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Morphological observations, length-weight relationships, and condition factors of the Whipfin fish, *Gerres filamentosus* (Cuvier, 1829) in the Hurghada Red Sea, Egypt

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Abstract

During the period from January 2010 to December 2010, the biometric studies of 669 (both sexes- 12:39 centimeters) the whipfin, silver biddy, *Gerres filamentosus* (Cuvier,1829) have been described to clarify the identity of the fish population in the Hurghada Red Sea, Egypt. The straight lines of the regression equations of twenty one morphometric measurements relative to the total length or the head length indicate the linear relationships of the different body parts. Significant curvilinear relationship existed between total length and other morphometric characters and between head length and other characters of the head. Relationships between total length and various body measurements of the fish were highly significant ($p < 0.01$) except the relationship between total length and 2nd spine dorsal fin length of fish ($p < 0.05$). The Meristic characters including the number of fin rays, lateral line scales and gill rakers were found to be more or less similar except slight differences. The length-weight relationships respect to the total or the gutted weight were also investigated. It is obvious that, the value of the exponent (n=2.9475) indicates the negative allometric growth of this species. The values of condition factors (k_c) in the total length body-weight relationships for female , male and combined sexes were found to be 1.49 , 1.47 and 1.51, respectively. The mean values of relative condition factors (k_n) were 1.03 , 0.97 and 1.00 for female , male and combined sexes, respectively. However, relative condition factor (K_n) of *Gerres filamentosus* computed for July was 1.116 ± 0.24 and for January was .934 ± 0.012, which suggest the specimens were healthy and in good condition due to spawning cycle or other physiological activities or environmental factors. In searching of new potential aquaculture marine species, *Gerres filamentosus* may play role for enhancement of fish production as well as upliftment of socioeconomic condition in Egypt.

Keywords: *Gerres filamentosus*, morphometry, Length-Weight, Condition Factor

1. Introduction

Nelson (1994) listed 40 species belonging to 8 genera such *as Dipterous, Eucinostomus, Eugerrenes, Gerres, Paregueila, Pentaprion, Ulaema* and *Xystaema* in the world waters.

Fishes belonging to the family Gerreidae are small to moderate in size, brightly colored, and inhabit near-shore waters with sandy substrate (El-Agamy, 1988). They are widely distributed in tropical and sub-tropical waters in many parts of the world (Cyrus and Blaber 1982 and Araujo *et al.*, 1999). Until now, about 44 species of Gerreid fishes were recognized worldwide (Nelson, 2006; Rodriguez-Romero *et al*., 2008), ten of which were recorded in the coastal waters of China (Shen, 1993 and Wu *et al.*, 1999). The majority of species are benthic dwellers in the tidal areas of estuaries and very shallow coastal water.

Fish are said to be isometric growth when length increases in equal proportions with body weight for constant specific gravity. The regression coefficient for isometric growth is '3' and values greater or lesser than '3' indicate allometric growth (Le Cren , 1951). Thus 'k'

factor measures the variations from an ideal fish, which holds the cube law while 'Kn' measures the individual deviations from the expected weight derived from the length-weight relationship. There are no known species-specific conservation measures in place for *Gerres filamentosus.* However, there are several marine protected areas within its distribution (Feary, *et al*., 2015) . *Gerres filamentosus* prefers tropical to temperate seas, which is most often encountered solitary or in small schools (Randall, 1995) and adults of this species tend to inhabit shallow coastal waters with either sandy bottoms or coral-line areas; *Gerres filamentosus* is most often caught with beach seines and trawls and is sometimes caught as by catch (Carpenter, *et al.* 1997). Gerres filamentosus may enter lakes; the maximum recorded total length (TL) is 35 cm (Roux, 1986) and lower freshwater reaches of rivers; it is marketed fresh in most cases, but can be salted or turned into fish sauce (Woodland 2001). Juveniles are found in brackish mangrove estuaries; sometimes enter fresh water and tidal creeks (Allen, 1991, Allen, et al. 2002).

Gerres filamentosus forms part of a species complex and recently new species has been described (Iwatsuki et al. 2002). Therefore some records of this species may be confused with these (*Gerres infasciatus*, *G. macracanthus* and *G. microphthalmus*). Formerly known from Philippines, Indonesia, New Guina, India and the Arabian Gulf, *Gerres macracanthus* is newly-recorded from Japan, China, the Gulf of Thailand, the Red Sea and South Africa. A lectotype and three paralectotypes are designated to a neotype for Gerres filamentosus(Cuvier,1829) (Iwatsuki et.al,1996). Seasonal variations in water clarity indicate that mangroves were the preferred settling habitats for Gerres filamentosus, especially during the dry period before the rainy season (Lugendo et. al., 2007).Moreover, the relationship of fish abundance and species diversity to water temperature and salinity differed among estuaries (Tzeng *et. al*., 2002). Meristic and morphometric characters and the differences between the three gerreids known from Iraqi waters [*G. filamentosus* Cuvier, 1829, *G. oyena* (Forsskål, 1775), and *G. longirostris* (Lacepède, 1801)] are discussed by Ali *et al*., 2014. They added a new records of *Gerres limbatus* bring the total number of *Gerres* species in Iraq to four. Additionally, two new size records are reported for this species. By using Principal Component Analyses (PCA) to Clarifying the high similarity between fish species on the morphometric and the morphological characters, and genetic distance of the specimens showed that *Alburnus adanensis* should be evaluated as a synonym of *Alburnus sellal* which inhabit Turkian river basins (Birecikligil *et. al*, 2016). However, very limited information is available so far on the length-weight relationship and condition factor of *Gerres filamentosus* in the world and therefore, the present study was undertaken to establish the pattern of growth and general condition of this fish species from the natural waters of Hurghada Red Sea, Egypt for direct use in fishery assessment. This work would also contribute to the existing knowledge by acting as a baseline data for carrying out research especially on taxonomy, racial study and morphology of other fish species in Egypt.

2. Materials and Methods

For the biometric study, a random fresh samples of 669 individuals of the whipfin fish *Gerres filamentosus* (Cuvier,1829), raning in total length between "12" and "39"centimeters from the commercial catch of Hurghada Red Sea ,Egypt(New lengths were recorded of this species) in the period from January 2010 to December 2010 were examined. Measurement of different body dimensions of "257"and "412" individuals of males and females, respectively were recorded by the aid of a divider on the left side of the fish, with the help of a fish-measuring board having divisions up to 0.1 cm. The length measurements were pooled for each month and analyzed, keeping the size intervals as 0.9 cm. For the morphometric identification the twenty one measurements were taken which are: Total length(T.L.), fork length (F.L.), standard length(S.L.), body depth(B.D.), head depth(H.D.) , head length (H.L.), snout length (Sn.), anterior point of snout to first dorsal spine-Pre-Dorsal Length(Pr.D.L.), pre-pectoral length(Pr.Pec.L.), pre-pelvic length(Pr.Pv.L.), Pre-anal length(Pr.A.L.), 2nd dorsal spine -when found(2nd D.S.), eye diameter(E.D.),pre-Orbital length(Pr.O.L.), post-Orbital length(Pt.O.L.), mouth width (M.), dorsal fin length (D.F.L.), caudal fin length(C.F.L.), pectoral fin length(Pec.F.L.), pelvic fin length(Pv.F.L.), anal fin length(A.F.L.). Length measurements were taken in centimeters with two decimal place correction by using measuring board and measurement tape. Five meristic characters were determined on the pooled sexes for '69' whipfin, silver-biddy fish, *Gerres filamentosus* (Cuvier, 1829) of '29' males and '40' females. Meristic characters including the number of fin rays, lateral line scales and gill rakers were recorded statistically according to Snedecor,(1956).

Weight measured in grams by electric balance with two decimal place correction. Fishes were identified according to Whitehead *et al.* (1984). Length-weight relationships were calculated using the least squares regression on log transformation of the equation:

$W = a\ L^n$ (Beckman,1948 and Le Cren,1951)

where:

W is the total weight (in gm) and L is the total length (in cm).

a is a constant and n is an exponent.

The systematic bias of the logarithmic transformation was corrected according to Sprugel (1983). Eviscerated weight (gutted weight) was used in all calculations of indexes to avoid any influence of the contents of the gonad and stomach on the weights.

3. Results and Discussion

Description:

The external features of *Gerres filamentosus* (Cuvier,1829) was described as follows: The second dorsal spine is laterally compressed, produced into a filament, whose tip extends and past the level of first anal spine. It`s body depth contained 2 to 2.5 times in standard length in larger specimen, up to 3 times in smaller

specimen. Mouth is small, strongly protrusible, fine teeth present in jaws. Second dorsal spine is laterally compressed, produced into a filament, whose tip extends past level of first anal spine (2nd spine filament often damaged). Third dorsal spine is laterally compressed, as long as distance from tip of snout to pre-opercular margin. Pectoral fin is long, tip of depressed fin reaching to level of origin of first anal spine and 2nd anal fin spine is much shorter than fin base. Caudal fin is deeply forked and its longest rays 3 times the length of median rays. Body color is silvery, with 7 to 10 columns of ovoid spots on upper portion of sides, coalescing as bars in small specimens. Body is compressed and elevated. On lateral line, there are 44 to 47 scales

The description of *Gerres filamentosus* (Cuvier, 1829) was added by Myers(1991) as follows: Small and relatively deep body is in small fish specimens with a slightly slender body in the larger specimens. The body is compressed. Body depth max is 2.0-2.5 in S.L . The pre-dorsal length is less than dorsal fin base length; pectoral fin length measurements more than head length. First dorsal and anal spines are very short. Second dorsal spine is thick and equal to or longer than the pelvic fin ray. Caudal fin is large and forked deeply. Gill raker has 5-6 on upper limb and 8-9 on the lower limb. Fresh specimens have silvery body with 7-10 oval black spots in vertical series on upper half side. Maxillary reaches beyond level of eye anterior edge. Scales above Lateral Line to middle dorsal spines are 4.5-5.5. Dorsal fin 2nd spine is filamentous, very long and 1.7-2.0 in Standard Length. Pectoral fins reaches beyond level of anal fin origin

Morphometic measurements:

The morphometric index of each measurement was calculated for every fish as a numerical ratio with reference to either total fish length or head length. The mean values of the ratio were summarized in table(1)

Regression analysis was performed on each morphometric character, using the standard formula: $Y= a + b X$ where Y= Morphological measurements in centimeters, X= Total body length or head length in centimeters, a and b are constants. The regression equations of observed and calculated values of all measurements are represented in table (2) and plotted in figures (1&2). The close proximity of observed and calculated values indicates the good fitness of the regression equations obtained for each of the different morphometric measurements. The high values of correlation coefficient of all measurements with either total fish length or head length,(very close to unity) confirm the close coincidence between them.

Table(1): Ranges and mean values (indices) of different percentages of body proportions of *Gerres filamentosus* (Cuvier,1829) in the Hurghada Red Sea, Egypt.

Morphometric Index	The Index Range		The Index Mean	
	Min.	Max.	Average	±S.D
F.L./T.L.	76.86144	87.94979	80.37666	2.346198
S.L./T.L.	71.93676	80.50209	75.31156	1.867844
H.D./T.L.	22.23938	26.54867	24.00481	1.058825
H.L./T.L.	20.69498	28.21566	25.61599	1.675904
Pec.F.L./T.L.	24.37276	29.838	27.98962	1.309536
Pv.F.L./T.L.	13.20463	15.45151	14.43569	0.453637
A.F.L./T.L.	11.91223	13.44778	12.74237	0.394077
C.F.L./T.L.	21.69884	28.75481	26.78979	1.743083
B.D./T.L.	26.48649	31.84258	29.74939	1.109415
D.F.L./T.L.	37.03704	44.35146	38.47238	1.705204
Pr.D.L./T.L.	29.7491	34.60621	32.80197	1.094492
Pr.Pec.L./T.L.	24.00513	28.03089	26.48658	0.860315
Pr.Pv.L./T.L.	29.77602	33.64017	31.20346	0.897672
Pr.A.L./T.L.	53.03103	60.66946	55.42608	1.549835
2nd.D.Spine/H.L.	64.51319	95.14925	74.17834	5.960995
Sn./H.L.	25.1497	39.2	28.13642	3.089525
M./H.L.	31.66515	44.4	36.09565	2.569674
E.D./H.L.	16.88555	30	20.63809	3.01209
Pr.O.L./H.L.	26.20564	41.04478	31.35919	3.416564
Pt.O.L./H.L.	32.57507	47.2	38.33852	2.916554
H.D./H.L.	79.43585	110	94.0585	6.654929

Table (2): Regression equations of different morphometric measurements of *Gerres filamentosus* (Cuvier, 1829) in the Hurghada Red Sea, Egypt during 2010; relative to total fish length and head fish length.

Morphometric Measurement	Regression Equation Y= a + b X	Correlation Coefficient (r)
Fork Length	F.L. = -0.09115 + 0.805925 T.L.	0.9947
Standard Length	S.L.= 0.0775028+ 0.719603 T.L.	0.9951
Head Length	H.L.= -0.54244+ 0.280646 T.L.	0.9876
Head Depth	H.D.= 0.386537+ 0.223684 T.L.	0.9877
Pre-Dorsal Length	Pr.D.L= 0.305667 + 0.315312 T.L.	0.991
Pre-Pectoral Length	Pr.Pec.L= 0.438857+ 0.245933 T.L.	0.9882
Pre-Pelvic Length	Pr.Pv.L.= 0.485321+ 0.290824 T.L.	0.9976
Pre-Anal Length	Pr.A.L.= 0.253349+ 0.542515 T.L.	0.9958
Body Depth	B.D.= -0.10677+ 0.302764 T.L.	0.9936
Dorsal Fin Length	D.F.L= 0.500502+ 0.362091 T.L.	0.995
2 nd Dorsal Spine	2^{nd} D.S= 0.175233+ 0.181678 T.L.	0.9897
Pectoral Fin Length	Pec.F.L.= - 0.58463+ 0.305837 T.L.	0.9953
Pelvic Fin Length	Pv.F.L.= 0.101155+ 0.140019 T.L.	0.9945
Ana Fin Length	A.F.L.= -0.10503+ 0.132039 T.L.	0.9941
Caudal Fin Length	C.F.L.= -0.57855+ 0.293656 T.L.	0.9904
Eye Diameter	E.D.= -0.15709+ 0.058979 T.L.	0.9641
Snout	Sn.= -0.01751+ 0.072187 T.L.	0.9829
Mouth	M.= 0.011708+ 0.091639 T.L.	0.9953
Head Depth	H.D.= 0.875498+ 0.788453 H.L.	0.9787
2^{nd} Dorsal Spine	2^{nd} D. S.= 0.574323+ 0.640092 H.L.	0.9798
Snout	Sn.= 0.143061+ 0.254027 H.L.	0.9707
Pre-Orbital Length	Pr.O.L.= 0.37544+ 0.247174 H.L.	0.9794
Eye Diameter	E.D.= -0.00949+ 0.205063 H.L.	0.9294
Post-Orbital Length	Pt.O.L= 0.345889+ 0.323134 H.L.	0.9786
Mouth	M.= 0.219033+ 0.321954 H.L.	0.9797

Fig.(1):Relationship of total length and different morphometric indices for *Gerres filamentosus* (Cuvier,1829) in the Hurghada Red Sea, Egypt

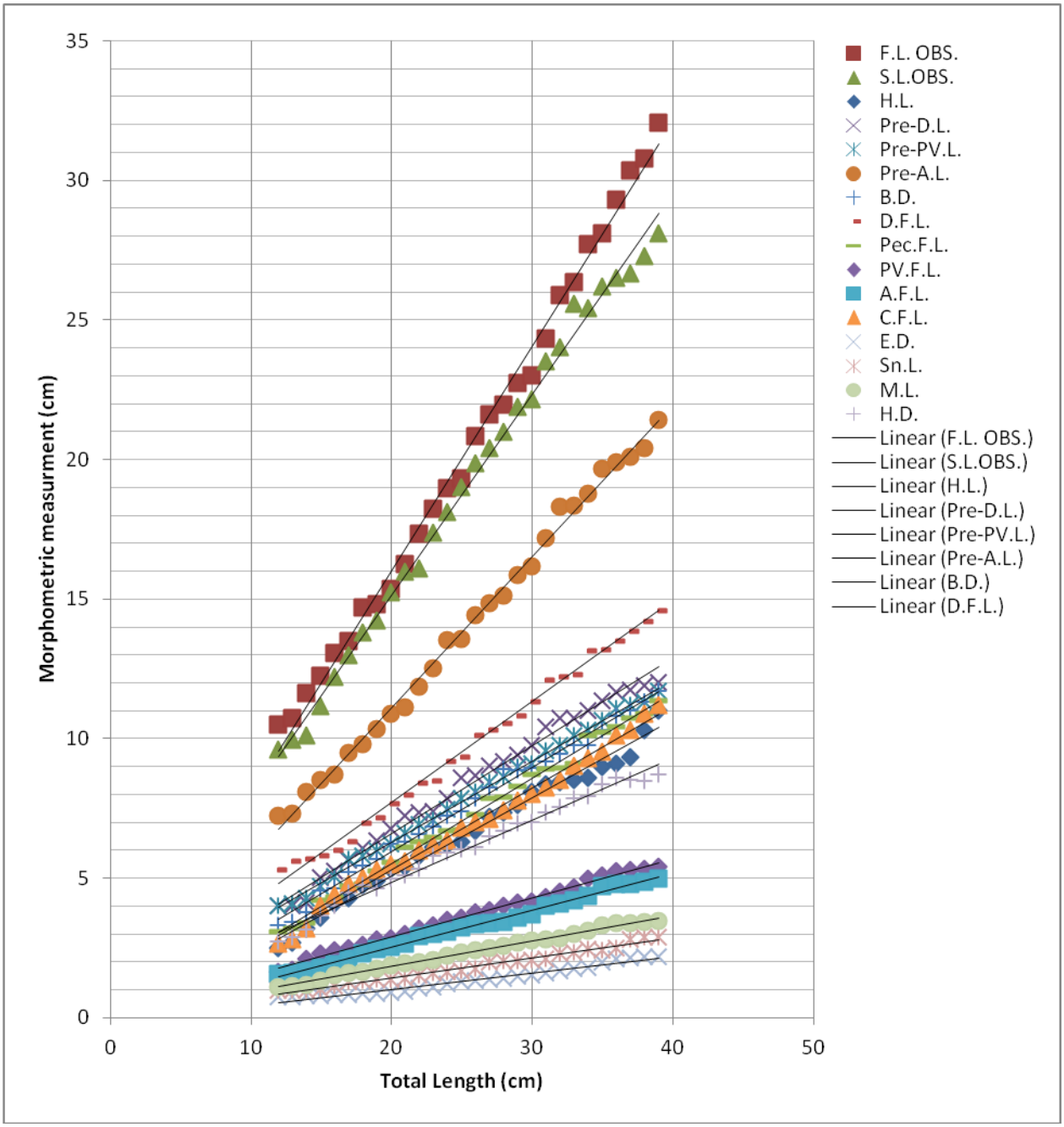
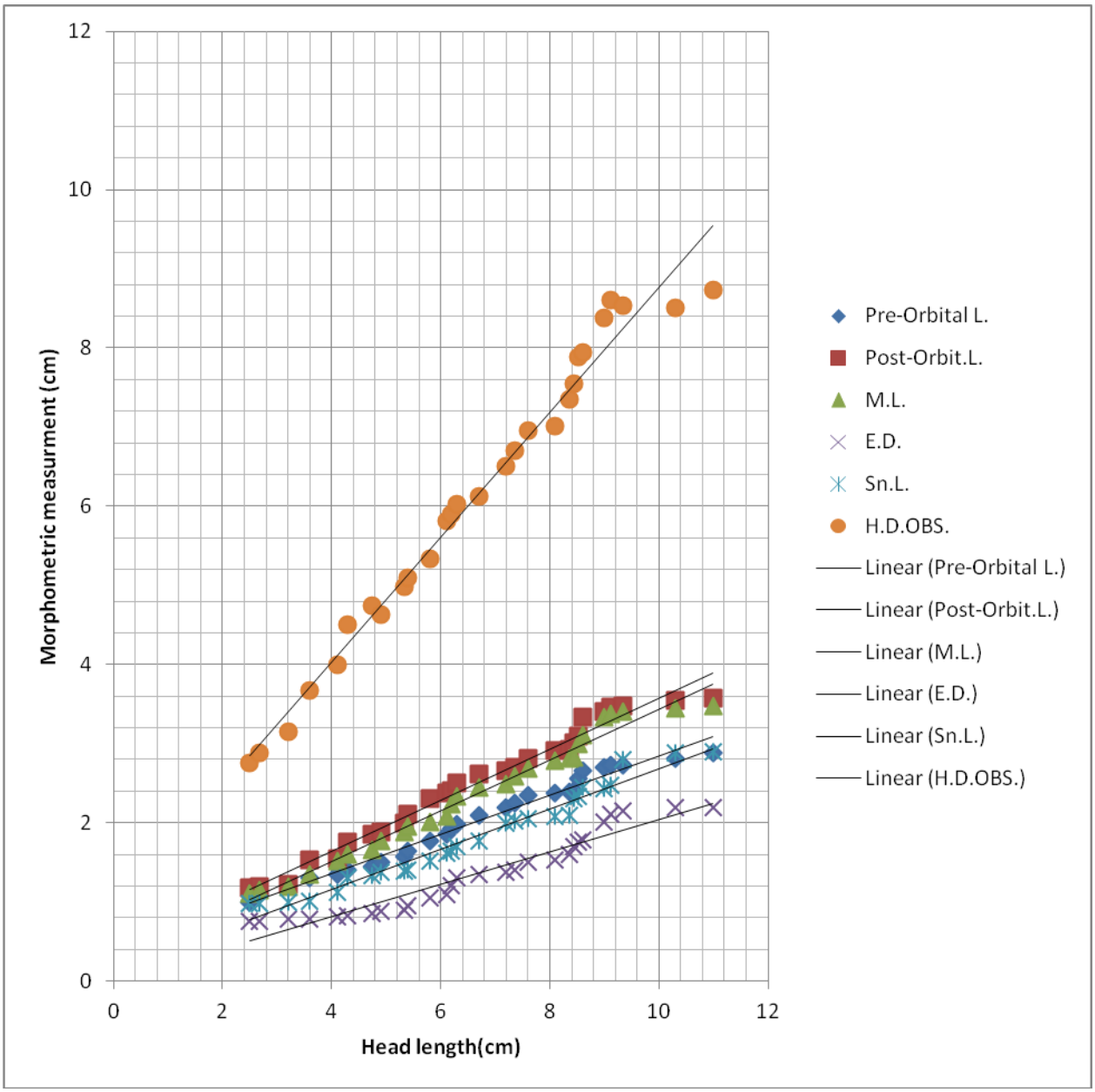


Fig.(2): Relationship of head length and different morphometric indices for *Gerres filamentosus* (Cuvier,1829) in the Hurghada Red Sea, Egypt



Length-Weight relationships:

The length-weight relationship of the whipfin(Flagfin/ threadfin), *Gerres filamentosus* (Cuvier, 1829) for the two sexes was calculated and summarized in these equations:

For males $W = 0.014649\ L^{2.9498}$ (r = 0.9986)

$\text{Log } W = -1.834192 + 2.9498\ \text{Log } L$

For females $W = 0.014845\ L^{2.9528}$ (r = 0.9990)

$\text{Log } W = -1.828420 + 2.9528\ \text{Log } L$

The significance of differences between the regression coefficients of both sexes was found that the difference was not significant at 5% level, hence the data of both sexes were pooled and the general power equation was calculated for combined sexes as follows:

$W = 0.015045\ L\ 2.9475$ (r = 0.9989)

$\text{Log } W = -1.822608 + 2.9475\ \text{Log } L$

Since , Allen (1951) suggested that the value of (n) remains constant at 3 for the ideal fish . It is obvious that the growth of *Gerres filamentosus* in the Hurghada Red Sea, Egypt slightly decreases to a power of the cube of length. Therefore, this species is negative allometric and its condition is not so good. While, El-Agamy (1988) found that the growth of *Gerres oyena* in the Arabian Gulf was isometric. While, the results of Hossain and Sultana.(2014)

on *Glossogobius giuris*) from Mithamoin haor, Kissorgonj, Bangladesh showed that the regression coefficients (b) between males and females did not show any significant difference ($p>0.05$) while b value significantly deviated from the expected cube value of 3 in case of male only thus indicating negative allometry.

The Condition Factors:

The condition factors either K_c or K_n of *Gerres filamentosus* (Cuvier,1829) in the Red Sea increased gradually reaching its maximum values (1.35) for the both sexes at July then gradually decreased onwards to reach the minimum values(0.98) at January. It represented in tables (3, 4 &5). Such change generally associated with the changeable values of gonad cycle. Generally speaking the Red Sea at Hurghada area during the period from January 2010 to December 2010 was slightly suitable environment for the investigated species. These results are in agreement with those results by Aziz *et al.*,(2013) of the relation between the total length and weight of *Gerres filamentosus* which was described as Log W = 1.321+2.5868 log L for males, Log W = 1.467 + 2.7227 log L for females and Log W = 1.481 + 2.7316 log L for sexes combined. In addition, the mean relative condition factor (K_n) values ranged from 0.9 to 1.14 for males, 0.89 to 1.11 for females and 0.73 to 1.08 for sexes combined .

Length-Weight relationship and condition factors were computed in tables (3) ,(4) and (5) for males, females and sexes combined , respectively. Table (6) represents the monthly variations in the Fulton's condition factor (Kc) and the relative condition factor (Kn) of (sexes combined) *Gerres filamentosus* (Cuvier,1829) in the Hurghada Red Sea during 2010.

Table (3) : Length-Weight relationship and condition factors of males, *Gerres filamentosus* (Cuvier,1829) in the Hurghada Red Sea, Egypt.

Length group (cm)	Number of Fish (Males)	Observed Weight (g.)	Calculated Weight (g.)	Condition Factor(K_C)	Condition Factor(Kn)
13.5- 14.4	3	38.90	34.84	1.64	1.12
14.5-15.4	7	40.60	42.74	1.39	0.95
15.5-16.4	10	49.70	51.73	1.41	0.96
16.5-17.4	18	57.30	61.90	1.36	0.93
17.5-18.4	25	74.50	73.30	1.49	0.33
18.5-19.4	28	88.32	86.01	1.50	1.03
19.5-20.4	25	101.10	100.10	1.48	1.01
20.5-21.4	16	118.20	115.64	1.50	1.02
21.5-22.4	27	135.00	132.69	1.49	1.02
22.5-23.4	20	146.36	151.32	1.42	0.97
23.5-24.4	21	173.50	171.61	1.48	1.01
24.5-25.4	15	192.30	193.62	1.46	0.99
25.5-26.4	10	218.50	217.41	1.47	1.01
26.5-27.4	7	248.70	243.07	1.50	1.02
27.5-28.4	4	275.40	270.65	1.49	1.02
28.5-29.4	6	301.10	300.22	1.47	1.oo
29.5-30.4	5	319.81	331.85	1.41	0.96
30.5-31.4	1	332.96	365.61	1.33	0.91
31.5-32.4	3	389.60	401.56	1.42.	0.97
32.5-33.4	2	430.16	439.78	1.43	0.98
33.5- 34.4	2	492.30	480.33	1.50	1.02
34.5-35.4	1	551.38	523.27	1.54	1.05
35.5-36.4	1	599.88	568.68	1.55	1.05

Table (4) : Length-Weight relationship and condition factors of females, *Gerres filamentosus* (Cuvier,1829) in the Hurghada Red Sea, Egypt.

Length group (cm)	Number of Fish (Females)	Observed Weight (g.)	Calculated Weight (g.)	Condition Factor(K_C)	Condition Factor(Kn)
11.5-12.4	1	25.10	22.56	1.65	1.11
12.5-13.4	2	30.00	28.61	1.56	1.05
13.5- 14.4	6	38.90	35.64	1.62	1.91
14.5-15.4	7	40.60	43.72	1.38	0.93
15.5-16.4	20	51.70	52.94	1.45	0.98
16.5-17.4	31	59.10	63.35	1.39	0.93
17.5-18.4	38	71.90	75.04	1.42	0.96
18.5-19.4	35	82.60	88.08	1.39	0.94
19.5-20.4	35	100.70	102.52	1.46	0.98
20.5-21.4	12	117.80	118.46	1.48	0.99
21.5-22.4	23	139.60	135.95	1.53	1.03
22.5-23.4	28	155.80	155.07	1.49	1.00
23.5-24.4	30	173.33	175.89	1.47	0.99
24.5-25.4	28	192.70	198.48	1.44	0.97
25.5-26.4	23	218.50	222.92	1.45	0.98
26.5-27.4	14	247.90	249.27	1.48	0.99
27.5-28.4	12	275.80	277.58	1.48	0.99
28.5-29.4	18	300.50	307.95	1.45	0.98
29.5-30.4	12	328.11	340.44	1.43	0.96
30.5-31.4	4	358.44	375.13	1.42	0.96
31.5-32.4	5	389.60	412.07	1.41.	0.95
32.5-33.4	5	451.64	451.34	1.49	1.00
33.5- 34.4	3	493.90	493.02	1.49	1.00
34.5-35.4	7	550.00	537.16	1.52	1.02
35.5-36.4	6	600.66	583.84	1.53	1.03
36.5- 37.4	2	650.20	633.12	1.53	1.03
37.5-38.4	3	733.02	685.09	1.59	1.07
38.5-39.4	2	788.31	739.79	1.59	1.07

Table (5): Length-Weight relationship and condition factors of sexes combined, *Gerres filamentosus* (Cuvier,1829) in the Hurghada Red Sea, Egypt.

Length group (cm)	Number of Fish (Females)	Observed Weight (g.)	Calculated Weight (g.)	Condition Factor(K_C)	Condition Factor(Kn)
11.5-12.4	1	25.10	22.54	1.68	1.11
12.5-13.4	2	30.00	28.57	1.58	1.05
13.5- 14.4	9	38.90	35.57	1.65	1.09
14.5-15.4	14	40.60	43.62	1.40	0.93
15.5-16.4	30	50.70	52.79	1.45	0.96
16.5-17.4	49	58.20	63.16	1.39	0.92
17.5-18.4	63	73.30	74.78	1.47	0.98
18.5-19.4	63	85.46	87.74	1.47	0.97
19.5-20.4	60	100.90	102.10	1.49	0.99
20.5-21.4	28	118.00	117.93	1.51	1.00
21.5-22.4	50	137.30	135.31	1.53	1.01
22.5-23.4	48	151.08	154.29	1.47	0.98
23.5-24.4	51	173.40	174.96	1.49	0.99
24.5-25.4	43	192.50	197.38	1.47	0.98
25.5-26.4	33	218.50	222.61	1.48	0.99
26.5-27.4	21	248.30	247.75	1.51	1.00
27.5-28.4	16	275.60	275.84	1.50	1.00
28.5-29.4	24	300.80	305.95	1.48	0.98
29.5-30.4	17	323.96	338.16	1.44	0.96
30.5-31.4	5	345.70	372.53	1.40	0.93
31.5-32.4	8	389.60	409.14	1.43.	0.95
32.5-33.4	7	440.40	448.05	1.48	0.98
33.5- 34.4	5	493.10	489.32	1.52	1.01
34.5-35.4	8	550.69	533.04	1.55	1.03
35.5-36.4	7	600.27	579.25	1.56	1.04
36.5- 37.4	2	650.20	628.05	1.56	1.04
37.5-38.4	3	733.02	679.48	1.62	1.08
38.5-39.4	2	788.31	733.62	1.62	1.07

Table (6): Monthly variations in the Fulton's condition factor (Kc) and the relative condition factor (Kn) of (sexes combined) *Gerres filamentosus* (Cuvier,1829) in the Hurghada Red Sea during 2010.

Month	Number of fish (combined sexes)	Condition Factors	
		Fulton's Condition Factor (Kc)	Relative Condition Factor(Kn)
January 2010	75	0.98	0.934±0.012
February	50	0.99	0.945± 0.011
March	67	1.10	0.947± 0.021
April	78	1.12	0.957± 0.32
May	119	1.30	0.976± 0.011
June	76	1.33	0.978± 0.021
July	29	1.35	1.116± 0.024
August	32	1.25	0.995± 0.001
September	33	1.25	1.012± 0.024
October	36	1.22	0.986± 0.012
November	35	1.20	0.966± 0.011
December 2010	39	1.10	0.955± 0.022

Table (6) shows the monthly variations in the Fulton's condition factor (Kc) and the relative condition factor (Kn) of (combined sexes) *Gerres filamentosus* (Cuvier,1829) in the Hurghada Red Sea during 2010. While, Sivashanthini and Abeyrami (2003) found that the cultivation of *Gerres oblongus* was likely to be profitable because of the consumer demand. The values obtained for the mean weight by sex show that females were significantly ($P< 0.05$) larger than males. They added that the calculated length-weight relationships of $W= 0.01127 \times L^{2.958}$ and $W= 0.015319 \times L^{3.126}$, obtained for males and females respectively. The present results agree with those results of Hussain *et.al* (2010) that studied the descriptive statistics and estimated parameters of length-weight relationship for 41 fish species in Korangi-Phitti Creek, Indus delta and northern Arabian Sea. They found the length-weight relation-ships and estimated the parameters of a=1.849, b=2.989 and r= 0.978 for total length range of 9 to 19 centimeters of *Gerres filamentosus* from the northern Arabian Sea. The comparative studies on the meristic features with the present study are summarized below in table (7). Iwatsuki *et al*.(1996) and Iwatsuki et al. (2015) stated that *Gerres filamentosus* is widespread species and had been recorded from Pakistan and India, from Kenya (East Africa) to south of South Africa, Mozambique, the Andaman Sea (eastern Indian Ocean) and widely throughout the western Pacific, including Southeast Asia and northern Australia, but, in fact, *G. filamentosus* does not occur from the Middle East(Arabian Gulf) where it has long been misidentified with *G. infasciatus* and/or *G. macracanthus* .

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Table(7): The comparative studies on the meristic features with the present study

Gerres filamentous (Cuvier,1829)	No. of fish	Dorsal spines/rays	Anal spines/rays	Pelvic fin spine/rays	Attachment of scales	Second dorsal spine
Cyrus&Blaber(1982) South Africa	34	IX-10-11	III-7-8	I, 5	firm	Elongate into free filament
Iwatsuki and Kimura (1998) Gulf of Thailand	3	IX, 10	III, 7	I, 5	-	Elongate into free filament
Iwatsuki,*et al.*(2015) the Red Sea and the Arabian Gulf,	9	IX, 10	III, 7	I, 5	-	Elongate into free filament
Present study(2010) Hurghada Red Sea, Egypt	69	IX-10-11 2^{nd} spine 1.7-2.0 in S.L.	III-7-8	I, 5	firm	Filamentous and very long when found

Gerres filamentous (Cuvier,1829)	Pectorals reach beyond level of anal origin	Lateral line scale count (one L.L.)	Standard length/ body depth	Total Gill rakers including rudiments (in parentheses)
Cyrus&Blaber(1982) South Africa	Yes	40-48	2.0-2.8	-
Iwatsuki and Kimura (1998) Gulf of Thailand	Yes	39-40+3-4	-	4-5(2-4)+1+7
Iwatsuki,*et al.*(2015) the Red Sea and the Arabian Gulf,	Yes	40-43	-	5-6(1-3)+1+7
Present study(2010) Hurghada Red Sea, Egypt	Yes	43-46	2.0-2.5	Lower limb: 8- 9 Upper limb: 5- 6 Total : 13-15

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