



University of zabol
Graduate school
Faculty of science
Department of Biology

**The Thesis submitted for the Degree of M.Sc
(in the field of Genetic)**

Title:

**The effect of *Sargassum* spp. extract on expression of immunity-
related genes (*lysozyme* and *crustin*) of *Litopenaeus vannamei***

Supervisors:

Dr. Fatemeh haddadi

Dr.Sagad pourmozafar

Advisors:

Dr.Saeed tamadoni gahromi

Dr.Hosein kamaladini

By:

Shima Abbaszadeh

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Abstract:

Algae are very simple organisms, containing chlorophyll, which are formed from one or more groups of cells in a colony. Algae account for 60% of the Earth's oxygen production. The use of porcine algae in the diet has had physiological effects on shrimp. Shrimp could be a viable alternative to antibiotics if they have a positive effect on the expression of immune-related genes. Accordingly, in this study, the effect of extracts extracted from the alga *Sargassum spp* on the function of *lysozyme* and *crustin* genes and hemolymph markers of *Litopenaeus vannamei* was investigated. This study was conducted in a completely randomized design with 4 treatments and each treatment with 3 replications. Treatments including 0, 5, 10 and 20 g per kg of food, aqueous extract of *Sargassum spp* algae were performed. RNA was extracted from hepatopancreas and Real Time PCR technique was used to study gene expression and data were analyzed by SPSS 17 software and DNA extraction and PCR were performed for genetic identification of macroalgae. The results of *lysozyme* and *crustin* gene expression and biochemical index of glucose were not significant and the biochemical indices of albumin, triglyceride, cholesterol and protein were not significant. The results of gene sequence matching showed 99% homology of *PSbA* gene of *Sargassum spp* isolate against algal strains in NCBI gene bank. The homology results of *Sargassum spp* algae with *Sargassum ilicifolium* strain were 99.76%. The results show that algae extract on *Litopenaeus vannamei* did not have a significant effect on the expression of *lysozyme* and *crustin* genes, so it did not have an immunogenic effect on the defense system of *Litopenaeus vannamei*.

Keywords: *Sargassum*, *Litopenaeus vannamei*, *Lysozyme* gene, *Crustin* gene, Macroalgae