CULTURE OF TWO CONSECUTIVE GENERATIONS
OF CUTTLEFISH, Sepia officinalis (Linnaeus, 1758),
USING LIVE GRASS SHRIMP (Palaemonetes varians)
AS THE ONLY PREY

António V. Sykes, Pedro M. Domingues & José P. Andrade

CCMAR - Universidade do Algarve
Campus de Gambelas - 8000–810 Faro – PORTUGAL
email: asykes@ualg.pt

INTRODUCTION

Cephalopods have a great potential for aquaculture because of their short life cycles, fast growth rates, high food conversion efficiencies and high market value (Lee, 1994; Lee et al., 1998). The cuttlefish, Sepia officinalis, is one of the species of cephalopods most commonly cultured, both in Europe and United States, because it has several characteristics that make it one of the most promising cephalopod species to be cultured in large scale (Forsythe et al., 1994).

Until now, acceptable growth rates and low mortality have been obtained feeding live myxishrimp during the first few weeks of their life. Nevertheless, costs associated with mysid production and their low fecundity (Domingues et al., 1998; 2000) makes them a bottleneck in the first stage culture of the cuttlefish.

Live grass shrimp (Palaemonetes varians) might be used as an alternative first diet, since it has been used in post-hatching culture of the cuttlefish with good results (Domingues et al., 2001).

The objective of this research was to determine if S. officinalis could be cultured through the life cycle exclusively on a diet of live grass shrimp, and the consequences on growth, mortality, age at the time of spawning, fecundity and fertility, among other aspects of the life cycle.

MATERIAL & METHODS

Winter Cycle: Summer Cycle:
► 27 hatchlings; ► 30 hatchlings;
► Temperature - 15±3 °C; ► Temperature - 23±2 °C;
► Salinity - 35±2 PSU; ► Salinity - 37±2 PSU.

Both populations were fed ad libitum with live grass shrimp (P. varians). Cuttlefish were weighed every 10 days. Data collected was used to calculate: 1) Mean Weight; 2) Mean Instantaneous Growth Rate (IGR) (%Body Weight d⁻¹)=\(\frac{\text{Ln}W_2-\text{Ln}W_1}{t}\times100\), where W₂ and W₁ are the final and initial weight, respectively. In the natural logarithm and t the number of days of the time period and 3) Survival rates.

Eggs were collected and 50% were weighed on a daily basis, and total egg numbers and weight were determined. Egg laying periods were determined for both experiments. From all the newly born hatchlings, about 30% were individually weighed to determine mean hatching weight. Fertility (number of hatchlings born from the total of eggs laid) was also determined.

All adult cuttlefish were weighed after death and examined for sex determination, to determine differences in weight between males and females, as well as sex ratio within each group.

CONCLUSIONS

►We succeeded in culturing the cuttlefish during two consecutive generations using live grass shrimp as the only prey;
►Hatchlings easily preyed upon grass shrimp with sizes that could be twice as big as their mantle length, in both cycles;
►Temperature was the most important factor to explain the great differences between the winter and summer cycles;
►Growth was considerably faster during the summer and life span was shorter, due to the much higher temperatures (23±2 °C compared to 15±3 °C);
►Grass shrimp seems to be a good food for the culture of the life cycle of the cuttlefish. It replaced mysids as first food with similar results in body weight at the time of spawning.

REFERENCES


ACKNOWLEDGEMENTS

António Sykes would like to thank the Fundação para a Ciência e a Tecnologia, from the Portuguese government, that provided the funding for this research.