FATTY ACID COMPOSITION OF THE FAT IN THE TWO SEXES OF THE OYSTER, *CRASSOSTREA MADRASENSIS* (PRESTON)

DEPOT fats, which vary considerably in different species of organisms, have been little studied in marine invertebrates. Most of the studies have been so far on the total fat content based on insufficient or small samples. Relatively very little is known regarding the composition of the fat. Toyama, Takagi and Tanaka[1] studied the fatty oils of a variety of aquatic invertebrates. All other early investigations were related to the *unsaponifiable* fraction of mixed fat, pooled together from both sexes of the species.

I have been investigating the biochemical aspects of sex change in the common backwater oyster *Crassostrea madrasensis* and as a preliminary step have studied the analytical characteristics and fatty acid composition of the fat of male and female oysters separately. The present note records some of the chief differences in the analytical constants and the major fatty acids of the depot fat in the two sexes of the oyster.

The analytical constants of fat, *viz.*, saponification value, iodine value, acid value, Reichert-Meissl and Polenske value were determined according to the methods given by Lewkowitsch and Warburton,[2] and Bolton.[3] Unsaponifiable matter and ester fatty acids were separated adopting the method suggested by Viswanathan *et al.*[4] The mixed fatty acids thus obtained were subjected to reversed phase paper chromatography, following the method suggested by Viswanathan and Meera Bai.[5]

The results obtained are given in Table I.

It will be seen that the fatty acid composition differs in the two sexes. In the male the fat has a higher proportion of unsaturated fatty acids (as shown by the iodine value) and in the female the fat has a higher percentage of saturated fatty acids.

Differences in the fat of the two sexes are also seen in regard to the percentage of water-insoluble and water-soluble fatty acids, free fatty acids and unsaponifiable matter.

Apart from the above differences, a noteworthy feature is the absence of myristic acid in the male specimens, but not in the female. Myristic acid is generally an important constituent of animal fats and hence its absence is remarkable.

We know little regarding the variations in composition of animal fat during the life-history of the animal and with reference to sex. However, Lovern[6] has reported the preferential utilization of fatty acids of C_{22} (but not C_{14}) series, and that the concentration of fatty acids of C_{14}, C_{18} and C_{20} series falls in the female during the ripening of the eggs. This he attributes to the differential metabolic requirements in the two sexes.

TABLE I

	Female	Male
1. Colour of fat ..	Dark brown	Light brown and more-liquid
2. Percentage of fat ..	13·7	13·4
3. Saponification value	258·0±4·9	182·6±3·38
4. Iodine value ..	47·4±0·405	85·3±1·52
5. Acid value ..	84·4±0·15	29·8±0·101
6. Saponification equivalent	217·5	309·9
7. Water-soluble volatile fatty acids	11·25	14·65
8. Water-insoluble volatile fatty acids	2·3	3·1
9. Molecular weight :		
Experimental ..	346·2	312·5
Calculated ..	342·3	314·0
10. Unsaponifiable matter	3·49	4·86
11. Major fatty acids ..	Lauric acid	Lauric acid
	Palmitic ,,	Palmitic ,,
	Stearic ,,	Stearic ,,
	Myristic ,,	..
	Oleic ,,	Oleic ,,
	Linoleic ,,	Linoleic ,,

What is noted in oyster is more than a preferential utilization or differential metabolic requirements during spawning, but characteristic patterns of structure of the fat in the two sexes.

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V. K. VENUGOPALAN.

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