

# Potential of plant oils as alternative to fish oil for live food enrichment: effects on growth, survival, body compositions and resistance against environmental stresses in rainbow trout, *Oncorhynchus mykiss*

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Received: May 2014

Accepted: December 2014

## Abstract

Enrichment of live foods by essential nutrients such as highly unsaturated fatty acids is an important tool for improvement of larval fish quality. In this study, nutritional effects of *Artemia urmiana* enriched by fish and plant oils on growth, survival rate, body compositions and resistance against thermal, salinity and hypoxic stresses in rainbow trout, *Oncorhynchus mykiss* were examined. Six food treatments comprising a commercial feed, non-enriched *Artemia* nauplii and the nauplii enriched by either of fish, sunflower, canola and soybean oils were used in triplicates. The fish fed with *Artemia* enriched by fish, sunflower and canola oils had significantly higher ( $p < 0.05$ ) survival rate, total length, wet and dry weights, specific growth rate and lower food conversion ratio than those fed the commercial feed. However, there were no significant differences in growth indices between the fish fed fish oil-enriched and plant oil-enriched *Artemia*. Minimum eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) were reported in the fish fed with the commercial feed, while maximum EPA and DHA were in the fish fed canola oil-enriched and nonenriched *Artemia*, respectively. The fish fed canola oil enriched *Artemia* had significantly higher ( $p < 0.05$ ) resistance against environmental stresses compared to fish fed the commercial diet. Results showed that the plant oils, mainly canola and sunflower oils can be used for *Artemia* enrichment as a suitable substitute for the more expensive and rare fish oil for improving growth and resistance to environmental stresses in rainbow trout larvae.

**Keywords:** Rainbow trout, *Artemia urmiana*, Enrichment, Plant oils, Growth indices, Resistance against environmental stresses

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