

THE POPULATION STRUCTURE AND GROWTH PROPERTIES OF NORTH AFRICAN CATFISH (*CLARIAS GARIOEPINUS*, BURCHELL 1822) CAUGHT FROM KIRIKHAN GÖLBAŞI LAKE (HATAY, TURKEY)

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Abstract

In this study, the population structure and growth properties of 395 of specimens African catfish (*Clarias gariepinus*, Burchell 1822) caught from Kırıkhan Gölbaşı Lake (Hatay) between October 2001- September 2002 were examined.

The age composition of population varied between 0 and 5 ages, and the most abundant age group was first age group. Total length were between 12.8 and 47.8 cm. It was determined that growth was faster at earlier age.

Keywords

North African Catfish, Kırıkhan Gölbaşı Lake, Age and Growth, *Clarias gariepinus*

Introduction

Clarias gariepinus (Burchell, 1822), which has a wide distribution from the South and Central Africa to the Middle East and Turkey is especially in Hatay province. It is seldom consumed by local people but sold to Eastern Anatolia (Turkey) and Syria. The ecological perspective of freshwater in Africa is extremely different from that in Turkey.

Although several studies have already been conducted on these fish by Bruton and Allanson (1980), El Bolock (1972), Pivnicka (1974), in Turkey there are very few, such as Kındır (2000), Yalçın (1999). The present study was conducted to observe the population structure and growth features of *Clarias gariepinus* in Gölbaşı Lake.

Materials And Methods

In this study, a total of 395 specimens were collected from Gölbaşı Lake (Hatay) between October 2001 and September 2002 monthly. After being caught, the fish specimens were brought to the laboratory where the weights and total lengths were measured to the nearest 0.1 g and 1.0 mm respectively. The age of samples was recorded using their sixth and seventh vertebrae (Pivnicka, 1974).

Von Bertalanffy growth parameters, length-weight relationships and relative growth rate in length of samples were calculated according to; $L_t = L_\infty (1 - e^{-K(t+t_0)})$ in length and $W = a * L^b$ respectively. Where, W= Body weight (g), L= Total length (cm), L_t = total length at the age of t, L_∞ =maximum asymptotic length, K=Brody's growth constant, t_0 = computed age at the time of hatching, a and b are constants (Chugonova 1963; Von Bertalanffy 1957).

Condition coefficient was calculated for all samples using the equation $K = (W/L^3) * 100$ where, W= Body weight (g), L= Total length (cm) (Ricker, 1975).

Results

Population structure

The age group of all specimens examined are shown in Figure 1. Age variation ranged between age group 0 and 5 and the most common was group 1 (35.7%), followed by group 2 (22%). Age groups 1, 2 and 3 contained 77.4% of all specimens studied.

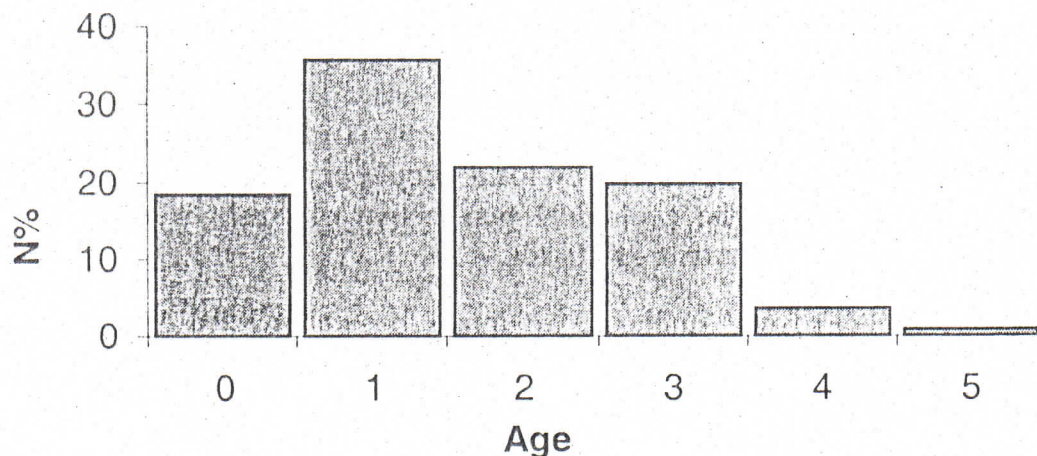


Figure 1. The age of African catfish from Gölbaşı Lake

Length frequency distribution

The length of samples ranged from 12.8 to 47.8 cm (Figure 2). The length frequency distribution of samples were mainly concentrated within the length group of 21.5-24.4 cm. Length groups between 18.5 and 36.4 cm contained 80% of all specimens studied.

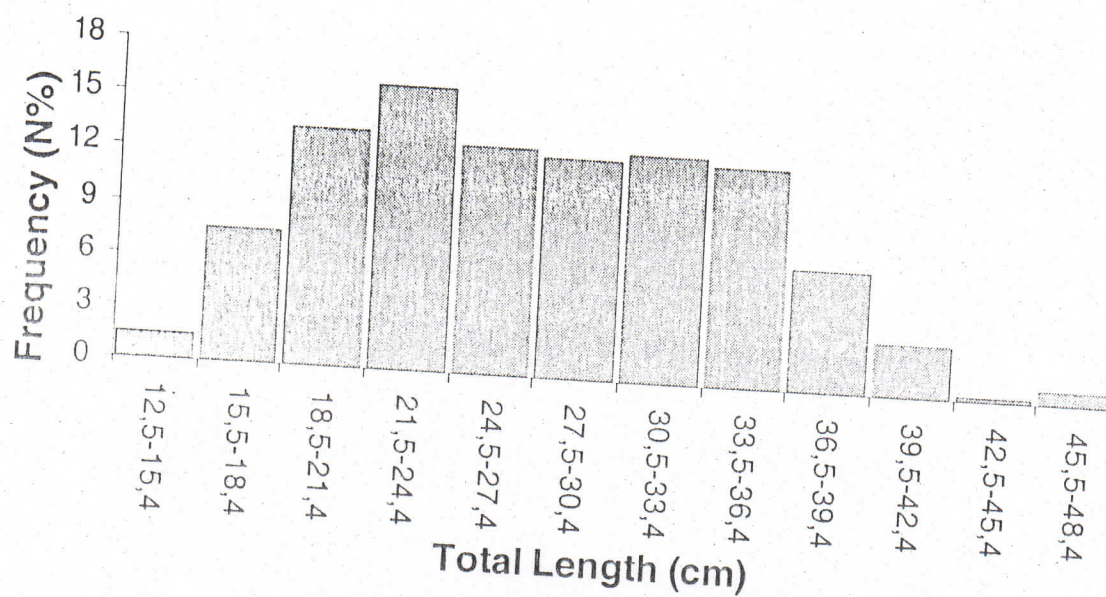


Figure 2. The length frequency distribution

Length-weight relationship

The length of an individual whose weight is known and the weight of an individual whose length is known were calculated with the logarithmic length-weight relationship using the regression coefficient of length and weight ($W=aL^b$). The length-weight relationship was calculated for samples, as given in Figure 3.

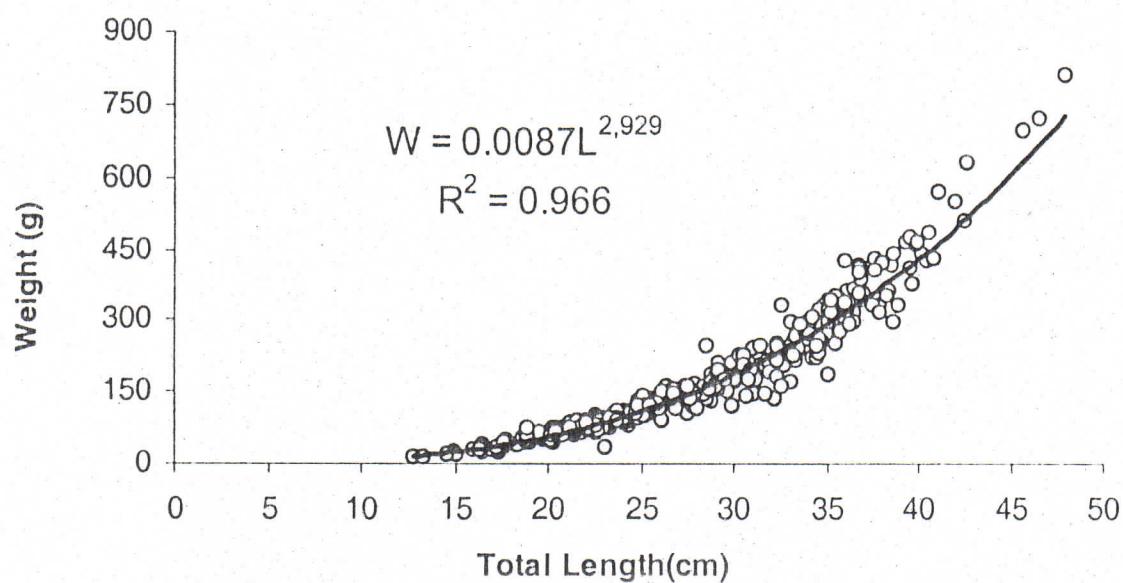


Figure 3. The length-weight relationships

Growth

The Von Bertalanffy growth equation using age-length relationship growth parameters according to sex and the theoretical length of the specimen (Table 1).

Table 1. Von Bertalanffy growth parameters and equations of the African catfish from Gölbaşı Lake

Sex	Growth Parameters			Growth Equations
	L_{∞}	K	t_0	
Females	65.12	0.193	-1.53	$L_t = 65.12(1 - e^{-0.193(t+1.53)})$
Males	57.03	0.232	-1.48	$L_t = 57.03(1 - e^{-0.232(t+1.48)})$
Population	61.11	0.216	-1.46	$L_t = 61.11(1 - e^{-0.216(t+1.46)})$

Sex ratio

Among the 395 specimens sampled, 162 were female (41.01% of the sample), 155 were male (39.21% of the sample) and 78 were unknown sex (19.75% of the sample).

Condition factor

The condition factor of *Clarias gariepinus* was 0.686 for population and occurred in summer was higher than other seasons. Condition values of *Clarias gariepinus* in relation to saeson are given in Figure 4.

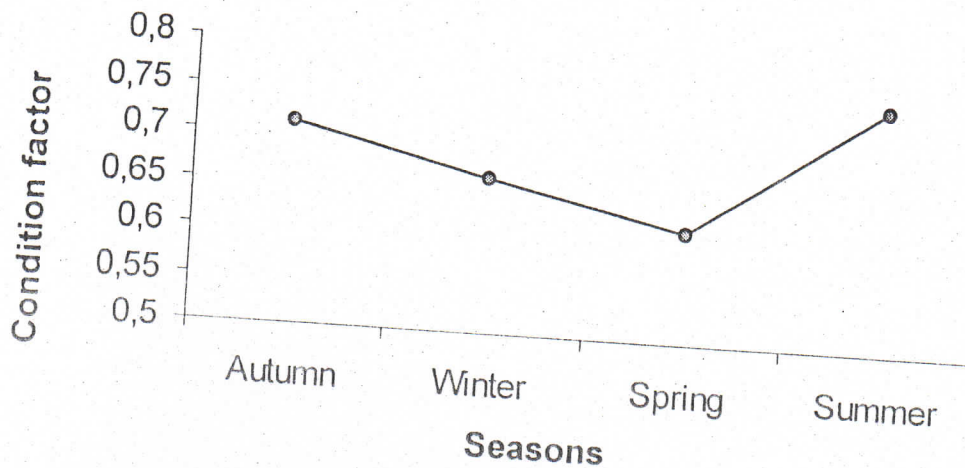


Figure 4. Condition indexes as seasons

Discussion

The age distribution of the African catfish samples in Gölbaşı Lake ranged from 0 to 5 age groups and population density was high in age group 1 (35.7%). In Sakarya river, the age distribution was between 2 and 4 (Kındır, 2000), in Asi River it was in age groups 0 and 5. High individual numbers were observed in age groups 1 (37.64%) (Yalçın 1999). The maximum age was estimated to be 5 for males and females in Asi River (Yalçın 1999), which agrees with the results of the present study.

Length distribution in the *Clarias gariepinus* in the Gölbaşı Lake was ranged from 12.8 to 47.8 cm. The length group that contained the most fish (15.95%) 21.5-24.4 cm group.

The length-weight relationship of African catfish in Gölbaşı Lake for samples was recorded by $W=0.0087L^{2.929}$ ($r^2=0.97$). In Sakarya River (Kındır 2000), it was $W=0.024L^{2.957}$, Asi River $W=0.0127L^{2.817}$ ($r^2=0.97$) (Yalçın 1999).

The condition factor of *Clarias gariepinus* population in the Gölbaşı Lake was 0.69 for population. In Asi River, the condition factor for all samples was

0.71 and in Sakarya River was 0.63 for population. Compared with these values, the condition factor of the African catfish samples of Gölbaşı Lake is same. The lowest condition values for samples (0.617) was found in Spring and the highest (0.755) in summer. Yalçın(1999); Bruton and Allanson (1980) found the highest condition coefficient in African catfish population in summer.

Bruton and Allanson (1980) estimated the following growth parameters of *C. gariepinus* in the Sibaya Lake: $L_{\infty}=71.5$ cm, $k=0.43$ y^{-1} (for all samples). El Bolock (1972) in the Berrage Lake: $L_{\infty}=143$ cm, $k=0.08$ y^{-1} (for both sex). In present study $L_{\infty}=61.11$ cm, $k=0.216$ y^{-1} (for all samples). This can be related to the temperature, the food availability and high fishing pressure or a manifestation of different metabolic activity in the study area, both of which influence fish growth.

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