

G_G0024: SEMI-CONTINUOUS CULTIVATION OF COPEPOD *Oithona* SP. FED WITH MIXED MICROALGAE *Isochrysis galbana* AND *Tetraselmis suecica*

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Abstract: Copepod is the zooplankton widely used as live feed in marine fish hatchery. With this study, mixed microalgae, *Isochrysis galbana* and *Tetraselmis suecica*, were used for copepod *Oithona* sp. cultivation under laboratory condition. It was found that copepod fed with mixed microalgae had the highest nauplii density of 3,445 ind./L and adult density of 1,442 ind./L which was significantly higher than copepod fed with single microalga. Semi-continuous harvesting of copepod was successfully and average nauplii copepod productivity of 4,208±4,190 ind./L/day was achieved with mixed microalgae feeding.

Introduction: Copepod is the zooplankton used as live feed for marine animal larviculture. Copepod is high in nutritional value and small in size, which can be widely fed to several fish species. Size of copepod nauplius is only 56-120 microns so it can be used for grouper larviculture due to the small mouth size of grouper larvae². To produce a good quality copepod, high nutritional microalgal species must be fed into copepod culture. This study is an attempt to apply mixed culture of microalgae, *Isochrysis galbana* and *Tetraselmis suecica*, as feed for copepod culture under laboratory condition.

Methodology: Stock culture of microalgae was prepared by adding 100 ml of *I. galbana* or *T. suecica* stock culture into 800 ml of F/2 algal medium in 1 L Duran bottle. On the other hand, mixed culture of microalgae was performed by an inoculation of 25 ml *I. galbana* and 75 ml *T. suecica* stock cultures. Microalgae were grown under continuous light (8,000 Lux) with continuous aeration. The experiment consisted of three replicates. When the microalgae reached exponential growth phase, 100 ml of copepod (*Oithona* sp.) stock culture was added into algal cultures. During the experiment, semi-continuous harvesting was performed by replacing 300 ml of copepod culture with 300 ml of *I. galbana* (C1), *T. suecica* (C2), or a mixture of *I. galbana* and *T. suecica* (T1). Cell density of microalgae was measured by cell count with haemocytometer under light microscope. Growth of copepod was determined by Sedgewick-Rafter counting chamber. Ammonia concentration in copepod cultures was measured according to standard method for water and wastewater analysis.

Results and Discussion: Growth curve of copepod under semi-continuous cultivation are shown in Figures 1-3. It was found that the highest copepod density was found in copepod fed with mixed microalgae. Average density of adult copepod fed with *I. galbana* (C1), *T. suecica* (C2) and mixed culture of *I. galbana* and *T. suecica* (T1) were 348±471, 630±546 and 1,442±957 ind./L, respectively. Number of nauplii were also highest in mixed microalgae feeding with the average density of 861±1,073, 1,584±1,467 and 3,445±2,368 ind./L for C1, C2 and T1, respectively. Average nauplii copepod productivity under semi-continuous cultivation with mixed microalgae was 4,208±4,190 ind./L/day. Similar results were found

with *Acartia sinjiensis* fed with *Isochrysis sp.* and *T. chuii*³. This was probably due to higher rate of development and metamorphosis¹. Ammonia concentrations in C1, C2 and T1 were 0.142 - 0.364, 0.164 - 0.257, and 0.167 - 0.305 mg NH₄-N/L, respectively, which were in acceptable range.

Conclusion: In conclusion, copepod fed with mixed microalgae had significant higher density than single microalga diet. Semi-continuous harvesting could be performed for several times without any effect on copepod production. Mixed microalgae feeding could be further applied for copepod production in fish hatcheries.

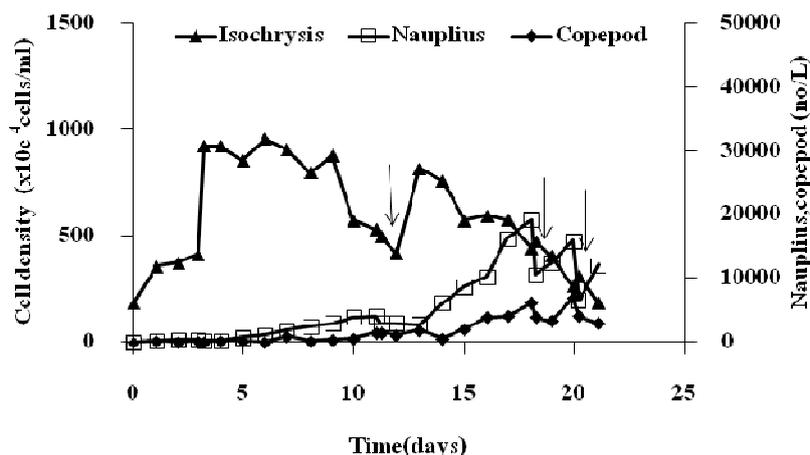


Figure 2. Semi-continuous culture of copepod fed with *Isochrysis galbana*. Arrows indicate copepod harvesting and microalgal addition.

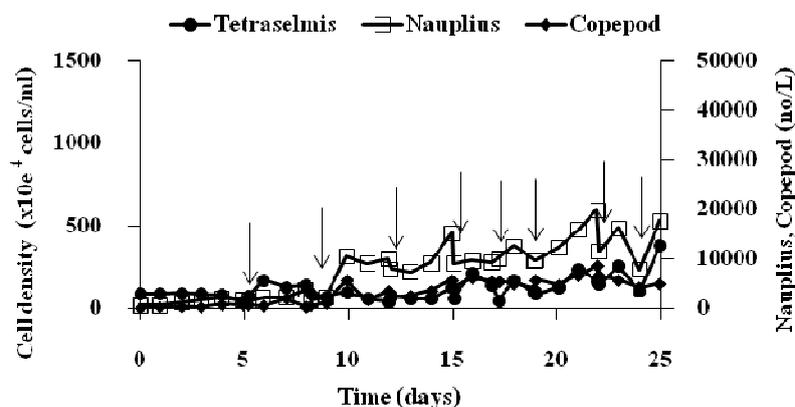


Figure 3. Semi-continuous culture of copepod fed with *Tetraselmis Suecica*. Arrows indicate copepod harvesting and microalgal addition.

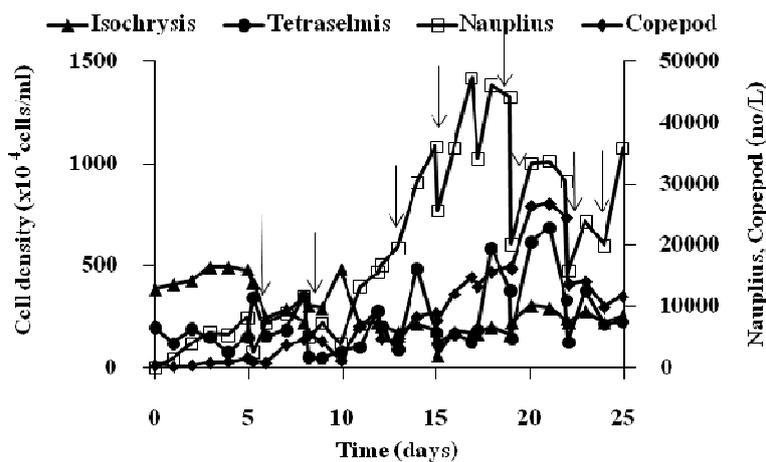


Figure 4. Semi-continuous culture of copepod fed with mixed microalgae *Isochrysis galbana* and *Tetraselmis Suecica*. Arrows indicate copepod harvesting and microalgal addition.

References:

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