

10th Euro-Global Summit on

Aquaculture & Fisheries

October 08-09, 2018 | London, United Kingdom

Sex inversion in common carp (*Cyprinus carpio*) by immersion technique: The interaction effect of hormone concentration and immersion time

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In fish culture various tools and methods have been practiced for the control of sexual differentiation in a diverse ways for different types of fish species to reduce and control the unwanted spawning. Sex reversal with synthetic male steroid hormone is today became the most important technique and frequently applied to produce mono sex male populations in some indigenous species. In this technique generally androgen (male hormone) is used in aquaculture to change one sex to another from eggs or the first feeding fry stage of fish. Keeping this in view the present trial was conducted with the aim to masculinize common carp (*Cyprinus carpio*) by egg immersion technique. Specifically, to evaluate the effect of different hormone concentrations (17 α -methyltestosterone @ HC: 150, 300, 450 and 600 $\mu\text{g l}^{-1}$), immersion times (IT: 24, 48 and 72 hrs.) and their interaction effect (HC x IT) on the hatching percentage of *Cyprinus carpio* eggs, percent survival and percent of males. Results showed that eggs hatching percentage decreased with increased IT likewise, survival of treated fry was affected by increasing the IT ($P < 0.001$). The main interaction effect of HC x IT showed that the highest percent of male individuals (95%) was attained at 450-600 $\mu\text{g l}^{-1}$ HC for 72 hrs. IT, followed by 88-92.50% at 150-300 $\mu\text{g l}^{-1}$ HC for 72-hrs IT, 87.50% at 48-hrs IT for rest of the hormone treatments, and lowest 47.50% was recorded in control ($P < 0.05$). Increased percent male of *Cyprinus carpio* was obtained with increasing HC across all IT. It was observed that the immersion treatment at 600 $\mu\text{g l}^{-1}$ for 72 hours was more effective to change the sex ratio of pre hatch *Cyprinus carpio*. From this successful experimental trial it was concluded that sex inversion of *Cyprinus carpio* by eggs immersion in synthetic male steroid hormone is an alternative safe technique of fish masculinization in contrast to oral administration of hormone in fish feed.

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