Title: The protective effect of protein hydrolysates from rainbow trout (Oncorhynchus mykiss) by-products (bioactive peptide) against induced learning and memory impairments in rats

Summary:

One of the characteristics of animals and humans is the change in behavior based on past experiences. Learning and memory refer to acquiring information, retaining it, and storing it. The adverse effects of alcohol consumption on overall health, especially on memory, have been reported. Previous studies support the idea that alcohol consumption can seriously impair memory. This impairment includes a reduction in brain volume, especially in memory-related areas such as the hippocampus, as well as a decrease in the number of neurons in these regions. Recent studies have reported positive effects of bioactive peptides on physiological functions of the body, including improved learning and memory. Recent studies have also that bioactive peptides derived from hydrolyzed proteins of fish by-products have many benefits, including antioxidant activities, anti-hypertensive effects, antimicrobial properties, and positive effects on memory. The aim of this study was to investigate the modulatory effect of hydrolyzed proteins extracted from rainbow trout waste on the reduction of alcohol-induced learning and memory impairment in rats. This study was conducted on 24 male Wistar rats aged 6 to 8 weeks with an average weight of 250±15 grams. The rats were divided into four equal groups. The first group served as the control and did not receive any substance. The second group received only alcohol. The third group solely received the peptides, and finally, the fourth group received both alcohol and the peptides. The experiment lasted for one month. The consumed alcohol dose was 4 to 6 grams per kilogram of body weight, and the used peptide dose was 50 milligrams per kilogram of body weight. After the treatment period, in order to assess spatial memory, the animals underwent evaluation using the Morris Water Maze. The results of performance, including time and distance traveled in the target quadrant, were analyzed statistically. The statistical analysis showed no significant difference in the mean performance among the groups. Therefore, it can be concluded that the bioactive peptides used in this study, at the mentioned doses, did not have preventive effects on the adverse effects of alcohol on learning and memory.

Key words: learning and memory, bioactive peptides, rainbow trout by-products, alcohol, rats