

# SEASONAL VARIATION IN THE CHEMICAL COMPOSITION OF POMFRET - II SILVER POMFRET (*PAMPUS ARGENTEUS*)

K. K. SOLANKI, M. K. KANDORAN\* & R. VENKATARAMAN

Central Institute of Fisheries Technology, Sub-station, Veraval

Seasonal variation in the proximate composition of different body regions of silver pomfret (*Pampus argenteus*) is reported. The fat content of the fish is high during winter whereas during summer the fish becomes lean. A comparison of average values of proximate composition and energy values of silver pomfret and black pomfret (*Parastromateus niger*) is given.

## INTRODUCTION

Silver pomfret (*Pampus argenteus*), one of the most favoured table fish, is landed in large quantities in Veraval and many other coastal regions of our country. Its longer ice storage life compared to black pomfret (*Parastromateus niger*) (Venkataraman *et al*, 1966) has enhanced its commercial value. No systematic work seems to have been done on the seasonal variation in the proximate composition of this fish. The knowledge of variation in fat is important in determining the quality and food value of fish, since fatty fish has a higher calorific value (Stansby and Lemon, 1941). Hence investigations were carried out at the CIFT Sub-station, Veraval, on the proximate composition of silver pomfret and its

variation depending on size and body regions.

## MATERIAL AND METHODS

Fresh silver pomfrets of varying size groups (length: 16 to 28 cm. weight: 150 to 775 g.) were collected at random from Veraval coast for consecutive months and analysed for moisture, fat, total nitrogen and ash contents by taking the dorsal parts of the fish to study the fluctuation in proximate composition of different size groups.

Seasonal fluctuation in proximate composition of matured samples was also studied for all the months in an year, except July and August, for two consecutive years.

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\* Present address : CIFT, Cochin-682003.

TABLE I  
Proximate composition of silver pomfrets of varying sizes

Month of catch	Weight in g.	Length in cm.	Mois- ture %	Fat %	Total nitrogen %	Ash%
November, 1969	640	26.0	71.76	8.351	2.705	1.301
„	580	25.3	74.04	6.533	2.910	1.295
„	400	22.5	79.66	0.319	3.055	1.556
„	350	21.8	79.75	0.335	3.034	1.560
„	165	16.5	79.89	0.226	3.080	1.581
December, 1969	775	27.5	74.10	6.551	3.007	1.279
„	685	27.1	75.29	5.596	3.044	1.426
„	305	21.0	79.57	0.610	3.07	1.468
January, 1970	795	28.0	73.46	8.21	2.956	1.381
„	440	24.0	76.31	3.604	2.978	1.406
„	375	22.5	78.32	1.508	3.088	1.310
„	325	21.5	78.75	1.18	3.055	1.559

Sampling of the fish muscle and skin was done according to the method reported earlier (Venkataraman, Solanki and Kandoran, 1968). Estimations of protein, fat, moisture and ash were done according to the AOAC (1960) method and energy value by the method followed by Jafri, Khawaja and Qasim (1964).

#### RESULTS AND DISCUSSION

A significant variation in the proximate composition of silver pomfrets of varying size groups is noticed (Table I). In general, as the size increases there is a gradual drop in moisture, total nitrogen and ash contents with corresponding increase in the fat content. This increase in fat is the most salient feature of the

adult fish. Variation in the moisture, total nitrogen and ash contents, though gradual, is also prominent as in the case of fats. Similar finding had been reported for other fishes also (Chidambaram *et al.*, 1952; Thompson, 1956 & Khawaja, 1966).

Due to the significant variation in the proximate compositions of mature and immature fish the seasonal analysis was confined to the mature forms only.

Table II reveals similarity in moisture and protein contents in respect of different parts *viz.* head, middle and tail portions during the years 1965-66 and 1966-67. The percentage composition of fat decreases steadily in the order skin, head portion and middle portion. The

TABLE II  
Proximate composition of the different body regions of silver pomfret (1965-1967)

		Skin		Head		Middle		Tail	
		1965-'66	1966-'67	1965-'66	1966-'67	1965-'66	1966-'67	1965-'66	1966-'67
Moisture %	Mean	52.87	46.65	69.53	69.77	74.29	74.32	74.18	73.34
	Range	44.8-61.3	32.3-54.0	61.9-76.80	64.9-76.00	70.9-79.2	69.3-77.8	70.9-78.1	66.9-77.2
Fat %	Mean	21.5	28.98	9.55	11.83	5.83	5.45	5.36	6.55
	Range	13.5-30.1	17.3-47.0	4.3-14.7	6.0-17.5	1.9-9.6	2.15-9.0	1.8-8.4	2-10.0
Protein %	Mean	22.15	23.69	17.49	17.00	17.15	17.85	19.90	18.40
	Range	16.1-25	17.2-31.0	15.2-20.8	16.1-18.3	14.8-20.3	16.4-20.0	15.7-20.6	16.5-21.5

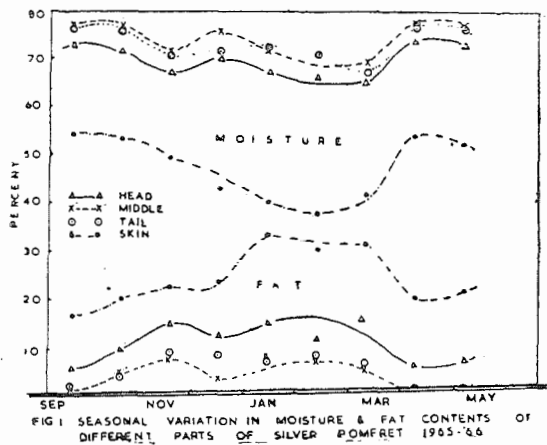


Fig. 1

moisture and fat compositions of middle and tail portions are almost same. Similar observation was reported in the case of black pomfret also (Venkataraman *et al.*, 1968). The higher percentage of fat in skin and head regions may be due to the concentration of depot fat when the fish gets matured. The negative correlation between moisture and fat values is quite distinct in all the body regions of the fish analysed.

Figure 1 shows that fat content of the fish is high during December to March and minimum during the rest of the period. Fatty condition of fish coincides with winter and it is depleted to the minimum during summer.

The slight increase in the average values of fat content of the fish during the season 1966-67 (Fig. 2) can be attributed to the variation in environments, or geographic location of catch (Venkataraman and Chari, 1951; Stansby, 1953; Karrick *et al.*, 1952) in addition to variations in size, maturity, reproductive cycle and season itself (Thompson, 1966). The percentage of protein is found to be

similar in all the months of the period of study excepting March, April and May 1967, when it was slightly higher than the previous year. In general the percentage of protein is maximum during January and February and least in April, May and October.

Though there is a negative correlation between protein and moisture content, it is not so significant as in the case of fat and moisture. Power (1964) has shown that oily fishes like herring, while showing a considerable increase in the amount of oil, have shown only very little change in protein constituents and the elevated moisture level was accompanied by a drop in muscle protein.

There is no significant variation in the ash content showing the constancy of the mineral constituent in the adult species.

Comparison of proximate composition of silver and black pomfrets (Table II) shows no significant difference in the average values of moisture contents whereas the fat content is 2% more and protein 1% less in silver pomfret. The total energy values per 100 g. of muscle in case of silver pomfret were 136.71 and 146.73 calories during 1965-66 and

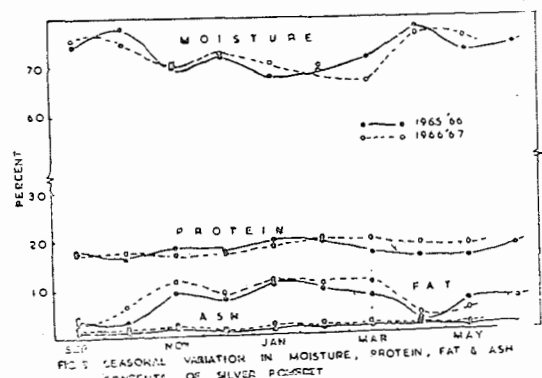


Fig. 2

TABLE III  
Comparison of moisture, fat, protein and energy values of silver pomfret with that of black pomfret

	Silver pomfret		Black pomfret*	
	1965-'66	1966-'67	1965-'66	1966-'67
Moisture %	72.67	72.48	73.63	72.79
Fat %	6.91	7.94	4.17	5.02
Protein %	17.66	17.77	18.77	18.93
Total energy value:				
Cal./100 of fresh muscle (of fat and protein only)	136.71	146.73	115.77	124.33

\* Venkataraman *et al.* 1968

1966-67 respectively. In the case of black pomfret the corresponding values were only 115.77 and 124.33 calories during the same period. This difference may be attributed to the high percentage of fat in silver pomfret.

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