# CHAPTER 5

## CONCLUSIONS AND RECOMMENDATIONS

Conclusions :

1. Early developement of tropical oyster (C. lugubris) was studied. Each stage of the early developement was observed. The developemental process was similar to C. gigas , C. virginica i.e.,the newly released unfertilized egg (fig.20) has a pear shape and compress. Within few minutes of exposing to sea water,the egg becomes globular in shape and with high density (fig.21). About 35 minutes afterfertilization, the first polar body (fig.22) appears on animal pole. The second polar body (fig.23) is seen 20-25 minutes after the formation of the first polar body. The first cleavage (fig.24) is formed within 75-100 minutes after fertilization by the meridional division of blastomere. At the beginning of this stage,the zygote appears to consist of three cells as in the American oyster and Galtsoff called it "trefoil". At the end of this stage,The zygote is divided into two unequal cells. The [illegible] blastomere again are divided meridionally into 4 quadrants and the biggest one becomes posterior portion. This stage is called the second cleavage stage (fig.26) which required 120 minutes after fertilization. The third cleavage stage (fig.27) is formed by equitorial division of the zygote. Since this stage is caused by the first quartet,the [illegible] micromeres are on the animal pole and the macromeres are on the vegetal

pole.The fourth and the fifth cleavage is reached by the formation of t the second and third quartet respectively (fig.28 and 29). The multicellular stage or the sixth cleavage stage is reached within 3 hours after fertilization (fig.30). By the epibolic gastrulation of sterroblastula,the moving blastula or the swimming blastula is reached (fig.31) within 4½ hours. The larvae of this stage have developed the strong positive phototaxis character. Brusca stated in the general patterns of invertebrates developement that during the trochophore stage of mollusks,the gut is complete and cilia become visible also shell secretion begins, The trochophore stage of C. lugubris took about 20 hours after fertilization. Yonge defined the veliger stage of oyster by the appearence of velum and this could beused for the veliger stage definition of C. lugubris . The straight hinge stage or D-shaped larvae (fig.34) is formed within 48 hours after fertilization.

2. It was found that the time required for every stage of the developement were decreased with the increase of incubation temperature.

3. The average percentage of the hatchability of oyster larvae increased from 57.18± 2.44 to95.41± 1.03 when the acclimation temperature increased from 23.5°C to 32.5°C.

4. The average percentage of abnormally developed eggs increased from 5.82± 2.91 to 8.26±4.56 when the acclimation temperature increased from 23.5°C to 32.5°C.

5. The average percentage of undeveloped eggs decreased from 21.89± 14.17 to 0.22± 0.44 when the acclimation temperature increased from 23,5°C to 32.5°C.

6. The maximum temperature that prevent the hatchability was at 35.5°C.

7.The critical thermal maximum (CTM) of the blastula swimming stage of oyster larvae at the three levels of incubation temperature were all the same at 48.5°C.

8. The CTM of D-shaped larvae acclimated at 23.5°C,28.0°C and 32.5°C were 48.17±0.29°C,48.17±0.29°C and 48.5°C respectively. The obtained data showed only a slight relationship between the CTM and the acclimation temperature.

9. The 12 hr-$Lt_{50}$ of the D-shaped larvae acllimated at 23.5°C, 28.0°C and 32.5°C were 34.95°C,37,95°C and 37.95°C respectively. The 24 hr-$Lt_{50}$ of D-shaped larvae acclimated at 23.5°C, 28.0°C and 32.5°C were 34.5°C,37.45°C and 37.6°C respectively. The obtained data showed that both 12 hr-$Lt_{50}$ and 24 hr-$Lt_{50}$ increased with the increse of the acclimation temperatures.

Recommendations :

1. The general biology of C. lugubris should be studied for more basicinformation.

2. The optimum condition for the developement of the tropical oyster (C. lugubris) should be intensively studied.

3. The effect of temperature on the developement of oyster larvae should be repeated to confirm the result.

4. The effect of the various toxicants on developement of oyster larvae could be possibly done by following some parts of this method. The result of this could be used for defining the water quality criteria

for mollusks.

5. The method of rearing from egg until spat should be improved for the mariculture program.

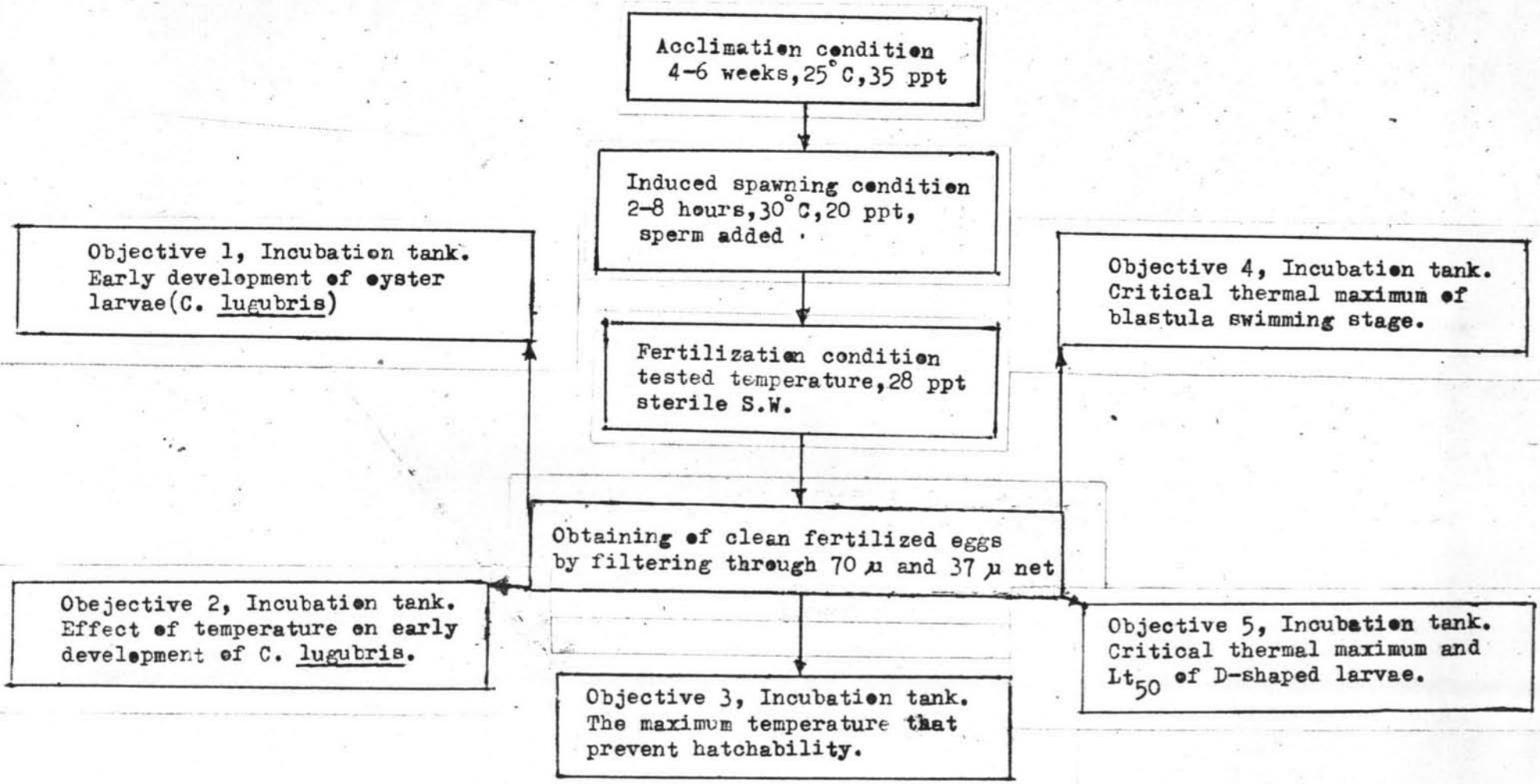


Figure 43 : The diagram for the studying of the effect of temperature on the development of oyster larvae (C. lugubris).