Original Research Article

Effect of Calcium on Fresh Water Bivalves during Pearl Culture

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ABSTRACT:
In the present investigation Calcium content was estimated from January 2013 to December 2013 at site A and site B and expressed as mg/L. Calcium was maximum in March (60.1 mg/L) and minimum in December (24.0 mg/L) from site A and Calcium was maximum in March (57.7 mg/L) and minimum in November (24.0 mg/L) from site B. during study both the sites have good calcium concentration having good results for pearl culture.

Keywords: Calcium, Pearl culture, Bivalves, *Lamellidens marginalis* and *Lamellidens corrianus*

INTRODUCTION

Bivalves have been exploited worldwide for food, and pearl culture (Janaki Ram et al., 1992). Pearls are naturally very beautiful in nature; this is only gem in nature which does not require lapidary treatment. Pearl is composed of about 82% to 86 % aragonite crystals of calcium carbonate. Calcium play important role in bivalves life. Calcium is major constituents of bivalve shell; bivalve shell is important part of their body. Two valves are present in bivalves they provide protection to internal organ, protection from predators and from mechanical damage of bivalves. A shell of bivalves also acts as exoskeleton of body. Formation of this protective cover requires calcium from surrounding water (Jankiram, 2008). Calcium is one of the most abundant substances of the natural waters. It present in high quantities in rocks. The quantities of calcium in natural waters varies from 10 mg / L to 100 mg/ L depending upon the types of the rocks (Sairy et al., 2010). Disposal sewage, Industrial waste is an important source of calcium. Concentration of calcium is reduced at higher pH due to its precipitation as $CaCO_3$. 20 to 30 ppm calcium content is required for the growth of mussel, shell growth and nacre secretion (Janaki Ram et al., 1992).

MATERIAL AND METHODS

For the study of pearl culture *Lamellidens marginalis* and *Lamellidens corrianus,* fresh water bivalves were selected for pearl culture operation.

Study area:

Area I- This area is farm Lake situated on Nanded Osmannagar road, near CIDCO. Farm Lake is about 29 x 14.5 x 58 m in dimension and lined by 500 micron plastic sheet.

Area II- This area 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. These two areas were selected for estimation of calcium during pearl culture operation.

Calcium is the one of the important nutrients required by the bivalves and it is estimated by EDTA method (Trivedy et al., 1986) by using and calculated by formula such as.

$$\text{Calcium (mg/ L)} = \frac{x \times 400.8}{ml \ of \ sample \ taken}$$

Where, x = Volume of EDTA used.

RESULT AND DISCUSSION

Site A

Calcium was maximum in March (60.1 mg/L) and minimum in December (24.0 mg/L). Average calcium content was (40.8 mg/L) from January 2013 to December 2013. (Table 1)

Site B

Calcium was maximum in March (57.7 mg/L) and minimum in November (24.0 mg/L). Average calcium content was (44.7 mg/L) found from January 2013 to December 2013. (Table 1)

Table 1: Shows month wise variations in calcium (mg/L) from Jan – Dec during the year 2013 at site A and site B.

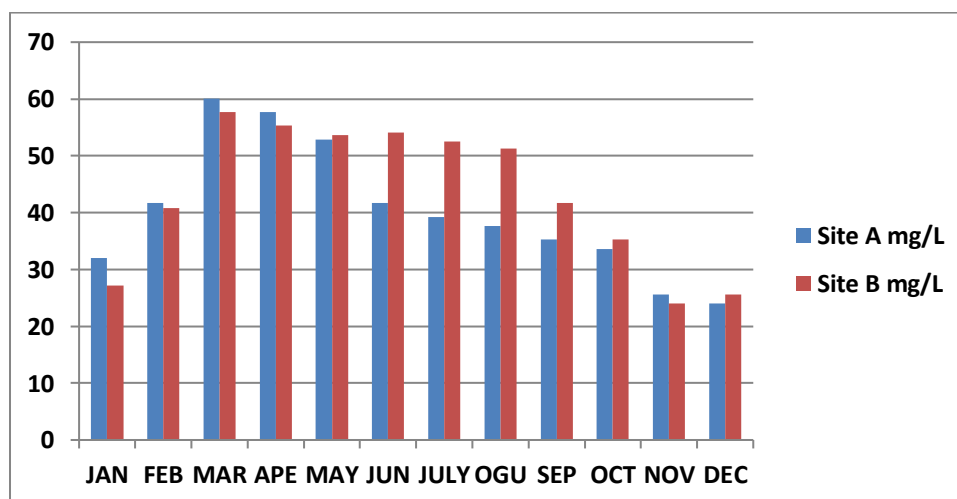| Month	Site A mg/L	Site B mg/L
Jan	32.06	27.2
Feb	41.68	40.8
Mar	60.1	57.7
Apr	57.7	55.3
May	52.9	53.70
Jun	41.68	54.10
July	39.2	52.50
Aug	37.67	51.30
Sep	35.27	41.68
Oct	33.6	35.27
Nov	25.6	24.0
Dec	24.0	25.6
Average	**40.1**	**43.2**

Figure 1: Shows month wise variations in calcium (mg/L) from Jan – Dec during the year 2013 at site A and site B.

T-test for Calcium

T-test for Calcium showed the average Calcium of both side is same. (Table 2)

Table 2: Shows T-test for calcium (mg/L) at site A and site B from Jan to Dec 2013

	N	Mean	St Dev	SE Mean
Calcium Site A	12	40.1	11.6	3.4
Calcium Site B	12	43.3	12.6	3.6

DISCUSSION

During study period maximum calcium content was found during summer and minimum in winter season. 20 to 30 ppm calcium content is required for the growth of mussel, shell growth and nacre secretion (Janaki Ram, 1997). Site A and site B is having adequate calcium content. Graph showing the monthly changes in calcium concentration from two sites. During the pearl culture operation both the season nacre was developed by mussels. Study showed that calcium play very important role in pearl culture. Therefore both the sites are suitable for pearl culture (Janaki Ram, 2008).

ACKNOWEDGEMENT

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