Influence of the photoperiod on growth rate and insulin-like growth factor-I gene expression in Nile tilapia Oreochromis niloticus

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The effects of the duration of the light phase photoperiod (8 h light or 16 h light) on the growth and hepatic insulin-like growth factor-I (IGF-I) gene expression in Nile tilapia Oreochromis niloticus were evaluated. There was a slight but not significant tendency for fish in the long light phase group (LP) to display elevated specific growth rate (G) both in mass (M) and standard length (LS) compared with that in the short light phase group (SP; P = 0.057 for GM; P = 0.055 for GL). Significantly, higher food conversion efficiency was observed in the LP than in the SP. There were significant positive correlations between IGF-I concentrations and G, both in M and LS. A significantly negative correlation was observed between IGF-I mRNA level and eye colour pattern. The lack of significant differences in G and hepatic IGF-I gene expression, despite the significant difference in feed conversion efficiency, may be related partly to the development of different levels of social interactions in the different groups within a photoperiod regime leading to increased variation of results within each group. These findings suggest that hepatic IGF-I gene expression has potential utility as a growth rate indicator for this species of fish and social status, as quantified by eye colour pattern, appears to be a much stronger determinant of growth rate and IGF-I transcript level than does light phase photoperiod length.

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