

Some aspects of characterization of an unidentified diatom species and its performance as a live food for larval stages of the shrimp, *Penaeus monodon*

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ABSTRACT

Live feed are essential in larval rearing of shrimp and presently, only two species of diatoms, *Chaetocerus* sp. and *Skeletonema* sp. are used in shrimp hatcheries globally. *Chaetocerus* cultures "crash" very often and it is difficult to maintain pure cultures of *Skeletonema* sp. Therefore a unicellular unidentified diatom species was isolated and was propagated with a view to employ in larval rearing of *Penaeus monodon*. Growth rate of the diatom was measured at different salinities. Feeding experiments under laboratory conditions were carried out giving the diatom as the sole food ($5,000 \text{ cells ml}^{-1}$) to zoea larvae and a mixture of the diatom and rotifer, *Brachionus plicatilis* ($5,000 \text{ cells ml}^{-1}$ and $10 \text{ rotifer ml}^{-1}$) to mysids up to day one old post larvae (Pl_1). The diatom was then used to feed zoea larvae in the commercial scale production of 18 days old post larvae (Pl_{18}).

Six days old colonies of the diatom appeared greenish brown and measured 2-3 mm in diameter on the agar plate. Diatom cells in the liquid medium were 8-12 μm long and 4-5 μm wide and cylindrical in shape. The maximum cell density ($3.7 \times 10^6 \text{ ml}^{-1}$) was achieved at 84 hours from inoculation at salinity of 27 g l^{-1} in the liquid medium and the cell density remained above $3.0 \times 10^6 \text{ ml}^{-1}$ for 196 hours after reaching its peak. Cell density of the diatom species achieved at this salinity was significantly higher ($P < 0.05$) than those in other salinities tested. The generation time of the diatom was 5.92 hours. A survival of 91.4% to 100% was recorded from nauplii to Pl_1 under the laboratory feeding experiment. Survival recorded for the commercial scale production from nauplii to Pl_{18} ranged from 44.2% to 88.6%. The time taken for metamorphosis from zoea stage to mysis stage and mysis stage to post larva stage was 4 and 3 days respectively.

The diatom species isolated in the present study can be successfully cultured and the results of the feeding experiment and the commercial scale production show that this diatom species appears to be suitable as a live food for the larval stages of the shrimp *P.monodon*.