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Age, growth and sex ratio of the Catfish *Malapterurus electricus* (Gmelin, 1789) from the Large Reservoir, Lake Nasser, Egypt

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ABSTRACT

The Electric Catfish, *Malapterurus electricus*, a species from order Siluriformes is widely distributed in Africa and occurs in all freshwater systems. It is a commercial species in Nasser Lake fisheries, with an average annual catch of about 130 MT. Limited biological data are available on this species. In the present study, random samples of *M. electricus* were monthly collected from the commercial catch of the lake's main landing sites during 2019. A total number of 538 specimens of *M. electricus* were collected for biological investigations. Results revealed that the total length ranged from 24.0 to 51.5cm, and the total weight ranged from 192.4 to 2785.9g. The length-weight relationship, with a statistically highly significant coefficient (R^2= 0.9127) showed a tendency of the *b-value* (2.89) towards negative allometric growth. The estimated mean condition factor (Kc) was 1.483 ± 0.238 for combined sexes. Vertebrae were used for age determination, and six age groups were identified. Age groups III^+ and IV^+ were the most dominant in the catch since they constituted about 54.3% and 30.7%, respectively. The sex ratio revealed that the male percentage was higher than that of females (60% males to 40% females) in all samples. The spawning season of *M. electricus* extended from July to October during the study period. This study afforded biological data about electric catfish in Lake Nasser to sustain the catch and provide necessary information to benefit the exploitation of its resources.

INTRODUCTION

Fisheries and aquaculture play essential roles in the food supply, food security, and income generation **(FAO, 2022)**. Fisheries contributed about 30% of the total consumption of animal protein per capita **(Wang *et al.*, 2015)**. Inland ecosystem of reservoirs and lakes provide supporting, protection and nursery ground to the early life cycle stages of all commercially important freshwater fishes, particularly those belonging to families like Malapteruridae, etc. **(World Fish Centre, 2004)**. Inland water fisheries provide employment opportunities along the capture fisheries value chain and, to some

extent, reduce rural-urban drift **(FAO, 2022)**. The catch of inland water fisheries of Africa (3.21 Million MT) account for 46% of its wild fisheries.

The sector of fish wealth in Egypt is considered the main factor of food security as well as social and economic development. The fish production from natural and aquaculture resources play an important role in bridging the food gap. In the last 20 years, the fish production increased due to aquaculture growing. On the other hand, fisheries from natural resources underwent gradual decreases, while contributing with less than 20% (420 thousand MT) of total fish production (2.43 million MT) in 2020 **(GAFRD, 2022)**.

After the collapse of the tourist industry in 2011, around 1.4 million Aswan Governorate people were severely affected with respect to their income and livelihood, and most population headed to other income sources such as fisheries. Because of limited fish production from the Nile River and the absence of fish farms, Nasser Lake is considered the main source of fish for Upper Egypt, especially in Aswan with significant employment opportunities **(Habib *et al*., 2014)**. Nasser Lake is considered one of the most important inland lakes in Egypt, with an average annual catch of 25.4 thousand MT **(El-Far *et al*., 2020)**. The electric catfish, the subject of study, is a commercial fish species inhabiting Nasser Lake, which gives the necessity to conduct a biological study for the sustainability of its resource.

Generally, catfishes are an important food source of high nutritive value **(Deolalikar, 2016)**. They live mostly in swamps and occasionally in rivers around the reed beds flanking the flowing water **(Alwyne, 1975)**. About 2000 catfish species belonging to 31 families are known, with 13 families endemic to South America **(Lauder & Liem, 1983)**, and three families endemic to Africa **(Lowe-McConnell, 1987)**.

18 species of electric catfish belonging to the family Malapteruridae (Order: Siluriformes) were identified **(Carl, 2007)**. *Malapterurus* is a genus of family Malapteruridae that are widely distributed in Africa, with unknown major widespread threats **(Azeroual *et al*., 2010)**. Genus *Malapterurus* lives among rocks or roots in turbid and standing waters with low visibility. This species is found in the western and central tropical freshwater of Africa **(Moller, 1995)**. Genus *Malapterurus* is represented by only one species, *Malapterurus electricus* **(Gmelin, 1789)**. *M. electricus* is a voracious piscivore that is restricted to the Nile River, Chad Lake and Nasser Lake **(Moller, 1995; Olaosebikan & Raji, 2013)**.

Research conducted on *M. electricus* biology has a short history although this species was early known by the ancient Egyptians (**Kramer, 1974**). Thus, the present study aimed to provide the required biological data on the electric catfish *M. electricus* to

provide information necessary for the best exploitation of its resource in Nasser Lake, Egypt.

MATERIALS AND METHODS

Area of study

Lake Nasser is located at south Egypt and north Sudan borders between latitude 20^{o} 27' to 23^{o} 58'N and longitude 30^{o} 07' to 33^{o} 15' E. Its surface area is approximately 5248km^{2}, with a maximum capacity of 165km^{3} and a mean depth of 130m **(UNEP, 2015)**. The lake is approximately 550km long (>350km in Egypt and the rest in Sudan) and 35km across at its widest point. The lake possesses 85 side extensions (Khors); 48 are on the eastern side and 37 on the western side of the old Nile River main stream (Fig. 1). Fish samples were collected from the three fish landing sites (Aswan, Garf-Hussein, Abu-Simbel) along Lake Nasser.

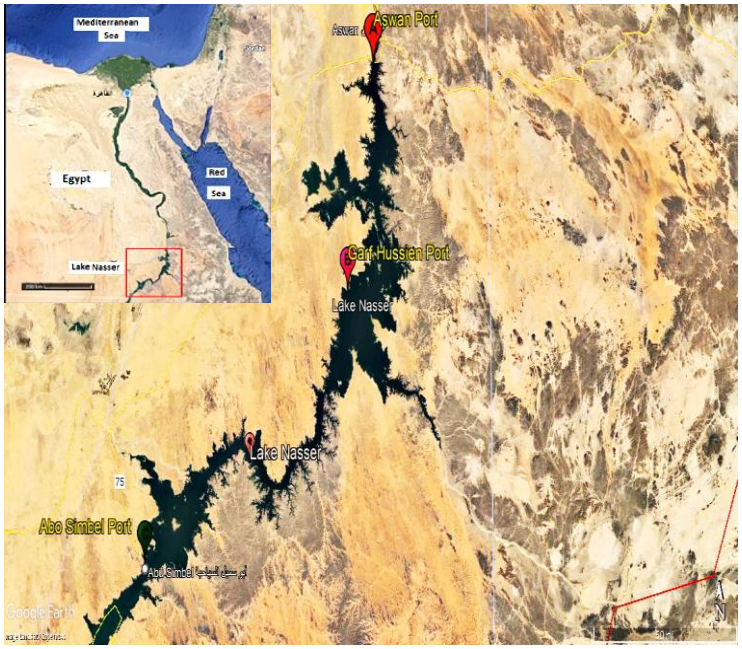

Fig. 1. Map of Egypt showING the location of Nasser Lake and its Landing sites

Samples and data collection

Monthly samples of Electric catfish, *M. electricus*, (Fig. 2) were collected from different landing sites in Nasser Lake from January to December 2019. 538 of *M. electricus* specimens were collected and were freshly transferred to the laboratory in an ice box for further measuring and examination. In all specimens, total and standard length were measured to nearly 0.1cm, and the total and gutted weight were weighed to nearly 0.1g. The samples were dissected for sexing and gonad maturation. Vertebrae were excluded and preserved for subsequent age determination. The vertebrae were examined under an

optika trinocular microscope, supported with a 20 m-pixl digital camera and monitor system using reflecting light.

Fig. 2. Electric catfish *Malapterurus electricus* (Gmelin, 1789) from Nasser Lake, Egypt

Data analysis

The length-weight relationship of *M. electricus* was estimated using the power equation of logarithmic modification equation: $W = a L^b$ **(Le Cren, 1951)**, where W is the total weight in g; L is the total fish length in cm, and ***a*** and ***b*** are constants. The condition factor (K) was monthly calculated according to **Fulton (1904)** using the equation of $K = 100 \times W/L^3$, where W is the gutted weight (g), and L is the total length (cm). The relative condition factor (Kr) is the ratio of observed weight of a given length to expected weight of the same length, as calculated from the length-weight relationship. Aging was determined using vertebrae. The vertebrae were examined under a microscope supported by a camera monitor system using reflected light. Gonado-somatic index (GSI) was calculated using the equation of **Sokal and Rohlf (1969**) [$GSI = W_g \times 100 / W$, where W_g is the gonad weight (g), and W is gutted weight (g)]. The sex ratio was investigated as the percentage of males to females (M: F) according to **Snedecor (1956)**. Data processing, statistical operation, and figuring the relations were treated using MS office (Ver. 2016), SPSS (Ver. 20), and GraphPad (7) software.

RESULTS

1. Length frequency distribution

Length-frequency data has a practical application in the field of fishery science as it can be used for the estimation of age and fish stock size. The length frequency distribution of *M. electricus* from Nasser Lake is shown in Table (1). Generally, the total length ranged from 24.0 to 51.9cm (No.= 538), and the total weight ranged from 192 to 2786g. The total lengths of males ranged from 24.5 (192 g) to 51.5 cm (2786 g), with an average of 37.7cm (924 g) [No. = 309]. The majority of males (83.50%) were those from the 31- 45cm- length group. For females, the total lengths ranged from 24.5

(285.2g) to 50.5cm (1962g), with an average of 35.7 cm (798g) [No.= 209]; most fish samples (53.59 %) were those from 29 to 35cm- length group.

Table 1. Length frequency distribution of *M. electricus* collected from Nasser Lake during the period from January to December 2019

Length group	Total No.	Male		Female		Un-sexed	
		No.	%	No.	%	No.	%
24-25.9	4	2	0.6%	1	0.5%	1	5.0%
26-27.9	5	3	1.0%	2	1.0%	-	-
28-29.9	39	18	5.8%	19	9.1%	2	10.0%
30-31.9	52	26	8.4%	24	11.5%	2	10.0%
32-33.9	78	40	12.9%	36	17.2%	2	10.0%
34-35.9	68	32	10.4%	33	15.8%	3	15.0%
36-37.9	67	37	12.0%	28	13.4%	2	10.0%
38-39.9	76	44	14.2%	30	14.4%	2	10.0%
40-41.9	51	36	11.7%	13	6.2%	2	10.0%
42-43.9	31	25	8.1%	5	2.4%	1	5.0%
44-45.9	28	18	5.8%	8	3.8%	2	10.0%
46-47.9	17	12	3.9%	4	1.9%	1	5.0%
48-49.9	10	6	1.9%	4	1.9%	-	-
50-51.9	12	10	3.2%	2	1.0%	-	-
Total No.	538	309	100.0%	209	100.0%	20	100.0%
Min. length	24.0	24.5		24.5		24.0	
Max. length	51.1	51.1		50.5		46.0	
Aver. Length	36.85	37.67		35.71		36.2	

2. Length – weight relationship

The relationship between total length (L) in cm and total body weight (W) in g was calculated for males, females and combined sexes. In general, the fish weight increased in the form of power equations, with a high correlation coefficient (R^2 around 0.9). The following equation represents L-W relationships (Fig. 3):

For males: -

$W = 0.0157\ L^{3.0052}$ $(R^2 = 0.9201)$

For females: -

$W = 0.0378\ L^{2.7701}$ $(R^2 = 0.8967)$

For combined sexes: -

$W = 0.0242\ L^{2.8904}$ $(R^2 = 0.9127)$

For males, the value of the allometry coefficient "b" (slope of the regression line) was 3.00, showing an isometric growth. While, values of 2.77 and 2.89 were recorded for females and combined sexes, respectively. Late values were significantly different from the theoretical value 3 (t-test; $P< 0.05$), indicating a negative allometric growth.

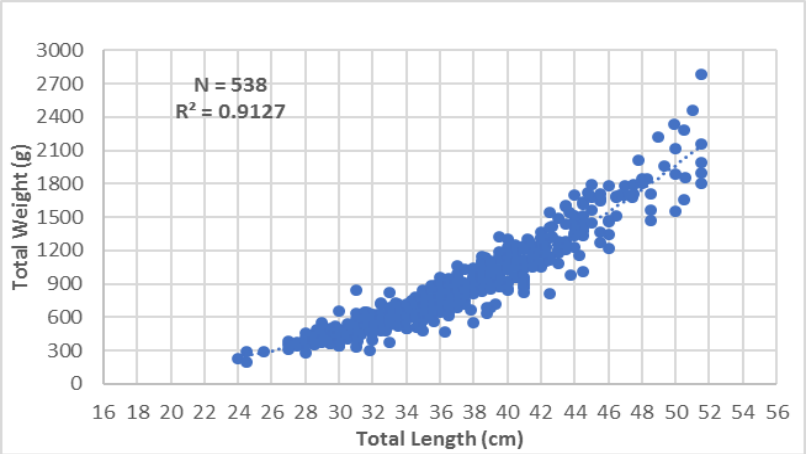

Fig. 3. Length-weight relationship of *M. electricus* (combined sexes) collected from Nasser Lake during 2019

3. Condition factor

Both absolute (Kc) and relative condition factor (Kr) were calculated according to fish length and month variation.

3.1. Condition factor variation according to length

Mean condition factor (K) corresponding to different length groups of males, females and combined sexes were estimated. In general, absolute condition factor (Kc) decreases as the fish length grows. Average values of Kc in combined sexes decreased from 1.507 (± 0.948) in the length group of 24cm to be about 1.44 (± 0.188) in the length group of 52cm, with an average of 1.483 (± 0.238), as shown in Fig. (4A). On the other hand, the average values of (Kr) increased gradually from 0.975 (± 0.61) in the length group of 24cm to 1.039 (± 0.143) in the length group of 45cm, with an average of 1.01 (± 0.159), as shown in Fig. (5A).

3.2. Monthly variation of condition factor

The monthly variation of condition factor (Kc) exhibited specific fluctuation in both sexes during different months of the year. In combined sexes, the absolute condition factor (Kc) higher value was recorded in February (1.546 ±0.168), while the lower value was recorded in November (1.37 ±0.157), as shown in Fig. (4B). Regarding the relative condition factor, higher average value of Kr was recorded in September (1.044 ±0.132), whereas its lower value was in November (0.907 ±0.100), as displayed in Fig. (5B). Notably, the values of the average absolute and relative condition factors for males and females have the same trend in the monthly variation.

4. Age determination

There were two types of rings visible in vertebrae of *M. electricus*; an opaque ring (summer period) and a white ring (winter period). Like most hard structures used in fish aging, vertebrae is analyzed by counting growth bands present along the vertebral cone from the focus (centrum) to the edge of the whole vertebra (Fig. 6).

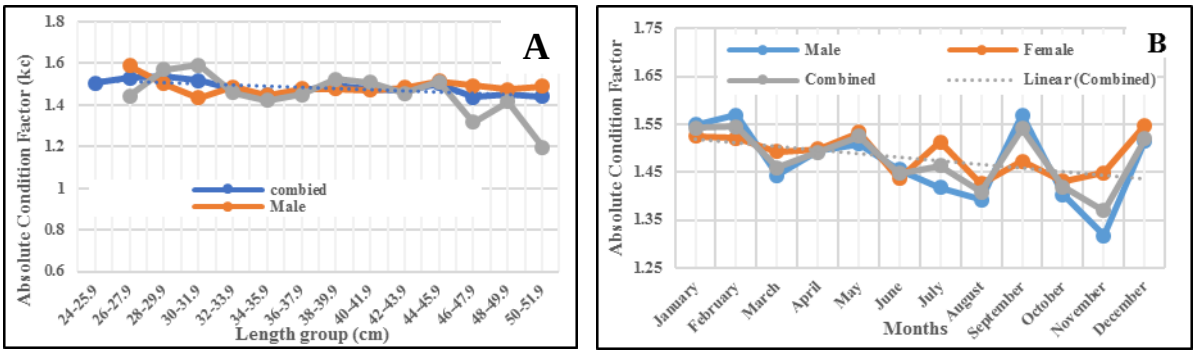

Fig. 4. Absolute condition factor variation of *M. electricus* from Nasser Lake during 2019 (A) according to length groups and (B) according to months

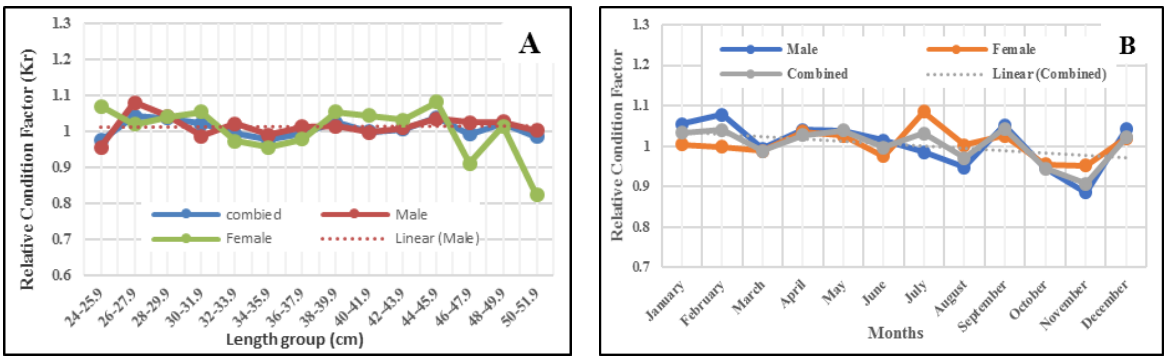

Figure 5. Relative condition factor variation of *M. electricus* from Nasser Lake during 2019 (A) according to length groups, and (B) according to months

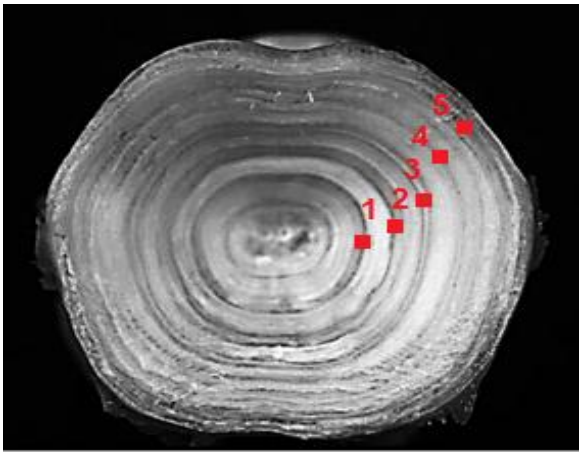

Fig. 6. Vertebrae of *M. electricus* from Nasser Lake used for age determination (43cm TL, 5 years)

The age composition of *M. electricus* is graphically represented in Fig. (7). The age group (III) was the most dominant in the catch of *M. electricus* (54.3%), followed by age group (IV) (30.7%) and age group II (9.29%). Specimens of age groups I & VI were represented by the same percentage (0.56%).

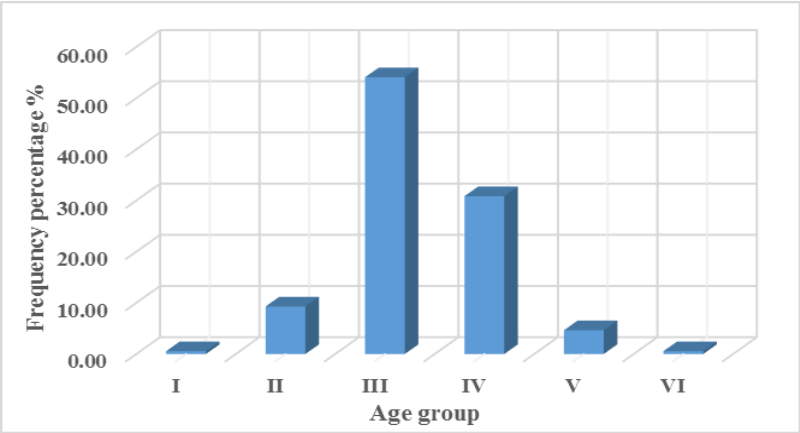

Fig. 7. Age composition of *M. electricus* collected from Nasser Lake during the period from January to December 2019

5. Growth estimation

5.1. Growth in length

From the age determination, the longevity of *M. electricus* was estimated to be six years by counting the annual growth rings. Length at the end of each year was estimated to be 24.33, 30.87, 37.31, 42.77, 47.80 and 51.17cm, with an increment of 24.33, 6.54, 6.44, 5.46, 5.03 and 3.36cm, at the 1st, 2nd, 3rd, 4th, 5th and 6th year of life, respectively. *M. electricus* attained the highest increment at the end of the first year of life, after which the annual increment in length decreased gradually with the increasing age until it reached its lower value at the end of the 6th year of life (Fig. 8).

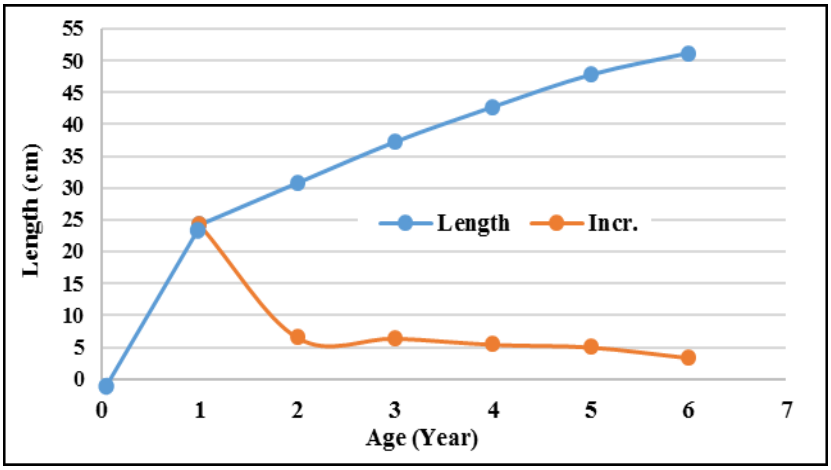

Fig. 8. Growth in length and annual growth increment for *M. electricus* collected from Nasser Lake during the period from January to December 2019

5.2. Growth in weight

Each age group's average calculated weights were 235.60, 712.07, 1175.56, 1444.15, 1645.74 and 1829.52g for the 1st, 2nd, 3rd, 4th, 5th and 6th years of life,

respectively. The annual increment of weight increased with the increase in age until it reached its maximum value at the end of age group II, with an increment of 235.60, 476.47, 463.49, 268.59, 201.59 and 183.78g, respectively, after which a gradual decrease in other age groups were recorded (Fig. 9).

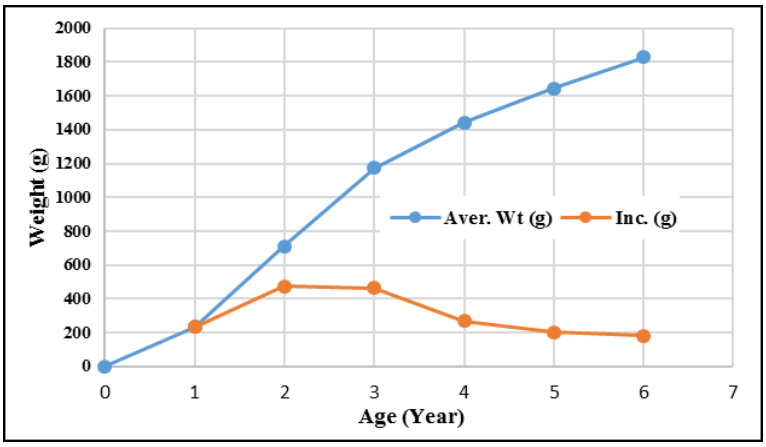

Fig. 9. Growth in weight and annual growth increment for *Malapterurus electricus* collected from Nasser Lake during the period from January to December 2019

6. Gonado-somatic index

A monthly variation in the gonado somatic index (GSI) values are represented in Fig. (10). The minimum values were recorded in May (0.050) for males; while for females, they were recorded in November (0.487). Meanwhile, the maximum values which confirm the spawning season was found to be during the period from July, August to October, with a peak in September for females (8.518) and a peak in October for males (1.146).

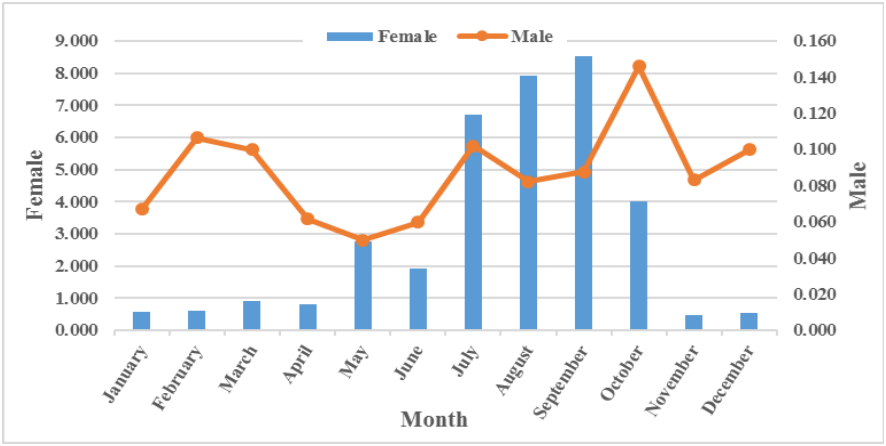

Fig. 10. Monthly variation of the gonado-somatic index (GSI) for male and female of *M. electricus* collected from Nasser Lake during the period from January to December 2019

7. Sex ratio

7.1. Variations of sex ratio according to length groups

Males of *Malapterurus electricus* recorded a high percentage in the majority of length groups, except for the length group 28- 29.9cm, where the females increased (M: F 1: 1:1) and were close to (1) in the length groups of 30- 31.9 and 32- 33.9cm, respectively. The parity was observed only at length group 34- 35.9cm. Generally, for most lengths, males have outnumbered females, with a percentage of 60% of the total fish (Table 2).

Table 2. Variation of sex ratio with length for *M. electricus* collected from Nasser Lake during the period from January to December 2019

Length group	Total No.	Male		Female		Ratio
		No	%	No	%	
24-25.9	3	2	67	1	33	1:05
26-27.9	5	3	60	2	40	1:0.7
28-29.9	37	18	49	19	51	1:1.1
30-31.9	50	26	52	24	48	1:0.9
32-33.9	76	40	53	36	47	1:0.9
34-35.9	65	32	49	33	51	1:1.0
36-37.9	65	37	57	28	43	1:0.8
38-39.9	74	44	59	30	41	1:0.7
40-41.9	49	36	73	13	27	1:0.4
42-43.9	30	25	83	5	17	1:0.2
44-45.9	26	18	69	8	31	1:0.4
46-47.9	16	12	75	4	25	1:0.3
48-49.9	10	6	60	4	40	1:0.7
50-51.9	12	10	83	2	17	1:0.2
Total	518	309	60	209	40	1:0.67

7.2. Monthly variation in sex ratio

The sex ratio is expressed as the number of males to females and reflects the reproduction potential of the fish. The ratio of males of *M. electricus* showed that higher values were observed in February, March, April and October (approximately 70%), while the lower value was found in May. Females recorded the lowest percentage in February (31%) and the highest percentage in May (64%). Generally, it is obvious that the males predominated fish samples (60%), while the females formed about 40% of the total sampled fish during the whole period of study (Fig. 11).

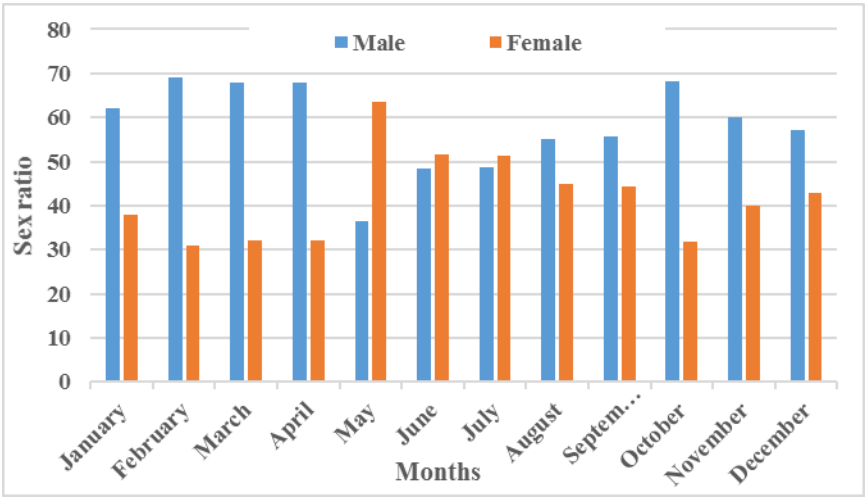

Fig. 11. Monthly variation in sex ration of *M. electricus* collected from Nasser Lake during the period from January to December 2019

DISCUSSION

Length frequency distribution is an essential tool to assess the status of an exploited fish population and determine the age, growth, survival, mortality rates and length at first capture **(El-Ganainy, 1992)**. In the present study, the observed total length of *M. electricus* collected from Nasser Lake ranged from 24.5 to 51.5cm for males and from 24.5 to 50.5cm for females, while the total length for combined sexes ranged from 24 to 51.5cm. These results differed from those obtained by **Kouassi *et al.*, (2019**) who mentioned that lengths of *M. electricus* in the Lake of Buyo, Côte d'Ivoire ranged from 11.5 to 34cm for all sexes. **Fagbenro *et al.*, (2012)** reported that the standard length of *M. electricus* ranged from 10.1 to 30.5cm in Mahin Lagoon, Nigeria.

The length-weight relationship of a fish species is an important biological tool in managing the fish population. It provides mathematical expiration between length and weight measurements as that one may be converted to the other, where the weight of the fish increases as a function of its length **(Le Cren, 1951)**. Value of "b" in L-WR is usually used to show the robustness of the fish. Generally, the value of "b" is 3 for fishes with an isometric growth, and the value of "b" is higher or lower than 3 for fishes with an allometric growth **(Farrag, 2022)**. In the present study, "b" values were 3.01 and 2.89 for males and combined sexes, respectively. This means that, isometric or tendency towards isometric growth was observed for males and combined sexes. In contrast, females exhibited an allometric growth (b= 2.77).

These results agree with the findings of **Arome *et al.* (2007)** in the Benue River in Nigeria, where *M. electricus* recorded an isometric growth, with no apparent difference in the size of females and males. The "b" value was 2.76 in a tributary of Ikpa River, Nigeria **(Udo, 2012)** In addition, the "b" value was 3.14, exhibiting a positively

allometric growth of *M. electricus* in Agaie – Lapai dam, Niger State, Nigeria **(Bake *et al*., 2016)**. The value of the allometry coefficient "b" (slope of the regression line) varied from 2.94 to 2.95 in the dam lake of Buyo Côte d'Ivoire **(Kouassi *et al*., 2019)**. This minute variety, where the functional regression "b" value represents the body form, is directly related to the weight affected by ecological factors, such as seasonal influences, temperature, food supply, spawning conditions and other factors such as sex, age, habitat type, gonad development, fishing time and area **(Froese, 2006; Soykan *et al*., 2020)**, Table (5).

Table 5. Comparison between parameters of length weight-relationship and condition factor (kc) of *Malapterurus electricus* from different locations with the present study

Author/s	Location	Sex	a	b	r^2	Kc
Arome and Garba (2007)	lower Benue River, Nigeria	M	1.47	2.86	—	2.30
		F	1.69	3.04	—	2.28
		C	1.57	2.95	—	—
Offem *et al*., (2009)	inland wetlands, Cross River, Nigeria	C	-2.0	3.1	0.9	1.0
Udo, 2012	Iba-Oku stream, Ikpa River, Nigeria	C	1.34	2.76	0.86	2.62
Bake *et al*., (2016)	Agaie-Lapai Dam, Niger state , Nigeria	C	2.60	3.14	0.94.	1.13-1.98
Goli, *et al*.,(2019)	The lake of Buyo, Côte d'Ivoire	M	1.55	2.95	0.93	2.46
		F	1.50	2.92	0.95	2.53
		C	1.53	2.94	0.94	—
Present study	Nasser Lake, Egypt	M	0.0157	3.00	0.92	1.43-1.59
		F	0.0378	2.77	0.89	1.20-1.59
		C	0.0242	2.89	0.91	1.44-1.54

M: Male; F: Female C: Combined sexes

The fish condition factor (K) measures of the degree of well-being, plumpness or fatness and interactions between abiotic and biotic factors in fish physiological conditions. It is greatly affected by several factors, such as age, sex and season **(Lagler, 1956; Froese, 2006; Famoofo & Abdul, 2020)**. In the present study, the gutted weights were used to calculate the condition factor (K) to avoid the impact of stomach fullness. Variations of condition factor in both sexes, length groups and different months of the year were calculated.

Regarding fish length, the lowest mean average value of absolute condition factor (Kc) for *M. electricus* (1.438± 0.111) was detected in length group 46- 47.9cm, while the highest mean value (1.530±0.154,1.535± 0.190) was recorded in length groups 26- 27.9 and 28- 29.9cm, respectively. In addition, the highest mean value of average of relative condition factor (Kr) (1.041± 0.085, 1.036± 0.127) was registered in length groups 26- 27.9 to 28- 29.9cm, respectively, whereas the lowest mean value (0.975±0.610) was recorded in length group 24- 25.9cm. For monthly variations, the highest mean value of the average condition factor was recorded during January and February, and the lowest

mean values were recorded during November for both absolute condition and relative condition factor.

The present results agree with those of **Bake *et al*. (2016)** for the same species in the Agaie-Lapai dam lake in Nigeria. According to these authors, the condition factor of this species ranged from 1.13 to 1.93, with a mean value of 1.48 ± 0.22. In this respect, **Kouassi *et al*. (2019)** reported that. the mean condition factor (Kc) of *M. electricus* in Lake of Buyo Côte d'Ivoire was 2.53 ± 0.34 and 2.46 22 ± 0.39 for females and males, respectively. This difference or similarity in condition factors may be related to the environmental conditions of the species and different locations.

Age determination is an important tool in studying the biology of fish. In conjunction with length measurements, age data can give information on size composition, life span, mortality and reproduction. The age of fish determined is highly effective in determining the status of any fish stock through the calculation of fishing and natural mortality rates **(VanderKooy *et al*., 2020)**. In the present study, *M. electricus* in Nasser Lake had no long lifespan, reaching six years of age, and age groups III^+ and IV^+ were the most abundant in the catch, constituting more than 85%. The same species in man-made Lake Buyo, Côte d'Ivoire **(Kouassi *et al*., 2019**) reaches four years.

Gonado-somatic index (GSI) has been widely used as a low-cost indicator of fish reproductive condition and spawning period **(Plaza *et al*., 2007)**. In the present study, GSI values were high during the breeding season for females, which started in July and ended in October, and early May for males. These results concur with most of the other studies, as for instance, **Sagua (1979)** in Lake Kainji in Nigeria; **Arome and Garba. (2007**) in the Benue River in Nigeria and the study of **Goli *et al*. (2019**) in the dam lake of, Buyo, Côte d'Ivoire. Minor differences in the spawning season may reflect different temperature regimes and feeding dominance among the areas **(Kashiwagi *et al*., 1987**).

The application of sex ratio is useful in the study of the spawning population. In the present study, males of *M. electricus* is more abundant in all length groups; in addition, males' numbers were higher than females during the whole period of study, except May, June and July. Generally, males accounted for 60%, and females accounted for 40% of the total collected samples. These results coincide with the findings of **Goli *et al*. (2019**) who conducted a study on the dam lake of Buyo, Côte d'Ivoire. **Arome *et al*. (2007**) reported that, variation of the sex ratio was observed in the number of females of *M. electricus* in the Benue River in Nigeria, with a higher percentage during May and September than the number of males. These differences may be attributed to the difference in the time of spawning season, displacement for food search, reproductive period and the mortality rate by sex **(Kartas & Quignard, 1984)**.

CONCLUSION

This study shedded light on some biological aspects of the electric catfish, *M. electricus*, in Nasser Lake to provide information necessary for the best exploitation of its resource. This study revealed that the length-weight relationships of *M. electricus* showed an isometric growth pattern. Mean condition factor values indicate that there is no significant difference between males and females. It also showed that the environmental conditions in Nasser Lake are suitable for the growth of the fish, compared to the other lakes in Africa. *M. electricus* in Nasser Lake has a long lifespan reaching six years, and age groups III and IV dominated the catch. Males were dominant (about 60%) in the catch. The spawning season of *M. electricus* in Nasser Lake extends from July to October, which could be used as a measure of the management plan in the lake.

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Arabic Summary

تحديد العمر والنمو والنسبة بين الجنسين في أسماك السلور الكهربائي (*Malapterurus electricus*) في خزان مائي كبير، بحيرة ناصر، مصر

أسماك الرعاد (السلور الكهربائي) ، *Malapterurus electricus*، هو نوع من رتبة السلوريات (القراميط) التي تنتشر على نطاق واسع في إفريقيا ، وتوجد في جميع أنظمة المياه العذبة الرئيسية. وهي سمكة تتواجد في بحيرة ناصر وذات قيمة إقتصادية، حيث يبلغ متوسط مصيدها السنوي حوالي 130 طن. القليل من البيانات البيولوجية متاحة عن هذا النوع في بحيرة ناصر. تم تجميع عينات عشوائية شهرياً من أسماك الرعاد من مواقع الإنزال الثلاثة الرئيسية في البحيرة (ميناء أسوان ، جرف حسين ، أبو سمبل) خلال الفترة من يناير إلى ديسمبر 2019. تم فحص 538 عينة من سمكة الرعاد لتوفير المعلومات البيولوجية الضرورية. أظهرت النتائج أن الطول الكلي تراوح من 24.0 إلى 51.5 سم والوزن الإجمالي تراوح من 192.4 إلى 2785.9 جرام. أوضحت علاقة الطول والوزن أن قيمة (2.89) "b" تشير إلى اتجاه نحو النمو متساوي القياس بمعامل ذي دلالة إحصائية عالية. متوسط معامل الحالة المقدر (Kc) هو 1.478 ± 0.190 للذكور و 1.487 ± 0.213 للإناث. تم استخدام الفقرات لتحديد العمر وتم تحديد ست فئات عمرية. كانت الفئات العمرية الثالثة والرابعة هي الأكثر وفرة في المصيد. كما أظهرت الدراسة أن نسبة الذكور كانت أعلى من نسبة الإناث (حوالي 60% ذكور مقابل 40% إناث) كما اوضحت الدراسة أن موسم تكاثرأسماك الرعاد في بحيرة ناصرتكون خلال الفترة من يوليو إلى أكتوبر. توفر هذه الدراسة بيانات بيولوجية عن سمك الرعاد (السلور الكهربائي) في بحيرة ناصر بغرض إستدامة المصيد وتوفير المعلومات اللازمة لاستغلال موارده.