

Pulse-Electric Fields Inductions for Preliminary Sex Reversal of Blue-Spotted Coral Trout

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The present study proposes an alternative technique of monosex-male reversal for the commercially important marine fish, blue-spotted coral trout (*Plectropomus leopardus*), using transient square pulse-electric and androgen hormone dose. The egg of *P.leopardus* had a simple spherical shape ($\approx 0.8 \pm 0.1$ mm) and its critical age of 6-19 hpf (hour post fertilization) were induced in the external field with 1-8 square wave pulses of 5-50 μ s duration and amplitude of 350-500 VDC (equivalent to 87.5-125.0 kV.m^{-1}). The suspending medium of electroporation (EPM) contained PBS buffered (1M mannitol added to make the EPM medium isotonic to seawater, pH 7.5 adjusted with NaOH) with the minimized concentration of the androgen hormone 17 α -methyltestosterone (MT). These electrical parameters affect sex reversal rate. The optimized values are 400 VDC, 5 square-wave pulses of 50 μ s duration with the concentration of 1,500 $\mu\text{g.l}^{-1}$ MT. Nevertheless, we have not yet accurately determined the sex reversal rate since their sex will be stable only after they are 2-3 years old. This

study only claims sex reversal of 18 months old fish with temporary all-male sex reversal rate at 76.45-82.51% (n=18), less than 27% egg death. The capacity of our equipment was acceptable at a commercial density ranging from 550-1,000 eggs/50ml for each induction. This novel technique could reduce the MT dose down to a minimized value with a rapid throughput of only quarter-hour per batch of eggs and using only 50 ml lots of hormone containing medium.

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