CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

From this study for the population dynamics of the Asian moon scallop, *Amusium pleuronectes* (Linn.), around Chang Islands, eastern coast of the Gulf of Thailand, lead to the following results :

1. The growth parameters of the von Bertalanffy growth model estimated from shell height-frequency data by using the ELEFAN program are that asymptotic shell height; L_{∞} = 11.4 cm, and the growth constant; K = 1.3 (per year). The growth curves for the population in the area show two cohorts per year. These results appear to be reasonable and comparable with those previous studies of the same species, *Amusium pleuronectes* in the Philippines, and the *Amusium balloti* in Australia. Estimates from separated populations according to the separated areas, i.e. inner and outer zones, around Chang Islands are also very similar. The species is considered as a fast-growing scallop.

2. As same as the result obtained from the same species in the Philippines, longivity or life-span of *A. pleuronectes* from Chang Islands is approximated to be about 2 years. This scallop is classified as a short-lived species.

3. Total mortality (Z) of *Amusium pleuronectes* around Chang Islands is estimated by ELEFAN program to be 4.36. Approximate natural mortality (M) based on the mean M/K values from available

bivalve literatures is 1.82. The fishing mortality (F) yielded by substracting the M from Z value is equal to 2.54.

4. The recruitment pattern determined from the ELEFAN program, consists of two recruitment pulses per year, one major and one minor. The major pulse of about 77.4 % recruitment and the minor 22.8 % are separated by about 4 and 8 months interval.

5. All the relationships among different shell dimensions of *Amusium pleuronectes* from Chang Islands, determined from 634 specimens, are allometric. Shell height (H) - shell length (L), shell height - shell depth (D), and shell length - shell depth relationships are respectively expressed as:

$$L = -0.372 + 1.035738\ H \quad ; \quad \text{with } r^2 = 0.9887$$

$$D = -0.47502 + 0.2621\ H \quad ; \quad \text{with } r^2 = 0.9132$$

$$D = -0.38489 + 0.253624\ L \quad ; \quad \text{with } r^2 = 0.9277$$

6. The relationships between shell height and various weights of *Amusium pleuronectes* are all allometric. From 634 specimens, except for shell height-gonad weight relationship which was determined from only 576 specimens, the relationships of shell height to total weight (TW), shell weight (SW), flesh weight (FW), adductor muscle weight (AW) and gonad weight (GW), respectively, are expressed as :

$$TW = 0.045401\ H^{3.184}$$

$$SW = 0.0242298\ H^{3.103}$$

$$FW = 0.0121668\ H^{3.473}$$

$$AW = 0.004891\ H^{3.561}$$

$$GW = 1.223 \times 10^{-6}\ H^{6.606}$$

7. Maturation and spawning of *Amusium pleuronectes* of Chang Islands occur and continue throughout the year, with the major peak of spawning in January-March. Maturity size of the species resulted from this study starts from 4.8 cm.

8. The infestation of pea crab *Pinnotheres* sp. in the scallop *Amusium pleuronectes* was found most abundant in August with the rate of 18.97 %. This commensal crab causes deformation of gonad shape, and the gonad indices values are somewhat lower in the infested scallops than the uninfested specimens although the difference is not statistical significant.

Recommendations

1. The scallop *Amusium pleuronectes* is one of the valuable fishery resources in Thai waters, but until now there are still quite a few attentions being paid to the species. Various aspects on the biology and populations studies for this scallop are needed to be accomplished very soon to provide the baseline data which would necessarily lead to the conservation and management of Thai fisheries, e.g. studying distribution and abundance, investigation of the natural stock, determination of yield per recruitment, etc.

2. The potential of scallop aquaculture should be taken in consideration, as the *Amusium pleuronectes* is a fast-growing and short-lived species. The culture technology being in use for other scallop species in many countries may be applied for Thai scallop as well. The experimental scale should be undertaken to find out the feasibilities.

3. As this scallop species can continue reproduction throughout the year, the experiment on artificial propagation of the species should be carried out. If possible, the hatchery seed producing may be the other way to provide scallop seeds for culture besides seed collecting from natural beds.