

**Abstract of the DVM thesis No. 12439, Faculty of Veterinary Medicine, Urmia University**

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**Title: Modulatory effect of protein hydrolysates from rainbow trout (*Oncorhynchus mykiss*) by-products (bioactive peptide) on gut microbiota after exposure to alcohol in rats**

**Summary:**

Gut microbiota is a complex ecosystem of microorganisms that live in the digestive system of organisms and plays an important role in maintaining gut health and overall well-being. The harmful effects of alcohol consumption on intestinal microbiota have been widely reported. Studies show that alcohol consumption leads to a disorder in intestinal microbial flora, inflammation and increased risk of diseases such as liver cirrhosis, colorectal cancer, etc. Fish by-products are a significant source of protein and make up to 50% of the total weight of fish. Recent studies have shown that hydrolyzed protein obtained from fish by-products, especially bioactive peptides, exhibit various health benefits including antioxidant, antihypertensive, and antimicrobial activities. The purpose of this research was to investigate the modifying effect of hydrolyzed proteins extracted from fish waste on the microbiome of rats that have received alcohol. This research was conducted in 24 male Wistar rats aged between 6 and 8 weeks and with an average weight of  $250 \pm 15$  grams. The rats were divided into four groups, namely the control group (C), the group only receiving alcohol (A), the group receiving the combination of alcohol and the peptide (A+P), and the group receiving only the peptide (P). All groups were treated and maintained for one month. The amount of alcohol consumed was 4 to 6 grams per kilogram of body weight and the dose of peptide was 50 mg per kilogram of body weight. Hydrolyzed peptides were prepared from wastes of rainbow trout in Artemia and Aquaculture Institute (Urmia University). At the end of the treatment period, the rats' fresh feces were collected and bacterial genomic DNA was extracted using the extraction kit. Then the dominant microbiome of the intestine was identified by polymerase chain reaction based on the 16S rRNA gene. Finally, the reaction product was sequenced and the final identification was made by comparing the gene information recorded in the gene bank. The results showed that the bacterial diversity in group A that consumed only alcohol decreased. In the group P, consuming only peptides, beneficial bacterial composition was documented. In the group A+P, the same bacterial flora were observed as in the group P. It can be concluded that bioactive peptides have significant beneficial effects on altered gut microbiota caused by the alcohol.

**Key words:** gut microbiota, bioactive peptide, fish by-products, alcohol, rat