The Consumed Natural Diet of Chondrostoma regium (Heckel, 1843) from Tigris River, Salah Al-Deen Province

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Abstract:

The foreguts of a total of 515 fish of *Chondrostoma regium* (Heckel, 1843) (locally: Bala'aot Malloky) were studied. These fish were collected from Tigris River at Salah Al-Deen Province (between Al-Hagag & Yathrib) for 20 months between March and October of the next year. Detritus, plant in origin materials (19.6%, 23.0% & 24.9%); green and blue green algae, mostly *Cladophora, Cosmarium* and *Merismpedia* sp. (17.1%, 12.9% & 12.2%) and diatoms, mostly *Diatoma, Chanathes, Amphora* and *Cyulbella* sp. (16.9%, 8.8% & 8.2%) were the main food categories taken by these fishes according to occurrence (O%), volumetric methods (V%) and ranking index (R%). Debris (not part of the diet) took 45.3% of the studied fish foreguts by volume. Detritus was also the most important food category (25.9%, 18.2%, 22.9% & 19.8%, by ranking index) at all sampling stations respectively, and taken by different fish size groups (168-200, 201-300 & 301-350mm).The diet overlaps between these fish size groups and that between different sampling stations were ranged between 0.86-1.0, *i.e.* fish were mainly feeding on the same food organisms.

Key words: *Chondrostoma regium*, Tigris River, Natural diet, Iraq

Introduction:

Published Iraqi works on commercially important fish species from Tigris River waters are not enormous. However, good information is available on some fish species belong to genus *Barbus*. Though our data may represent the first information on the important fish species in this particular area of the river. However, it must be pointed out that some of the available information is from research work of M.Sc. and Ph.D. students in various Iraqi Universities such as [1,2,3&4].

This series of papers are about natural food and feeding ecology of the available fish species in the study area from Tigris River. These include the identification of the most important food categories taken by fish, and the seasonal variation in the diet. The present work aims to provide information on the consumed diet of *Chondrostoma regium* (Heckel, 1843), [*C. regius* (Heckel, 1843), in Al-Daham [5]; *Chondrochilus regius* (Heckel, 1843), in Coad [6]]. *C. regium* (Cyprinidae, Cypriniformes) is a subtropical fresh water fish native to Tigris-Euphrates basins in Iraq, Iran and Syria [7]. This species found in both rivers and lakes & reservoirs. It known from Turkey in lake Beysehir and river Goksu, Seyhan Southern Anatolia [8], *C. regium* prefers stone grounds and still waters [9].

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However, *C. regium* is the most common (by number) fish in the study area, whereas, it was listed as endangered species in Turkey [10].This species is a tasty fish [11], but relatively not widely sold as food fish by itself. They sell it with *L. abu* and other small fish's lots in local markets at north of Baghdad.

Materials and Methods:

Tigris River reaches of Salah Al-Dien province from Al-Hajaj to the south of its confluence with Al-Adheim river (at Yathrib) were sampled, Fish fauna of the area were studied. Four sampling stations were chosen along the study area. Three of them were north of Sammura Barrage. These were: Al-Hajaj, Al-Dour and Abu-Dalaf, while the fourth station was along the confluence area with Al-Adheim river south the barrage between Balad and Yathrib.

The river is with rocky bottom at station 2 (Al-Dour) and the north part of Station 1. Fast water current and number of natural weirs were available at these two stations. While at station 3 (Abu-Dalaf), water current is slow due to the affect of Sammura barrage. However, at station 4 (Yathrib) the water speeds are always under the affect of the current from Al-Adheim river, especially during the raining seasons (December–April).The dam on Al-Adheim river were finished during 2001.

Monthly samples were taken from each station using different gill nets of different mesh sizes (15, 20, 30, 40, 50 mm) tight together, forming one net with length between 70-85 m. The nets were floated for 20-30 minutes before pulling them out. This process was repeated three to four times along the sampling area of each station. Fish were killed immediately by a blow to the head, after they were taken out of the nets. Samples were frozen and brought back to laboratory at Baghdad for scientific investigation. Data were taken for fishes, which includes total weight, total length, age and sex. Samples from the foreguts of some of these fishes were taken for stomach contents study [12].

Two methods were used to analyze the foreguts contents. The occurrence method (O%) [13] and the volumetric method (V%) [12]. Ranking index (R%) were also used according to [14]. Empty stomach, stomach with trace of food, stomach ¼ full, ½ full, ¾ full, completely full and distended with food were awarded, zero, 5, 10, 20, 30, 40, and 50 points, respectively [12&15]. Dietary similarity was estimated using the index used by Horn [16]: $C_H = 2 (\sum Xi\ Yi) / (\sum X^2 i + \sum Yi^{2)}$.

Where C_H = similarity (overlap) index, S= total items in both groups; Xi = proportion of total diet of fish group X contributed by prey taxon i ; Yi = proportion of total diet of fish group Y contributed by prey taxon i.

Result and Discussion:

A total of 3574 fish were collected throughout the 20 months of study period. Fish were representing 24 species and belonging to seven families and three orders. *Chodrostoma rgium* occurred in most monthly samples and dominated the catches, followed by *Liza abu* (Heckel, 1843), *Cyprinion macrostmus* (Heckel, 1843), *Varicorhinus trutta* (Heckel, 1843). Whereas, *Barbus luteus* (Heckel, 1843), *B.grypus* (Heckel, 1843), *B.esocinus* (Heckel, 1843) and *Aspius vorax* (Heckel, 1843) were also found in most samples but at low percentages. Some economically important fish such as *Barbus sharpyi* (Gunther, 1874), *B.xanthopterus*

(Heckel, 1843) and *Silurus triostegus* (Heckel, 1843) were appear very rare in the total catch.

A total of 1043 *C. regium* were collected. It formed about 31% of the total fish catches in the study area by number. These fishes ranged between 168-350 mm in length and 38-396 grams in weight, (Table 1). The relationships between total length (L) and total weight (W) of sampled fishes took the following equations:

Males: log W = –1.76 + 2.42 log L (r = 0.855, n = 511).

Females: log W = 1.89 + 2.83 log L (r = 0.918, n = 291).

Both sexes: log W = 1.34 + 2.71 log L (r = 0.920, n =802).

Khalaf *etal*. [17] and Allouse *etal*., [18] studied this species in the Diyala river at Rustamiy and found that (b) of total length –total weight relationship was 2.49. Whereas, Oymak [19] found that b of total weight and fork length equivalent to 3.199 in females, and b=3.278 in males for fish from Ataturk Dam, Turky. This proved that *C. regium* of Tigris River is fatter than that of Diyala River and thinner than the fish at the reservoir of Ataturk Dam.

Table 1: The ranges of total length, total weight and their means of *C.regium* age groups collected from Tigris River.

Age groups	%	Total length (mm)	Mean length ± s.d. (mm)	Total weight (g)	Mean weight ± s.d (g)
2	0.6	168-202	184 ± 11.4	38 – 63	49 ± 8.5
3	38.9	185-275	205 ± 3.5	44 – 209	67 ± 1.7
4	46.0	200-315	232 ± 8.4	58 – 323	95 ± 8.2
5	12.4	240-320	262 ± 10.7	68 – 304	135 ± 14.5
6	1.6	269-335	293.6± 20.0	130-412	251.2± 70.1
7	0.4	293-350	311 ± 23.8	208-396	300 ± 69.5

Diet composition

Foreguts contains of 515 C. *regium were* studied. Seasonal composition of fish diet as described by both, occurrence and volumetric methods, as well as ranking

index were given in tables (2-6). Table 2 is showing that organic detritus (plant materials in origin) (19.6%, 23.0%, 24.9%), algae (green and blue green) (17.1%, 12.9%, 12.2%), and diatoms (16.9%, 8.8%, 8.2%), were the most important food categories taken by fish during the period of study. However, debris (sand and mud) formed 20.0%, 45.3%, 50.1% of fish foregut, but didn't treated as part of the diet, but may help in food digestion [20]. Fish foreguts tended to be fuller during autumn rather than spring and summer at all the stations. So, more points were awarded per fish during winter and autumn than other seasons. This may be due to the presence of high percentage of sand in fish guts.

Station 1: Detritus (20.4%, 23.7%, 25.9%), and algae (16.1%, 15.7%, 13.6%) and Diatoms (18.0%, 8.1% and 7.8%) were the main food items found in the foreguts of caught fish from this station (Table 2). However, detritus formed its peak of representation during 1st spring, forming 62.8% of the foregut contents total volume. Occurrence method, on other hand, showed that detritus were taken by most of fish (30.2%) especially during 1st spring. Algae formed its highest representation during 2nd spring of sampling (19.3%, 22.1%), (Table 3).

Station 2: Few fish were captured during the first six months of sampling and with few amount of food inside (Table 4). These fish were mainly taken detritus, (18.4%, 17.1% & 18.2%), green algae (17.6%, 13.4% & 13.7%) and diatoms (17.8%, 10.2%

& 10.5%) beside debris. However, consumed diet of fish at this station did not differ from that of other stations. Detritus formed its peak of importance (15.5%, 26.4%) during the 2nd spring, while, algae came first during the second summer. It formed 16.7% of fish diet by volume (Table 4).

Station 3: Detritus (19.3%, 21.4% & 22.9%), algae (17.0%, 13.2% & 12.5%) and diatoms (16.4%, 9.0% and 8.2%) were formed the main fish diet during the study period. (Table, 2). However, Detritus (38.3%) and algae (19.8%) made their peak of importance during 1st summer and 2nd spring according to the volumetric method respectively, (Table 5). Station 4: Captured fish from station 4 (Table 2) consumed similar food items. Organic detritus (19.5%,26.7% & 29.1%), algae (18.0%,8.7% & 8.7%) and diatoms (15.6%,8.8% & 7.6%) formed the main food items taken by fish during the study period. However, detritus (41.3%, 25.8%) and algae (17.1%, 14.6%) formed their peaks of representation by volumetric and occurrence methods during 1st. summer and 2nd. Spring respectively, (Table 6). The data of the 20 months from all the stations were pooled in Table 2. This Table shows that more than 92% of the fish feed on detritus and have large amounts of debris in their guts. This suggests that fish were taken its food from the bottom of the river. This is in contrary with the diet of *C .regium* collected from Tigris River nearby its tributary Diyala river [11]. *C. regium* was found mainly feeding on zooplanktons, however, detritus ranked fourth. Debris (sand and mud) took only about 4% of the foreguts contents given volume. In this study algae and diatoms contributed with noticeable percentages (21.7%) in the diet by volume, and mostly occurred in all the considered fish during the period of study. These algae included the followings: *Cladophora* sp. *Cosmarium* sp. and *Merismpedia* sp., while diatoms species include : *Achanathes* sp. , *Amphora ovalis* Kuetz., *Cocconeis placentula* Ehr., *Cyclotella* sp. , *Cymbella affinis* Kuetz.,

Cymbella aspera (Ehr.) Clever, *Cymbella prostata* (Berkeley) Cleve, *Cymbella* sp., *Gomphonema* sp., *Melosira* (*Aulcosira*) sp., *Diatoma elongatum* (Lyngh.), *Ditoma vulgare* Bory, *Nitzschia palea* (Kuetz.) W.Smith, *Nitzschia dissipata* Kuetz. Grun. *Navicula cryptocephala* Kuetz., *Gyrosigma* sp., and *Amphora ovalis* Kuetz.

Size variation in diet

Data on diet composition of different fish size groups are given in (Table 7). These groups might include fishes from different ages. By volumetric method, the most important food categories (excluding debris) taken by small fishes (168-200 mm), medium size fishes (201-300 mm) and larger fishes (301-350 mm) were organic detritus, except for small fishes from station 1 (algae = 19.2%). Algae (green and blue-green) came second in the diet of most sizes groups. Table 8A showed that, different size of fish took the same food categories within the same sampling stations, with (C_H) ranging between 0.86 and 1.0. However, no information on the diet overlap between different size groups of *C .regium* from other Iraqi water are available, to be compared with.

Similarity of diets

Similarity index (C_H) between fishes diets from station 1 and other stations were ranged between 0.97 and 1.0. These values indicated that fish from different stations of sampling were mainly feeding on the same food organism (Tables 8A&B). Similarity values of 0.6 or greater are accepted as

showing significant similarity [21]. Galliet and Barry [22] compared five indices of overlap, including Horns index, and found that the indices gave similar results.

Table 2: The percentage composition of fish diet from different sampling stations according to the occurrence (O%), volumetric (V%) and ranking index (R%) methods.

Stations	1st			2nd			3rd			4th			All		
NO. of fish	190			71			104			150			515		
Food categories	O%	V%	R%	O%	V%	R%	O%	V%	R%	O%	V%	R%	O%	V%	R%
Adult insects	0.6	0.4	+	1.6	0.7	0.1	0.4	0.2	+	0.3	0.1	+	0.6	0.3	+
Chironomidea L.&P	4.2	2.0	0.5	5.9	1.3	0.4	3.9	1.5	0.3	3.7	1.3	0.1	4.1	1.6	0.4
Other insects L, P&N.	1.3	1.8	0.1	0.6	0.6	+	0.6	0.3	+	1.7	0.4	+	1.2	0.5	+
Zooplankton	2.0	0.6	+	2.9	1.1	0.2	2.8	1.5	0.2	0.8	0.3	+	2.0	0.8	0.1
Annelida	3.2	0.5	0.1	3.5	0.7	0.1	1.9	0.4	+	1.8	0.3	+	2.5	0.5	0.1
Mollusca	0.1	+	+							0.1	+	+	0.1	+	+
Tardigrada							0.6	0.4	+				0.1	0.1	+
Nematoda							0.8	0.6	+				0.2	0.1	+
Higher plant T.	0.1	+	+	3.0	1.2	0.2	1.0	0.5	+	4.4	2.1	0.5	2.0	0.9	0.1
Organic detritus	20.4	23.7	25.9	18.4	17.1	18.2	19.3	21.4	22.9	19.5	26.7	29.1	19.6	23.0	24.9
Algae G&BG	16.1	15.7	13.6	17.6	13.4	13.7	17.0	13.2	12.5	18.0	8.7	8.7	17.1	12.9	12.2
Diatoms	18.0	8.1	7.8	17.8	10.2	10.5	16.4	9.0	8.2	15.6	8.8	7.6	16.9	8.8	8.2
Debris (S. & M)	20.9	43.5	48.8	18.4	51.3	54.7	20.5	44.1	50.2	19.4	45.0	48.7	20.0	45.3	50.1
Unidentified digested food	13.0	4.4	3.1	11.0	2.9	1.8	14.7	6.9	5.6	14.7	6.3	5.2	13.6	5.2	3.9

(L. larvae, P. pupae, N. nymphs, T. tissues, G. green, BG. blue-green, S&M. sand and mud)
+ : less than 0.1

Table 3 : Seasonal variation in the diet of *C. regium* at Al-Hajaj (station 1) according to volumetric (V%) and occurrence (O%) methods. The relative abundance of each food is given in (%).

Months	SPRING 1988		SUMMER		AUTUMN		WINTER		SPRING 1989		SUMMER	
No. of fish	19		29		38		31		34		39	
Food categories	O%	V%	O%	V%	O%	V%	O%	V%	O%	V%	O%	
Adult insects	1.9	1.5							1.1	1.1	0.9	1.1
Chironomidea L. & P			2.4	1.0	2.3	0.6	3.4	1.3	5.7	3.6	6.6	4.2
Other insects L,P&N	1.9	0.9	12.0	1.0	1.1	0.4	4.0	3.3	1.2	1.4		
Zooplankton	1.9	0.5					0.7	0.3	0.6	0.5	6.3	2.0
Annelida					3.5	0.5			4.5	1.0	5.3	1.1
Mollusca					0.6	0.1	1.3	0.1				
Tardigrada												
Nematoda												
Higher plant T.											0.4	0.1
Organic detritus	30.2	62.8	27.0	25.0	20.2	21.1	21.7	15.2	18.8	28.2	17.3	21.5
Algae	3.8	3.2	5.9	2.1	18.5	17.0	18.0	19.0	19.3	22.1	17.3	16.4
Diatoms	5.7	1.4	17.7	4.9	19.0	4.6	20.1	11.0	19.3	10.5	17.3	11.1
Debris (S. & M)	30.1	19.4	28.0	60.0	20.8	52.1	20.1	45.9	19.3	28.1	17.3	38.7
Unidentified digested food	24.5	10.3	17.7	6.0	13.3	3.6	10.7	3.9	10.8	4.5	11.5	3.8

(L. larvae, P. pupae, N. nymphs, T. tissues, G. green, BG. blue-green, S&M. sand and mud)+ : less than 0.1)

Table 4 : Seasonal variation in the diet of *C. regium* at Al-Dour (station 2) according to volumetric (V%) and occurrence (O%) methods. The relative abundance of each food is given in (%).

Months	SPRIBG 1988		SUMMER		AUTUMN		WINTER		SPRING 1989		SUMMER	
No. of fish	3		5		15		26		10		11	
Food categories	O%	V%	O%	V%	O%	V%	O%	V%	O%	V%	O%	V%
Adult insects									3.6	1.5	3.0	3.5
Chironomidea L.& P					7.4	1.2	1.6	0.3	6.4	2.0	6.0	3.5
Other insects L,P&N					1.2	0.3			0.9	0.1		
Zooplankton							8.6	2.5			3.0	1.2
Annelida					6.2	1.5			1.6	0.8	9.1	1.2
Mollusca												
Tardigrada												
Nematoda												
Higher plant T.									10.0	6.5		
Organic detritus	60.0	66.6	33.3	40	18.5	15.5	21	12.6	15.5	26.4	15.2	14.7
Algae (B.&BG)					18.5	15.2	21	11.6	15.5	12.9	16.7	16.7
Diatoms			33.3	10	18.5	8.0	21	10.6	15.5	10.5	16.7	13.6
Debris (S. & M)	40.0	33.3	33.3	50	18.5	55.5	21	60.8	15.5	33.8	16.7	42.0
Unidentified digested food					11.1	2.8	5.5	1.4	15.5	5.5	13.6	3.6

(L. larvae, P. pupae, N. nymphs, T. tissues, G. green, BG. blue-green, S&M. sand and mud)
+: less than 0.1)

Table 5 : Seasonal variation in the diet of *C. regium* at Abu-Dalaf (station 3) according to volumetric (V%) and occurrence (O%) methods. Relative abundance of each food is given in (%).

Months	SPRING		SUMMER		AUTUMN		WINTER		SPRING		SUMMER	
No. of fish	31		3		15		31		19		5	
Food categories	O%	V%	O%	V%	O%	V%	O%	V%	O%	V%	O%	V%
Adult insects	0.8	0.6									3.7	4.9
Chironomidea L&P.	1.6	0.4			5.6	2.1	2.0	0.5	9.8	4.6		
Other insect L,P&N.	0.8	0.3					1.2	0.7				
Zooplankton	9.8	5.1					1.2	1.1				
Annelida							3.3	0.6	40.0	0.6		
Mollusca												
Tardigrada	2.4	1.6										
Nematoda	3.3	2.5										
Higher plant T.									4.0	3.0	3.7	0.4
Organic detritus	18.7	29.8	28.6	38.3	19.7	10.4	20.3	19.3	17.6	31	18.5	16.2
Algae	9.8	5.9	14.3	1.7	21.1	16.4	20.3	13.0	17.6	19.8	18.5	18.9
Diatoms	8.0	3.8			21.1	9.4	20.4	10.9	17.6	10.4	18.5	8.9
Debris (S. & M)	22.8	28.9	28.6	50.0	21.1	60.0	20.3	51.3	17.6	26	18.5	44.9
Unidentified digested food	22.0	20.8	28.5	10.0	11.3	1.7	11.1	2.7	11.8	4.5	18.5	5.8

(L. larvae, P. pupae, N. nymphs, T. tissues, G. green, BG. blue-green, S&M. sand and mud)
+: Less than 0.1

Table 6 : Seasonal variation in the diet of *C. regium* at Al-Adheim (station 4) according to volumetric (V%) and occurrence (O%) methods. The relative abundance of each food is given in (%).

Months	SPRING 1988		SUMMER		AUTUMN		WINTER		SPRING 1989		SUMMER	
No. of fish	15		27		36		28		28		16	
Food categories	O%	V%	O%	V%	O%	V%	O%	V%	O%	V%	O%	V%
Adult insects					1.4	0.2						
Chironomidea L.&P			5.6	1.7	4.2	0.8	5.5	1.8	0.6	0.6	5.4	3.4
Other insects L,P&N.							1.2	0.4	5.5	1.2	1.7	0.7
Zooplankton					0.7	0.2	0.7	0.3			4.4	1.4
Annelida					1.4	0.3	3.1	0.5	1.2	0.3	4.3	1.5
Mollusca							0.6	0.1				
Tardigrada												
Nematoda												
Higher plant T.							8.0	3.5	11.0	6.2		
Organic detritus	22.6	32.1	25.8	41.3	21.1	26.5	17.1	16.6	17.1	24.3	17.4	32.1
Algae (G.&BG)	16.1	10.7	10.1	7.0	14.8	4.3	16.7	7.9	17.1	14.6	17.4	11.5
Diatoms	17.7	5.8	20.2	9.9	19.7	5.4	16.7	11.6	17.1	10.5	17.4	5.8
Debris (S. & M)	22.6	32.1	25.8	41.3	21.1	26.5	17.1	16.6	17.1	24.3	17.4	32.1
Unidentified digested food	19.4	13.4	13.5	5.8	16.2	6.3	13.4	4.7	13.3	6.3	15.2	4.8

(L. larvae, P. pupae, N. nymphs, T. tissues, G. green, BG. blue-green, S&M. sand and mud)
+: less than 0.1

Table 7 : The percentage composition of fish diet of three fish size groups (S,M,La) according to the occurrence (O%) and volume (V%) methods.

Stations	Station 1						Station 2						Station 3						Station 4 *			
Fish size No. of fish	S (30)		M (150)		La (10)		S (20)		M (45)		La (6)		S (24)		M (68)		La (12)		S (23)		M (127)	
Food categories	O %	V %	O %	V %	O %	V %	O %	V %	O %	V %	O %	V %	O %	V %	O %	V %	O %	V %	O %	V %	O %	V %
Adult insects	0.7	0.1	0.6	0.6							2.6	1.0			0.7	0.3					0.3	0.1
Chironomidea L.&P	2.1	1.6	4.3	1.9	9.4	4.5	10.5	5.2	3.9	1.1	4.8	1.0	10.7	5.5	2.7	1.1	2.6	0.9	2.5	2.7	3.9	1.1
Other insects L,P&N	2.8	3.1	1.3	0.5			2.6	0.4			0.4	0.1			1.0	0.6					2.0	0.4
Zooplankton	2.8	0.6	1.9	0.7			2.6	2.0	1.9	0.7	3.5	1.3	4.0	3.1	1.0	0.5	6.8	3.8	1.7	0.1	0.7	0.3
Annelida	3.4	0.5	3.3	0.6	1.8	0.2					5.7	1.0	4.0	0.8	2.1	0.4			2.5	0.1	1.7	0.4
Mollusca			0.2	+																	0.2	+
Tardigrada																	2.6	1.5				
Nematoda													1.3	0.4	0.3	0.2	1.7	1.6				
Higher plant T.					1.8	0.2	7.9	3.2	5.8	1.5	0.9	1.0	5.3	4.3	0.3	0.1			5.0	3.0	4.2	1.9
Organic detritus	20.0	15.6	20.6	25.9	18.9	23.1	15.8	27.2	19.4	14.5	18.3	17.1	16.0	25.0	21.0	23.1	17.1	15.2	18.5	25.0	19.7	27.0
Algae G&BG	15.2	19.2	16.3	15.2	17.0	11.1	15.8	11.0	19.4	12.4	17.0	14.0	16.0	17.4	16.5	12.8	18.8	12.5	18.5	11.4	17.9	8.3
Diatoms	17.9	8.2	17.9	7.6	18.9	12.7	15.8	9.4	19.4	12.7	17.5	9.3	14.7	11.3	17.9	9.2	13.7	7.5	19.3	9.3	14.8	0.9
Debris (S. & M)	20.6	45.7	21.0	42.8	18.9	43.8	15.8	36.3	19.4	54.3	18.3	51.5	16.0	26.4	21.6	45.2	20.5	48.3	19.3	43.0	19.4	45.4
Unidentified digested food	14.5	5.3	12.6	4.2	13.2	4.3	13.2	5.2	10.7	2.6	10.9	2.7	12.0	5.8	14.8	6.5	16.2	8.6	12.6	5.2	15.2	6.5

(L. larvae, P. pupae, N. nymphs, T. tissues, G. green, BG. blue-green, S. small (168-200) mm, M. medium (200-300) mm, La. Large (300-350) mm.

+ less than 0.1

* No Large Fish from Station 4

Table 8: Values of index of food similarity between fishes of different fish size roups and from different sampling Stations (B).

A	Small Fish (168-200) mm				Medium Fish (200-300) mm				Large Fish (300-350) mm			
	ST1	ST2	ST3	ST4	ST1	ST2	ST3	ST4	ST1	ST2	ST3	ST4
Small fish	-	-	-	-	0.93	0.91	0.91	0.98	0.97	0.93	0.86	-
Medium fish	0.98	0.91	0.91	0.98	-	-	-	-	0.99	1.0	0.98	-
Large fish	0.97	0.93	0.86	-	0.99	1.0	0.98	-	-	-	-	-

B	All Fishes			
	ST1	ST2	ST3	ST4
ST1	-	0.97	1.0	0.99
ST2	-	-	0.98	0.97
ST3	-	-	-	0.99
ST4	-	-	-	-

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الغذاء الطبيعي المتناول من قبل سمكة البلعوط الملوكي Chondrostoma regium (Heckel, 1843) من نهر دجلة، محافظة صلاح الدين

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الخلاصة:

فحصت محتويات الجزء الأمامي من القناة الهضمية لـ 515 سمكة بلعوط ملوكي *Chondrostoma regium* (Heckel, 1843) صيدت من نهر دجلة عند محافظة صلاح الدين (بين الحجاج ويثرب) ولمدة عشرين شهراً، إبتداء من أذار إلى تشرين الأول من العام التالي. كان الفتات العضوي ، مواد نباتية الأصل (19.6%، 23.0% و24.9%) والطحالب الخضر والخضر المزرقة والتي تشكل معظمها *Cladophora, Cosmarium* & *Merismpedia* sp (17.1%، 12.9% و12.2%) والدايتومات المختلفها والتي منها *Diatoma, Cyulbella* sp&*Chanathes, Amphora* (16.9%، 8.8% و8.2%) الغذاء الرئيس للأسماك المصيدة خلال مدة الدراسة على ضوء طرائق التكرار والحجم ودليل مستوى الأهمية على التتالي. واحتلت الرمال 45.3% من حجم محتويات الجزء الأمامي من القناة الهضمية للأسماك المدروسة. وكان الفتات العضوي في مقدمة الغذاء المتناول من قبل مجاميع الأحجام المختلفة (168-200، 201-300 و301-350ملم). وكذلك هو الحال في محطات الدراسة المختلفة مسجلاً (19.8% & 22.9%,18.2%, 25.9%,) حسب دليل مستوى الأهمية. وكان التداخل الغذائي بين مجاميع الأسماك الطولية ذلك بين مجاميع الأسماك المصيدة من المحطات المختلفة يتراوح بين 0.86-1.0. أي إن الأسماك تتشابه نسبياً بغذائها المتناول من المحطات كافة.