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37- BIOCHEMICAL CHANGES IN THE OYSTER *CRASSOSTREA MADRASENSIS* (PRESTON) WITH MATURATION

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INTRODUCTIOJNJ

Central IVIarme Fisheries Institute has perfected the technique of culturing the common edible oyster *Crassostrea madrasensis* (Preston). Venicataraman and Chari 1951 had studied the fluctuation in biochemeical composition in the whole oyster meat for different months in the naturally growing oysters of Ennore, Madras. In the presenr paper a study has been made about the biochemical composition with maturity in male and female oysters cultured at Tuticorin, Tamil Nadu.

METERIAL' AND METHODS

The edible oyster, *Crassostrea madrasensis* were collected from the Institute's Farm at the Tuticorin Bay. The oysters were carefully opened and gonadial smear examined microscopically. The stages of maturity were divided into five namely, immature, maturing, ripe, spent and indeterminate. In the indeterminate stage the sexes were not distinguishable. Since oysters attain first maturing by the first year, such older oysters were catagorised as indeterminate, which were either in post spent stage or in the process of sex change. In the immature stage sex could be distinguished. In the maturing female and male oysters the developing stages of the gametes were easily distinguishable but the gametes were not fully ripe. The eggs were elongated and dense. In the ripe stage eggs were free, less granular and oozing; in the males the sperms were easily distinguishable. In the spent stage the gonads were generally brownish, watery and a few unreleased gamets could be observed here and there which were in the stages of absorption.

Fromeachoyster, mantle, gills and adductor muscle were carefully dissected out. The rest of the tissue has been taken herein as visceral mass. Tissues of 3-5 oysters of particular stage were pooled, of which a part was used for the determination of moisture by drying at 55° C in a hot air oven and the rest were minced and from this weighed portions were talcen for the determination of lipid, protein and carbohydrate, The tissues used for moisture estimation were used for the determination of ash by incineration at 600° C in a muffle furnace,

Protein was estimated by biuret method a^er Gornall et al (Dawson et al 1969). Determination of total carbohydrate was carried out by anthrone method (Umbreit et al 1959) and lipid by Folch's method.

RESULTS AND DISCUSSION

The data obtained are given in tables 1 -3. The values for moisture and ash though significantly varied between the tissues, for the sartie tissue did not fluctuate very much and so were pooled together. In visceral mass the moisture content varied between 77.93% to 82.62%, and the high moisture content was observed in oysters which were in spent stage, Venkatarman and Chari (1951) have found the total moisture content to vary between 76.67o/„ to 85.04% f^^ naturally growing whole edible oyster of g^^ore, Madras, Further these authors dried the sample at 105° C. The same authors have a'so found the ash content to vary from 0.52% ^o 2.06%. Lipid content was found to vary with maturation but for the same stage, between the sexs, differences were not significent; therefore the data were pooled stage-wise and

TABLE: 1 *Organwise moisture and ash content /'" percentage.*

	Moisture	Ash
Mantle	79.50	6.1
GJH	81.11	6.6
Adductor muscle	78.00	5.6
Visceral mass	77.95-82,62	3.9

average taken. In different organs the lipid content fluctuated between 0.20% to 2.20%. The lowest values were obtained in the mantle tissue and the highest in the visceral mass during ripe condition. Venkataraman and Chari (1951) did not study the fluctuation with maturation but they found for the whole oyster meat the fat content to vary between 1.36%-3.07% during different months.

TABLE: 2 *Percentage lipid content In different stages.*

	Imma-ture	Matur-ing	Ripe	Spent	Indeter-minate
Mantle	0.21	0.25	0.30	0.20	0.20
Gill	0.73	0.78	0.86	0.74	0.71
Adductor muscle	0.80	0.82	1.00	0.90	0.83
Visceral mass	1.00	1.61	2.20	1.20	1.91

Protein content was found to be minimum (809%) in the gills of immature female oysters. The highest values (16.00%) were observed in the visceral mass of ripe males. Oysters which were in ripe, spent and indeterminate stages contained higher percentage of protein. Among the tissues adducter muscle showed lesser fluctuation between stages of maturity (11,63%-15.77%). Venkataraman and Chari (1951) have found the protein content in the whole oyster ^ggt to vary seasonally between 5.72% to 13.31'..

The percentage of total carbohydrate content in the tissues varied between 0.9 to 8.6. The higher carbohydrate content was met with in the mantle and in the gills. Visceral mass in the maturing and ripe oysters contained lesser percentage of carbohydrate. For the whole oysters meat the carbohydrate (glycogen) content varied in different months between

TABLE:3 *Protein and carbohydrate content* (%) *in various tissues wtth maturation in male and female oysters.*

	Male				Female				
	Immature	Maturing	Ripe	Spent	Indeterminate	Immature	Maturing	Ripe	Spent
PROTEIN									
Mantle	12.46	10.71	16.24	13.00	15.58	11.76	17.90	15.01	12.52
Gill	10.57	9.77	13.93	12.04	12.85	8.09	11·53	11.82	12.89
Adductor muscle	11.90	15.77	14.92	12.03	11.40	13.24	14.23	15.00	11.63
Visceral mass	14.32	10.56	16.00	15.82	15.05	13.22	14.82	12.01	12.84
CARBOHYDRATE									
Mantle	3.3	4.9	7.0	3.0	1.1	2.6	8.6	5.2	0.6
Gill	1.9	5.9	4.1	2.7	1.0	2.9	2.5	2.6	2.7
Adductor muscle	1.1	4.5	3.4	2.5	0.9	1.6	1.9	5.0	3.1
Visceral mass	4.9	2.5	1.5	2.0	3.1	5.3	1.1	2.0	5.3

0.44%-5.85% (Venkataraman and Chari 1951). The higher variation between the present worl< and that of Venkataraman and Chari (1951) is due to the fact that in the present work total carbohydrate content was measured while the earlier workers determined the glycogen content only,

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