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## The Effect of Fry Rearing Temperatures on Sex Ratios in Nile Tilapia — Interactions between Genotype and Temperature

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### Abstract

For a profitable Nile tilapia aquaculture the importance of monosex culture of males has since long been recognised. Masculinizing with hormones is in many cases applied to increase the percentage of males. Nevertheless, many consumers are interested in environmentally friendly production and refuse to consume fish which received foodstuffs that contain hormones or similar active substances. Since some years more details were discovered about the influence of environmental factors like temperature on the sex determination of reptiles and some fish species. The objective of the present study is to test the effect of different fry rearing temperature levels on the sex ratios of Nile tilapia (*Oreochromis niloticus*) from two different origins (Lake Manzala, Egypt and Lake Rudolph, Kenya). Temperature treatments were conducted with 18°C for 20 days or with 36°C and 38°C for 10 days starting at day 10 after fertilisation. Sex ratios were obtained when the fish reached approx. 30 g. Treatments with 18°C for 20 days did normally not result into sex ratios significantly different to controls. In contrast to this in most cases the 36°C treatment for 10 days led to a significantly higher percentage of males if compared with the corresponding controls. Lifting the temperature to 38°C did not further increase the percentages of males. Differences in the sensibility of the sex determining mechanism to temperature treatments were observed between the two examined origins. It could be shown that in Nile tilapia simple temperature treatments can repeatedly increase the percentage of males. The genetic background of the response of sex ratios to temperature treatments is promising for a genetic improvement of this trait. It has to be evaluated if and how fast selection programmes can lead to Nile tilapia strains which allow the easy, cheap and sustainable production of all male stocks by temperature treatments.

**Keywords:** Genotype-environment-interactions, *Oreochromis niloticus*, sex ratio, temperature