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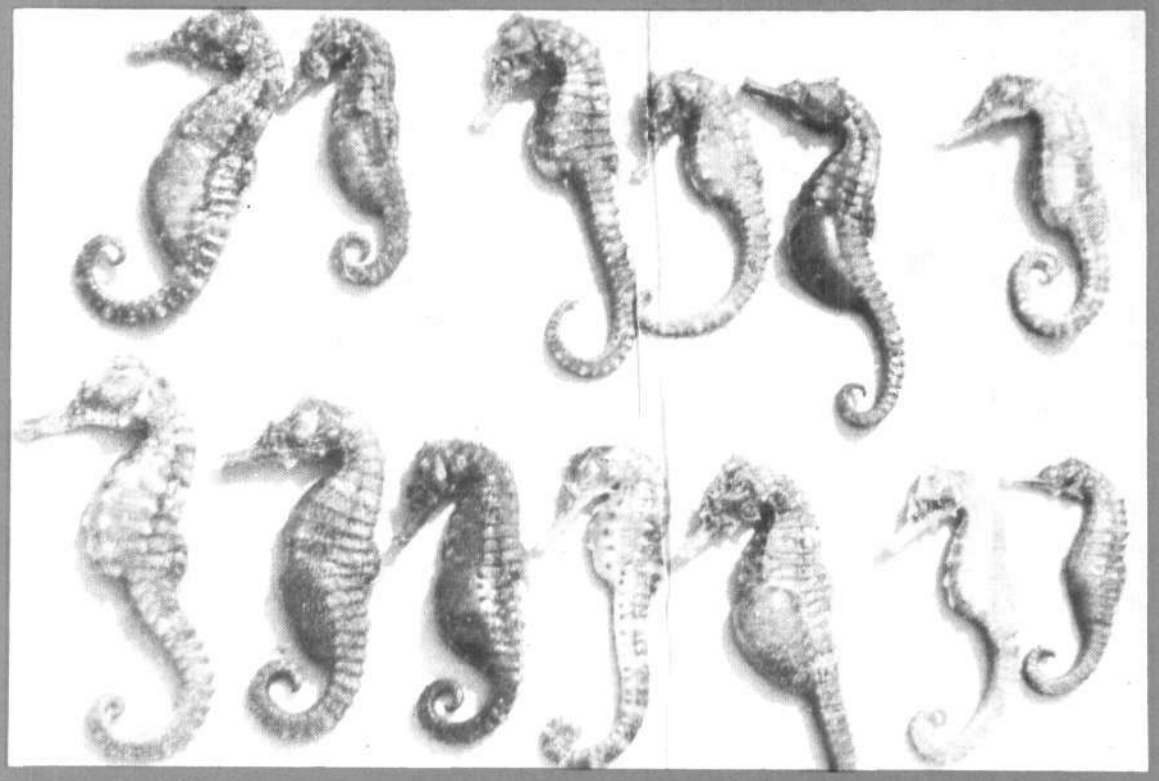

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PEARL PRODUCTION IN RELATION TO THE GRAFT TISSUE IN THE PEARL OYSTER *PINCTADA FUCATA* (GOULD)

T. S. Velayudhan*, A. C. C. Victor, S. Dharmaraj and A. Chellam

Tuticorin Research Centre of CMFRI, Tuticorin - 628 001

Introduction

In the production of cultured pearls, a small piece of mantle from a donor oyster known as graft tissue is implanted into recipient oyster along with a shell bead nucleus. The outer epithelium of the pallial tissue of the grafted mantle piece secretes the nacreous substance over the nucleus, resulting in the formation of pearl. It is of interest to know which region of the mantle gives good quality pearls and also higher production rate. The results of a study conducted in the Indian pearl oyster *Pinctada fucata* (Gould) on this aspect are dealt in this paper.

How the experiment was done?

The graft tissue was prepared and implanted along with nucleus in the gonad in front of the intestinal loop. The mantle tissue from 4 areas namely anterior (a), posterior (b), middle (c), and central (d), regions were used (Fig. 1). Anterior pallial mantle piece was used in 25 pearl oysters and the size of the nucleus was 4 mm. A total of 50 oysters were planted with graft tissue drawn from the posterior mantle of which 25 were implanted with 3 mm and the remaining 25 with 4 mm nuclei. A total of 265 pearl oysters were implanted with graft tissue taken from the middle of the pallial mantle of which 88 oysters were implanted with 3 mm nuclei, 108 with 4 mm nuclei, 53 with 5mm nuclei and 16 with 6 mm nuclei. For the central mantle, the graft tissues from the vicinity of adductor muscle and below the hinge line was selected. A total of 48 pearl oysters were grafted with central mantle of which 12 were implanted with 3 mm and the remaining 36 with 4 mm nuclei. The implanted oysters were reared at a depth of 5 m in the C.M.F.R.I. pearl oyster farm located in the Harbour at Tuticorin, for periods varying from 47-454 days (Table 1). Periodic farm maintenance work such as cleaning of cages, removal of foulers, borers, predators etc. was done. The percentage of pearl production was calculated based on the total number of implanted oysters harvested at the close of the experiment. The pearls were graded into A, B, C, and D categoried based on quality (Table 1).

* Present address: C. M. F. R. Institute, Cochin - 682 031.

TABLE 1. *Details of pearls produced in relation to the area of mantle tissue used*

Date of implantation	No. of oysters implanted	Graft tissue used from	Duration of culture (days)	Surviving oysters	No. of pearls	% of pearl production	*Quality and percentage of pearl production			
							A	B	C	D
10-08-1988	25	Anterior mantle	324	13	1	7.69	—	—	—	100.00
10-10-1988	50	Posterior mantle	75-253	26	10	38.40	—	60.00	30.00	10.00
15-10-1988	265	Middle mantle	47-454	88	89	50.28	13.48	23.60	40.45	22.47
16-07-1988	48	Central mantle	309	17	9	52.94	—	33.33	66.67	—

* Top perfectly round with good lusture 'A'.

Perfectly round with one flow or blemish and with good lusture 'B'.

Wild shaped or half good and half bad or partially coated spherical; could be polished 'C'.

Rejects, all the malformed and badly coated that could not be used; nucleus could be extracted by processing 'D'.

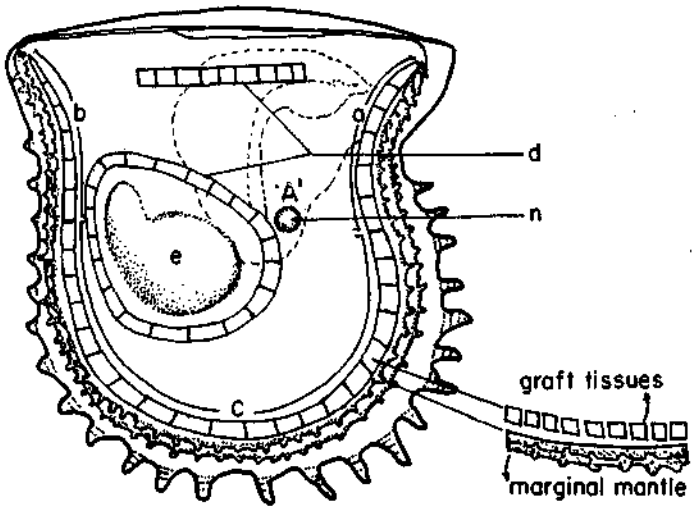

Fig. 1. Right mantle of pearl oyster with adductor muscle. (a) Anterior pallial mantle, (b) Posterior pallial mantle, (c) Middle pallial mantle, (d) Central mantle region, (e) Adductor muscler. The right mantle is completely removed to show the nucleus (n) implanted in the 'A' position of the gonad.

Findings and conclusions

Anterior mantle: Only one d quality pearl (7.69%) was formed.

Posterior mantle: Among the oysters which received the graft tissue from this region, 38.40% of them have yielded pearls. The B, C, and D-groups accounted for 60, 30 and 10 respectively.

Middle mantle: Examinaton of the oysters which received the mantle tissue from this region showed that pearl production occurred in 50.28%. The A, B and C grades accounted for 13.48, 23.60 and 40.45 per cent respectivly.

Central mantle: A total of 52.94% pearls resulted in the oysters which received graft tissues from this region. B - group pearls formed 33.33% and C - group 66.67%.

This study showed that the middle region of mantle when used as graft tissue resulted in not only high percentage of pearl formation (50.28%) but also, the marketable pearls (A, B and C - groups) accounted for 77.53% of the total pearls produced. The A - group pearls which command high market value were produced only in this case. The central mantle also gave a high percentage (52.94) of pearls but A - group pearls were absent. The other two regions gave low yield (7.69 to 38.40%) of pearls. It is suggested that the graft tissues from the middle region of the mantle is most suitable for producing good quality pearls.