Relationship Study Between Total Length with Otolith Length and Thickness in Two Fish Species: *Coptodon zillii* (Gervais,1848) and *Cyprinus carpio"* (Linnaeus,1758)

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Relationship Study Between Total Length with Otolith Length and Thickness in Two Fish Species: *Coptodon zillii* (Gervais,1848) and *Cyprinus carpio*" (Linnaeus,1758)

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Abstract. This study aimed new indications that may clarify the relationships between the total and standard lengths, and the length of the otolith, as well as the thickness and weight of these bones compared to the body weights of two different species of invasive fish in the Iraqi aquatic environment, the common carp *Cyprinus carpio* of the Cyprinidae family, and the common Tilapia. *Coptodon zillii*, from the Cichlidae family. The results showed that the otolith were not related to some of the vital characteristics of the studied fish, and there were differences in the correlation coefficient between some vital measurements with high significant degrees at levels (0.01) and (0.05), when comparing the otolith from the two sides of the head from the right. While the rest is for one individual and between individuals of the two different species.

1. Introduction

Otolith is an important vital evidence by which the age of fish can be estimated in general, and fish species of smooth bodies fish that do not have scales [1], and its importance is evident in estimating the age of fish and the relationship of age to size, growth and survival rate [2], it is possible to use otolith in estimating the age from the complete shape of the bone, or by estimating the calcareous growth on it due to age [3].

The whole otolith is used as it is without making a change to it for various biological studies related to growth and age, or dyeing it to obtain more accurate results when taking different readings to estimate age or weight gain represented by growth [1,4]. Also, the use of some digestive enzymes with dyes to analyze the components of the ear bones and find the relationship between growth and age or growth and weight increases is also an ideal method [1].

The components of the otolith can be analyzed as a comparative analysis between fish species, and the difference is in the composition of the bone composition of different species [5], or the analysis of some elements in the composition of the otolith that differ between species according to the comparative analysis of these elements in the bones of the compared species [3].

The otolith is also one of the important evidences of modern anatomy, as it can be inferred from it on the different species of fish according to the shape of those bones, which belongs to the species and therefore to the family of that species of fish. It is also possible through its diagnosis to know the species accurately, according to what was mentioned In studies [6,7].

he otolith remains the best in terms of determining the age of the fish, the relationship of age with growth, the relationship of size with age and weight gain, in addition to studying the larval development in fish hatchlings of different species and areas of their presence, in addition to being the sensitive organ for hearing and balance especially in all bony fish species [8].

This study aimed to know indications that may clarify the relationships between the total, standard lengths, and the length of the otolith, as well as the thickness and weight of these bones compared to the body weights of two different species of invasive fish in the Iraqi aquatic environment, the

common carp *Cyprinus carpio* of the Cyprinidae family, and the common Tilapia. *Coptodon zillii*, from the Cichlidae family".

2. Materials and Methods

Specimen of each species, along with two species belonging to two different families, namely the Cyprinidae family, the common carp Cyprinus carpio, and the second species is the common tilapia Coptodon zillii, which belongs to the Cichlidae family, as the otolith of both species were extracted by following the method known to fish specialists as mentioned in previous studies [9,10].

The otolith on the right side were isolated from the otolith on the left side of the head for both species. The otolith was preserved for the first time in a formalin solution with a concentration of 10% for a period of five days, after that the otolith were preserved in methyl alcohol with a concentration of (70%) for a full month, then they were left to dry on blotting paper at room temperature and were preserved in small plastic bottles marked according to the species. Dino-lite digital microscope pro has a magnification (40X) in imaging and diagnosing ear bones for both species.

3. Results and Discussion

The results of biometrics identified:

In Figure (1), the common carp *Cyprinus carpio*, as the average weight of the samples was (470.9 gm) and the average total length of it was (29.52 cm), average standard length was (25.18 cm), while the average head length of the studied samples was For these fish (6.49 cm), the average length of the otolith on the right side of the head was (0.51 cm), and the average thickness of the otolith on the right side of the head was (0.34 cm). On the right side of the head (0.015 gm), while the average biometric measurements of the otolith on the left side of the head were (0.48 cm) for the total length of the bones, (0.07 cm) for the thickness of these bones, while the average weight of the otolith on the one hand was left or the head" (0.017 gm).

Figure 1. *Cyprinus carpio*

3.1. Common tilapia Coptodon zillii

Figure (2), the average weight of the models was (263.4 gm) and the average total length of them was (23.24 cm), and the average standard length was (18.61 cm), as was the average head length of the models of the common tilapia. (5.88 cm), while the average length of the otolith on the right side of the head was (0.83 cm), average thickness of the otolith on the right side of the head was (0.12 cm). The average weight of the otolith on the right side of the head was (0.12 gm) The biometrics of the otolith on the left side of the head were (0.81 cm) for the total length of the bones, and (0.12 cm) for the thickness of these bones, while the average weight of the otolith on the left side of the head was" (0.07gm).

Figure 2. *Coptodon zillii*

3.1.1. Illustrations of the shape of the otolith of the studied species

Figure (3) shows the otolith of the species *Cyprinus carpio*, as front and back images of the otolith were taken on both sides of the head, right and left, to know the shape of the bones and the differences between the two bones in the same head of the fish and the extent of the contrast between these two sides of the same fish. Fish were randomly selected for imaging the otolith.

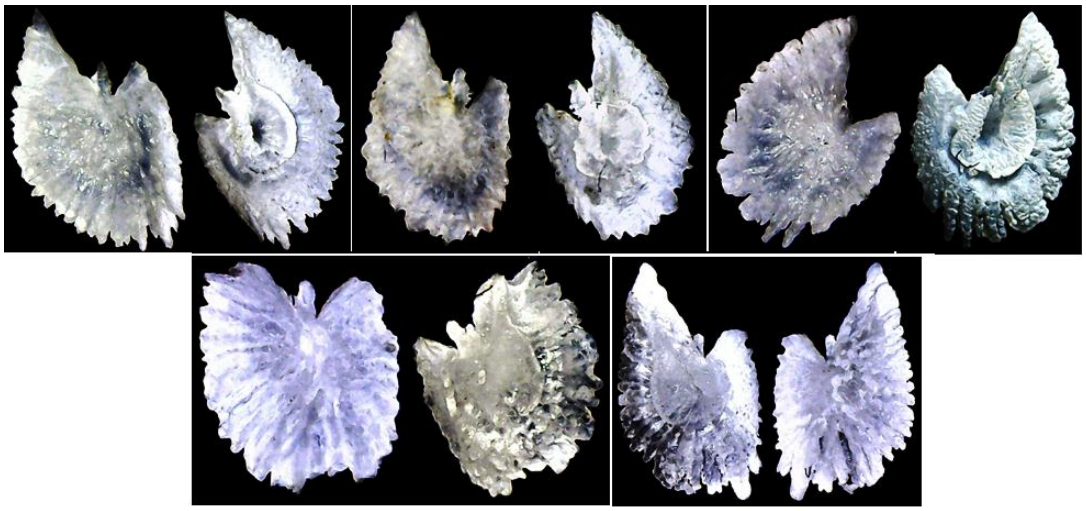

Figure 3. *Cyprinus carpio* otolith

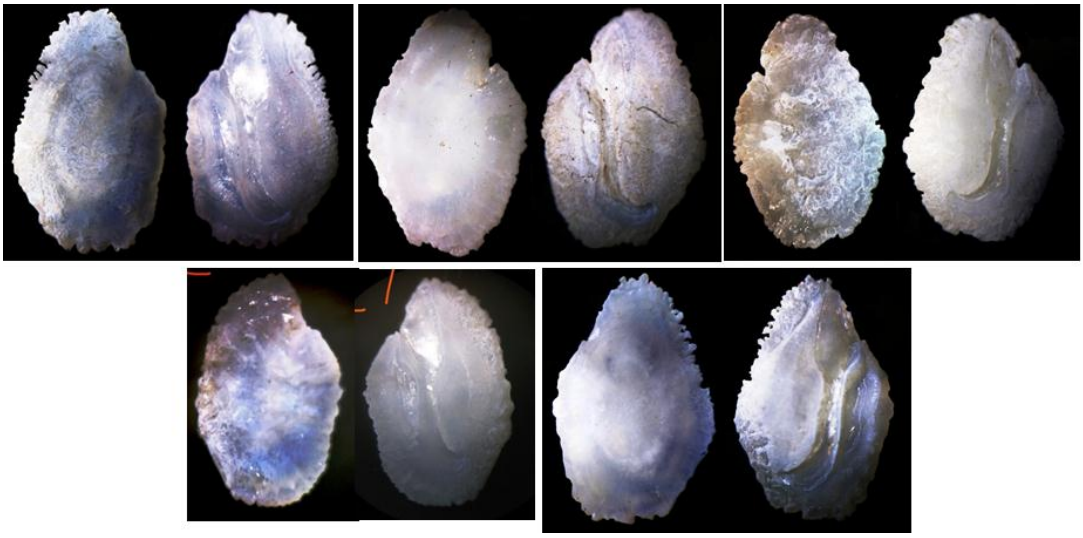

Figure 4. *Coptodon zillii* otolith

3.2. Statistical analysis

Statistical analysis was made of the available data for both species, as some relationships were compared between *C. carpio* and *C. zillii* fish in terms of total and standard length, head length and weight for the studied models, as shown in Table (1).

Table 1. Comparison between the two species studied for some biological traits

Species	Total length	Standard length	Head length	Weight
Cyprinus carpio	a 29.58±0.30	a 25.18±0.20	a 6.49±0.02	a 470.92 ± 5.63
Coptodon zillii	b 23.24±0.25	b 18. 61±0.18	b 5.88±0.07	b 263.40 ±6.09
Significant level	*	*	*	*

Letters that are different from each other within the same column mean that there are significant differences at the level" (P≤0.05).

It is noted from Table (1) the emergence of high significant differences between some biometrics between the two studied species, as it is possible that the difference between the two types is due to the difference between the families to which these two species belong, as the species differ significantly between the families and even the difference between the species within the family One, according to the phenotypic and vital characteristics of the species that belong to a particular family, and its difference from the second type, each according to its general phenol typical characteristics, which are different among fish species according to the characteristics of the classification and diagnosis of those families.

It was proposed to compare the relationships between some of the vital characteristics of the two studied species and the location of the ear bones from the head of the fish and for each type, as the ear bones were taken from the right and left sides of the head for both types *C. caroio* and *C. zillii*, and the total length of the bones from both sides of the head was determined as well about the thickness and weight of those bones, as high significant differences appeared at levels (0.01) and (0.05), when comparing these bones between the two types and for the left and right sides of the head, as shown in Table (2).

Table 2. Comparison of some biometrics of otolith on both sides of the head for the two species *C. carpio* and *C. zillii*

Species	Otolith Thickness		Otolith Weight		Otolith length	
	left	Right	Left	Right	left	Right
Cyprinus carpio	a	a	a	a	a	a
	0.126	0.349	0.070	0.074	0.819	0.833
	±	±	±	±	±	±
	0.00	0.07	0.00	0.00	0.00	0.00
Coptodon zillii	b	b	b	b	b	b
	0.073	0.123	0.014	0.015	0.483	0.513
	±	±	±	±	±	±
	0.00	0.00	0.00	0.00	0.00	0.00
Significant level	*	*	*	*	*	*

Letters that are different from each other within the same column mean that there are significant differences at the level (P≤0.05).

The correlation coefficient was found between some biological traits such as total and standard length, head length and weight, and compared this correlation with the length of the otolith on the right and left sides of *C. carpio's* head, as shown in Table" (3).

We note from Table (3) that the correlation coefficient between each of the total and standard length, head length and fish weight was highly significant at a significant degree (0.01), and this is an indication of the occurrence of weight gains that are accompanied by a clear change in these studied biometrics In addition the continuous growth in fish with age, and this relationship is in fact a direct positive relationship, while when comparing the correlation between total and standard length, head length and weight of fish with biometrics of otolith and for both sides of the head, significant degrees were shown. It is negatively high, which gives an impression on the inverse relationship between the total and standard lengths, the head length, and the weight of the fish with the weight of the ear bones on the right side of the head, as confirmed by [11,12], as the otolith are a good indicator of the total length of the fish, while The otolith on the left side of the head showed a highly significant negative correlation, which shows that the growth of otolith on the left side is not related to the weight increases in the body, as well as not related to the increases in both the total and standard length. And the length of the head, from here the differences appear clear between the coefficient of the different correlation between the otolith on both sides of the head with some of the vital characteristics studied in this analysis [13].

Table 3. Correlation coefficient between some *C. carpio* biological traits

		Total length (cm)	Standard length (cm)	Head length (cm)	Weight (gm)
Total length (cm)	"Pearson Correlation"	1	0.976**	0.862**	0.863**
	"Sig. (2-tailed)"	0.000	0.000	0.000	0.000
	N	25	25	25	25
Standard length (cm)	"Pearson Correlation"	0.976**	1	0.898**	0.766**
	"Sig. (2-tailed)"	0.000	0.000	0.000	0.000
	N	25	25	25	25
Head length (cm)	"Pearson Correlation"	0.862**	0.898**	1	0.805**
	"Sig. (2-tailed)"	0.000	0.000	0.000	0.000
	N	25	25	25	25
Weight (gm)	"Pearson Correlation"	0.863**	0.766**	0.805**	1
	"Sig. (2-tailed)"	0.000	0.000	0.000	0.000

	N	25	25	25	25
Right Otolith length (cm)	"Pearson Correlation"	0.134	0.138	0.068	0.056
	"Sig. (2-tailed)"	0.524	0.511	0.747	0.791
	N	25	25	25	25
Right Otolith weight (gm)	"Pearson Correlation"	-0.189	-0.174	-0.199	-0.253
	"Sig. (2-tailed)"	0.365	0.407	0.339	0.223
	N	25	25	25	25
Right Otolith thicknes (cm)	"Pearson Correlation"	0.101	0.092	-0.042	0.004
	"Sig. (2-tailed)"	0.631	0.662	0.844	0.985
	N	25	25	25	25
Left Otolith length (cm)	"Pearson Correlation"	-0.269	-0.276	-0.238	-0.220
	Sig. (2-tailed)	0.193	0.182	0.251	0.291
	N	25	25	25	25
Left Otolith weight (gm)	"Pearson Correlation	-0.045	-0.037	-0.046	-0.075
	"Sig. (2-tailed)"	0.831	0.861	0.828	0.722
	N	25	25	25	25
Left Otolith thickness (cm)	"Pearson Correlation"	-0.242	-0.254	-0.250	-0.214
	"Sig. (2-tailed)"	0.244	0.221	0.228	0.303
	N	25	25	25	25

relation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).
a. Fisha. Fish_Type = *C. carpio*

The correlation coefficient was also determined for some of the biological characteristics specified in this study, such as the total and standard lengths, head length and weight, and compared this correlation with the length of otolithon the right and left sides of the head, as well as the thickness of these bones on both sides of the head of the type *C. carpio*. Table (4) shows it" .

The data from Table (4) showed that there is a high positive significant relationship at the level (0.01) between the length of the otolith and its thickness on the right side, which gives agreement with the increase occurring in a direct way between the length and thickness of otolith with the growth and increase in bone growth In general, the correlation between the length of otolith on the right side with the weight gain of fish was expressed in a highly significant inverse relationship at the level (0.01), and the increase in the length of otolith on the right side was not affected by the increase in growth, and the reason may be due to the aforementioned [13]. As the increase in the length of otolith correlates with the total and standard lengths, head length, and weight in *C. carpio* fish.

Table 4. Correlation between total and standard lengths and head length with the length and thickness of the otolith on both sides of the head *C. carpio*

		Right Otolith length cm	**Right Otolith weight gm**	**Right Otolith thickness cm**	**Left Otolith length cm**
Total length cm	Pearson Correlation	0.134	-0.189	0.101	-0.269
	Sig. (2-tailed)	0.524	0.365	0.631	0.193
	N	25	25	25	25
Standard length cm	Pearson Correlation	0.138	-0.174	0.092	-0.276
	Sig. (2-tailed)	0.511	0.407	0.662	0.182
	N	25	25	25	25
Head length cm	Pearson Correlation	0.068	-0.199	-0.042	-0.238
	Sig. (2-tailed)	0.747	0.339	0.844	0.251

	N	25	25	25	25
Weight gm	Pearson Correlation	0.056	-0.253	0.004	-0.220
	Sig. (2-tailed)	0.791	0.223	0.985	0.291
	N	25	25	25	25
Right Otolith length cm	Pearson Correlation	1	-0.094	0.815**	0.291
	Sig. (2-tailed)	0.000	0.656	0.000	0.158
	N	25	25	25	25
Right Otolith weight gm	Pearson Correlation	-0.094	1	0.092	-0.294
	Sig. (2-tailed)	0.656	0.000	0.661	0.154
	N	25	25	25	25
Right Otolith thickness cm	Pearson Correlation	0.815**	0.092	1	0.170
	Sig. (2-tailed)	0.000	0.661	0.000	0.416
	N	25	25	25	25
Left Otolith length cm	Pearson Correlation	0.291	-0.294	0.170	1
	Sig. (2-tailed)	0.158	0.154	0.416	0.000
	N	25	25	25	25
Left Otolith weight gm	Pearson Correlation	-0.108	0.533**	-0.134	-0.507**
	Sig. (2-tailed)	0.609	0.006	0.523	0.010
	N	25	25	25	25
Left Otolith thickness cm	Pearson Correlation	0.301	-0.256	0.203	0.976**
	Sig. (2-tailed)	0.144	0.218	0.332	0.000
	N	25	25	25	25

**. "Correlation is significant at the 0.01 level (2-tailed)" . *. "Correlation is significant at the 0.05 level (2-tailed)" .

a. Fisha. Fish_Type = *C. carpio*

We also studied the correlation coefficient between some of the studied biological characteristics of the type *C. carpio* and the thickness and weight of otolith for the right and left sides of the head, as well. The data is shown in Table (5), and a comparison between the measurements of otolith from the right and left sides of the head of one individual.

The length of otolith on the right side was not affected by the length and thickness of otolith on the left side and there is a discrepancy between these bones even for one individual, as shown in Table (5). The correlation between the weights of the otolith on the right and left sides was highly significant, and indication of the symmetrical growth between the otolith between the two sides of the head for one individual. This result inland with [14,2] about the existence of some significant relationships in the measurements of the ear bones on both sides of the head for one individual.

Table 5. The correlation between some biological traits with the thickness and weight of the ear bones on both sides of the head for *C. carpio*

		Left Otolith weight gm	**Left Otolith thickness cm**
Total length cm	Pearson Correlation	-0.045	-0.242
	Sig. (2-tailed)	0.831	0.244
	N	25	25
Standard length cm	Pearson Correlation	-0.037	-0.254
	Sig. (2-tailed)	0.861	0.221
	N	25	25
Head length cm	Pearson Correlation	-0.046	-0.250
	Sig. (2-tailed)	0.828	0.228
	N	25	25
Weight gm	Pearson Correlation	-0.075	-0.214
	Sig. (2-tailed)	0.722	0.303
	N	25	25
Right Otolith length cm	Pearson Correlation	-0.108	0.301

Right Otolith length cm	Pearson Correlation	-0.108	0.301
	Sig. (2-tailed)	0.609	0.144
	N	25	25
Right Otolith weight gm	Pearson Correlation	0.533**	-0.256
	Sig. (2-tailed)	0.006	00.218
	N	25	25
Right Otolith thickness cm	Pearson Correlation	-0.134	0.203
	Sig. (2-tailed)	0.523	0.332
	N	25	25
Left Otolith length cm	Pearson Correlation	-0.507**	0.976**
	Sig. (2-tailed)	0.010	0.000
	N	25	25
Left Otolith weight gm	Pearson Correlation	1	-0.539**
	Sig. (2-tailed)	0.000	0.005
	N	25	25
Left Otolith thickness cm	Pearson Correlation	-0.539**	1
	Sig. (2-tailed)	0.005	0.000
	N	25	25

**. Correlation is significant at the 0.01 level (2-tailed) . *. Correlation is significant at the 0.05 level (2-tailed) .

a. Fisha. Fish_Type = *C. carpio*

The correlation between the length of otolithon both sides of the head with the thickness and weight of these bones was at a highly significant, which shows the indications of stable and continuous growth between otolith of the head of one individual and the occurrence of weight gains and bone growth in particular expressive about it with a positive direct relationship.

As for the type *C. zillii*, it also had a share in conducting correlation coefficient analyzes and finding it among some of the studied biological characteristics proposed in this study, and comparing them with previous data related to the type *C. carpio*. *C. zillii.*

Table (6) shows the values of the correlation coefficient between some vital traits and their relationship with each other, and it is noted that the correlation is highly significant at the level (0.01) and with positive results between each of the total length and its relationship to the standard length, head length and weight, as it was These traits are all at a high, positive, significant level among themselves to give a clear correlation as an indication of growth accompanied by weight gains for fish, and this indicator is almost constant for most researchers, and the correlation between lengths, weights, and growth has been expressed in many previous research studies.

Table 6. Correlation coefficient between some *C. zillii* traits

		Total length cm	**Standard length cm**	**Head length cm**	**Weight gm**
Total length cm	"Pearson Correlation"	1	0.933**	0.978**	0.969**
	"Sig. (2-tailed)"	0.000	0.000	0.000	0.000
	N	25	25	25	25
Standard length cm	"Pearson Correlation"	0.933**	1	0.886**	0.952**
	"Sig. (2-tailed)"	0.000	0.000	0.000	0.000
	N	25	25	25	25
Head length cm	"Pearson Correlation"	0.978**	0.886**	1	0.948**
	"Sig. (2-tailed)"	0.000	0.000	0.000	0.000
	N	25	25	25	25
Weight gm	"Pearson Correlation"	0.969**	0.952**	0.948**	1
	"Sig. (2-tailed)"	0.000	0.000	0.000	0.000
	N	25	25	25	25
Right Otolith length cm	"Pearson Correlation"	-0.037	-0.097	-0.026	-.0014
	"Sig. (2-tailed)"	0.860	0.643	0.901	0.949
	N	25	25	25	25

Right Otolith weight gm	"Pearson Correlation"	0.096	0.038	0.119	0.095
	"Sig. (2-tailed)"	0.649	0.857	0.572	0.650
	N	25	25	25	25
Right Otolith thickness cm	"Pearson Correlation"	-0.136	-0.173	-0.094	-00.135
	"Sig. (2-tailed)"	0.516	0.407	0.656	0.521
	N	25	25	25	25
Left Otolith length cm	"Pearson Correlation"	-0.426*	-0.299	-.0424*	-0.370
	"Sig. (2-tailed)"	0.034	0.146	0.035	0.069
	N	25	25	25	25
Left Otolith weight gm	"Pearson Correlation"	-0.137	-0.013	-0.209	-0.031
	"Sig. (2-tailed)"	0.514	0.951	0.317	0.883
	N	25	25	25	25
Left Otolith thickness cm	"Pearson Correlation"	-0.129	0.001	-0.192	-0.005
	"Sig. (2-tailed)"	0.540	0.998	0.358	0.981
	N	25	25	25	25

**. Correlation is significant at the 0.01 level (2-tailed) . *. Correlation is significant at the 0.05 level (2-tailed)
a. Fish_Type = *C. zillii*

According to what was done with the type *C. carpio*, the correlation coefficient was determined for some of the biological characteristics specified in this study, such as, the total and standard length, head length and weight, and compared this correlation with the length of the ear bones on the right and left sides of the head, as well as the thickness and weight of these bones on both sides of the head of the species *C. zillii*.

The relationship between the length and thickness of otolith on the right side of the head showed a high significant correlation inversely, which indicates that the length and thickness of otolith on the right is not associated with one of these vital characteristics represented by the total and standard length and the length of the head And weight, which is in fact an inverse relationship, was symmetrical and similar in its results for the bones on both sides of the head, while the ear bone on the left side of the head showed a high inverse significant correlation with both the characteristics of total length and head length
Which explains the discrepancy between the bones of the two sides of the head for one individual, and this confirms the results presented in Table (7). [15,16] indicated the incompatibility and correlation between some fish biometrics with otolith measurements, as it is It may be due to the difference between the studied species.

Table 7. Correlation between total and standard lengths and head length with the length and thickness of the otolith on both sides of the head *C. zillii*.

		Right Otolith length cm	**Right Otolith weight gm**	**Right Otolith thickness cm**	**Left Otolith length cm**
Total length cm	Pearson Correlation	-0.037	0.096	-0.136	-0.426*
	Sig. (2-tailed)	0.860	0.649	0.516	0.034
	N	25	25	25	25
Standard length cm	Pearson Correlation	-0.097	0.038	-0.173	-0.299
	Sig. (2-tailed)	0.643	0.857	0.407	0.146
	N	25	25	25	25
Head length cm	Pearson Correlation	-0.026	0.119	-0.094	-0.424*
	Sig. (2-tailed)	0.901	0.572	0.656	0.035
	N	25	25	25	25
Weight gm	Pearson Correlation	-0.014	0.095	-0.135	-0.370
	Sig. (2-tailed)	0.949	0.650	0.521	0.069
	N	25	25	25	25
Right Otolith length cm	Pearson Correlation	1	-0.204	0.760**	-0.219
	Sig. (2-tailed)	0.000	0.328	0.000	0.293
	N	25	25	25	25
right Otolith	Pearson Correlation	-0.204	1	-0.174	-0.024

weight gm	Sig. (2-tailed)	0.328	0.000	0.405	0.909
	N	25	25	25	25
Right Otolith	Pearson Correlation	0.760**	-0.174	1	-0.253
thickness cm	Sig. (2-tailed)	0.000	0.405	0.000	0.221
	N	25	25	25	25
Left Otolith	Pearson Correlation	-0.219	-0.024	-0.253	1
length cm	Sig. (2-tailed)	0.293	0.909	0.221	0.000
	N	25	25	25	25
left Otolith	Pearson Correlation	0.083	0.000	0.054	0.260
weight gm	Sig. (2-tailed)	0.694	1.000	0.796	0.210
	N	25	25	25	25
Left Otolith	Pearson Correlation	-0.016	-0.048	-0.085	0.204
thickness cm	Sig. (2-tailed)	0.941	0.818	0.687	0.328
	N	25	25	25	25

**. Correlation is significant at the 0.01 level (2-tailed) . *. Correlation is significant at the 0.05 level (2-tailed) . a. Fish_Type = *C. zillii*

Table (8) shows the strength of the correlation coefficient obtained between the two otolith on both sides of the head of the type *C. zillii* with some biometrics taken for fish as a comparison between these two bones on both sides of the head for one individual, as the correlation was clear and in the form of Directional between the weight of otolith on the left side of the head with its thickness and weight, while the correlation coefficient between the two characteristics of the weight and thickness of otolith on the left side of the head with each of the characteristics represented by total length, head length and weight were highly significant relationships at level (0.01) and inversely, which shows that the growth of otolith is not correlated with one of these measurements, although some researchers find that otolith on both sides of the head are not dependent on expressing some of the studied vital relationships and do not agree with This study agrees with these two opinions [17,18], while this study agreed with what was stated by[13] about the possibility of adopting different otolith in determining many relationships and vital connections between fish after some corrective equations are made during the data adjustment.

The length of otolith on the right side was highly significant and inversely with the thickness of otolith on the left side of the head for the same individual, which allows us to conclude that some bones may be affected by factors that change from the studied measurements between Both sides of the head for one person. The thickness of the bones on the right side of the head agreed with the bones on the left side of the head for the same individual with a highly significant correlation factor, with an inverse relationship [19]. Some studies confirm the possibility of adopting the length and width of otolith in determining some vital measurements of fish after conducting some symmetry equations for these bones. Many studies did not address the relationship between the weight of the different otolith on both sides of the head and the total and standard length, head length and weight. The possibility of relying on the weight of otolith in determining some biometrics of fish [20].

Table 8. The correlation between some biological traits with the thickness and weight of the otolith on both sides of the head for *C. zillii*..

		Left Otolith weight gm	**Left Otolith thickness cm**
Total length	Pearson Correlation	-0.137	-0.129
cm	Sig. (2-tailed)	0.514	0.540
	N	25	25
Standard	Pearson Correlation	-0.013	0.001
length cm	Sig. (2-tailed)	0.951	0.998
	N	25	25
Head length	Pearson Correlation	-0.209	-0.192
cm	Sig. (2-tailed)	0.317	00.358
	N	25	25

Weight gm	Pearson Correlation	-0.031	-0.005
	Sig. (2-tailed)	0.883	0.981
	N	25	25
Right Otolith length cm	Pearson Correlation	0.083	-0.016
	Sig. (2-tailed)	0.694	0.941
	N	25	25
Right Otolith weight gm	Pearson Correlation	0.000	-0.048
	Sig. (2-tailed)	1.000	0.818
	N	25	25
Right Otolith thickness cm	Pearson Correlation	0.054	-0.085
	Sig. (2-tailed)	0.796	0.687
	N	25	25
Left Otolith length cm	Pearson Correlation	0.260	0.204
	Sig. (2-tailed)	0.210	0.328
	N	25	25
Left Otolith weight gm	Pearson Correlation	1	0.564**
	Sig. (2-tailed)	0.000	0.003
	N	25	25
Left Otolith thickness cm	Pearson Correlation	0.564**	1
	Sig. (2-tailed)	0.003	0.000
	N	25	25

**. Correlation is significant at the 0.01 level (2-tailed)* Correlation is significant at the 0.05 level (2-tailed)
a. Fish_Type = *C. zillii.*

4. Conclusion

The Otolith are important indicators of the life of fish, which give different correlations between many biometrics, It is not necessary that the study of these bones be from one side of the fish head without the other side. Not relying on a specific type of these bones as being It is a fixed model for the study, but it is necessary to study the different types of otolith spread in the head of fish. From here, we recommend studying many of these different features among the different types of otolith in the same head of one individual within the same family, and activating modern studies with high-quality digital technology in diagnosing these bones and moving away from traditional studies.

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