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Food habits of endemic opudi fish (*Telmatherina prognatha,* Kottelat 1991) in Matano Lake, South Sulawesi, Indonesia

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Abstract. *Chadijah A, Sulistiono, Affandi R, Haryani GS, Mashar A. 2020. Food habits of endemic opudi fish (*Telmatherina prognatha, *Kottelat 1991) in Matano Lake, South Sulawesi, Indonesia. Biodiversitas 21: 1373-1378.* The opudi fish (*Telmatherina prognatha*) is endemic fish in Matano Lake, South Sulawesi. This study aims to analyze food habits of the opudi fish. This study was conducted from March 2018 to February 2019 in the Matano Lake at six sampling sites in Lawa River, Wotu pali, Salonsa Beach, Utuno, Petea River, and Tanah Merah. The sampling was taken using bag nets with 0.5 inches of mesh size. Food observation was carried out by examining the stomach of the fish. Analysis of the diet includes index stomach content (ISC), occurrent frequency and index of preponderance (IP). The fish was consisted of 687 males and 478 females. Stomach contents of the fish consisted of three kinds of foods such part of insect, debris and plankton. IP for male consisted of part of insect (58%), debris (13%), and plankton (*Nitzschia* sp. *Eunotia* sp. 11%). IP for female consisted of part of insect (33%), *Navicula* sp. and debris (17%), followed by *Nitzschia* sp. (13%).

Keywords: Matano Lake, stomach content, *Telmatherina*

INTRODUCTION

Lake Matano is one of the ancient lakes in the Malili Lake complex which is located on Sulawesi Island. The geographical condition of Sulawesi Island because it is located in the transitional area between Oriental and Australian mintakat causes the lake to have high diversity of fish including various endemic fish species (Whitten et al. 1994). Lake Matano is located in the upper course and is followed by Mahalona Lake in the middle and Towuti Lake in the downstream. This lake has a depth of 590 m with an area of 164 km^2 (Nontji 2017).

Opudi fish (*Telmatherina prognatha*) is an endemic fish that lives in Lake Matano. Male opudi (*T. prognatha*) is a type of roundfins fish that has striking polychromatism i.e. to have morphological characteristics with striking colors (Herder et al. 2006). It also has fat body shape with a height ratio of 24-34% of SL (standard length) and abdominal fins in unmodified female fish.

Food is an important factor influencing the existence and spread of organisms both horizontally and vertically. Factors affecting fish food types include food size, food availability and fish's appetite for food. Based on the number of variations in the food, fish are classified into various types, namely, euryphagic is a fish that eats various types of food, stenophagic is a fish that eats a little type of food, and monophagic is a fish whose food consists of only one type of food (Hart and Reynolds 2002). Telmatherinidae is a cannibal, fish that consumes eggs of other types of Telmatherin fish. Based on study conducted by Gray and McKinnon (2006) there are two types of Telmatherin fish becoming egg predator, namely *T. celebensis* and *T. sarasinorum*.

Some studies on Lake Matano include); Habitat spawning of *Telmatherina sarasinorum* (Kottelat 1991) in Lake Matano, South Sulawesi (Nilawati et al. 2010); Biometric character, mating behavior and habitat of *Telmatherina albolabiosus* (a new species of sailfin silverside (Atheriniformes: Telmatherinidae) from Lake Matano, South Sulawesi) (Tantu and Nilawati 2010); Habitat, distribution, and size structure of opudi fish (*Telmatherina antoniae*) in Lake Matano (Tantu et al. 2012).

Study on food habits of opudi fish has been carried out by Gray and McKinnon (2006), especially about the behavior of feeding of fish family Telmatherinidae and by Sulistiono et al. (2006) regarding the food habits of opudi fish (*T. celebensis*) in Lake Tuwuti. However, studies on the food of opudi fish (*T. prognatha*) have never been done before. This food-related information is preliminary information that can be used as a basis for further study.

The purpose of this study is to find out eating habits including the type of food and the percentage of food of opudi fish (*T. prognatha*) in Lake Matano, South Sulawesi, Indonesia. The results of this study are expected to be basic information that can be used in the management of opudi (*T. prognatha*) fish in Lake Matano.

MATERIALS AND METHODS

Study location

The study was conducted in Lake Matano, East Luwu Regency, South Sulawesi. Sampling was done once in each month for one year, starting from March 2018 to February 2019. The study location consists of six research stations, Lawa River (St 1: S $02^0$25'52.58" E $121^0$13'26.16"), Wotu Pali (St 2: S $02^0$28'46.86" E $121^0$16'33.16"), Salonsa Beach (St 3: S $02^0$30'17.50" E $121^0$19'45.04"), Utuno (St 4: S $02^0$33'36.12" E $121^0$25'07.85"), Sungai Lawa (St 5: S $02^0$31'06.44" E $121^0$27'11.74".) and Tanah Merah (St 6: S $02^0$28'14.14" E $121^0$23'50.97") (Figure 1).

The determination of the research station was done based on several considerations including the appropriateness of research station to represent habitat characteristic and some previous studies conducted by Hadiaty and Wirjoatmodjo (2002) regarding the distribution of Telmatherina fish and the condition of the research station which was suitable for operational sampling operations

Procedures

Fish sampling was done at six study stations. The sampled fish were caught then sorted and measured for length and weight. Fish samples were then dissected to remove the stomach and then preserved using 10% formalin. Identification of the contents of the stomach was then carried out in the laboratory. Stomach contents were weighed using a digital scale with accuracy of 0.001 g. Observation of the contents of the stomach using a microscope, then identified using the identification book of Ward and Whipple (1959) and Needham and Needham (1962) with an enlargement of 10 / 0.25.

Data analysis

Index stomach contents (ISC) is determined to understand the level of fish's relative feed intake. ISC is determined using the formula according to Hyslop (1980):

$$ISC = \frac{SCW}{BW} x100$$

Where:
ISC : index stomach contents (%)
SCW : total stomach contents weight (g)
BW : total fish weight (g)

The composition of the diet and the determination of the main food of opudi fish (*T. prognatha*) were known by analysis of the contents of the digestive tract. Calculation of the contents of the digestive tract was done by calculating the index of preponderance for analysis of the degree of fullness of natural feeds composition in the digestive tract of opudi fish (*T. prognatha*). The formula used refers to Natarajan and Jhingran (1961).

$$IP = \frac{VixOi}{\sum(VixOi)} x100$$

Where:
IP : main index (Index of preponderance)
Vi : percent volume of a particular food
Oi : percent incidence of some type of food
$\sum(VixOi)$ = total VixOi of all kind of food

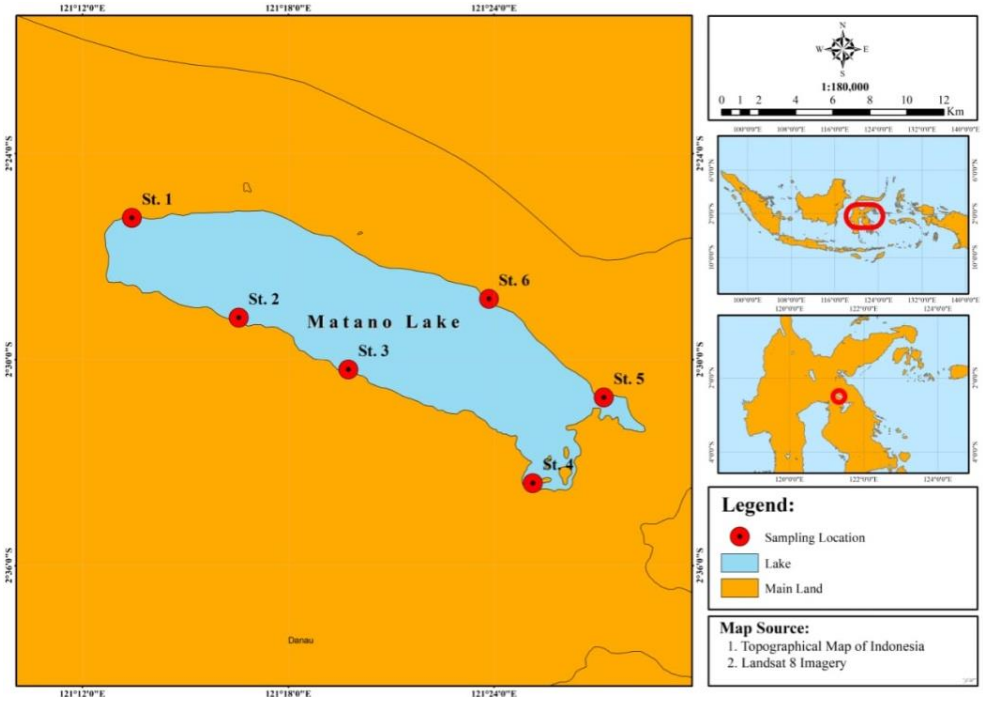

Figure 1. Study location of feeding habits of fish opudi (*Telmatherina prognatha*) in Matano Lake, South Sulawesi, Indonesia

RESULTS AND DISCUSSION

The number of sample fish at the six study locations analyzed for stomach contents was 1 165 individuals consisting of 687 males and 478 females. Of the total fish samples being analyzed, 90% of the fish's stomachs were filled with food. There were four food groups, namely pieces of insects, debris and plankton. The largest percentage of food groups are insects.

Index stomach contents (ISC)

Determination of the level of food consumption based on the study location was carried out to determine index stomach contents (ISC) of opudi (*T. prognatha*) at the study site. An index of fullness of stomach contents based on the study station is presented in Figure 2.

Figure 2 shows that the largest ISC of opudi (*T. prognatha*) is found at Station 4 (Utuno) with 3.66%, while the lowest ISC at Station 6 (Tanah Merah) is 3.31%. The highest ISC female opudi is at Station 3 (P.Salonsa) with 4.19% and the lowest is at Station 2 (Wotu Pali) with 3.51% This indicates that opudi fish (*T. prognatha*) at Stations 3 and 4 are active in foraging. Based on the results of two way ANOVA analysis, there is no ISC value of male and female opudi fish (P=0.311; α=0.05). While the ISC scores between research stations differ (P=0.02; α=0.05).

The temporal analysis of the stomach contents of opudi (*T. prognatha*) is presented in Figure 3. The ISC obtained during the study was quite fluctuating every month. The highest ISC was obtained in March both in male and female fish, namely 5.45% and 4.97%, respectively. Whereas, the lowest value of ISC was obtained in April at 3.13% for males and 1.92% for females. Based on the results of two way ANOVA analysis, temporally, there is no ISC value of male and female opudi fish (P=0.07; α=0.05), while there were differences in ISC values during the study (P=0.00; α=0.05).

Index preporedence

The results of the index analysis of preporedence on 174 male and female opudi fish (*T. prognatha*) are presented in Table 1. The natural food of opudi fish (*T. prognatha*) in the form of insect, debris, and plankton pieces is mostly found in intestines of the opudi fish.

Food composition of opudi fish (*T. prognatha*) consists of insects, debris, and plankton pieces. Male and female opudi fish (*T. prognatha*) also have a similar composition, but the percentage of each type of food. In male fish, the highest percentage of food was part of insect (58%) followed by debris (13%) and *Nitzschia* sp. and *Eunotia* sp. (11%), while in female fish, the highest percentage was part of insect (33%), *Navicula* sp. and debris (17%), followed by *Nitzschia* sp. (13%). Opudi fish (*T. prognatha*) food composition at each study station has different percentage. In Table 2 shows the percentage of opudi fish (*T. prognatha*) from six study locations.

At Station 1, the highest percentage was part of insect (41%), then *Nitzschia* sp. (22%) and *Eunotia* sp. (15%). At Station 2, the percentage was part of insect (28%), then *Nitzschia* sp. (25%) and debris (20%). Food composition at Station 3 was part of insect (34%), debris (28%) and *Nitzschia* sp. (15%). At Station 4 the food percentage consisted of part of insect (63%), *Eunotia* sp. (10%), debris and *Nitzschia* sp. (8%). Station 5 percentage was part of insect (73%), *Nitzschia* sp. and debris 6%, copepod (5%). While at Station 6 was part of insect (59%), debris (22%) and *Nitzschia* sp. (7%).

Table 3 presents the temporal composition of the opudi (*T. prognatha*) food during the study. Food composition of opudi fish (*T. prognatha*) was quite varied each month. In March-February the type of food that has the highest IP obtained was part of insects (28-85%). In May the highest IP obtained was copepod (36%).

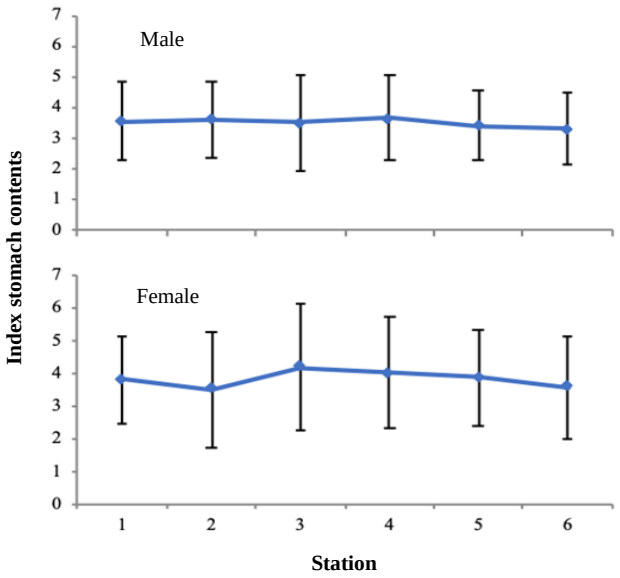

Figure 2. Spatial index stomach contents (ISC) of the opudi fish (*Telmatherina prognatha*) in Matano Lake, Indonesia

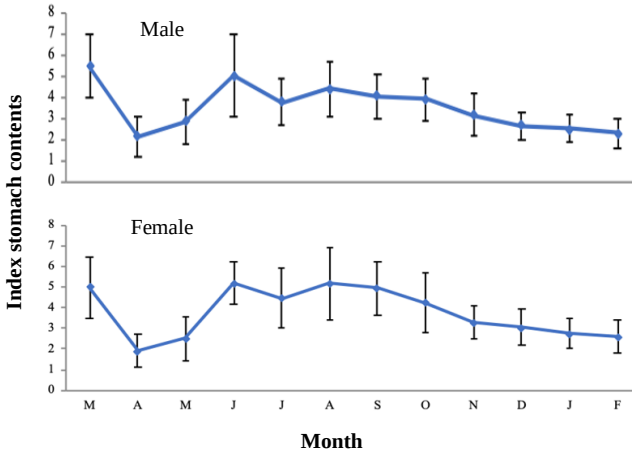

Figure 3. Temporal index of the fullness of the stomach contents of the opudi fish (*Telmatherina prognatha*) caught in Matano Lake, Indonesia

Table 1. Food composition of male and female opudi fish (*Telmatherina prognatha*) caught in Matano Lake, Indonesia

Type of food	Index of preponderance (IP)	
	Male	Female
Insect		
Part of insect	58.43	32.85
Zooplankton		
Tintinnopsis sp.	0.10	0.09
Polyphemus sp.	3.28	4.02
Copepod	2.12	5.62
Difflugia sp.	0.74	0.70
Harpacticoida	0.14	0.12
Phytoplankton		
Nitzschia sp.	10.78	13.16
Eunotia sp.	10.55	7.36
Navicula sp.	0.26	16.76
Synedra sp.	0.17	0.86
Diatoma sp.	0.16	1.04
Pleurosigma sp.	0.11	0.07
Pinnularia sp.	0.08	0.07
Cocconeis sp.	0.07	0.18
Closterium sp.	0.07	0.23
Microalga		
Aphanizomenon sp.	0.05	0.14
Debris	12.89	16.74

Table 2. Food composition of opudi fish (*Telmatherina prognatha*) caught in six stations at Matano Lake, Indonesia

Type of food	Index of preponderance (IP)					
	St 1	St 2	St 3	St 4	St 5	St 6
Insect						
Part of insect	41.12	27.52	33.90	63.20	72.58	59.17
Zooplankton						
Tintinnopsis sp.	0.36	0.57	0.19	0.07	0.01	0.01
Polyphemus sp.	3.15	3.20	4.75	5.90	4.09	1.27
Copepod	3.23	2.65	4.74	1.94	4.72	2.32
Difflugia sp.	0.59	0.06	0.08	1.57	1.17	1.36
Harpacticoida	0.10	0.32	0.14	0.15	0.16	0.21
Phytoplankton						
Nitzschia sp.	21.65	24.60	15.40	7.79	6.15	7.12
Eunotia sp.	14.86	14.64	12.05	9.85	4.31	4.60
Synedra sp.	4.23	3.25	0.18	0.16	-	-
Closterium sp.	1.10	0.11	0.10	0.05	0.01	-
Pinnularia sp.	0.77	0.96	-	0.23	-	-
Pleurosigma sp.	0.76	0.47	0.04	0.63	0.01	0.02
Diatoma sp.	0.50	0.35	0.12	0.34	0.27	1.32
Navicula sp.	0.08	0.04	0.33	0.21	0.46	0.26
Cocconeis sp.	0.01	1.10	0.20	0.15	0.02	0.01
Microalga						
Aphanizomenon sp.	0.24	0.08	0.06	0.07	0.12	0.05
Debris	7.24	20.09	27.70	7.69	5.91	22.28

Table 3. Composition of the opudi fish food (*Telmatherina prognatha*) temporally caught in Matano Lake, Indonesia

Type of food	Index of preponderance (IP)											
	Mar	Apr	May	Jun	Jul	Augts	Sept	Oct	Nov	Des	Jan	Feb
Insect												
Part of insect	36.49	30.21	9.91	62.43	34.06	27.83	54.88	59.86	61.24	57.35	67.67	85.18
Zooplankton												
Tintinnopsis sp.	0.39	9.72	-	-	-	-	-	-	-	-	-	-
Polyphemus sp.	-	-	-	3.39	17.38	22.73	4.23	3.30	2.07	1.39	3.33	0.12
Copepod	1.26	2.23	36.05	0.91	3.61	11.18	-	0.75	2.07	-	-	-
Difflugia sp.	0.56	-	-	0.08	0.59	4.01	0.27	3.99	1.24	1.23	-	0.58
Harpacticoida	0.11	-	-	0.02	-	0.29	0.13	0.15	0.97	0.21	2.22	0.34
Fitoplankton												
Nitzschia sp.	29.07	7.97	23.66	7.73	26.70	6.85	3.01	15.50	20.24	19.74	8.28	1.57
Eunotia sp.	4.02	0.01	0.05	7.94	15.13	22.47	24.55	6.16	9.56	6.68	15.17	4.48
Synedra sp.	9.52	-	-	-	-	-	-	-	-	-	-	-
Closterium sp.	-	10.34	0.01	-	-	-	-	-	-	-	-	-
Pinnularia sp.	1.41	-	-	-	-	-	-	-	-	-	-	-
Pleurosigma sp.	1.07	7.21	-	-	-	-	-	-	-	-	-	-
Diatoma sp.	-	3.23	8.83	0.48	-	0.26	-	-	-	-	-	-
Navicula sp.	0.01	3.74	2.33	0.01	0.01	-	-	-	-	-	-	-
Cocconeis sp.	-	2.57	-	-	-	-	-	-	-	-	-	-
Microalga												
Aphanizomenon sp.	-	-	0.07	-	1.12	0.01	-	0.08	-	-	-	-
Debris	16.09	22.71	19.08	17.01	1.40	4.35	12.92	10.22	2.61	13.41	3.33	7.73

Discussion

The Matano Lake is a deep water lake (8th deepest lake in the world and 1st deepest lake in Southeast Asia) and is the lakes in Indonesia with a depth of about 208 meters under sea level (crypto depression) (Nontji 2017). The differences in height among lakes have formed barriers preventing organisms to move upstream from downstream. This condition evokes a unique distribution pattern. The Matano Lake has some endemic genus of fish. The *Telmatherina prognatha* is one of the endemic fish species from the Order Artheriniformes and family Telmatherinadae that inhabits the Matano Lake (Hadiaty and Wirjoatmodjo 2002). It is a type of small fish with a maximum length in the range of 4.7-8.4 cm (Herder et al. 2006). It possesses a standard length of about 84 cm (Kottelat et al. 1993).

Opudi fish (*T. prognatha*) in the Matano Lake are active foraging at Utuno Station. This can be seen from the high ISC value at this station (Figure 2). The habitat at Utuno Station has a stretch of weeds which is assumed to be a place of life for insects which is a natural food for opudi fish (*T. prognatha*). In female fish, the highest ISC value was found at Salonsa Beach Station. This station has a large litoral area. In addition, the number of riparians along the lake is thought to be a food source for opudi fish (*T. prognatha*). Under normal conditions, fish will eat continuously, although the intensity is not the same depending on the index of fullness of stomach contents (Hart and Reynolds 2002).

The highest index of stomach content fullness was obtained in March both in male and female fish. While the lowest ISC in male and female fish occurred in April. High stomach index values indicate that the fish is in active foraging. The temporal fluctuation of ISC is quite high between March-June both in male fish and in female fish. This is thought to be related to the availability of natural food for those months. Study conducted by Sulistiono et al. (1999) suggested that the spawning season and increased water temperature were one of the factors causing Japanese whiting (*Sillago japonica*) fish to be active in eating. According to Wahyuni et al. (2004) increased activity of pufferfish feeding associated with changes in water conditions that directly affect the availability of food in the waters.

Food composition of opudi fish (*T. prognatha*) is the insect, debris and plankton pieces (*Nitzschia* sp., *Navicula* sp., and *Eunotia* sp.) which are natural foods for opudi fish (*T. prognatha*). This is similar to the statement of Sulistiono et al. (2006) that the main food of *T. celebensis* fish is insects; the supplement food is body insects and litter; while the complementary food is zooplankton consisting of *Closterium, Navicula, Nitzchia, Pinnularia, and Synedra*. Makmur et al. (2007) suggested that *T. antoniae* is an omnivore that tends to be carnivorous with its main food being plankton (*Navicula*, *Diploneis*, and *Cymbella*), shrimp and fish. Bilih fish (*Mystacoleucus padangensis*) is a type of phytoplankton-eating fish (*Synedra*) in Lake Toba (Suryanti et al. 2017).

The results of the analysis of IP opudi fish (*T. prognatha*) shows that there are no differences in the percentage of food between male and female fish. According to Hart and Reynolds (2002), the type and amount of food consumed by a fish species usually depend on age, place and time. There are differences in food composition between male and female opudi fish (*T. prognatha*).

The composition of the food of opudi fish (*T. prognatha*) spatially at six stations consisted of parts of insects, plankton (*Nitzschia* sp., *Navicula* sp., and *Eunotia* sp.), and debris. This food difference is thought to be related to food availability and habitat characteristics at each study location. Yeni and Elvira (2017) suggested that the presence of vegetation alongside a river affects the presence of various insects because the area is a habitat for insects. Habitat conditions are a lot of trees alongside the lake which are thought to be a direct contributor of debris to the waters. Debris in Matano Lake mostly comes from twigs and tree trunks that are located alongside the lake. This is thought to be the cause of opudi (*T. prognatha*) caught in this area consuming a type of debris food. Temporally the composition of the food of opudi fish (*T. prognatha*) is quite varied. However, the type of food in the form of pieces of insects that have the highest IP is around 37%-85%. The *T. celebensis* opudi is an insect eater (Sulistiono et al. 2006) although it tends to be omnivorous.

The difference in food composition is closely related to age and the availability of natural foods in the waters. Gani et al. (2015) state that oligotrophic lakes can cause low food diversity.

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REFERENCES

Gani A, Nilawati J, Rizal A. Habitat study and food habit Roro Lindu fish (*Oryzias sarasinorum* Popta, 1905). Jurnal Sains dan Teknologi Tadulako 4 (3): 9-18. [Indonesian]

Gray SM, McKinnon JS. 2006. A comparative description of mating behaviour in the endemic Telmatherinid fishes of Sulawesi's Malili Lakes. Environ Biol Fish 75: 471-482.

Hadiaty RK, Wirjoatmodjo S. 2002. Preliminary study: Biodiversity and distribution of fish in Lake Matano, South Sulawesi. Jurnal Iktiologi Indonesia 2 (2): 23-29. [Indonesian]

Hart PJB, Reynolds JD. 2002. Handbook of Fish Biology and Fisheries, Blackwell Science Ltd, Oxford.

Herder F, Schwarzer J, Pfaender J, Hadiaty RK and Schliewen UK. 2006. Preliminary checklist of sailfin silversides (Teleostei: Telmatherinidae) in the Malili Lakes of Sulawesi (Indonesia), with a synopsis of systematics and threats. Verhandlungen der Gesellschaft f ɾ Ichthyologie Band 5: 139-163.

Hyslop EJ. 1980. Stomach contents analysis—a review of methods and their application. J Fish Biol 17, 411-429.

Kottelat M, Whitten AJ, Kartikasari SR, Wirjoatmodjo S. 1993. Freshwater fishes of Western Indonesia and Sulawesi. Periplus Edition (HK) Ltd.

Kottelat M. 1991. Sailfin Silversides (Pisces: Telmatherinadae) of Lake Matano, Sulawesi, Indonesia. with descriptions of six new species. *Ichtyol Explor Freshw* 1 (4): 321-344.

Natarajan AV, Jhingran AG. 1961. Index of preponderance, a method of grading the food elements in the stomach analysis of fishes. Indian J Fish 8 (1): 54-59.

Needham P, Needham JG. 1962. A Guide to The Study of Fresh-Water Biology. Holden-day. Inc., San Francisco.

Nilawati J, Sulistiono, Sjafei DS, Rahardjo MF, Muchsin I. 2010. Spawning habitat of *Telmatherina sarasinorum* (Family: Telmatherinidae) in Lake Matano. Jurnal Iktiologi Indonesia 10 (2): 101-110. [Indonesian]

Nontji A. 2017. Danau-Danau Alami Nusantara. In: Ali F, Tanjung LR, Widiyanto T, Henny C, Ridwansyah I, Sulastri, Hidayat, Subehi L, Wibowo H, Maghfiroh M (eds) Pusat Penelitian Limnologi, Lembaga Ilmu Pengetahuan Indonesia. [Indonesian]

Sulistiono, Furkon A, Affandi R. 2006. Study on stomach contents of opudi fish (*Telmatherina celebensis*) in Towuti Lake, South Sulawesi. Jurnal Akuakultur Indonesia 5 (2): 149-156. [Indonesian]

Sulistiono, Watanabe S, Yokota M. 1999. Food and feeding habits of the Japanese Whiting, *Sillago japonica*, in Tateyama Bay. Suisanzoshoku 47 (3): 331-336.

Tantu FY, Nilawati J. 2010. Biometry, mating behavior and habitat of *Telmatherina albolabiosus* a new species of sailfin silverside (Atheriniformes: Telmatherinidae) from Lake Matano, South

Sulawesi. The 6th National Seminar on Fish & Congress of the Indonesian Iktiologi Society III (ID). MII, LIPI, KKP. p. B-8.

Tantu FY, Sulistiono, Muchsin I. 2012. Habitat, distribution, and size structure of fish opudi (*Telmatherina antoniae*) in the Matano Lake. Jurnal Agrisains 13 (2): 140-148. [Indonesian]

Wahyuni T, Sulistiono, Affandi R. 2004. Food habits buntal pisang fish (*Tetraodon lunaris*) di Mayangan Water, West Java. Jurnal Iktiologi Indonesia 4 (1): 25-30. [Indonesian]

Ward HB, Whipple GC. 1959. Freshwater Biology. Second edition, London.

Whitten BJ. 1994. Aeration and Oxygenation. In: Timmons MB, Lasordo TM (eds.) Aquaculture Water Reuse System: Engineering Design and Management. Elsevier Science B.V. Tokyo.

Yeni E, Elvyra R. 2017. Study on gut content of selais terang bulan fish (*Kryptopterus bicirrhis*, Valenciennes 1840) in Rantau Kasih Village Kampar Kiri River, Riau Province. Jurnal Biospecies 10 (2): 44-49. [Indonesian]