

Full Length Research Paper

# Production of salinity tolerant Nile tilapia, *Oreochromis niloticus* through traditional and modern breeding methods: II. Application of genetically modified breeding by introducing foreign DNA into fish gonads

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This study was conducted to produce a salinity tolerant Nile tilapia, *Oreochromis niloticus* through genetically modified breeding by introducing a fragmented purified DNA isolated from sea bream, *Sparus aurata* or Artemia, *Artemia salina* into the gonads. The results showed a significant improvement ( $P \leq 0.05$ ) in most of the growth performance and feed utilization parameters of genetically modified *O. niloticus* treated with sea bream-DNA and reared at different salinity levels up to 16 ppt compared to both genetically modified *O. niloticus* treated with Artemia-DNA and the control fish reared at the same salinity levels. Genetically modified *O. niloticus* treated with Artemia-DNA reared at 32 ppt, had displayed better traits results ( $P \leq 0.05$ ) compared to the other fish within the same salinity level. Furthermore, genetically modified *O. niloticus* treated with sea bream-DNA showed a silver color covering all the body and no dark vertical bands. The results of the random amplified polymorphic DNA (RAPD) fingerprinting showed highly genetic polymorphic percentage (35.95%) among fish receiving foreign DNA and their control using different random primers. The results of the present work suggested that, hyper-saline genetically modified *O. niloticus* with higher growth rate can be produced using a feasible and fast methodology.

**Key words:** Salinity tolerance, *Oreochromis niloticus*, productive performance, genetically modified, DNA transfer.

## INTRODUCTION

The shortage in freshwater in many countries and the competition for it in agriculture and other urban activities has increased the pressure to develop aquaculture in brackish water and sea water (El-Sayed, 2006). Tilapia

are important species, especially for tropical aquaculture and euryhaline fish that can live and thrive in a wide range of salinity from fresh water to full sea water even though some species tolerate a wider range of salinity than others (Philippart and Ruwet, 1982; Guner et al., 2005; Kamal and Mair, 2005).

Among the species cultured commercially, the Nile tilapia *Oreochromis niloticus* is one of the most important freshwater finfish in aquaculture but is not considered

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