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Food Habit and Condition Factor of Yellow-Finned Medaka (*Oryzias profundicola*) from Lake Towuti, South Sulawesi, Indonesia.

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ABSTRACT

The main objective of the present study was to analyze food habits and condition factors of yellow-finned medaka (*Oryzias profundicola*) in Lake Towuti. This research was conducted from January to June 2022. Locations of fish sampling in Tanjung Timbala; Tanjung Lengkobutanga; Tanjung Bakara,Tanjung. Saone and Tanjung Tominanga at Lake Towuti, South Sulawesi Indonesia. The total number of *O.profundicola* analyzed for food habits is 100 specimens (male = 50, female = 50). The tools used to take samples are "seser nets. The total length of the fish was measured using a digital caliper, and the total weight was measured using a scale with an accuracy of 0.01 g. The food type was calculated as the Relative Length of the Gut (RLG). Food habit was used by numerical method and the condition factor was estimated by the relationships between total length and body weight. RGL ranged from 1.77 to 1.79 for males with a total length of 4.97-5.03 cm and RGL ranged from 1.71 to 1. 79 for females with a total length of 4.35-5.35 cm. The gut contents of *O.profundicola* fish were of the *Ochterra humilis, Skeletonema, Limulus, Chlorella, Sinedra, Anabaena, Thalassionema, Coscinodiscus, Navicula, Rhyzosolenia , Merismopedia,* and *Diatoma*. The yellow-finned medaka fish were found to be omnivorous. The condition factor ranged from 1.40 to 1.53 for males and 1.09 to 1.13 for females. The condition factor was found the best for evaluating the well-being of this species in Lake Towuti. The outcomes of the study will be used to determine for future management of medaka fish to ensure its sustainability in Lake Towuti, especially the domestication of *O.profundicola.*

INTRODUCTION

Sulawesi is zoo-geographically located in the Wallace area **(Hutama *et al.*, 2016)**. The island of Sulawesi has several endemic fish species from the genus *Telmatherina, Paratherina, Glossogobius, Dermogenys, Mugilogobius, Oryzias and Tominanga* **(Parenti *et al.*, 2013; Jayadi *et al.*, 2021)**. Especially in South Sulawesi, there is a Malili Lake complex located in East Luwu Regency which has lakes consisting of Lake Matano, Lake Mahalona, Lake Towuti, Lake Wawantoa/lanto and Lake Masapi. Lake Matano and

Lake Towuti are ancient lake in Indonesia **(Nasution *et al.*, 2014)**. Endemic fish in this lake have a diversity of species that are ecologically and climatologically was different so that they are not found in any part of the world **(Hutama *et al.*, 2016)**.

Lake Towuti is a tectonic lake that covered 56,000 ha total areas with a maximum depth of 203 m and was classified as an oligotrophic lake **(Haffner *et al.*, 2001)**. Lake Towuti is one of the biodiversity hotspots because it has a diversity of endemic fish but its sustainability is increasingly threatened **(Parenti, 2011; Prianto *et al.*, 2016))**. There are 17 endemic fish species were found in Lake Towuti **(Hadiaty, 2018)**. Meanwhile, the results of research by **Jayadi *et al.*, (2021)** were found twelve endemic fish species in Lake Towuti, namaly *Telmatherina bonti, Telmatherina celebensis, Paratherina striata, Tominanga sanguicauda, Tominanga aurea Oryzias profundicola, Oryzias matanensis, Oryziasmarmoratus, Mugilogobius hitam, Glossogobius flavipinnis, Glossogobius matanensis* and *Dermogenys megarhamphus.*

One of the endemic fish species as a source of food for residents around Lake Towuti is the yellow-finned medaka (*Oryzias profundicola*). The yellow-finned medaka was first discovered in Lake Towuti by **Kottelat (1990)**. *O. profundicola* has potential as ornamental fish and model fish **(Fahmi *et al.*, 2008)**. *O.profundicola* is rice fish at Lake Towuti and it was included in the category of near threatened fish in the Status IUCN Red List 2019 **(Lumbantobing, 2019)**. Consequently, it needs protection, preservation and sustainability, so that its economic and ecological value is always sustainable. However, the endemic fish from Lake Towuti were sharply declined during the last decade due to exploitation factors that tend to be excessive and intensive **(Samuel *et al.*, 2009)**, introduction of alien species **(Herder *et al.*, 2012; Syafei and Sudinno, 2018)**, habitat perturbation and destructive fishing practices **(Mamangkey and Nasution, 2014)**.
Therefore, it is necessary to have a management policy to protect and preserve *O. profundicola* fish in Lake Towuti. To support these activities, it is necessary to do restocking and domestication. However, this activity is still difficult to carry out due to limited information on *O.profundicola*. Information on *O. profundicola* has been reported only regarding taxonomic status and description (**Kottelat**, **1990)**, a phylogenetic analysis and taxonomic revision **(Parenti, 2008)**, ichthyofauna of the endemic fish in Lake Towuti (**Jayadi *et al.*, 2021**). Information on biological aspects including of condition factor and food habits of *O. profundicola* has not been reported. Examining the food habit of a species is important for evaluating the ecological role and position of the species in the food web of ecosystems **(Allan and Castillo, 2007)**. Further information regarding to the condition factor is an important quantitative parameter to determine the relative degree of robustness and nourishment in fish **(Mortuza and Al-Misned, 2013).**

The main objective of present study was to analyze the condition factor and food habit of *O.profundicola* in Lake Towuti. The results of this study will be used as a basic concept to domestication in order to maintain their sustainability of *O. profundicola* in Lake Towuti.

MATERIALS AND METHODS

Study Site:

The research was conducted for 6 months from January to June 2022 in Lake Towuti, South Sulawesi, Indonesia. Locations of fish sampling are: Tanjung Timbala; Tanjung Lengkobutanga; Tanjung Bakara, Tanjung Saone, and Tanjung Tominanga (Figure 1).

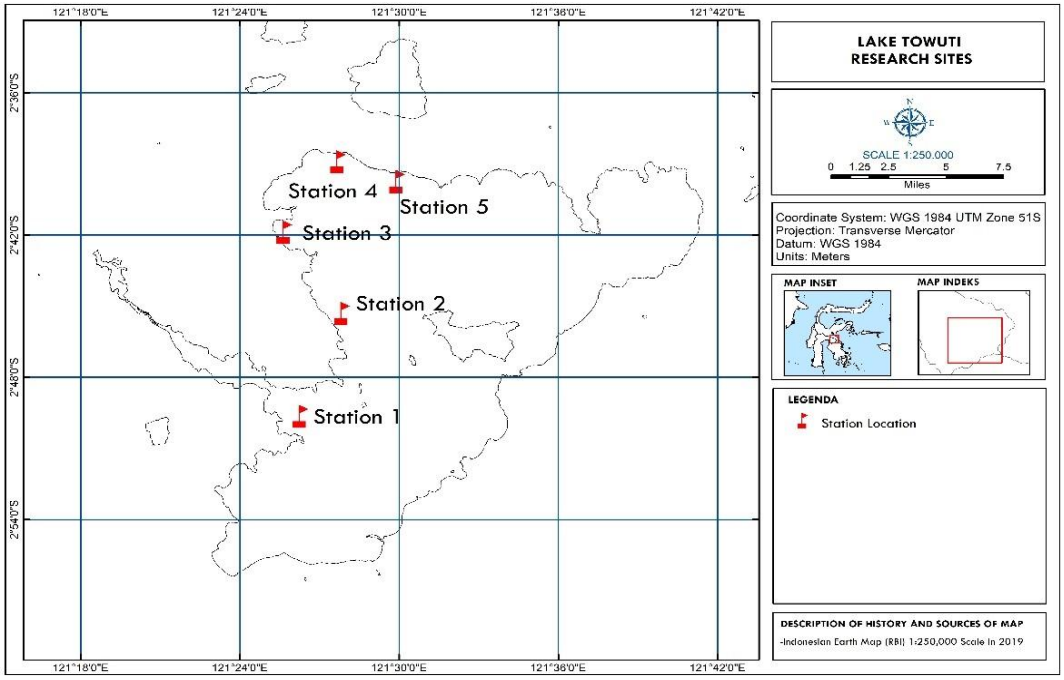

Figure 1. Stations location in Lake Towuti

The geographical coordinates for the sampling station are shown in Table 1.

Table 1. Sampling sites and their coordinates

Sampling Locations	GPS Coordinates
Station I. Tanjung Timbala	121° 26' 21.377" E 2° 49' 18.546" S
Station II. Tanjung Lengkobutanga	121° 27' 54.243" E 2° 44' 55.073" S
Station III. Tanjung Bakara	121° 25' 35.720" E 2° 41' 38.489" S
Station IV. Tanjung Saone	121° 27' 46.984" E 2° 38' 49.247" S
Station V. Tanjung Tominanga	121° 29' 56.101" E 2° 39' 36.957" S

Samples collection:

The tools were used to take samples of *O.profundicola* are "seser nets" with a mesh size of 3/4 inc, the length of the net in one fishing gear is 15 m and a height of 1.50 m and the length of the bag is 3 m. The number of fish caught every month is counted and the females and males are separated. Furthermore, the fish were preserved using 3% formalin for analysis of condition factor and feeding habit.

Fish measurement:

The total length of fish was measured using a digital caliper and the total weight was measured using a scale with an accuracy of 0.01 g

Relative length of gut :

Measurement of the relative length of the gut is one method used to distinguish fish based on the type of food. The relative length of the gut can be calculated according to the following formula:

RLG = GL (cm) / TL (cm) **(Zuliani *et al.*, 2016)**

Where RLG = Relative Length of gut, GL= Length of gut, TL=Total length

Food habit:

Food habit was used numerical method by **(Effendie, 1979),** namely by dissecting the gut contents. Then the gut contents were diluted with 2 ml of water. The diluted gut contents were placed on a Sedwick rafter to be observed under a 100X magnification microscope. Identification of the type of food was carried out using the plankton identification book from **Sachlan (1982) and Davis (1955)** The types of organisms were found in the fish gut will be analyzed according to the following formula:

$$\text{Percentage number of a food item} = \frac{\text{Total number of the particular item}}{\text{Total number of all food items}} \times 100$$ **(Effendie, 1979)**

Condition factor (CF):

Condition factor shows the physiological well-being of the fish. This was determined according to the relationship:

$$CF = \frac{W_{cal}}{W_{pred}}$$ **(King, 1995)**

Where CF = Condition factor, Wc_{al} = Body weight of fish in gram and W_{pred} =the average weight of the fish obtained from the relationship length of weight (g) or (aL^b).

If CF > 1 means that the individual or population is in better condition, and CF < 1 means that the individual or population is in less good condition

RESULTS

Relative length of gut (RLG)

Table 2 indicates the RLG of both males and females. RGL was ranged from 1.77 to 1.79 for male with a total length of 4.97 - 5.03 cm and RLG was ranged from 1.71 to 1.

79 for female with a total length of 4.35 - 5.35 cm.. The RLG at each station is as follows: station of Tanjung Timbala is 1.79 male and 1.76 female, station of Tanjung Lengkobutanga is 1.79 male and 1.71 female, station of Tanjung Bakara Station is 1.79 male and 1.74 female, station of Tanjung Saone is 1.78 male and 1.74 female and station of Tanjung Tominanga is 1.77 male and 1.79 female. Table 2 shows that the RGL at each station is relatively the same between males or females.

Table 2. Mean relative length of gut (RGL) of *O. profundicola* in Lake Towuti

Station	Total Length (cm)		Length of Gut (cm)		RGL	
	Male	Female	Male	Female	Male	Female
Tanjung Timbala	4.98	4.83	8.92	8.52	1.79	1.76
Tanjung Lengkobutanga	4.97	5.35	8.88	9.14	1.79	1.71
Tanjung Bakara	4.97	4.69	8.88	8.16	1.79	1.74
Tanjung Saone	4,98	4.46	8.88	7.78	1.78	1.74
Tanjung Tominanga	5.03	4.46	8.91	7.98	1.77	1.79

Analysis of Food Habits

The food habit of fish is the type and quantity of food consumption by fish (in the gut contents). The total number of yellow-finned medaka fish was analyzed regarding their food habits is 100 specimens. The number of fish was observed at each station is 20 specimens, consisting of 10 males and 10 females. The results of the temporal analysis regarding the amount of food and food proportions of male (Table 3) and female (Table 4) and food groups (Table 5) on yellow-finned medaka fish. The composition of the food eaten by both male and female was not different, but the amount of food in the stomach and the proportion of food at each station were different. The composition of the food habits on *O. profundicola* consists of: *Ochterra humilis, Skeletonema, Limulus, Chlorella, Sinedra, Anabaena, Thalassionema, Coscinodiscus, Navicula, Rhyzosolenia, Merismopedia, Diatoma.* Table 3 shows types of food was found mostly in male fish at all stations were *Ochterra humilis* in the range of 16.91% - 20.63%, *Lumnulitus sp* in the range 10.86% -16.17%, *Skeletonema sp* in the range 10.65% -13.92%, *Chlorella sp* range of 9.05%-12.12%. While the types of foods were found mostly in female fish at all stations (Table 4) as follows: *Ochterra humilis* in the range of 16.91%-20.63%, *Lumnulitus sp* in the range of 11.25%-13.90%, *Chlorella sp* in the range of 9, 28%-12.88% and *Skeletonema sp* ranges from 10.43%-12.62%. The food groups of yellow-finned medaka fish in Table 5 were found at each station including: Bacillariophyceae, Chlorophyceae, Cyanophyceae, Insects, and Arachnida. The food groups in the stomach of males and females were similar at each station, but the percentage of food groups in the stomach of yellow-finned medaka fish was difference at each station.

Table 3. Food habits of male *O. profundicola* in Lake Towuti

Type of food	I		II		III		IV		V	
	N	**%**	**N**	**%**	**N**	**%**	**N)**	**%**	**N**	**%**
Ochterra humilis	115	17.19	122	20.30	140	19.97	111	18.78	134	19.59
Skeletonema sp	92	13.75	67	11.15	74	10.56	65	11.00	79	11.55
Limulus sp	74	11.06	98	16.31	85	12.13	66	11,17	90	13.16
Chlorella sp	72	10.76	62	10.32	81	11.55	55	9,31	84	12.28
Sinedra sp	56	8.37	36	5.99	58	8.27	42	7.11	44	6.43
Anabaena sp	53	7.92	39	6.49	45	6.42	27	4.57	36	5.26
Thalassionema sp	46	6.88	30	4.99	49	6.99	42	7.11	40	5.85
Coscinodiscus sp	45	6.73	28	4.66	33	4.71	38	6.43	43	6.29
Navicula sp	38	5.68	32	5.32	48	6.85	37	6.26	47	6.87
Rhyzosolenia sp	36	5.38	28	4.66	47	6.70	39	6.60	24	3.51
Merismopedia sp	35	5.23	49	8.15	36	5.14	30	5.08	35	5.12
Diatoma sp	7	1.05	10	1.66	5	0.71	39	6.60	28	4.09
	669	100	601	100	701	100	591	100	684	100

Table 4. Food habits of female*O. profundicola* in Lake Towuti

Type of food	I		II		III		IV		V	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**N**	N	**%**
Ochterra humilis	105	16.91	118	17.82	134	19.17	132	20.63	147	19.52
Skeletonema sp	94	15.14	77	11.63	72	10.30	65	10.16	95	12.62
Limulus sp	81	13.04	84	12.69	89	12.73	72	11.25	89	11.82
Chlorella sp	83	13.37	86	12.99	64	9.16	60	9.38	97	12.88
Sinedra sp	41	6.60	33	4.98	71	10.16	33	5.16	36	4.78
Anabaena sp	31	4.99	33	4.98	44	6.29	34	5.31	39	7.17
Thalassionema sp	24	3.86	30	4.53	46	6.58	54	844	29	5.18
Coscinodiscus sp	43	6.92	38	5.74	24	3.43	40	6.25	75	3.85
Navicula sp	64	10.31	70	10.57	51	7.30	43	672	75	9.96
Rhyzosolenia sp	23	3.70	23	3.47	44	6.29	35	5.47	28	3.72
Merismopedia sp	22	3.54	51	7.70	38	5.44	33	5.16	36	4.78
Diatoma sp	10	1.61	19	2.87	13	1.86	39	6.09	28	3.72
	621	100	622	100	695	100	640	100	753	100

Note : N, Number of food in the stomach (fish); %,Proportion of food; I, Tanjung Timbala; II, Tanjung Lengkobutanga; III, Tanjung Bakara; IV, Tanjung Sone; V, Tanjung Tominanga

Table 5. Food Group of *O. profundicola* in Lake Towuti

Group of Food	I				II				III				IV				V			
	M		F		M		F		M		F		M		F		M		F	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Bacillariophyceae																				
Synedra sp	56	8.25	41	6.60	36	5.94	33	5.19	58	8.27	71	10.29	42	6.91	33	5.16	44	6.35	36	4.78
Navicula sp	38	5.60	64	10.31	32	5.28	70	11.01	48	6.85	51	7.39	37	6.09	43	6.72	47	6.78	75	9.96
Ryzosolenia sp	36	5.30	23	3.70	28	4.62	23	3.62	47	6.70	44	6.38	39	6.41	35	5.47	24	3.46	28	3.72
Skeletonema sp	92	13.55	94	15.14	67	11.06	77	12.11	74	10.56	72	10.43	82	13.49	65	10.16	88	12.70	95	12.62
Coscinodiscus sp	37	5.45	43	6.92	16	2.64	38	5.97	33	4.71	24	3.48	38	6.25	40	6.25	43	6.20	29	3.85
Diatoma sp	7	1.03	10	1.61	10	1.65	19	2.99	5	0.71	13	1.88	39	6.41	39	6.09	28	4.04	28	3.72
Thallassionema sp	46	6.77	24	3.86	47	7.76	4	0.63	49	6.99	46	6.67	42	6.91	54	8.44	40	5.77	39	5.18
Chlorophyceae																				
- *Clorella* sp	72	10.60	83	13.37	62	10.23	86	13.52	81	11.55	64	9.28	55	9.05	60	9.38	84	12.12	97	12.88
Cyanophyceae																				
- *Anabaena* sp	53	7.81	31	4.99	39	6.44	33	5.19	45	6.42	44	6.38	27	4.44	34	5.31	36	5.19	54	7.17
- *Merismopedia* sp	35	5.15	22	3.54	49	8.09	51	8.02	36	5.14	38	5.51	30	4.93	33	5.16	35	5.05	36	4.78
Insect																				
- *Ochterra humilis*	115	16.94	105	16.91	122	20.13	118	18.55	140	19.97	134	19.42	111	18.26	132	20.63	134	19.34	147	19.52
Arachnida																				
- *Limulus* sp	92	13.55	81	13.04	98	16.17	84	13.21	85	12.13	89	12.90	66	10.86	72	11.25	90	12.99	89	11.82

Note : M, Male; F, Female; I, Tanjung Timbala; II, Tanjung Lengkobutanga; III, Tanjung Bakara; IV, Tanjung Sone; V, Tanjung Tominanga

Condition factor

The results of the study on the analysis of the condition factors of *O. profundicola* in Lake Towuti are presented in Table 6, it shows that condition factor was ranged from 1.40 to 1.53 fo male and 1.09-1.13 for female. These results of the condition factor was found the best for evaluating the well-being of *O. profundicola* in Lake Towuti.

Table 6. Condition factor of *O. profundicola* in Lake Towuti

Month	n (Fish)		Relative condition factor	
	Male	Female	Male	Female
January 2022	176	248	1.08±0.41	1.09±0.45
February 2022	229	361	1.08±0.40	1.08±0.40
March 2022	173	370	1.06±0.34	1.08±0.40
April 2022	103	119	1.06±0.30	1.05±0.31
May 2022	147	170	1.08±0.35	1.09±0.46
Junie 2022	165	226	1.04±0.53	1.13±0.55

DISCUSSION

Relative gut length

The internal morphology (e.g., stomach shape and size, gut length) provide important information on species feeding ecology **(Juanes and Conover, 1994; Wootton, 1998).** Analysis of gut content is widely used to ascertain the food and feeding habit of fish species. The relative gut length (RLG) analysis can be used to determine the food habits of fish based on their diet by consume. The results of the analysis were showed that the fish indicate to the class of herbivores, omnivores or carnivores. RLG of *O. profundicola* were presented in Table 2. The relative length of the gut of male fish was ranged from 1.77 to 1.79 and 1.71 to 1.79 for female in Lake Towuti. The RLG value smaller than 1 indicates carnivorous diet, RLG value between 1 and 3 indicate omnivores feeding, and the RGL value bigger than "3" based on vegetative material or detritus **(Karachle and Stergiou, 2010; Nikolsky, 1963; Ward-Campbell and Beamish, 2005)**. Therefore, RLG of *O. profundicola* was ranged between 1 and 3 indicates omnivores feeding.

The results of research by **Susilo *et al.* (2021)** showed that the gut length ratio of yellow rasbora (*Rasbora lateristriata* Blkr.) ranged from 0.53 to 0.81 including was an omnivorous fish with a short intestine. **Gurkan and Taskavak (2017)** recorded the RLG on *Syngnathus acus* were 0.097±0.08, *Syngnathus typhle* was 0.137±0.02 and *Nerophis ophidion* was 0.106±0.04 including as carnivorous type feeding fish. Research by **Novalina (2019)** showed that RLG of *Oryzias nigrimas* was in the range of 2.48-3.26, which is an omnivorous-herbivorous fish. Furthermore, **Icas *et al.*, (2019)** found that *Osteochilus sp* is an herbivore fish with a RLG of 3.57. The ratio of gut length to body

length of fish can change with changes in body size and diet **(Karachle and Stergiou, 2010).** Fish with longer guts allow food to spend more time in the gut, but fish with shorter gut require less time to digest food **(Nikolsky, 1963; Gurkan and Taskavak 2017)**.

Food Habits

Feeding habits were found in the gut contents of fish at the research station included food groups (Table 5), namely: phytoplankton and zooplankton. Phytoplankton were obtained from Bacillariophyceae (*Synedra, Navicula, Ryzosolenia, Skeletonema, Coscinodiscus, Diatoma, Thallassionema*), Chlorophyceae (*Clorella*), Cyanophyceae (*Anabaena* and *Merismopedia*). Zooplankton were found groups of insects (*Ochterra humili*s) and Arachnida (*Limulus*).

Several studies of food habits in endemic fish include: food groups in the stomach of *Telmatherina prognatha* in Lake Matano, namely the insect, debris and plankton pieces *(Nitzschia sp., Navicula sp., and Eunotia sp*.) **(Chadijah *et al.*, 2020)** meanwhile, the main food of *T. celebensis* fish are insects; the soup insects, zooplankton consisting of *Closterium sp, Navicula sp, Nitzchia sp, Pinnularia sp, and Synedra sp* **(Sulistiono *et al.*, 2006)**. Furthermore, **Gani *et al.*,** (2015) obtained food components in *Oryzias sarasinorum* such as *Melosira sp., Synedra sp., Rhizosolenia sp and Thalassionema nitzschionides*.

Based on the analysis of the stomach contents of *Telmatherina ladigesi* was found of insects (*Plecoptera, Ephemenoptera, Diaptera, Chironomus, Hemiptera*), crustaceans (*Branchiopods, Cladocera*), protozoa, rotifers, Bascillariophyceae, Chorophyceae **(Andriani, 2000)**. Furthermore, **Sulistiono (2006)** reported that *T. celebensis* in Lake Towuti was consumed of insects, diatoms, desmids and litter. Further explained that the main food of *T. celebensis* was consumed of *Ochtera humilis* (insects) in Lake Towuti **(Furkon, 2003)**. The natural food of *Mystacoleucus padangensis* in Toba Lake were the phytoplankton of the Bacilariopiceae (*Rhizosolenia,Synedra, Gonatozygon, Closterium, Surirella, Pinnularia, Oscillatroria, Melosira, Gyrosigma, Aulacoseira* and Zooplankton (*Creseis, Tubifex* and *Daphnia*) **(Suryanti *et al.*, 2017).**

The ability of fish to consume of food were determined by the type, size, color, taste, behavior, condition of fish, age, food availability, time of consume, and conditions of aquatic environmental **(Helene and Richard, 2006)**. The food habits of a fish species usually depend on age, place and time **(Hart and Reynolds, 2002)**. The availability of food in nature is one of the factors that determine the population, growth, reproduction and population dynamics as well as the condition of fish in a water **(Lagler *et al.*, 1977)**. The feed composition of fish was very influenced by season and location **(Medeiros and Arthington 2008)**. Differences in food habits can be influenced by differences in the anatomical structure of the digestive organs **(Lagler *et al*. 1977; Effendie, 2002)**.

Condition Factor

In fisheries science, the condition factor is used in other to compare the condition fitness of wellbeing of fish and it is based on the hypothesis that heavier fish of a particular length are in a better physiological condition **(Bagenal and Tesch, 1978)**. The condition factor can also be useful in monitoring fishing intensity, ontogenetic population structure, and growth rates **(Ahmed *et al.*, 2017)**. The results of the study in Table 5 show the condition factors of yellow-finned medaka fish ranged from 1.40 to1.53 for male and 1.09 to 1.13 for female. These results indicate the condition of yellow-finned medaka fish is better. Study by **Rinandha *et al.*, (2020)** were found **t**he condition factor of *Oryzias matanensis* showed a smaller range in males (0.61 - 1.80) than in females (0.47 - 1.98) from Lake Towuti**. Nasution (2007)** recorded that the condition factor of *T. celebensis* 0.93 – 1.21 for male and 1.09 – 1.26 for female in Towuti Lake. Analysis of the relative condition factors of *T. prognatha* 0.986 ± 0.208 for male and 1.0086 ± 0.157 for female **(Chadijah *et al.*, 2019).** Studies by **Omar *et al.*, (2020)** explained that the condition factor of *M. ladigesi* in the Bantimurung River (male 1.0107 and female 1.0192) and the Pattunuang River (male 0.9850 and female 1.0044). The relative condition factors of *Lagusia micracanthu*s was fluctuated from 0.86 to 1.43 in Pattunuang River, 0.65 to 1.45 in Bantimurung River, and 0.55 to 1.26 in Pucak River **(Nur *et al.*, 2020)**

According to **Effendie (2002)** that fish whose condition factor is 0-1, indicates that the fish were classified as flat or not fat fish. Table 5 shows that there are differences in the condition factors of male and female *O. profundicola*, allegedly due to the influence of the weight of the food contained in the digestive tract as well as the size, age of the fish and the environmental conditions in which the fish are located. The variation in the value of condition factors in *O. profundicola* is thought to be influenced by food, age and gonad maturity. The condition factor of fish is strongly affected by both biotic and abiotic environmental variables on the physiological condition of fish **(Saliu, 2001; Atama *et al.*, 2013; Faradonbeh *et al.*, 2015).** Condition factor can also be affected by factors like sex, season, age and maturity stages of fish **(Abowei *et al.*, 2009; Kefas *et al.*, 2020).** Furthermore, **Rakib *et al.*, (2021)** suggests that the variation of condition factors in fish is strongly influenced by body size, age, sex, gonad maturity and behavior before and after spawning. Condition factors will be helpful for future management of fish the emerging climate change **(Sabbir *et al.*, 2020).** Condition factor is an index used for monitoring age, growth rate and feeding intensity in fish **(Asiedu *et al.*, 2020).**

CONCLUSION

The relative length of the gut of *O. profundicola* was ranged from 1.77 to 1.79 for male and 1.71 to 1.79 ror female. The *O. profundicola* are omnivores feeding. The composition of the food habits on yellow-finned medaka fish consists of: *Ochterra humilis, Skeletonema, Limulus,Chlorella, Sinedra, Anabaena, Thalassionema,*

Coscinodiscus, Navicula, Rhyzosolenia, Merismopedia, Diatoma. The male of condition factors of *O. profundicola was* ranged from 1.40 to 1.53 and female was ranged from 1.09 to 1.13. The condition factor of *O. profundicola* is better.

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