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The Application of Ultrasound to Produce All-Male Tilapia Using Immersion Protocol

Ninth Work Plan, Reproduction Control Research 8 (9RCR8)
Abstract

Amrit Bart and A.R.S.B. Athauda
Aquaculture and Aquatic Resources Management
Asian Institute of Technology
Pathumthani, Thailand

James S. Diana
School of Natural Resources and Environment
The University of Michigan
Ann Arbor, Michigan, USA

Abstract

This study was initiated in February of 2000 and is expected to be completed by December 2000. The experiment is designed to reveal the application of cavitation-level ultrasound to enhance delivery of androgens using immersion protocol. This experiment is in two parts: 1) a preliminary study to detect the effect of ultrasound on sex reversal using two androgens commonly available in Asia (17α-methyltestosterone and andostrenedione) and 2) an examination of the effects of two novel and more potent hormones using a protocol established by CRSP researchers. In the preliminary experiment the variables tested were androgens (17α-methyltestosterone and andostrenedione), duration of treatment (1 or 2 h), and hormone concentrations (100 or 500 μg l^{-1}). Fish were treated on days 10 and 13 post-hatch. This study has been completed, and the results clearly indicate an effect of ultrasound. Although the rate of sex reversal was less than 100% in all cases, significant differences were observed between those treated with and without ultrasound in two-hour treatments, irrespective of the hormone concentration used. The highest number of males (88 to 94%) was obtained from the two-hour ultrasound-treated group, while the lowest number of males (44 to 75%) was observed from the same group without application of ultrasound. The second experiment is underway to examine the hormones trenbolone acetate (TA) and 17α-methyldihydrotestosterone (MDHT) at different concentrations (250 or 500 μg l^{-1}) and duration of treatment (1 or 2 h). We expect a higher and more consistent rate of sex reversal between treatments by varying these parameters.

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