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SAOWAPA SAWATPEERA : STUDIES ON FEEDING AND GROWTH OF THE THAI ABALONE HALIOTIS ASININA LINNEAUS. THESIS ADVISOR : SUCHART UPATHAM, Ph.D., MALEEYA KRUATRACHUE, Ph.D., YAOWALUK CHITRAMVONG, Ph.D. 143 P. ISBN 974-662-085-1

Samples of the abalone, *Haliotis asinina*, were collected from Samed Island, Rayong Province, Thailand by SCUBA diving every three months for a period of one year for determination of gut contents. The average shell length and total body weight for these samples were 68.3 ± 9.1 mm and 48.2 ± 11.4 g. The average volume of micro-contents ($< 120 \mu\text{m}$) in gut contents was 80.3 % and that of macro-contents ($> 120 \mu\text{m}$) was 19.7 %. Most micro-organisms were benthic diatoms (99.3 %) and the dominant genera were *Nitzschia*, *Amphora*, *Cocconeis*, *Navicula* and *Diploneis*. Macro-contents consisted mainly of sand granules and foraminiferans. Therefore, the main food of *H. asinina* along Samed Island appeared to be comprised of benthic diatoms which were the predominant floral elements in the local environment.

Larval development of *H. asinina* was observed from fertilization to the formation of the fourth tubules of cephalic tentacle under the water temperature 25, 28, 31 and 34 °C. After settlement, the development of the post-larvae through the formation of the first respiratory pore was observed under room temperature (28-35 °C). The average size of fertilized egg was $126.4 \pm 17.1 \mu\text{m}$ in width and $148.2 \pm 10.4 \mu\text{m}$ in length. The time periods of larval development were 65, 49, 41 and 41 hours at water temperatures of 25, 28, 31 and 34 °C, respectively. The biological zero point was 15.0 ± 0.3 °C. The effective accumulative temperatures (EAT) of complete larval development of *H. asinina* in water temperatures of 25, 28, 31 and 34 °C were 650, 637, 656 and 779 °C-hours, respectively. The size of larvae at the completion of development was $178.3 \pm 5.2 \mu\text{m}$ in width and $245.7 \pm 4.6 \mu\text{m}$ in length. The formation of the first respiratory pore began on day 24 to day 30 depending on the temperature, diatom type and density of abalone in settlement tank.

Experiments on natural food utilization by *H. asinina* were conducted over a period of 184 days using nine species of macroalgae, *Acanthophora spicifera*, *Gracilaria fisheri*, *G. salicornia*, *G. tenuistipitata*, *Enteromorpha intestinalis*, *Caulerpa racemosa*, *Dictyota dichotoma*, *Padina minor* and *Sargassum polycystum*. The highest growth rate (23.6 ± 2.4 mg/day in weight), survival rate (95.6 ± 1.6 %), and the best food conversion rate (FCR) (3.2 ± 0.5) were obtained with the red alga, *G. tenuistipitata*. The brown alga, *P. minor*, gave the lowest growth (-0.3 ± 0.3 mg/day in weight) and survival rate (7.8 ± 1.6 %). The proximate composition of these nine species of algae was determined to suggest correlation with growth rates. *G. tenuistipitata* was found to have the highest content of protein and carbohydrate.

Experiments of artificial food utilization by *H. asinina* were conducted over a period of 140 days using seven formulae of artificial diets and fresh *G. salicornia* as control. Protein sources of diet formulae I - IV were 30 % macroalgae (*A. spicifera*, *E. intestinalis*, *G. fisheri* and *G. salicornia*) and diet formulae V - VII were 30 % casein and 30 % macroalgae (*G. fisheri*, *G. salicornia* and *G. tenuistipitata*). The abalone fed fresh *G. salicornia* had a higher growth and survival rates than those fed artificial diets. Among artificial diets, the highest growth rate (6.4 ± 2.3 mg/day in weight) was obtained with the diet containing casein and *G. salicornia*; the best FCR (19.2 ± 4.7) with diet containing casein and *G. salicornia*; and the survival rate (78.3 ± 2.9 %) with diet containing *G. fisheri*.