

Laboratory Culture of the Caspian Sea Calanoid Copepod *Acartia clausi* (Giesbrecht, 1889) at Different Salinity Levels

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Abstract: The Caspian Sea calanoid copepod, *Acartia clausi*, has good potential for mass culture as a live feed for mariculture. This study was carried out to investigate the effects of salinity on density of *A. clausi* at four salinities of 13, 20, 35 and 45 ‰ in 15 L carboys container and mass culture at two salinities of 13 and 35 ‰ in 100 L fiberglass culture tanks over a two weeks period. *A. clausi* was cultured at temperature 25-26 °C and fed with two algal diets including *Isochrysis galbana* and *Chaetoceros calcitrans* at food concentration 40×10^3 cells mL⁻¹. Results showed that salinity had significant effects on density in 15 L container. With an initial stocking density of 5 adults LG¹, maximum and minimum mean density reached to 435.13 ± 75.05 and 103.96 ± 12.56 individuals LG¹ at salinities of 13 and 45 ‰ with significant (P<0.05) differences between treatments, respectively. Population density was not significant at 13 and 35 ‰ in 15 L containers (P>0.05). In 100 L tanks with an initial stocking density of 18-20 adults LG¹, the mean density was not significant (P>0.05) at two salinities of 13 and 35 ‰. Total mean copepod production reached to densities of 1048.15 ± 186.4 and 1402.26 ± 270.7 individuals LG¹ with the dominance of nauplius stages at salinities of 13 and 35 ‰, respectively. Maximum density was recorded 3437 individuals LG¹ (3267 nauplii, 73 copepodites (C1-5) and 97 adults LG¹) at salinity of 35 ‰. The results of this study recommended that *A. clausi* is a euryhaline species and can tolerate different salinities in culture conditions; however, it is better to be cultured at salinity of 35 ‰ for maximum population density growth.

Key words: Copepod % Salinity % *Acartia clausi* % Density % Caspian Sea % Live Feed

INTRODUCTION

Copepods constitute a major part of the diet of fish larvae in the natural pelagic food chain; in which, the three main orders including Calanoida, Harpacticoida and Cyclopoida have each been investigated for their suitability for larval and juvenile fish that each order has its advantages and disadvantages [1].

In aquaculture, copepods are generally considered to be nutritionally superior live feeds, as they are a valuable source of protein, lipid (especially highly unsaturated fatty acids contents, 20:5n-3 and 22:6n-3), carbohydrates, enzymes (amylase, protease, exonuclease and esterase),

vitamins (C and E), small size, digestibility and their swimming motion [2-4], which are essential for larval survival, growth, digestion and metamorphosis [5-8]. Different studies showed that copepods diets show more significant benefits to increase larval marine fish growth and development better than rotifers *Brachionus* spp. and *Artemia* [6, 9-16]. Despite these findings, enriched rotifers and *Artemia* will probably continue to be the live feeds of choice in commercial hatcheries [15-17].

In general, copepods are difficult to culture at sufficient densities to be economically efficient on a commercial scale, because they require high water volumes for cultivation in captivity and this is perceived