POPULATION CHARACTERISTICS OF BAGRUS BAYAD IN THE NOZHA-HYDRODROME DURING 1968-70.

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ABSTRACT

During two fishing periods (1968—69 & 1969—70), 6135 fish of *Bagrus bayad* from the Nozha hydrodrome were studied. The analysis of length frequency and age composition of the catch revealed the presence of annual fluctuation in the strength of different year-classes. The most obvious was the high abundance of 1967 year-class and the scarcity of 1966 year-class.

The length-weight relationship, as well as the condition factor of *B. bayad* showed marked differences according to size and sex. The adult fish is more robust than the small immature ones. The weight, as well as the condition factor for males are less than that for females of corresponding lengths. Seasonal variation in the condition factor also exist, with minimum values in the winter months.

INTRODUCTION

Bagrus bayad Forsk., a species of Family Bagridae, is well known in the Nile River, up to Lake Albert. It is also known from the Chad Basin, the Senegal, and the Niger (Boulenger, 1907). In Egypt, *B. bayad* is one of the most common fresh water fishes. In the last few years, and as a result of the freshness of the Northern Delta lakes, after the construction of the Aswan High Dam and the change of irrigation and draining systems, the catch of this fish has been greatly increased.

However, many of thc biological characteristics of *B. bayad* have not been well investigated. So, the present study deals with the population characteris-

tics of *B. bayad* in the Nozha-hydrodrome during 1968-1970. This aims towards gaining information necessary for the management and improvement of the existing fishery.

MATERIAL & METHODS

The materials used in this investigation were obtained from the commercial catch of the Nozha-hydrodrome during two fishing periods (from October 1968 to April 1969 and from October 1969 to March 1970). Fishes were mainly caught by seine nets, as well as by gill and trammel nets. A number of 6135 fish were used for studying the biological characters such as, body length, body weight, gutted weight, sex and stage of maturity. The vertebrae were also collocted for age determination.

THE NOZHA-HYDRODROME

The N. hydrodrome is an isolated part of Lake Mariut, near Alexandria, having the area of 504 hectars, and an average water depth of six meters. The hydrodrome is regularly supplied with fresh water from the Nile through the Mahmoudia Canal.

The hydrodrome was constructed during the second world war , but its exploitation as a fishing area started in 1954. At that time, the majority of the catch was composed of true Nile fishes (Tilapia, Barbus, Labeo, Lates, Bagrus & Synodontis spp.), while few species (Mugil and Anguilla spp.) were immigrants from the sea (Elster, 1960). Annual transplantation of Mullet fry was started in 1954 and continued throughout the following years. This have raised the fish yield of the hydrodrome.

Evaluating the fish production of the hydrodrome , the results were not satisfactory. It was believed that the presence of large amounts of different carnivorous fishes (Lates, Clarias, Anguilla and Bagrus spp.) greatly affected the fish yield. So, to reduce the effect of these predators, partial draining accompanied by extensive fishing operations were carried cut durng the period from the 25th of July 1964 to the 31st of Jannary 1965. The carnivorous fish taken during this overfishing period , represented about 36 % of the total fish catch.

To increase the fish production of the hydrodrome , the common carp

(Cyprinus carpio) was also transplanted in February and March 1965. This fiish has satisfactorily established itself in the new habitat. In 1966 and the following years periodical commercial fishing has been carried out in a regular exploitation of the hydrodrome. Table (1) shows the annual catch of the N. hydrodrome in kg. and percent, according to fish species. The data of 1964/65 represent the fish yield of the N. hydrodrome during the previously mentioned overfishing period. It is evident that the catch of *B. bayad* has been progressively increased from 368 kg. (1.3%) in 1966 to 3396 kg. (5.8%) and 4528 kg. (7.9%) in 1969 & 1970 respectively. The marked increase, which has happened in the last years, was due to the abundance of 1967 year class in the commercial catch.

Table (2) shows the catch composition of the N. hydrodrome in kg. and percent, during the first fishing period (from October 1968 to April 1969). It has to be mentioned that the catch of *B. bayad* markedly increased during the winter months. This is most probably due to the inactive condition of that fish, as a result of the low water temperature during winter.

LENGTH FREQUENCY

The study of length frequency of *B. bayad* in the commercial catches of the N. hydrodrome (Table 3) show that the size frequency of the fish varies considerably in the two fishing periods. In the first fishing period, two size groups were markedly observed. The first size group was composed of small fishes with length range from 25 to 40 cm., while the second size group consisted of large fishes with length range from 57 to 77 cm. T.L.. In the second fishing period, three size groups were observed. The first size group lies between 27 and 37 cm., the second between 47 and 57 cm., and the third between 65 and 80 cm. T.L..

The bimodality of the curve in the first fishing period was due to the relative scarcity of age groups III in the catch. The scarcity of this age group was the result of sampling , as the data of the second fishing period show that in 1969-1970 fishes of age group IV were much less common than those of adjacent age groups.

The detailed analysis of fish length in the first fishing period shows five modes, at 35, 58, 65-70, 77 and 83 cm., while in the second fishing period, six modes of fish lengths are observed at 33, 50-55, 64, 73, 78 and 83 cm..These modal

Table (1) — Annual fish catch (Kg. & %) of the Nozha-Hydrodrome according to fish species (percentage between brackets).

Fish species	1964/1965	1966	1967	1968	1969	1970
Common Carp	—	770	8299	47410	23661	23730
	(0.0)	(2.8)	(15.4)	(41.8)	(40.5)	(41.3)
Grey Mullet	14611	4576	13296	32756	13472	12751
	(29.9)	(16.4)	(24.5)	(28.9)	(23.1)	(22.2)
Lates niloticus	5335	4618	5727	13056	3751	3465
	(10.9)	(16.5)	(10.6)	(11.5)	(6.4)	(6.0)
Anguilla spp.....	7916	419	1498	1459	2780	2745
	(16.2)	(1.5)	(2.8)	(1.3)	(4.8)	(4.8)
Tilapia spp.....	8850	10351	18699	12087	8175	5433
	(18.1)	(37.1)	(34.6)	(10.6)	(14.0)	(9.4)
B. bayad	938	368	1450	1770	3396	4528
	(1.9)	(1.3)	(2.7)	(1.6)	(5.8)	(7.9)
Barbus & Labeo spp	6601	6057	4051	4321	3017	4380
	(13.5)	(21.7)	(7.5)	(3.8)	(5.2)	(7.6)
Other fishes	4617	775	1016	666	169	446
	(9.5)	(2.8)	(1.9)	(0.6)	(0.3)	(0.8)
Total catch (Kg.)	48868	27934	54036	113525	58421	57479

Table (2) — The catch composition (Kg. & %) of the Nozha-hydrodrome during the Ist fishing period (percentage between brackets).

Fish species	October 1968	November 1968	December 1968	January 1969	February 1969	March 1969	April 1969	Total catch
Common Carp	17762	16150	10752	5659	2850	2423	1800	57396
	(54.2)	(44.2)	(50.4)	(54.8)	(49.3)	(64.8)	(56.1)	(50.5)
Grey Mullet	6045	15157	6714	1760	870	189	76	30761
	(18.5)	(41.5)	(31.5)	(17.0)	(14.2)	(5.1)	(2.4)	(27.1)
Lates niloticus	6961	3552	1350	460	94	1	—	12418
	(21.3)	(9.7)	(6.3)	(4.5)	(1.6)	—	—	(10.9)
Anguilla spp.....	74	78	1072	1054	199	684	771	3932
	(0.2)	(0.2)	(5.0)	(10.2)	(3.4)	(18.3)	(24.0)	(3.4)
Tilapia spp	751	940	524	194	138	277	400	3224
	(2.3)	(2.6)	(2.5)	(1.9)	(2.4)	(7.4)	(12.5)	(2.8)
B. bayad	163	154	472	787	1367	60	83	3086
	(0.5)	(0.4)	(2.2)	(7.6)	(23.7)	(1.6)	(2.6)	(2.6)
Barbus & Labeo spp..	819	440	453	393	293	63	70	2531
	(2.5)	(1.2)	(2.1)	(3.8)	(5.1)	(1.7)	(2.2)	(2.2)
Other fishes	182	71	13	19	17	41	11	354
	(0.6)	(0.2)	(0.1)	(0.2)	(0.3)	(1.1)	(0.3)	(0.3)
Total catch (Kg.)	32757	36542	21350	10326	5778	3738	3211	113702

Table 3 : Length Frequency of the commercial catch of **B. bayad** from the N. hydrodrome in the two fishing periods (1968—69) & (1969—70).

Length (cm)	No. of fish in fishing period		Length (cm)	No. of fish in fishing period	
	1968-69	1969-70		1968-69	1969-70
12	2	—	49	—	26
13	1	—	50	—	58
14	2	2	51	4	85
15	3	2	52	3	64
16	4	—	53	6	72
17	5	3	54	3	61
18	6	1	55	12	72
19	18	1	56	18	43
20	32	2	57	35	51
21	18	4	58	19	22
22	58	3	59	18	15
23	58	4	60	28	11
24	74	8	61	10	5
25	100	10	62	32	3
26	116	12	63	34	—
27	106	63	64	32	3
28	194	34	65	73	3
29	150	32	66	40	2
30	246	28	67	62	4
31	202	42	68	54	4
32	324	46	69	39	5
33	336	32	70	78	2
34	276	28	71	56	3
35	398	22	72	70	6
36	252	6	73	34	3
37	352	12	74	24	5
38	222	8	75	27	6
39	144	6	76	29	10
40	116	2	77	51	6
41	86	—	78	13	5
42	57	2	79	16	1
43	14	—	80	14	4
44	6	2	81	9	1
45	3	—	82	1	4
46	—	3	83	3	2
47	—	5	84	2	—
48	—	18	85	2	—

sizes can not be considered as a result of selectivity of fishing methods, because the fish represent the catch of various types of fishing gears.

Also, it has to be mentioned that there is an agreement between the modal sizes and length of different age groups as shown from the examination of vertebrae. The length and age of the modal sizes are as follows:

1 —	Modal	sizes	(33-35)	cm.	T.L.	for	age group	I.
2 —	»	»	(52)	»	»	»	» »	II.
3 —	»	»	(58)	»	»	»	» »	III.
4 —	»	»	(65-67)	»	»	»	» »	IV.
5 —	»	»	(70-73)	»	»	»	» »	V.
6 —	»	»	(77-78)	»	»	»	» »	VI.
7 —	»	»	(83)	»	»	»	» »	VII.

AGE COMPOSITION

In a fish population, the different age groups are often not equally represented. The relative abundance of the different age groups may be due to different mortality affecting the year classes as they become older. Also it may be due to fluctuations in the initial sizes of different year-classes with the result that certain year classes may be more abundant than others.

Studying the age composition of *B. bayad* in the Nozha-hydrodrome during the two fishing periods, strong, moderate and weak generations were observed. Table (4) shows the number and percentage of fish in each year class in the two fishing periods.

Fishes of 1961 and 1962 generations were represented by few numbers in the catch and this does not provide a safe basis for the estimation of their relative strength. Moreover, fishes of these year classes were within the catchable size during the second half of 1964 and therefore were greatly affected by the overfishing period.

Fishes of 1963 and 1964 year classes were also affected to some extent during the overfishing period as they were still under the catchable size in that time. These year classes were represented by 4.7 and 8.0 % of the catch in the first fishing period and 1.9 and 2.8 % in the second fishing period respectively.

Fishes of 1965 and 1966 generations were poorly represented in the catch of the two fishing periods. This was most probably due to the scarcity of the spawning stock resulting from the overfishing carried out in 1964.

Fishes of 1967 generation were predominating in the two fishing periods. This year class was represented by 69 and 57% of the catch in the first and second fishing periods respectively. This powerful generation was most probably due to the appearance of good recruitments of the year classes in the spawning stock after the overfishing period.

Table 4. Age composition of the commercial cach of *B. bayad* of the N. hydrodrome in the two fishing periods (1968-69 and 1969-70).

Year	First Period		Second Period	
Classes	No.	%	No.	%
196	—	—	88	8.1
1968	603	12.0	302	27.6
1967	3485	69.1	620	56.7
1966	81	1.7	10	0.9
1965	173	3.3	20	1.9
1964	402	8.0	31	2.8
1963	235	4.7	20	1.9
1962	56	1.1	2	0.2
1961	7	0.1	—	—
Total	5042		1093	

Fishes of 1968 year class, although they were small in the first fishing period, represented 12 %, while in the second fishing period, they constituted about 28 % of the catch. It has to be mentioned that this year class enter the catch for the first time and so it is difficult to evaluate its strength.

LENGTH-WEIGHT RELATIONSHIP

One of the most striking study of a fish robustness is the length-weight relationship. This may be determined from the general equation ($W = c L^n$), where c & n are constants, whose values are calculated from the logarithms of the total length and actual weights (Beckman, 1948).

Examination of the data obtained for the total body weights of *B. bayad* from the N. hydrodrome showed a difference between sexes. In case of the small immature fish, the females were slightly heavier than the males of the same length. This difference in weight becomes more obvious in case of adult fishes (Table 5).

Assuming that sexual maturity of this species begins at a total body length higher than 50 cm. , the length-weight relationship of the immature fish (12—50 cm. T.L.), as well as that of mature males (51—77 cm. T.L.) and females (51—85 cm. T.L.) are as follows:

For immature fish ($\log W = -5.4246 + 3.0866 \log L$)

For adult males ($\log W = -5.4666 + 3.1253 \log L$)

For adult females ($\log W = -5.7357 + 3.2304 \log L$)

The most important difference in these length-wieght relations, were the values of the exponent (n), which measures the ratio of the instantaneous rate of increase in weight and length. The exponent (n) of the mature fish is greater than that of the immature ones, and in case of the adult fish, the exponent of females is greater than that of males.

Taking into consideration the above mentioned numbers of males and females, together with 1193 fish of unknown sex, the following general equation would be the more suitable for studying the length weight relationship of *B. bayad* during the period of investigation.

$$(\log W = -5.8100 + 3.2477 \log L)$$

The length range used (12-85 cm. T.L.) covers the greatest possible range of lengths obtained from the catch of the N. hydrodrome.

Comparison of the actual and calculated weights (Table 5) shows that the equation fits the empirical data reasonably well. The values of the exponent (n) show that the weight of *B. bayad* increases to a power greater than the cube of length and thus indicates that the body shape changes rapidly as the fish grow in length.

Table 5. The empirical and calculated weights of *B. bayad* in the Nozha-hydrodrome during (1968-1970) according to fish length.

Length (cm)	Males		Females		Combined sexes.		
	No. of fish	Av. emp. weight (gm)	No. of fish	Av. epm. weight (gm)	No. of fish	Av. emp. weight (gm)	Calculated weight (gm)
12	1	13	—	—	1	13	9
13	1	14	—	—	1	14	11
14	2	17	—	—	4	17	14
15	3	19	—	—	5	20	18
16	—	—	—	—	2	25	22
17	1	30	1	28	6	32	27
18	2	34	2	38	4	36	33
19	4	36	1	41	10	37	39
20	4	41	1	48	11	43	46
21	4	50	2	57	10	51	54
22	7	57	2	69	21	61	63
23	4	73	4	80	19	77	72
24	4	78	1	88	23	80	83
25	4	88	4	97	31	94	95
26	9	96	7	100	37	96	108
27	10	112	9	122	36	113	122
28	13	124	7	133	59	124	137
29	6	144	8	149	47	139	154
30	12	158	13	166	77	156	172
31	9	170	13	174	63	167	191
32	18	191	21	185	107	190	212
33	10	198	11	226	93	209	234
34	13	228	16	241	83	233	258
35	19	255	18	254	121	249	283
36	13	274	16	280	98	271	311
37	21	301	20	313	103	306	339
38	7	326	23	330	68	323	370
39	9	362	14	362	49	357	403
40	11	392	7	380	38	385	437
41	8	431	9	431	32	417	472
42	8	453	13	479	29	462	512
43	—	—	3	501	5	498	551
44	1	545	2	542	4	530	596
45	2	578	1	572	3	575	641
46	—	—	2	702	2	720	688
47	—	—	2	825	2	825	738
48	2	765	2	830	4	790	790
49	—	—	2	900	2	900	845
50	1	910	4	920	5	918	903

Table 5.— (continued)

Length	Males		Females		Combined sexes		
(cm)	No. of fish	Av.emp. Weight (gm)	No. of fish	Av.emp. Weight (gm)	No. of fish	Av.emp. weight (gm)	Calculated wt. (gm)
51	1	1100	4	934	7	991	941
52	1	1040	—	—	2	1035	1025
53	4	1097	2	1195	8	1129	1091
54	2	1202	2	1153	5	1196	1159
55	5	1217	7	1224	17	1230	1230
56	1	1340	5	1344	14	1344	1303
57	10	1380	8	1414	29	1381	1381
58	1	1480	7	1545	16	1536	1462
59	3	1568	5	1595	14	1594	1545
60	2	1698	5	1662	18	1615	1631
61	4	1778	2	2067	9	1876	1721
62	3	1842	1	2120	20	1755	1814
63	3	1814	2	2165	19	1941	1911
64	2	1954	3	2255	19	2055	2012
65	5	2015	2	2370	38	2079	2115
66	6	2083	1	2450	26	2135	2223
67	3	2133	4	2558	34	2328	2335
68	11	2405	1	2615	33	2441	2450
69	9	2526	4	2815	26	2565	2567
70	8	2645	5	2869	45	2759	2692
71	3	2717	6	2940	30	2901	2819
72	4	3048	5	3167	38	3035	2948
73	6	3169	5	3248	27	3210	3083
74	5	3245	3	3358	21	3357	3223
75	1	3360	2	3420	15	3546	3368
76	2	3520	10	3776	22	3775	3515
77	2	3735	14	3872	35	3921	3667
78	—	—	8	4142	11	4103	3824
79	—	—	2	4293	9	4309	3986
80	—	—	7	4392	11	4540	4122
81	—	—	6	4592	9	4617	4324
82	—	—	1	4680	1	4680	4500
83	—	—	5	4770	5	4770	4681
84	—	—	2	4860	2	4860	4866
85	—	—	1	5000	1	5000	5056

Bishai (1970) studying the length-weight relationship of 5336 *B. bayad* (10-83 cm. T.L.) in the Sudan during the period from September 1963 to January 1967, gave the general equation ($\log W = -1.8291 + 2.9373 \log L.$), and stated that there is no difference between the weight of male and female lfish of the same length less than 3 years old or 50 cm. long. With increasing of engtth and age, female *B. bayad* acquries a higher weight than males due to the increment in the weight of ripe females.

To check the effect of the weights of the stomach content and the gonads upon the length-weight relationship of *B. bayad*, these organs were removed and the gutted weights of the mature fish were obtained for both males and females (Tablo 6).

The examination of data revealed the presence of significant differnce in the gutted weights of the two sexes. The mature females are still heavier than the males of the same length. This means that either the females eat more than the males or the females are more efficient in converting food into flesh.

Also, it has to be mentioned that in the N. hydrodrome, during investigation the heaviest male attained 3750 gm of weight and 77 cm T.L., while the heaviest fomale reached 5000 gm of weight and 85 cm. T.L.. In the Sudan, Bishai (1970) found that the heaviest male attained 5000 gm of weight and 65 cm. St. L. (about 77 cm T.L.), while the heaviest female reached 7500 gm of weight and 75 cm. St.L. (about 89 cm. T.L.). This means that *B. bayad* in the Sudan attains larger sizes and heavier weights than in the N. hydrodrome.

CONDITION FACTOR

The condition factor of a fish can be determined from the equation ($k = W / L^3$). This formula assumes that growth is isometric, otherwise as Le Cren (1951) has pointed out, the condition factor (K) will tend to increase or decrease with fish length. Beverton & Holt (1957) stated that important departure from isometric growth are rare and therefore, the values of the condition factor are completely comparable not only between different samples or populations of the same species, but also between different species.

Table 6. The gutted weight of mature males and females of *B. bayad* from the N. hydrodrome, during 1968-1970, according to fish length.

Length (cm)	Males		Females	
	Number of fish	Av. weight (gm)	Number of Fish	Av. weight (gm)
51	1	870	4	892
52	1	970	—	—
53	4	1043	2	1070
54	2	1148	2	1150
55	5	1156	8	1196
56	1	1260	5	1278
57	12	1307	8	1327
58	1	1385	7	1459
59	3	1418	5	1498
60	2	1500	5	1566
61	4	1698	2	1932
62	3	1745	1	2010
63	3	1693	2	2040
64	2	1757	3	2155
65	6	1828	1	2260
66	6	1965	1	2340
67	3	2038	4	2430
68	11	2277	1	2470
69	9	2367	4	2644
70	8	2522	5	2752
71	3	2630	6	2665
72	4	2963	5	2850
73	6	2855	5	2936
74	5	3056	3	3228
75	1	3155	2	3320
76	2	3340	8	3617
77	2	3560	14	3697
78	—	—	8	3914
79	—	—	2	4076
80	—	—	6	4124
81	—	—	6	4281
82	—	—	1	4430
83	—	—	4	4515
84	—	—	2	4668
85	—	—	1	4800

Table (7) was obtained by computing the average values of (K) for the males, females and combined sexes, in accordance to different length groups of *B. bayad* in the N. hydrodrome during the period of investigation. It is clear that the smaller length groups have lower values of (K), which is in accordance with the results of growth in weigth. This is in contrast to the finding of Bishai (1970), who stated that the condition factor for fishes of two years old is higher than for other age groups.

For fishes longer than 50 cm. T.L., the condition factor markedly increases and the value of (K) for the females is higher than that for the males of coresponding lengths. Similar results were obtained by Bishai (1970) who stated that the degree of robustness of adult females is higher than that of males.

Table 7. Variation in the condition factor for different sexes of *B. bayad* in the Nozha-Hydrodrome during the period of investigation, according to length groups.

Length group (cm)	Males		Females		Both sexes	
	No.	K	No.	K	No.	K
≤ 20	17	1.009	3	0.993	20	1.007
21—30	60	1.029	38	1.033	98	1.031
31—40	121	1.061	145	1.075	266	1.069
41—50	18	1.112	29	1.106	47	1.108
51—60	18	1.274	29	1.318	47	1.301
61—70	51	1.293	20	1.419	71	1.328
71—80	20	1.350	52	1.415	72	1.397
≥ 80	—	—	11	1.422	11	1.422

Table (8) shows the monthly variation in the condition factor for the immature and mature fish (separate sexes). In spite of some discrepancies, the condition factor generally decreases as we go from October to February. This decrease is more pronounced in the males than in females. Also, it is evident that the condition factor is much higher for the adult fish than for the immature ones, and during the same month, the value of (K) for the females is higher than that for males.

Comparison of the present results with those given by Daget (1954) and Reynolds (1967) for *B. bayad* living in the Niger and Volta Lakes respectively, it can be seen that the value «K» given by these authors (1.236) is slightly higher than the average value of «K» (1.208) for *B. bayad* living in the Nozha Hydrodrome.

Table 8. Monthly variation in the condition factor for the immature and mature *B. bayad* of different sexes in the Nozha Hydrodrome, «assuming that sexual maturity begins after 50 cm. total length» .

Months	Immature Fish		Males		Females	
	No.	K	No.	K	No.	K
October	15	1.084	—	—	7	1.359
November	97	1.078	13	1.326	18	1.442
December	116	1.095	24	1.312	29	1.378
January	44	1.035	18	1.248	23	1.393
February	136	1.042	25	1.282	31	1.404
March	13	1.043	3	1.284	1	1.308
April	10	1.082	6	1.308	3	1.339
Average	431	1.055	89	1.295	112	1.394

SUMMARY & CONCLUSION

It was believed that the Nozha-hydrodrome contains large amounts of carnivorous fish, which affect its fish production. So. partial draining, accompanied with extensive fishing were carried out during the period from July 1964 till the end of January 1965. This overfishing period caused accidental changes in the composition of fish population in the hydrodrome throughout the following years. Studying the population chara teristics of *B. bayad* in the Nozha-hydrodrome during 1968-70, led to the following conclusions;

The examination of the length frequency of the catch revealed the presence of 2 size groups in the first fishing period, at 25-40 and 57-77 cm. T.L.. In the 2nd fishing period 3 size groups are observed at 27-37, 47-57 and 65-80 cm.T.L..

Analysis of the age composition of the catch in the 2 fishing periods revealed the presence of annual fluctuation in the strength of different year classes. The most stricking is the abundance of 1967 generation, which predominate the catch during the 2 successive periods, whereas the 1966 year class has been considered exceptionally weak, as it is hardly traced in the catch of the 2 fishing periods. This was most probably due to the scarcity of the spawning stock during 1966 as a result of the overfishing period in 1964, and the appearance of good recruitments in the spawning stock of 1967.

Over the length interval, 120-840 mm, and during the period of investigation (October-April), the general length-weight relationship of *B. bayad* in the N. hydrodrome was described satisfactorily by the equation (log W= —5.8100 + 3.2477 log L).

The examination of fish weights revealed the presence of sexual differences. The females are slightly heavier than males in the young ages, whereas considerable differences are observed in case of adult fish. Also, it has to be concluded that the adventage in weight of females is not the result of differences in the weight of gonads.

The condition factor of *B. bayad* is small for young fish and considerably increases with the attainment of maturity. Also, sexual differences occur in the condition factor of mature fish, the degree of robustness of adult females is higher than that of males. For both sexes, seasonal variation in the condition factor was observed. The value of «K» decreases from the autumn through the winter months.

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