The effects of dietary galactooligosaccharide on innate immune response and stress resistance of Narrow clawed crayfish (*Astacus leptodactylus* Eschscholtz, 1823)

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Abstract:
The aim of this study was to evaluate the ability of dietary prebiotic galactooligosaccharide (GOS) on the innate immune response and stress resistance of narrow clawed crayfish (*Astacus leptodactylus*). To this purpose, 120 crayfishes (27.88 ± 0.27) randomly distributed into 12 fiberglass tanks at a density of 10 crayfish per tank. Crayfish fed with different GOS-enriched diets (0, 1, 2 and 3%) two times a day (9 am and 4 pm) at the rate of 1.5 % of body weight. At the end of a 97-day feeding trial, crayfish fed 2% GOS supplemented diets had significantly higher total haemocyte count (THC), semi-granular cell (SGC) and hyaline cell (HC) counts compared to the other groups ($P < .05$). Moreover, the highest catalase (CAT) activity was observed in crayfish fed 3% GOS-enriched diet while the highest lysozyme (LYZ) activity was detected in treatments fed 2 and 3% enriched diets ($P < .05$). Furthermore, 24-h post exposure to air, dietary GOS supplemented diet could significantly improve the THC, SGC and HC count in crayfish fed 1 and 2% GOS as well as CAT activity in 3% GOS-supplemented group ($P < .05$). Based on present results, dietary GOS-enriched diets as prebiotic could beneficiary modulate innate immune response as well as stress resistance of *A. leptodactylus*.

Keywords: Dietary galactooligosaccharide, immune response, stress, Narrow clawed crayfish