THE APPLICATION OF ULTRASOUND TO PRODUCE ALL-MALE TILAPIA USING IMMERSION PROTOCOL

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Abstract

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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 androstenedione) 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 androstenedione), 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-methyl-5α-dihydrotestosterone (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.