

ESTIMATIONS OF PHYSICO CHEMICAL PARAMETERS DURING MUSSEL CULTURE FROM NANDED REGION MAHARASHTRA.

A. V. Suryawanshi

Research Scholar Dept. of Fishery Science N.E.S .Science College Nanded. (M.S.) 431605

ABSTARCT

water samples were taken at regular monthly interval from Jan 2013 to Dec 2013 from site for analysis of physic-chemical parameters such as Temperature, Ph, Transparency, Total alkalinity, Dissolve Oxygen (DO), Free Carbon dioxide (CO₂), Chloride, Hardness, Calcium, Magnesium. During study period average air temperature was 26.4°c and water temperature was 23.9 °c. Hydrogen ion concentration was ranged from 7.6 to 8.4. Average transparency was found (50.3 cm). Average free CO₂ was (3.4 mg/L). Average dissolved oxygen content was (6.6 mg/L). Average chloride content was (77.6 mg/L). Average value was (115.3 mg/L). Average calcium content was (44.7 mg/L). Average magnesium content was (0.89 mg/L). *Lamellidens marginalis* and *Lamellidens corrianus* showed 80% survival rate from hanging culture method. During pearl culture operation excess mortality was observed in summer season.

Key words- physicochemical parameters & mussel culture

INTRODUCTION

The quality of aquatic life depends on the water quality and Fresh water bodies utilize successfully for Fish production, it is very important to study physico chemical factors, which Influence the biological productivity of water body. Mussel culture is a relatively less intensive form of aquaculture that depends upon natural stocks for seeding and depends on primary productivity for feeding. (Sasikumar & Mohamed 2000). Mussels are filter feeders, feeding exclusively on plankton and suspended organic particles that are available in the surrounding environment. Suspended materials available in the waters are trapped onto the mucous coating of the gills and are ingested. Mussel culture therefore involves the utilization of natural productivity in the cultured area. Physicochemical parameters are directly related with the mussel culture.

MATERIAL & METHODS

Study area is in between latitude 19° 10' & 29"N and longitude 77° 18' & 01" E. it is a circular cement tank with 2 m diameter and 1 meter dept and filled with bore well water and it is situated in N.E.S. Science

College, Nanded. It is a circular cement tank with 2 m diameter and 1 meter depth. Tank is filled with tap water and water level is maintained by using the same water. Tank is used for the study of physicochemical parameters. water samples were taken at regular monthly interval from Jan 2013 to Dec 2013, for analysis of physico-chemical parameters such as Temperature, pH, Transparency, Total alkalinity, Dissolve Oxygen (DO), Free Carbon dioxide (CO₂), Chloride, Hardness, Calcium, Magnesium. (Trivedy & Goel, 1986) and APHA (2000).

Physicochemical parameters and biological parameters such as temperature, hydrogen ion concentration, transparency, alkalinity, free CO₂, dissolve oxygen, chlorides, hardness, calcium, magnesium, productivity and planktons were studied from January 2013 to December 2013. These parameters are essential for mussel and pearl culture as they affect mussel and pearl culture operation. Productivity of pond, which is very important for the growth of mussel and it directly related to the food and feeding habits of mussel. For the study mussels were culture by adopting different methods such as basket culture, Rack culture, hanging culture in the same environmental condition (McCoy and Chongpeepien, 1988). In each culture system 10 mussels of each species such as *Lamellidens marginalis* and *Lamellidens corrianus* were used. Estimation of survival rate % from each culture methods by using formula given by (Bagenal, 1978).

Survival rate (SR%)

$$\text{Survival rate} = \frac{\text{Number of mussels survived}}{\text{Total number of mussels cultured}} \times 100$$

RESULT & DISCUSSION

The maximum air temperature was found in May (35°C) and minimum in December (19°C). Maximum water temperature was found in May (30°C) and minimum in December (18°C). T-test for Air Temperature and water temperature showed that the average air temperatures of both the sides are same. Highest hydrogen ion concentration was observed in March (8.4) and lowest in January (7.6). The average hydrogen ion concentrations are same throughout year. Water transparency was maximum in January (61.75 cm) and minimum in June (40 cm). The average transparencies are found same throughout year. Alkalinity was maximum in May (215 mg/L) and minimum in December (40 mg/L). T-test for total alkalinity showed the average alkalinity are found same throughout year. Free CO₂ was maximum in May (6.1 mg/L) and minimum in December (1.8 mg/L) T-test for free carbondioxied showed the average Free CO₂ is not same throughout year. Dissolved oxygen content was maximum in December (9.44 mg/L) and minimum in May (2.43 mg/L). T-test for Dissolved oxygen: showed the average dissolved oxygen content is same throughout year. Chloride content was maximum in May (109.5 mg/L) and minimum in December (53.33 mg/L). T-test for chloride showed the average chloride content are same throughout year. Hardness was maximum in March (146 mg/L) and minimum in November (64 mg/L). T-test for Hardness showed

the average Hardness was same throughout year. Calcium was maximum in March (57.7 mg/L) and minimum in November (24.0 mg/L). T-test for Calcium showed the average Calcium was same throughout year. Magnesium was maximum in September (3.41 mg/L) and minimum in June (0.24 mg/L). T -test for Magnesium showed the average Magnesium was not same throughout year (Table no. 1 & 2).

For the study mussels were culture by adopting different methods such as basket culture, Rack culture, hanging culture in the same environmental condition. *Lamellidens marginalis* showed 60% and *Lamellidens corrianus* 70% survival rate % from basket culture. *Lamellidens marginalis* showed 60% and *Lamellidens corrianus* showed 60% survival rate from rack culture. *Lamellidens marginalis* showed 80% and *Lamellidens corrianus* showed 80% survival rate from hanging culture method. This study showed that hanging culture method is suitable method for mussel culture compared with other culture methods.

Table No. 01- show month wise variation in water parameters from Jan- Dec 2013 from culture tank, N.E.S. Science College Nanded.

Water parameters	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Air Temperature °c	21	23	25	28	35	32	30	29	27	24	22	20
Water Temperature °c	20	22	23	25	30	29	28	26	25	22	19	18
pH	7.6	7.8	8.4	8.0	8.0	8.0	8.0	7.9	7.9	7.9	7.8	7.8
Transparency (cm)	61.75	58.25	55.75	49.50	44.0	40.0	44.25	44.75	50.00	52.25	52.00	52.00
Alkalinity mg/L	40	55	200	205	2015	115	100	75	75	55	40	40
Free carbondioxied (mg/L)	1.9	2.0	5.5	5.8	6.1	5.1	3.2	3.0	2.5	2.5	2.1	1.8
Dissolve oxygen content (mg/L)	9.12	8.10	4.05	2.83	2.43	6.08	6.08	6.10	8.10	8.10	8.83	9.44
Chloride content (mg/L)	55.45	60.22	106.5	107.2	109.5	98.55	73.25	72.12	69.32	65.00	61.24	53.33
hardness (mg/L)	78	104	146	140	138	136	132	127	122	90	64	70
calcium (mg/L)	27.2	40.8	57.7	55.3	53.070	54.10	52.50	51.30	41.68	35.27	24.0	25.6
magnesium content (mg/L)	2.43	0.48	0.48	0.43	0.97	0.24	0.48	0.48	3.41	0.48	0.97	1.46

Table No. 02- shows T- Test for water parameters from culture tank, N.E.S. Science College Nanded.

WATER PARAMETERS	N	MEAN	St Dev	SE Mean
Air Temperature °c	12	26.33	4.64	1.3
Water temperature °c	12	23.92	3.92	1.1
pH	12	7.925	0.191	0.055
Transparency (cm)	12	50.38	6.38	1.8
Alkalinity mg/L	12	101.3	67.8	20
Free carbondioxied (mg/L)	12	3.46	1.67	0.48
Dissolve oxygen content (mg/L)	12	6.61	2.43	0.70
Chloride content (mg/L)	12	77.6	21.5	6.2
hardness (mg/L)	12	112.3	29.7	8.6
calcium (mg/L)	12	43.3	12.6	3.6
magnesium content (mg/L)	12	1.026	0.968	0.28

N-total number, St Dev- standard deviations, SE Mean- sample estimated mean.

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