

Evaluation of antibacterial compounds of aqueous and alcoholic extracts of *Chlorella vulgaris* on the shelf life of fish powder

Abdolmajid Nooraei¹

Peyman Mahasti Shotorbani ^{2*}

Afshin Akhondzade Basti³

Saeid Tamadoni Jahromi⁴

Maryam Tala⁵

1. Student of Food Hygiene and Quality, Islamic Azad University, International Branch, Qeshm Island, Qeshm, Iran.

2. Department of Food Hygiene and Quality, Oloum Tahghighat Branch, Islamic Azad University, Tehran, Iran.

3. Department of Food Hygiene and Quality, Faculty of Veterinary Medicine, Tehran University, Tehran, Iran.

4. Department of Biotechnology, Persian Gulf and Oman Sea Ecology Research Center, Iranian Fisheries Sciences Research Institute, Agricultural Research Education and Extension Organization (AREEO), Bandar Abbas, Iran.

5. Department of Fisheries, Islamic Azad University, Qeshm Branch, Qeshm, Iran.

***Corresponding author:**

pmahasti@yahoo.com

Received date: 2022.02.04

Reception date: 2023.03.13

Abstract

The aim of this study was to investigate the antibacterial composition of aqueous and alcoholic extracts of *Chlorella vulgaris* microalgae. The samples were isolated from the shores of the Persian Gulf during a series of screening methods. Subsequently, microalgae were isolated and identified and finally microalgae biomass was prepared. In the next step, aqueous and methanol extracts were prepared from the studied microalgae. For total count of bacteria (*Salmonella*, *Bacillus cereus*, and *Staphylococcus aureus*), pour plate method and nutrient agar culture medium were used. In this study, SPSS statistical software was used for data analyzing. The results show that the frequency of related microbial parameters such as *E. coli*, *Salmonella*, mold and yeast, as well as the amount of chemical agents studied in fish meal such as peroxide, free fatty acids in both aqueous and alcoholic extracts, the histamine and volatile nitrogen have increased by the time. In this regard, the results showed that the trend of *Salmonella* frequency changes was relatively similar to that of *E. coli* in the aqueous extract. So that with increasing its frequency, it had a relatively decreasing trend. *Salmonella*, mold, yeast and changes related to peroxide and total volatile nitrogen levels had a strong positive convergence to histamine levels. This is due to the interactions of microbial agents and the effect of these factors on some of the studied chemical agents and their interactions on the quality of fish powder in aqueous extract.

Keywords: *Chlorella vulgaris*, *E. coli*, *Salmonella*, Fish powder.