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Identification and culture of common diatoms as possible feed for *Penaeus monodon*.

By

Thanom Pimoljinda

Diatoms were collected from Buyuan Bay, and from the hatchery tanks at Tigbauan, to determine the commonly occurring species, the feasibility of culturing these species, and the potential of these selected species as food to larval *Penaeus monodon*. The commonly occurring diatoms were identified as *Chaetoceros calcitrans*, *Navicula grimeii*, *Nitzschia seriata*, *Nitzschia closterium* and *Amphiprora* sp. These diatoms were isolated by the microcapillary technique and unialgal cultures prepared using the synthetic medium formulated by the SEAFDEC Phycology Laboratory (Annual Report 1976). Pure cultures were maintained up to a maximum density of 3×10^6 cells/cc under controlled laboratory conditions and were used as starters for mass production in outdoor fiberglass tanks. Protein content analysis using the micro-Kjildahl method gave the following result: *Chaetoceros calcitrans*, 11.78%; *Nitzschia seriata*, 25%; *Nitzschia closterium*, 30.5%; *Navicula grimeii*, 9.06% and *Amphiprora* sp. 8.96%.

Feeding experiments were conducted to determine acceptability of the different diatom species and percentage survival of larval stages $Z_1 - M_2$. Larvae were placed in 4-L capacity plastic containers with a stocking density of 10/liter. The results of several feeding trials using the different mass-produced diatoms are summarized in Table I.

From the data gathered, *Chaetoceros calcitrans* appears to be the most promising candidate as feed for zoea and mysis stages of *P. monodon*. The average percentage survival of *C. calcitrans* was 63.76% for the 3 trials, and as high as 82.22% in the third trial. Comparatively high percentage survival of larvae was also recorded when *Nitzschia seriata* (48.17%) and *Nitzschia closterium* (67.6%) were given as feed, while both *Amphiprora* sp. and *Navicula grimeii* gave 0% survival. The poor results with *Amphiprora* sp. and *Navicula grimeii* may be due to their low protein content (8.96% and 9.06%, respectively) and the inability of the larvae to ingest them. *Navicula* and *Amphiprora* were observed to cling to the appendages of the larvae and to settle down in the medium making them unavailable to the larvae. Low survival was also noted when frozen *Chaetoceros calcitrans* was used (14.25%). This may be due partly to the effect of the flocculating agent (ALSO₄, 25g/L) used in concentrating the diatoms.

When protein contents of *C. calcitrans*, *N. seriata* and *N. closterium* are compared, the 2 *Nitzschia* species have relatively higher protein contents than *C. closterium* and, therefore, could be the more desirable feed candidates. However, few feeding trials were made using *Nitzschia* so that additional investigations will have to be done on this aspect.

Table 1. Survival rate of larvae *P. monodon* (7₁-M₂) using different species of diatoms as feed.

| Feeding Trial | Diatom species | No. of replicates | Average % survival | |
|---------------|----------------------------------|-------------------|--------------------|-------|
| I | <i>Chaetoceros</i> | 3 | 35.75 | 63.76 |
| II | <i>C. calcitrans</i> | 3 | 73.33 | |
| III | <i>C. calcitrans</i> | 5 | 82.22 | |
| IV | <i>C. calcitrans</i> (frozen) | 3 | 18.55 | |
| II | <i>Nitzchia seriata</i> | 3 | 48.57 | 48.17 |
| III | <i>N. seriata</i> | 5 | 49.97 | |
| III | <i>Nitzchia closterium</i> | 5 | 67.6 | |
| II | <i>Amphiprora</i> sp. | 3 | 0 | |
| I | <i>Navicula</i> sp. | 3 | 0 | |

