

The effects of dietary vitamin C on mucosal immune responses and growth performance in Caspian roach (*Rutilus rutilus caspicus*) fry

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- [Authors](#)
- [Authors and affiliations](#)

- Zahra Roosta
- Abdolmajid Hajimoradloo
- Rasoul Ghorbani
- Seyed Hossein Hoseinifar

- Zahra Roosta
 - 1
- Abdolmajid Hajimoradloo
 - 1
- Rasoul Ghorbani
 - 1
- Seyed Hossein Hoseinifar
 - 1

1. Department of Fisheries, Faculty of Fisheries and Environmental Sciences Gorgan University of Agricultural Sciences and Natural Resources Gorgan Iran

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Abstract

This study was conducted to investigate the effects of different levels of dietary vitamin C on some skin mucus immune parameters, mucus antimicrobial activity and growth performance of Caspian roach (*Rutilus rutilus caspicus*) fry. Six hundred sixty Caspian roach (1.4 ± 0.02 g) fry were allocated to 12 tanks (55 fish per tank),

and triplicate groups were fed diets containing 0, 1,000, 1,500 and 2,000 mg kg⁻¹ vitamin C for 60 days. At the end of the trial, the epidermal mucus protein level, alkaline phosphatase and antimicrobial activity against two gram-positive bacteria (*Streptococcus faecium* and *Micrococcus luteus*) and gram-negative bacteria (*Escherichia coli* and *Serratia marcescens*) as well as growth performance were measured. The results demonstrated that feeding on vitamin C significantly elevated skin mucus alkaline phosphatase and protein levels compared to the control group ($P < 0.05$). However, lysozyme activity was undetectable in both the vitamin C-fed roach fry and the control group. Skin mucus antimicrobial activity was increased following vitamin C administration, and the bacterial growth inhibition zones were significantly elevated in vitamin C-fed roach ($P < 0.05$). Similar results were obtained in case of the minimum inhibitory concentration of skin mucus. Also fish fed the control diet had a significantly lower weight gain, specific growth rate and condition factor compared to the other treatments ($P < 0.05$). These results revealed that dietary vitamin C beneficially affects the skin mucus immune parameters and growth performance of Caspian roach fry.

Keywords

Vitamin C *Rutilus rutilus* Skin mucus Immune response
Growth performance

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