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Original Research

Biometry and fouling study of intertidal black-lip pearl oyster, *Pinctada margaritifera* (Linnaeus, 1758) to determine their eligibility in the pearl culture industry

Authors:
Jha S and Mohan PM.

Institution:
Department of Ocean Studies and Marine Biology, Pondicherry University (Brookshabad Campus), Chakkargaon Post, Port Blair, 744112, Andaman and Nicobar Islands, India.

Corresponding author:
Jha S.

Email Id:
jhasweta.mb@gmail.com

Web Address:
http://jresearchbiology.com/documents/RA0423.pdf.

ABSTRACT:

The present study on the biometry and fouling load of black-lip pearl oyster, *Pinctada margaritifera* (Linnaeus, 1758), was conducted to understand the eco-biology of these intertidal oysters so that their eligibility in the pearl culture industry could be determined. Biometric parameters *viz*., Anteroposterior measurement (APM), hinge length (HL), thickness (THK) and total weight (TWT) of each oyster were checked for their correlation with dorsoventral measurement (DVM) and fouling load (ΔF) separately by regression analysis. Shell length of collected specimens ranged between 16 ± 3.7- 88.2 ± 6.5 mm. Most of the *P. margaritifera* from intertidal regions of Andaman were confined to 61-80 mm size group. The average size of all the shell dimensions and TWT increased with increase in the shell length. The rate of increase of all the biometric parameters except TWT, declined in size range >41-60 mm. Maximum and minimum fouling load was observed during September 2011 (27.8 ± 5.1 g) and July 2012 (3.2 ± 3.7 g), respectively. Lower size groups showed maximum correlation indicating isometric growth but in higher size range, allometry was observed as the rate of increase of biometric parameters varied with increasing size range. On the basis of this study it could be concluded that if transferred to suspended culture at an early stage, these intertidal oysters, adapted to survive in harsh environmental conditions, would acclimatize more easily to the new environment and would cross the 61-80 mm size range becoming larger and thicker, a parameter favourable for pearl production.

Keywords:
Black-lip pearl oyster, Allometry, Biofouling, Intertidal Limiting factors, Reproductive maturity, Pearl culture.

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INTRODUCTION

Pearl oyster *Pinctada margaritifera* (Linnaeus, 1758) is commonly known as the black-lip pearl oyster due to dark colouration of the nacre of its inner shell towards the distal rim (Saville-Kent, 1893). This exclusively marine, sedentary bivalve is distributed along the tropic belt within the Indo-Pacific Ocean (Pouvreau and Prasil, 2001; El-Sayed *et al.,* 2011).

P. margaritifera are cultured around the world for the production of black pearls, designer mabe (Kripa *et al.,* 2008), and for their lustrous inner shell known as mother of pearl which is used in the ornamental and button industry (Kimani and Mavuti, 2002; Fletcher *et al.,* 2006). A thorough knowledge of the biometry of pearl oyster is of prime importance in the pearl culture industry. Thickness and wet weight of the pearl oyster helps in predicting the nuclei size (Mohamed *et al*., 2006; Abraham *et al.,* 2007). Kripa *et al.,* (2008) considered shell size to be an important criteria for mabe production.

In different parts of the world, research is being carried out to understand the biometric relationship of black pearl oysters in natural and cultured conditions. Friedman and Southgate (1999) studied the biometric relationship of these oysters in Solomon Islands. Pouvreau *et al.,* (2000a) reported the isometric relation between their length and thickness in French Polynesia. El-Sayed (2011) studied the concept of allometric growth in *P. margaritifera* from the Egyptian coastal waters.

In India *P. margaritifera* is the most abundant in Andaman and Nicobar Islands (Alagarswami, 1983). Alagarswami (1983) and Abraham *et al.,* (2007) studied the biometric relationship between various shell dimensions *viz*., hinge length (HL), thickness (THK) and total weight (TWT) with the dorsoventral measurement (DVM) or the shell length of the black-lip pearl oyster in Andaman and Nicobar Islands. But the size range and total number of specimens studied by them were different from the present study. Alagarswami studied the correlation of biometric parameter of all the oysters without dividing them into any size group. None of these authors studied the correlation between DVM and the fouling load (ΔF).

In the natural habitat, several environmental factors such as availability of food and space, nature of substratum, fouling, competition, predation etc., affect the biometric growth of black pearl oysters (Alagarswami, 1991; Gervis and Sims, 1992; Mohamed *et al*., 2006). Fouling on the sedentary organism plays a major role in adversely affecting their growth and development as more the fouling more is the energy required for oysters to open its valve for food filtration and respiration (Alagarswami and Chellam, 1976; Mohammad, 1976; Alagarswami, 1987; Taylor *et al.,* 1997; Mohammed, 1998; Pit and Southgate, 2003).

The main objective of the present study was to determine the eligibility of intertidal *P. margaritifera* in the pearl culture industry by understanding their biometry as well as month-wise variation in the fouling load at natural habitat. A novel aspect of pearl oyster ecology explored in this study was the correlation between DVM-ΔF, which shall be the first known reference available from Andaman and elsewhere.

MATERIALS AND METHODS

Study Area

Preliminary surveys were conducted in 10 intertidal regions of South Andaman, out of which only three regions viz. Burmanallah (11°34’19” N; 92°44’39” E), Carbyn (11°38’49” N; 92°44’81” E) and Marina Jetty area (11°40’16” N; 92°44’53” E) showed natural availability of *P. margaritifera* and hence were selected as the study area for the present study conducted during July 2011 to July 2012.

Sampling Method

For studying the relationship between various shell dimensions during different growth size of the oysters, 151 specimens of *P. margaritifera* were

collected and brought to the laboratory in a bucket filled with raw sea water.

The individual morphometric parameters viz. shell length or the dorsoventral measurement (DVM), anteroposterior measurement (APM), hinge length (HL) and shell thickness (THK) were measured with the help of a digital vernier calliper (Aerospace, accuracy = 0.01 mm) using the method of Hynd (1955) and then grouped into five length classes with a class interval of 20 mm *viz*., 1-20, 21-40, 41-60, 61-80 and 81-100 mm. DVM and APM were measured excluding the growth process.

To minimize any error during the measurement of total weight (TWT), oysters were taken out from the bucket and kept outside in a tray covered with wet cloth for 15 minutes to remove the water trapped inside the oyster as described in Moullac *et al.,* (2012). Once most of the in-held water had seeped out, weight of the fouled oysters were measured by using digital balance (Professional Digital Scale, accuracy = 0.01 g).

The attached foulers on the shells of the oysters were then scrapped off and oysters were washed with filtered sea water to clean all the epiphytic growth. The cleaned oysters were weighed again to determine their actual total weight (foul free weight). The fouling load (ΔF) was calculated by comparing the individual weight of each fouled oyster with their respective weight after cleaning.

Statistical Analysis

The average value of biometric dimensions, fouling load and their rate of increment for five different size groups were obtained by calculating the mean and standard deviation. Month-wise average fouling load was also calculated using the same method. Pearson's Correlation Coefficient between biometric relationships *viz*., DVM-APM, DVM-HL, DVM-THK and the correlation between ΔF with biometric parameters (DVM, APM, HL, THK and TWT) were calculated by fitting the least square method equation, y = a+bx, of linear regression.

The length-weight relationship was determined by following the method of Abraham *et al.,* (2007) where the length measurements were expressed in centimeters and the weight was expressed in grams. Exponential curvi-linear regression models were prepared for the estimation of correlation between DVM-TWT, as their relationship was non-linear. The correlation values were tested for significance with one-way ANOVA adopting Hynd (1955).

RESULTS

Trend of biometric growth and fouling

The DVM of the 151 collected specimens ranged between 16 ± 3.7- 88.2 ± 6.5 mm. The average values of biometric dimensions of all the size groups and their fouling load have been graphically represented in Fig.1,

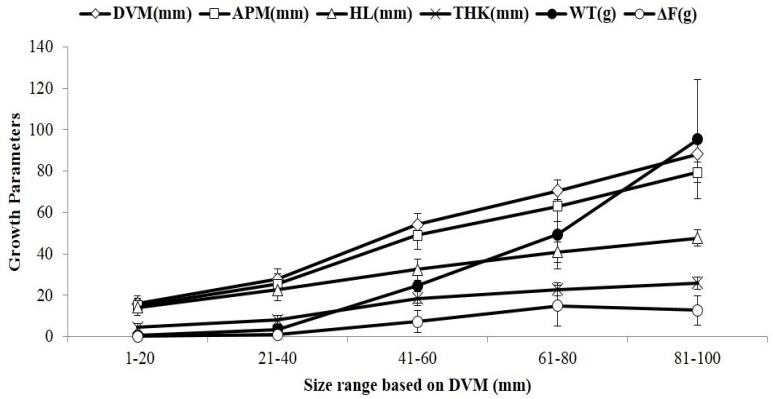

Fig. 1 Average biometric dimensions (±SE) of 5 size groups of *Pinctada margaritifera*.

along with their standard deviation values.

From the observation it was found that as the DVM increased the average size of all other shell dimensions also increased, though not at a constant rate (Fig. 2). ΔF also increased with the DVM except for the largest size group (81-100 mm) where ΔF was lesser than 61-80 mm group. The size group, 61-80 mm was the most heavily fouled of all the other size ranges. The monthly average fouling load on an individual specimen of *P. margaritifera* has been graphically shown in Fig.3. It can be inferred that ΔF showed a changing trend over a span of one year. Maximum fouling load was observed during the month of September 2011 (27.8 ± 5.1 g) followed by February 2012 (19.5 ± 13.5 g) and June 2012 (15.0 ± 3.6 g).

Fouling load was minimal during July 2012 (3.2 ± 3.7 g) followed by November 2011 (4.6 ± 6.9 g) and December 2011 (4.7 ± 14.1 g).

Correlation of DVM with other biometric parameters

The size-wise correlation of biometric dimensions with the DVM (at 99.5% significance level) has been presented in Table 1.

In the lower size group of 1-20 mm, the maximum correlation was observed between DVM-APM (r^2 = 0.876, P > 0.05, n = 18). Correlation coefficient values of DVM-THK (r^2 = 0.673, P < 0.001, n = 18) and DVM-HL (r^2 = 0.550, P > 0.05, n = 18) were moderate to low.

In the size group of 21-40 mm, higher degree of correlation was observed between DVM-APM (r^2 = 0.802, P > 0.05, n = 24) and DVM-HL (r^2 = 0.808, P < 0.001, n = 24). DVM-THK (r^2 = 0.673, P < 0.001, n = 24) and DVM-TWT (r^2 = 0.304, P > 0.05, n = 24) showed moderate and poor correlation, respectively.

The value of correlation between DVM-TWT (r^2 = 0.725, P < 0.001, n = 33) was highest for the 41-60 mm size group. However, it showed moderate correlation between DVM-APM (r^2 = 0.577, P = 0.002, n = 33) and DVM-HL (r^2 = 0.523, P < 0.001, n = 33).

Maximum number of individuals collected during the study belonged to the size group 61-80 mm. The regression analysis of this size group showed moderate to low correlation between DVM and all the other parameters, with the exception of DVM-APM (r^2 = 0.721, P < 0.001, n = 52).

In the largest size group of 81-100 mm (n = 24), all the parameters showed poor correlation with the DVM. The regression coefficient for most of the parameters of the above mentioned size ranges when tested against DVM with one-way ANOVA, showed significant value except for a few as mentioned in Table 1.

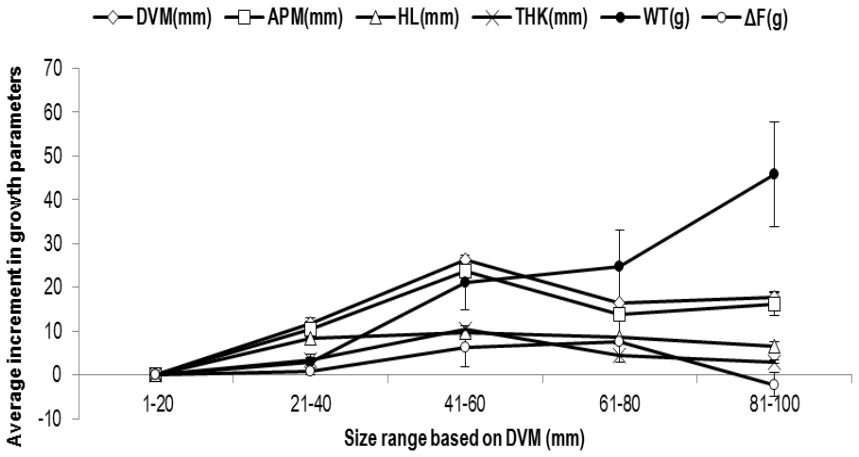

Fig. 2 Average increment (±SE) in the biometric dimensions of 5 size groups of *Pinctada margaritifera*.

Correlation of ΔF with biometric parameters

The regression analysis of biometric parameters with ΔF showed poor correlation in all the size groups except for a moderate correlation between TWT-ΔF (r^2 = 0.619, P < 0.001, n = 33) for the 41-60 mm size group (Table 2).

DISCUSSION

Maximum value of correlation coefficient for most of the shell dimensions was seen in small size oysters hinting towards isometric growth of the oyster at this stage. The site of attachment selected by settling larval stage plays a pivotal role in the biometric growth of these sessile organisms, as the Pediveliger larvae settle in the crevices of rocks during the juvenile stage and it has enough space available for growth in all the dimensions. Optimum space availability and lesser food requirement could be a possible reason for such type of growth.

Harsh environmental conditions *viz.* atmospheric and respiratory stress due to exposure during low tide, limited food availability (Bartol *et al.,* 1999), water temperature and turbidity (Pouvreau and Prasil, 2001), competition between foulers with oyster (Zhenxia *et al.,* 2007), limited space for growth (Abraham *et al.,* 2007), decrease in growth rate with age due to progressive investment of body energy in reproduction rather than shell growth (Pouvreau *et al.,* 2000b), etc., might have consequently resulted in the slow allometric growth rate (Gimin *et al.,* 2004; El-Sayed *et al.,* 2011) and hence poor correlation between DVM and other shell dimensions in the higher size groups of black-lip pearl oyster of intertidal region of South Andaman.

Shell Dimensional Relationship

The smaller oysters showed more increment in shell dimension than in total weight. It might be due to the fact that in the initial stages of the oyster's development, the body energy is mainly utilized towards the shell growth when compared to the tissue growth or reproductive development (Chellam, 1987; Dharmaraj *et al.,* 1987b; Gimin *et al.,* 2004).

A good correlation between DVM-APM was observed between smaller size groups, 1-20 mm (r^2 = 0.876, P > 0.05, n = 18) and 21-40 mm, (r^2 = 0.802, P > 0.05, n = 24) indicating comparable increase in the growth rate of the two variables. Low regression value for higher size groups could have been due to the investment of energy for tissue development or reproductive maturity.

The correlation values for DVM-HL in the present study were slightly better (highest being r^2 = 0.808, P = 0.001, n = 24, 21-40 mm) than that

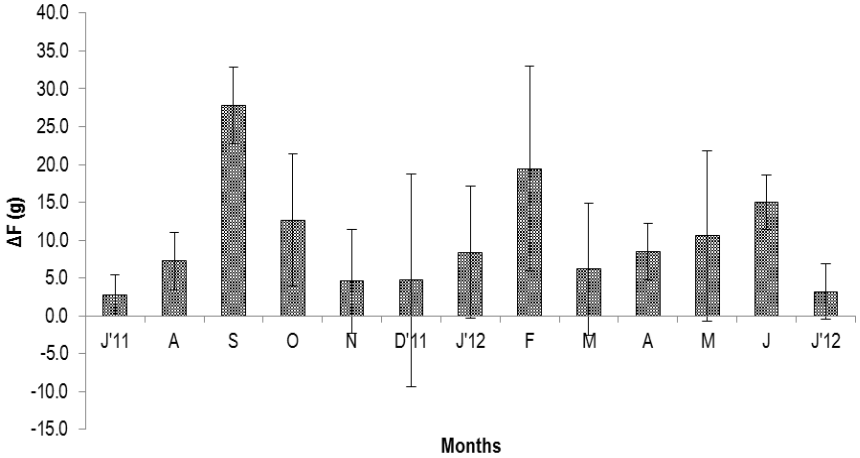

Fig. 3 Month-wise average fouling load (±SE) on *Pinctada margaritifera*.

Table 1. Estimates of biometric relationship between DVM and other shell parameters in different size groups of *Pinctada margaritifera*, along with the results of one-way ANOVA.

Size Group (mm)	N	Variables	'a' Value	'b' value	r^2 value	P value- S/NS
1-20	18	DVM- APM	0.848	0.878	0.876*	0.370 - NS
		DVM-HL	1.547	0.793	0.550	0.180 - NS
		DVM-THK	2.402	0.430	0.673*	< 0.001 - S
		DVM-TWT	0.275	1.218	0.218	< 0.001 - S
21-40	24	DVM-APM	1.113	0.955	0.802*	0.120 - NS
		DVM-HL	3.006	0.926	0.808*	0.001 - S
		DVM-THK	3.113	0.402	0.673*	< 0.001 - S
		DVM-TWT	0.304	2.236	0.304	0.110 - NS
41-60	33	DVM-APM	1.525	0.936	0.577*	0.002 - S
		DVM-HL	3.664	0.666	0.523*	< 0.001 - S
		DVM-THK	2.076	0.380	0.372	< 0.001 - S
		DVM-TWT	0.144	3.015	0.725*	< 0.001 - S
61-80	52	DVM-APM	20.16	1.182	0.721*	< 0.001 - S
		DVM-HL	1.911	0.554	0.378*	< 0.001 - S
		DVM-THK	2.158	0.355	0.343*	< 0.001 - S
		DVM-TWT	0.127	3.026	0.412*	< 0.001 - S
81-100	24	DVM-APM	48.46	0.351	0.210	0.001 - S
		DVM-HL	30.68	0.191	0.101	< 0.001 - S
		DVM-THK	12.82	0.148	0.106	< 0.001 - S
		DVM-TWT	1.878	1.786	0.180	< 0.001 - S

N= Number of individuals, a= Slope, b= Intercept, r^2= Correlation coefficient, *Pearson's correlation coefficient significance level= 99.5%, P= Significance value, S= Significant, NS= Non-Significant.

Table 2. Estimates of biometric relationship between ΔF and other shell parameters in different size groups of *Pinctada margaritifera*, along with the results of one-way ANOVA.

Size Group (mm)	N	Variables	'a' Value	'b' value	r^2 value	P value- S/NS
1-20	18	DVM - ΔF	0.019	2.032	0.293	<0.001- S
		APM - ΔF	0.020	2.232	0.325	<0.001- S
		HL - ΔF	0.029	1.592	0.292	<0.001- S
		THK - ΔF	0.076	0.429	0.236	<0.001- S
		TWT - ΔF	0.167	0.018	0.293	<0.001- S
21-40	24	DVM - ΔF	0.005	4.402	0.243	<0.001- S
		APM - ΔF	0.030	2.938	0.142	<0.001- S
		HL - ΔF	0.056	2.569	0.120	<0.001- S
		THK - ΔF	0.786	2.196	0.190	<0.001- S
		TWT - ΔF	0.235	0.111	0.331	<0.001- S
41-60	33	DVM - ΔF	0.012	3.649	0.300	<0.001- S
		APM - ΔF	0.034	3.248	0.412	<0.001- S
		HL - ΔF	0.646	1.890	0.211	<0.001- S
		THK - ΔF	1.790	1.981	0.341	<0.001- S
		TWT - ΔF	0.495	4.893	0.619*	<0.001- S
61-80	52	DVM - ΔF	0.031	3.035	0.088	<0.001- S
		APM - ΔF	0.286	2.017	0.091	<0.001- S
		HL - ΔF	1.214	1.61	0.063	0.002- S
		THK - ΔF	5.468	0.924	0.029	<0.001- S
		TWT - ΔF	0.150	7.487	0.066	<0.001- S
81-100	24	DVM - ΔF	7.363	1.940	0.046	<0.001- S
		APM - ΔF	1.717	2.450	0.057	<0.001- S
		HL - ΔF	10.81	0.134	0.038	<0.001- S
		THK - ΔF	1.949	1.802	0.096	<0.001- S
		TWT - ΔF	0.015	11.300	0.004	<0.001- S

N= Number of individuals, a= Slope, b= Intercept, r^2= Correlation coefficient, * Pearson's correlation coefficient significance level= 99.5%, P= Significance value, S= Significant, NS= Non-Significant.

obtained by Abraham *et al.,* 2007 (highest being $r^2 = 0.31$, n = 22, 36-55 mm) and the value ($r^2 = 0.79$, n = 106, 34.0-109.5 mm) obtained by Alagarswami (1983). The site of collection of specimen may also have an impact on this observation because oysters in the present study were collected exclusively from intertidal area where they are attached to the crevices of rocks having limited space for growth whereas in case of other authors sub tidal and deep water specimens were also studied.

The values obtained for coefficient of correlation between DVM-THK in the present study was moderate for size range 1-20 mm ($r^2 = 0.673$, $P < 0.001$, n = 18) and 21-40 mm ($r^2 = 0.673$, $P < 0.001$, n = 24). But was slightly lower ($r^2 = 0.372$, $P < 0.001$, n = 33) for size range 41-60mm) than those obtained by Abraham, (2007) ($r^2 = 0.82$ for size range 36-55 mm). In larger oysters, a poor correlation existed between DVM-THK ($r^2 = 0.343$, $P < 0.001$, n = 52 and $r^2 = 0.106$, $P < 0.001$, n = 24 for 61-80 mm and 81-100 mm size group respectively). This could be explained by the report of Sims (1993) which stated that, in the larger oysters the rate of increase of DVM becomes very slow and the subsequent growth consists mainly of increase in shell thickness with continuous secretion of nacre throughout its life.

As the size range and total number of specimen in biometry study by other authors (34-109.5 mm, n = 106, Alagarswami, 1983; 40.18-132.72 mm, n = 458, Abraham *et al.,* 2007) were different from the present study (7.06-99.01 mm, n = 151) the correlation value between shell dimensions also differed and only few size ranges could be compared.

Length –Weight Relationship

Similar to the observation of Abraham *et al.,* (2007), there was an increase in the average total weight with respect to increase in the average shell length (Fig. 1). Hence, the low value of correlation between these two variables in the present study suggests that the rate of increase in the individual TWT with respect to the increase in individual DVM is not uniform amongst the specimen belonging to the same size class.

In the size group of 1-20 mm ($r^2 = 0.218$, $P < 0.001$, n = 18) and 21-40 mm ($r^2 = 0.304$, $P > 0.05$, n = 24) the correlation between DVM-TWT was poor indicating gonadal development might still be in the nascent stages accounting for slower rate of increase in their tissue weight (Chellam, 1987). However, good and moderate correlation was observed in the size group 41-60 mm ($r^2 = 0.725$, $P < 0.001$, n = 33) and 61-80 mm ($r^2 = 0.412$, $P < 0.001$, n = 52), respectively, indicating that the concentration of body energy was beginning to direct more towards tissue growth rather than shell growth which finally concluded with low correlation values in the 81-100 mm group ($r^2 = 0.180$, $P < 0.001$, n = 24), where most of the body energy was directed towards tissue growth indicated by a higher rate of increase in TWT when the rate of increase of all the other biometric parameters declined.

In the present study, the lower degree of correlation between DVM-TWT compared to Alagarswami (1983), Friedman and Southgate (1999) and Pouvreau (2000) who obtained very good correlation between these two variables ($r^2 = 0.96$, 0.86 and 0.97 respectively) could be due to the fact that in the other studies specimen were either cultured in farm (Friedman and Southgate, 1999; Pouvreau, 2000a) or collected mostly from sub tidal or deep waters (Alagarswami, 1983; Abraham *et al.,* 2007).

In those habitats isometric growth can take place due to less stress per unit area in terms of availability of food and space, protection from direct sunlight and desiccation, predators, low turbidity and continuous oxygen supplies as opposed to the harsh intertidal condition in this study.

Shell Dimensions and Fouling Load

Biofouling caused by the settlement of fouling organisms on the shell surface adversely affects the

wellbeing of pearl oysters. It leads to retarded growth (Southgate and Beer, 2000), deformation and deterioration of the shell (Taylor *et al.,* 1997b; Doroudi, 1996) and even mortality of the oyster in extreme cases (Alagarswami and Chellam, 1976; Mohammad, 1976).

Maximum fouling load observed during the month of September 2011 (27.8 ± 5.1 g) followed by February 2012 (19.5 ± 13.5 g) and June 2012 (15.0 ± 3.6 g) could be attributed to the settlement of heavy foulers (weight-wise) such as predatory mussel, tube forming polychaetes, barnacles, sponges and ascidians found to be dominant during these months. Such settlement may have caused the increase in the fouling load (Dharmaraj 1987a) and in turn might have influenced the recruitment of other foulers.

Minimal fouling load during July 2012 (3.2 ± 3.7 g), November 2011 (4.6 ± 6.9 g) and December 2011 (4.7 ± 14.1 g) could be due to the fact that these months are peak period of spawning of the above foulers, no attachment of heavy foulers occurred during this period. Similar results were reported by Alagarswami and Chellam (1976), Dev and Muthuraman (1987) and Velayudhan (1988) in their studies on biofouling of Akoya pearl oyster *Pinctada fucata*.

Scardino *et al.,* (2003) and Aji (2011) in their respective studies on pearl oysters reported that the rate of fouling is lower in the smaller oysters due to the presence of periostracum layer (a physical defence against fouling) which wears off with aging in larger oysters. An increase in the shell surface area also facilitates higher settlement of biofoulers (Mohammed, 1998).

This explains the lower values of fouling load in size groups 1-20 mm (0.1 ± 0.1 g, n = 18) and 21-40 mm (1.0 ± 1.0 g, n = 24). Availability of more surface area for settlement of foulers and wearing off of the periostracum layer could be responsible for multifold time increment in the fouling load in the size groups 41-60 mm (7.3 ± 5.3 g, n = 33) and 61-80 mm (14.9 ± 9.9 g, n = 52) expressed in Fig. 1.

Occurrence of lesser ΔF in 81-100 mm size group (12.8 ± 7.1 g, n = 24) as compared to its preceding length group could be attributed to the attachment of these specimens in area having oligotrophic waters with less fouling activity, lesser competition for available resources and lower risk of predators which could be the reason for their large size in the first place.

A poor correlation in general was observed between ΔF and other shell dimensions for all the size groups except 41-60 mm ($r^2 = 0.619$, $P < 0.001$, n = 33) in Table 2. The variation in the growth rate of shell and rate of fouling in different size groups could be the reason for their poor correlation.

The Critical Size Group, 41-60 mm

Contrary to all the other size groups, 41-60 mm size group showed the best correlation between DVM-TWT with r^2 corresponding to 0.725. However, the correlation between other biometric dimensions was moderate to low (Table 1). Amongst all the size classes, ΔF showed better correlation with other shell dimensions in this size class (Table 2). The above observations suggest that the *P. margaritifera* of the intertidal regions of Andaman, attains initial sexual maturity in this size group with the beginning of their gonad development and complete reproductive development takes place as the oyster reaches 61-80 mm size group and becomes fully mature. This justifies their increased tissue weight and retarded growth of other shell dimensions with respect to DVM (Fig. 2). The body energy at this stage gets distributed more towards tissue growth than shell growth (Bayne and Newell, 1983; Dharmaraj, 1987b).

Gervis and Sims (1992) also stated that full maturity occurs in *P. margaritifera* in 2nd year at size >70 mm. Pouvreau *et al.,* (2000b) and Kimani and Mavuti (2002) in their respective studies on black-lip pearl oyster of French Polynesia and Kenya reported that the initial sexual maturity, corresponding to the smallest individual with mature gonads occur at the end of 1st

year at size <40 mm. Chellam (1987) in his study on Indian *Pinctada fucata* also reported that cultured oysters became sexually mature in 9 months (size <47 mm). This difference in size at sexual maturity of both the species in India is possible as *P. margaritifera* in comparison to *P. fucata* is a larger and late maturing species (Pouvreau *et al.,* 2000b).

From the present study it can be concluded that, 1) Smaller oysters show isometric growth pattern but in larger oysters, allometry is observed as the rate of increase of biometric parameters vary with increasing size range. 2) September, February and June months witness settlement of heavy foulers whereas fouling load is minimal during the month of July, November and December, 3) Even though ΔF did not show any significant correlation with the DVM, biofouling could also be a possible factor responsible for restricting the maximum size attained by these oysters or in extreme cases even mortality of the oyster by competing for resources required for their growth, 4) 41-60 mm size group is a critical stage in the life cycle of these specimen when sexual maturity initiates, 5) Harsh intertidal environment could be responsible for difference in growth pattern and also for confining most of the *P. margaritifera* from intertidal regions of Andaman, to the size group of 61-80 mm, 6) The intertidal *P. margaritifera* which are adapted to survive in tough environmental conditions would more easily acclimatize to a new environment such as in the case of suspended or raft culture, if transferred at an early stage, they could cross the 61-80 mm size range and become larger and thicker, a parameter favourable for pearl production.

The present biometric study of *P. margaritifera* will be helpful in 1) Understanding the correlation existing between length and other shell dimensions of different size groups in intertidal rocky habitat and the factors responsible for it, 2) Observing the trend of biofouling on various size ranges of *P. margaritifera* and its effect on their biometry. 3) It shall also throw some light on the importance of these intertidal oysters in the pearl culture industry.

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