Accepted Manuscript

Adjuvant efficacy of G2 (buffalo spleen extraction) against *Yersinia* septicemia in rainbow trout (*Onchorhynchus mykiss*)

Shafigh Shafie, Elahe Soltani, Mehdi Soltani, Saleh Mohaghegh Hazrati

PII: S1050-4648(18)30477-7

DOI: 10.1016/j.fsi.2018.08.011

Reference: YFSIM 5469

To appear in: *Fish and Shellfish Immunology*

Received Date: 11 June 2018

Revised Date: 3 August 2018

Accepted Date: 6 August 2018

Please cite this article as: Shafie S, Soltani E, Soltani M, Hazrati SM, Adjuvant efficacy of G2 (buffalo spleen extraction) against *Yersinia* septicemia in rainbow trout (*Onchorhynchus mykiss*), *Fish and Shellfish Immunology* (2018), doi: 10.1016/j.fsi.2018.08.011.

Running title: Efficacy of G2 adjuvant in vaccinated trout with *Y. ruckeri* vaccine

Adjuvant efficacy of G2 (buffalo spleen extraction) against *Yersinia* septicemia in rainbow trout (*Onchorhynchus mykiss*)

Shafigh Shafie[1], Elahe Soltani[2], Mehdi Soltani[3,4]*, Saleh Mohaghegh Hazrati[5,6]

[1]Department of Food hygiene and Quality Control, Faculty of Veterinary Medicine, Shahrekord University, Shahrekord, Iran, [2]Department of Microbiology, Faculty of Sciences, University of Tehran, Tehran, Iran, [3]Department of Aquatic Animal Health, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran,[4]Freshwater Fish Group and Fish Health Unit, Veterinary and Life Sciences, Murdoch University, Australia, [5]Faculty of Public Health, Tehran University of Medical Sciences, Tehran, Iran, [6]Dr Mohaghegh Foundation of Research Industrial Biotechnology, 16 Azar steet, Keshavarz Bolvard, Tehran, Tehran, Iran.

***Corresponding author:** Mehdi Soltani (DVM, PhD, professor of aquatic animal health) Present address: Freshwater Fish Group and Fish Health Unit, Veterinary and Life Sciences, Murdoch University, 6150 WA, Australia, Phone:+61 0491266854; Email: mehdi.soltani@morduch.edu.au

Abstract:

Adjuvant effect of G2 (extraction of buffalo spleen) was assessed in intraperitoneally immunized rainbow trout (100-150 g) with killed- *Y. ruckeri* bacterin biotype I [0.1 ml (1×10^7 cells/fish) of vaccine diluted with the adjuvant in a ratio of 1:1 (V/V)] at 12.4±1.3ºC for 10 weeks. Leucocyte and lymphocyte counts, anti-*Y. ruckeri* antibody titer and relative percent survival (RPS) in fish vaccinated with vaccine containing the adjuvant were significantly higher than the immunized fish with *Y. ruckeri* antigen alone throughout the experiment ($P<0.05$), but neutrophils count and lysozyme activity were mostly significantly higher in the latter group ($P < 0.05$). No difference was seen in the complement activity between vaccinated fish containing the adjuvant and vaccine alone ($P > 0.05$). The results of this work for the first time demonstrated that inclusion of G2 as an adjuvant in *Y. urckeri* vaccine can improve the efficacy of the vaccine against *Yersinia* septicemia in rainbow trout.