

Food and Feeding Habits of *Sarpa salpa* Salema (family: Sparidae) in the Libyan Coast of the Mediterranean Sea

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ABSTRACT

A total of 378 fish of *Sarpa salpa* were collected from eastern coast Libya 16 month period for biological study of food and feeding habits numerical method and the percentage of fish that contain low empty stomach. It was found that sea grasses is the main food of these fish that depend on it by 79.10% and following by algae with 15.10% and 4.33% crustaceans and there is no clear relationship between the lengths of these fish and the size of the food they eat.

Keywords: Food and feeding habits, *Sarpa salpa*, Libyan coast, Mediterranean Sea

INTRODUCTION

Studies on feeding biology of any organism depend firstly on a listing of prey organisms exploited, followed by assessment of the relative importance in diet, The diet studies based upon analysis of stomach contents is now a standard practice in fish ecology (Hynes, 1950; Pillay, 1952 and Lagler 1956).

The study of feeding preferences of fish species is important in classic ecological theory, mainly in identifying feeding composition, structure and stability of food webs (Post *et al.*, 2000).

It is known that members of the family Sparidae feed on live food (Ahmed, 1999). On the studying the feeding behavior of youngs and adults of *S. salpa* in the different areas of Mediterranean sea, Verlaque (1990) found that they have essentially herbivorous grazing ability and trophic mobility. The young fishes preferred mainly the epiphytes and filamentous algae. Some sparids, don't change their feeding habits along their life span, Hussain *et al.* (1987).

Some studies revealed that *S. salpa* in the various age groups feed mainly on detritus (Tomac *et al.*, 2000).

This present work concerned with studying diet of *S. salpa* and their monthly variation diet composition and variations of diets with length that were examined by the points of assessment method and data were expressed as percentage of the total food items.

MATERIAL AND METHODS

A total of 378 specimens of *S. salpa* collected in different months, were used to study food and feeding habits of the studied species. Each fish was weighted freshly to nearest 0.01 gm and its total length was determined in cm and the stomach was cut longitudinally and its contents were escaped out and transferred into a small Petri dish. Food items were sorted out and then identified as far as possible. Numerical methods were chosen for food analysis was applied to assess the volume of each food items by visual estimation. this method gives each food item point from 1-5 (e.g.0,1,2,3,4 and 5) were allotted to empty, quarter full ,half full, three quarter full

and completely full respectively. Monthly variation in diet composition was also examined and data were expressed annually and visual estimation for volume of each food item was done in order to apply point method (Hynes, 1950; Kislalioglu & Gibson, 1977).

Method of Hynes (1950) was adopted in the present study. The statistics measuring of food composition were driven by Godfriaux (1969).

RESULTS & DISCUSSION

Annual diet composition

Figure (1) displayed the percentage of the annual composition of *S. salpa* diet, Algae, Seagrasses crustacean, polychaeta digested food, and sediment is the main food groups for *S. salpa*.

Seagrasses were the major food items constituting 79.16% of all food consumed. Algae are the second food items constituting 15.10% of all food consumed, Crustacea constituted 4.33% of all food consumed in *S. salpa*. Polychaeta is one of minor food with about 0.41% of all food consumed, Digested food constituted 1.07% of all food consumed and sediment represented 0.10% of all food consumed.

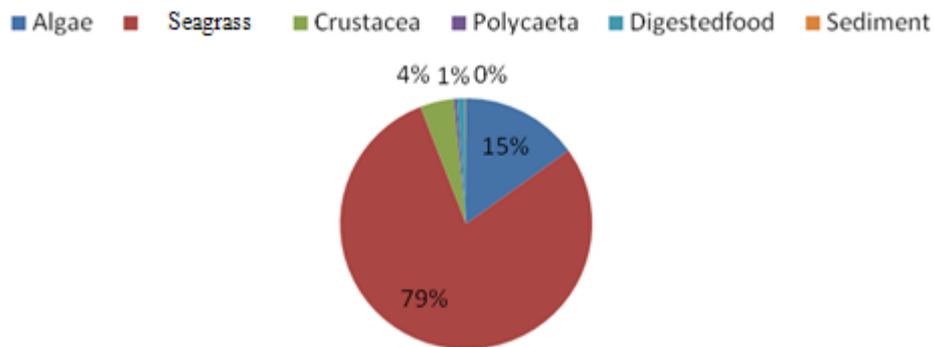


Fig. 1: Percentage of food composition of *S. salpa*.

This study is consistent with Tomac *et al.* (2000), who studied the feeding nutritional of *S. salpa* in the South Adriatic in Croatia and found that these species feed mainly on Seagrasses and Algae and crustacean also Ahmed, 1999 reported that the composition of *S. salpa* stomach contents collected off the South Sinai coasts which are volumetrically Seagrasses and Algae.

Monthly variations in the diet composition:

Monthly variations in the diet composition of *S. salpa* is illustrated in Table (1) by volume composition. Seagrasses recorded the highest value in August 2010 and February 2011 (100%), whereas the lowest value was recorded in May (3.21%). Algae disappeared in August 2010, January, February and March 2011, However, algae formed the largest component in December 2010 (77.15%) and May 2011(34%), while come crustaceans, Polychaeta and digested come with low rates in all months.

This agreement with Tomac *et al.*, (2000), who reported that *S. salpa* was considered as that depend on the Seagrasses for food also Verlaque (1990) studied the feeding behavior of *S. salpa* and the found that it is mainly herbivorous fish. Its dietary selectivity changed according to increase of its vertical distribution and grazing ability. In dense algal settlement, *S. salpa* behaved as highly selective herbivorous browser. When the trophic resources were overgrazed, it tend to become

a generalist grazer, feeding upon erect algae and on Seagrasses *posidonia oceanica* (L) *delile* leaves.

Table 1: Monthly variation in diet composition of *S. salpa*.

Months	Percentages of food items					
	Algae	Seagrasses	Crustacea	Polychaeta	Digested	Sediment
May (2010)	12	85.9	2.1	0	0	0
Jun	3.1	91.3	0.9	0	4.6	0
Jul	67.1	27.4	5.5	0	0	0
Aug	0	100	0	0	0	0
Sep	0.6	99	0.32	0	0	0
Oct	50.8	44.2	1.4	0	3.5	0
Nov	0.38	98.8	0	0	0.76	0
Dec	77.15	15	0	6.54	0	1.7
Jan (2011)	0	96	0	0	3.91	0
Feb	0	100	0	0	0	0
Mar	0	96.8	0	0	3.1	0
Apr	8.86	89	0	0	1.5	0
May	34	62	3.21	0.91	0.14	0
Jun	23.9	75.3	0.63	0	0	0
Jul	13	85	2	0	0	0
Aug	6.51	93.4	0	0	0	0

Food habits in relation to the length:

Fishes were classified into nine classes from 15.1 to 42 cm with 3 cm interval, the relation between food habits and length of *S. salpa* is represented in Fig. (2). Algae were found in all length groups and the percentage increased from 10% in small fish (15.1 – 18 cm) by volume composition, reaching their highest level (100%) in biggest fish (39.1 – 42 cm), Sea grasses disappeared in range length (39.1 – 42 cm), however crustaceans disappeared in largest size fish from length group (18.1 – 21 cm), Polychaeta found in range (21.1 – 24 cm) 0.35%, then the digested food were found in small length (15.1 – 18 cm). Thus, the highest rates of food items were sea grasses and algae in most lengths.

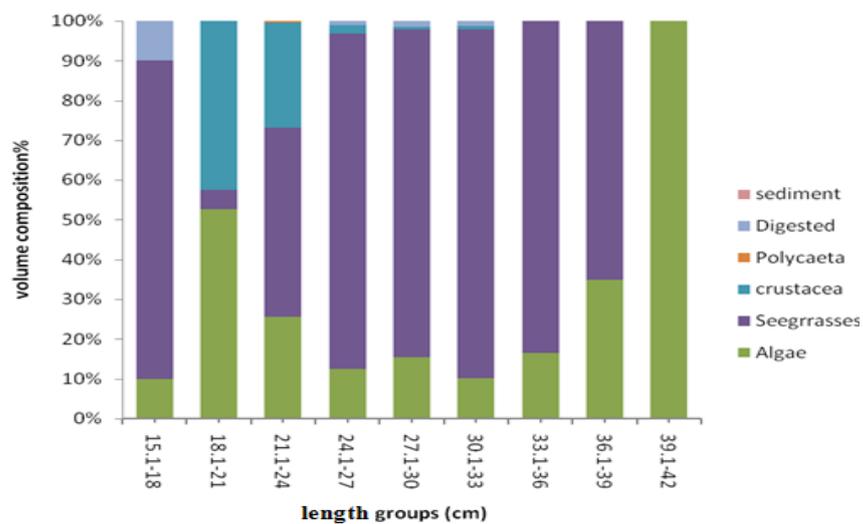


Fig. 2: The diet composition of different length classes of *S. Salpa*.

Intensity of food

The intensity of feeding was illustrated in Table (2), intensity of feeding in *S.salpa* clearly indicates high rate of feeding activity fishes with stomachs half full, three-quarter full and full of food constitute 59.66% of all analyzed individuals, whereas those with empty, traces of food and quarter full stomach were represented by 40.32% of total specimens. However, the intensity of food varied considerably from one month to another. The percentage of stomach full of food recorded the highest values in November (32%).

Table 2: Monthly variations in the intensity of food in the stomach of *S. Salpa*.

Months	Intensity of food in the stomach						
	No. of fish	Empty	Trace	1/4	1/2	3/4	Full
May 2010	26	0.0	0.0	7.69	26.92	38.46	26.92
Jun.	25	4	8	32	32	20	4
Jul.	25	0.0	32	16	28	16	8
Aug.	25	0.0	8	12	24	36	20
Sep.	21	0.0	14.28	28.75	23.8	19.04	14.28
Oct.	23	0.0	4.34	26.08	47.8	21.73	0.0
Nov.	25	4	4	24	20	16	32
Dec.	24	0.0	29.1	25	16.6	12.5	16.6
Jan. 2011	25	4	24	20	16	16	20
Feb.	21	0.0	23.8	33.33	19.04	23.8	0.0
Mar.	25	0.0	12	28	20	12	28
Apr.	25	4	28	24	24	12	8
May	25	4	28	16	24	16	12
Jun.	25	4	12	40	20	20	4
Jul.	22	0.0	13.6	27.27	22.72	22.72	13.6
Aug.	25	0.0	4	16	32	40	8

Sparidae are considered as herbivorous trophic category. Food and feeding habits of different species of Sparidae have been studied by many authors (FAO, 1987 Quignard and Tomasini, 2000; Bin-abdullah, Al-turk, 2005; Ahmed.1999).

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ARABIC SUMMARY

دراسة بيولوجية على العادات الغذائية لسلمه الشليه (*Sarpa Salpa* L., 1758) في الساحل الشرقي الليبي

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تم تجميع ٣٧٨ سلمه شليه خلال ١٦ شهرا من الساحل الشرقي الليبي لدراسة العادات الغذائية والاعتداء بالطريقة العددية. وكانت نسبة الأسماك التي تحوى على معدة فارغة منخفض. وقد وجد أن الأعشاب البحرية تعد الغذاء الرئيسي الذي تعتمد عليه هذه الأسماك بنسبة ٧٩.١٠% ويلي ذلك الطحالب بنسبة ١٥.١٠% ثم القشريات بنسبة ٤.٣٣% ولا توجد علاقة واضحة بين أطوال هذه الأسماك وحجم الغذاء الذي تتناوله.