucas Simon Torati (EMBRAPA Pesca e Aquicultura, Palmas-TO, Brasil), Sergio Ricardo Batlouni (UNESP – Universidade Estadual Paulista "Júlio de Mesquita Filho", Centro de Aquicultura da UNESP, Jaboticabal-SP, Brasil), Laíza Maria de Jesus Silva (UNESP – Universidade Estadual Paulista "Júlio de Mesquita Filho", Centro de Aquicultura da UNESP, Jaboticabal-SP, Brasil), Adriana Ferreira Lima (Embrapa Pesca e Aquicultura), Julia Trugilio Lopes (Instituto Federal do Tocantins (IFTO-Campus Pedro Afonso)), Jonas Pereira Alves (Embrapa Pesca e Aquicultura), André Silverio Pereira (EMBRAPA Pesca e Aquicultura, Palmas-TO, Brasil), Geovana de Souza Andrade (EMBRAPA Pesca e Aquicultura, Palmas-TO, Brasil), Luciana Nakaghi Ganeco Kirschnik (EMBRAPA Pesca e Aquicultura, Palmas-TO, Brasil)

Resumo do Tema:
Reproduction of Arapaima gigas in captivity is currently done after separation of couples in earthponds, with spawning naturally occurring during the rainy season, a method still unreliable. We tested the application of slow-release Evac GnRHa (40µg.kg-1) implants in five couples. Males and females were implanted on the 4th May (T0), on the 25th May (T23) and then at the 15th June 2021 (T44). Three couples not implanted were used as controls. Effects were evaluated on behavioural indicators of reproduction and spawning, ovarian development and on plasma levels of sex steroids. Observation of fish position in earthponds were not sufficient to conclude spawning occurrence and no reproduction (fingerling observation) were recorded. In implanted females, leading cohort oocytes (10% larger) significantly increased from 2.19 ± 0.40 mm (T0) to 2.66 ± 0.14 mm (T23) and then to 2.68 ± 0.04 mm (T44). In control couples leading cohort oocytes also increased from 2.13 ± 0.25 mm (T0) to 2.35 ± 0.39 mm (T23) and then to 2.46 ± 0.27 mm (T44). Fish colour pattern along the experiment were also evaluated, with optical indices influenced by the interaction of treatment and time. The optical index of the red colour of the head region showed an intensification after the application of the hormonal implant (T23), remaining high until T44. In control fish. This intensification was observed only in T44 possibly related to environmental factors. Plasma levels of 11-ketotestosterone (11KT) in implanted males increased from 0.69±1.02 ng.ml-1 (T0) to 3.51 ± 3.15 ng.ml-1 (T44) ($p<0.05$) over time, remaining steady in T23, there was no difference between groups in the same collection. Likewise, levels of testosterone (T) in implanted males increased from 1.42±0.69 ng.ml-1 (T0) to 6.60 ± 5.48 ng.ml-1 (T23) ($p <0.05$) and remaining steady in T44, also increased plasma levels between control and implant groups in T23 and T44 ($p<0.05$). In females, plasma levels of prostaglandin-F2α (PGF) remaining similar in different groups over time as well as in the same collection ($p>0.05$). And finally, 17,20β-dihydroxy-4-pregnen-3-one (DHP) plasma levels were higher in T23 compared to T0 over time, and increased in T23 and T44 in control and implant in the same collection ($p<0.05$). Although GnRHa-implants did not yield spawning observations, these were safe for broodstocks, elicited alterations in colour pattern, oocyte development and steroids of implanted fish over time like this between control and implant groups in the same collection, all indirect parameters of reproduction engagement.