



Certificate of Participation

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for Presentation of

**EFFECTS OF DIFFERENT LEVELS OF Bacillus subtilis AND Bacillus licheniformis ON DIGESTIVE ENZYME
ACTIVITIES IN Artemia urmiana**

A handwritten signature in black ink, appearing to be 'RP', written over a horizontal line.

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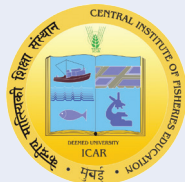
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STUDY THE ONTOGENY OF DIGESTIVE ENZYME ACTIVITIES IN *Artemia urmiana*

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Artemia as a major live food has special importance in aquaculture. *Artemia urmiana* is an endemic species of Iran. Urmia Lake the unique habitat of *Artemia urmiana* has been threatened over the last decade due to the successive droughts and pollutants entrance. As a result, the *artemia* population in the Lake has been sharply dropped in recent years. One possible approach to protect *Artemia urmiana* is to expand its large scale production. However, the Laboratory culturing of *artemia* is restricted due to problems involved in micro-algal production. Assessment of digestive enzyme activities is considered as an appropriate tool to study the digestive capacity of animals. However, few studies have been carried out in order to assess the feeding physiology of *artemia*.

This study was conducted to evaluate the ontogeny of digestive enzyme activities of *Artemia urmiana* (from instar I to maturity). *Artemia* hatching and rearing were performed according to standard protocols. In the first five days of rearing, *Saccharomyces cerevisiae* was used to feed *artemia*. From 6th day, a mixed diet containing wheat flour, soy flour and chickpea flour was fed to animals. The chemical composition of the diet is shown in Table 1. Samples were taken on days 1, 5, 10, 15 of the experiment.

The results showed that the gut of *Artemia urmiana* is active from the first day by secretion of digestive enzymes (Fig. 1). The activities of the digestive enzymes were increased with age. There were no significant differences among digestive enzyme activities. In day 5, lipase enzyme activity was higher than the others ($P < 0.05$). In the tenth and fifteenth days, significant differences were observed among all enzymes, and lipase activity was the highest. At the beginning of the experiment, amylase showed the highest activity, however over the time its activity decreased and lipase activity was increased. It seems older *artemia* can consume and digest more fats. It is likely that young growing *artemia* has good potential to use high starch and protein diets, whereas adult *artemia* is more adopted to use high fat diets.

Table 1- Chemical analysis of *Artemia urmiana* diet during the experiment (%)

| Ash | Crude Protein | Crude Fat |
|--------|---------------|-----------|
| 5±0.35 | 55±1.2 | 12±0.93 |

