

# 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 (CO<sub>2</sub>), 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 CO<sub>2</sub> 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).

During mussel culture excess mortality was observed in summer season due to maximum temperature.

**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 (CO<sub>2</sub>), Chloride, Hardness, Calcium, Magnesium. (Trivedy & Goel, 1986) and APHA (2000).

Physicochemical parameters and biological parameters such as temperature, hydrogen ion concentration, transparency, alkalinity, free CO<sub>2</sub>, dissolve oxygen, chlorides, hardness, calcium, magnesium, January 2013 to December 2013. These parameters are essential for mussel culture as they affect on growth and mortality of mussels. 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 culture methods (McCoy and Chongpeepien, 1988).

## 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 is found same throughout year. Free CO<sub>2</sub> 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 CO<sub>2</sub> 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). In culture period physic chemical parameters are very important for the growth of mussels. Changes in physicochemical parameter directly affects the growth and mortality of mussels. Mortality of mussel was observed maximum in summer it means temperature directly related with the growth and mortality of mussels.

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

<b>Water parameters</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>April</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug</b>	<b>Sept</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
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.**

<b>WATER PARAMETERS</b>	<b>N</b>	<b>MEAN</b>	<b>St Dev</b>	<b>SE Mean</b>
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.

## REFERENCES

**Abdullah Sairy, Mohammed Asef Iqbal, Mohammed Ilyas Fazil (2010):** Physico Chemical Analysis of the Freshwater at Kundalika Dam, Upli, Dist. Beed, (M.S.) India. *Global Journal of Environmental Research* 4 (1): 01-05p.

**Akamatsu Shigeru, Li Tajima Zansheng, Thomas M. Moses, and Kenneth Scarratt (2001):** the current status of Chinese freshwater cultured pearls. *GEMS & GEMOLOGY* Vol. 37(2): 96–113p.

**APHA (2000):** (American Public Health Association Manual) standard method for Examination of water and west management. 19<sup>th</sup> edition AWWA-APCF Washington, DC 20005.

**Bagenal T. (1978):** Methods for assessment of fish production in fresh waters. 3<sup>rd</sup> Edn., *Blackwell scientific publications*, Oxford, London.

**Buening Jorge T., Nathan L. Eckert and Douglas B. Aloisi (undated):** Effect of Source Water on Freshwater Mussel Culture in Compact Recirculating system. 1-7p.

**Brady Tony R., Doug Aloisi, Roger Gordon, Gary Wege (2011):** A Method for Culturing Mussels Using In-River Cages. *Journal of Fish and Wildlife Management* Vol 2 (1): 85-89p.

**Chaurasia Mahima and Pandey G.C. (2007):** Study of physicochemical characteristics of some water ponds of Ayodhya- Faizabad. *IJEP* 27 (11):1019 – 1023p.

**Eletta O. A.A. and F.A. Adekola (2005):** studied the physical and chemical properties of Asa river water, Kwara State, Nigeria. *Science Focus*, Vol. 10(1): 72-76p.

**Gaike P.P. and K.B. Shejule (2012):** Study of Physico-Chemical Properties of Kasura Dam from Jalna District (M.S) India. *Global Journal of Science Frontier Research Biological Sciences* Volume 12 Issue 4 Version 1.0.

**Harney N.V., A.A. Dhamani and R.J. Andrew (2013):** Seasonal Variations In The Physico-chemical Parameters Of Pindavani Pond Of Central India. *Weekly Science* Volume-1, Issue-6, 29p.

**Jemi Jacklin R. and G.S. Regini Balasingh (2011):** studies on physico-chemical characteristics of freshwater temple ponds in Kanyakumari District (south Tamilnadu). *International Journal of Geology, Earth and Environmental Sciences* Vol. 1 (1): 59-62p.

**McCoy E. W. and Tanittha Chongpeepien (1988):** Bivalve molluscs culture research in Thailand. *ICLARM Technical Reports* 19, 1-156p.

**McKindsey Christopher W, Philippe Archambault, Myriam D. Callier and Frédéric Olivier (2011):** Influence of suspended and off-bottom mussel culture on the sea bottom and benthic habitats: a review. *Canadian journal of Zoology*, vol. 89 (7): 622-646p.

**Sasikumar Geetha and K.S.Mohamed (2000):** Mussel Farming. *Handbook on Open Sea Cage Culture* 84-95p.

**Zhang Guofan and Xiwu Yan (2006):** A new three-phase culture method for Manila clam, *Ruditapes philippinarum*, farming in northern China. *ELSEVIER* 1-10p.