



Bioinformatics and experimental study of three medicinal plants on PBMCs proliferation and growth parameters of *Oncorhynchus mykiss*

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Abstract

One of the aims of this study was to evaluate the effect of plant extracts (*Camellia sinensis*, *Curcuma longa* and *Zingiber officinale*) on *Oncorhynchus mykiss* PBMCs¹ proliferation (as in vitro and in vivo) and fish growth parameters. The bioinformatics analysis was performed to investigate the interaction between IGF1² receptor protein and plant compounds. The effect of different concentrations (0.25, 0.5, 1, 2 and 3 mg/ml) of methanol and aqueous extracts on lymphocyte proliferation was evaluated by MTT assay. Three plants powdered were added to the ingredients of tested diets to represent 0.0 (control), 0.5 and 1 g per 100 g of feed. Fish were distributed to various treatments at a rate of 15 fish per 100-L aquarium, and fed one of the experimental diets for 4 wk. The results showed that all extracts had a positive effect on fish lymphocyte proliferation, and the best one was obtained from green tea. Also, the diet that had 1% of plants increased 10 percent PBMC proliferation significantly. In silico results demonstrated that green tea compounds had the highest affinity for interaction with IGF1 receptor protein. In conclusion, the results showed that these plants can improve the immune system and the growth of rainbow trout.

Keywords: Medicinal plants, PBMCs proliferation, Growth parameters, *Oncorhynchus mykiss*, Bioinformatics.

¹ Peripheral blood mononuclear cell

² Insulin-like growth factor I