



Effect of concentration of the microalga *Dunaliella tertiolecta* on survival and growth of fairy shrimp, *Phallocryptus spinosa* Milne Edwards, 1840 (Crustacea: Anostraca)*

Mohammad Reza Gharibi¹, Behroz Atashbar², Naser Agh³, Mohammadali Nematollahi⁴, Mohammad Sadegh Aramli⁵ & Ahmad Noori^{1*}

¹Department of Fisheries, Faculty of Marine and Atmospheric Sciences, Hormozgan University, Bandar Abbas, Iran

²Department of Ecology and Resource Assessment, Urmia Lake Research Institute, Urmia University, Urmia, Iran

³Department of Artemia and Aquaculture, Urmia Lake Research Institute, Urmia University, Urmia, Iran

⁴Department of Fisheries, Faculty of Natural Resources, University of Tehran, Karaj, Iran

⁵Department of Fisheries, Faculty of Natural Sciences, Urmia University, Urmia, Iran

Correspondence: M S Aramli, Department of Fisheries, Faculty of Natural Sciences, Urmia University, Urmia, Iran. E-mails: m.aramli@urmia.ac.ir; msaramli@gmail.com

*Correction added on 5 May 2015, after first online publication: the article title, author names and affiliations have been modified. Also, the species name '*Streptocephalus torvicornis*' has been replaced with '*Phallocryptus spinosa*' throughout the article.

Abstract

We investigated the effects of concentration of the microalga *Dunaliella tertiolecta* on the growth and survival of fairy shrimp, *Phallocryptus spinosa*. Newly hatched nauplii were stocked into containers, maintained at different concentrations of *D. tertiolecta* (at 18, 36, 54, 72 and 90×10^6 cells mL^{-1}). All treatments were in quadruplicate and each replicate was stocked with 100 larvae in a 2-L cylindrical bowl. We studied the survival and growth of the fairy shrimp after 3, 6, 9, 12 and 15 days of culture. The results indicated significant differences, in terms of growth and survival, of fairy shrimps fed at different algal densities. The highest and lowest growth and survival among the treatments were observed on Day 15, the highest in animals fed at a concentration of 90×10^6 cells mL^{-1} and the lowest in animals fed at a concentration of 18×10^6 cells mL^{-1} . We conclude that the growth and survival of the *P. spinosa* increased with increasing density of algae, to a threshold level. Within certain concentration limits, the addition of *D. tertiolecta* substan-

tially improved the performance of larval culture of *P. spinosa*, suggesting that this fairy shrimp has potential in terms of aquaculture development.

Keywords: Anostraca, fairy shrimp, *Phallocryptus spinosa*, microalgae, *Dunaliella tertiolecta*, growth and survival

Introduction

Fairy shrimp are entomostracan crustaceans living in ephemeral waters, worldwide. They belong to Phylum Arthropoda, Subphylum Crustacea, Class Branchiopoda and Order Anostraca (Sanoamuang, Murugan, Weekers & Dumont 2000; Sanoamuang, Saengphan & Murugan 2002; Sanoamuang & Saengphan 2006). They can be successfully cultured for mass production in circular concrete outdoor ponds and earthen ponds, and can be used as a suitable feed for aquatic animals such as ornamental fish and giant freshwater prawn (Saejung, Hatai, Wada, Kurata & Sanoamuang 2011; Sornsupharp 2012). *Phallocryptus spinosa* is one of the most common fairy shrimp species found in