Feeding Habits, Length-Weight Relation, and Growth Pattern of Snakehead Fish (*Channa striata*) from The Rice Field of Jejangkit Muara Village, Barito Kuala Regency, South Kalimantan Province, Indonesia

Junius Akbar[1], Eka Iriadenta[2]

Faculty of Fisheries and Marine, Lambung Mangkurat University, Banjarbaru, Indonesia

Abstract*—The research about "feeding habits, length-weight relationship and growth pattern of snakehead fish which caught in rice field JejangkitMuara, South Kalimantan" had been done during June-August 2018which divides into two parts: rice field JejangkitMuara village, Barito Kuala regency, South Kalimantan province for sampling, and identification at Fish Nutrition Laboratory, Aquaculture Department, Faculty of Fisheries and Marine, LambungMangkurat University, Banjarbaru. The aims of the research were to analyze feeding habits, relation between length-weight and growth pattern of snakehead fish (Channastriata) which caught in rice field JejangkitMuara village, Barito Kuala regency, South Kalimantan province. The results of the research showed that the length-weight relation with formula $W = 0.8191\ L^{0,7762}$ with value of r = 0.321092 which mean that length-weight relationships indicated the pattern of negative allometric type of growth (b<3). Snakehead fish has the fish as their primary feeding habits.*

***Keywords*—Channa striata, snakehead, feding habits, length-weight relation, growth pattern, South Kalimantan.**

I. INTRODUCTION

The snakehead fish (*Channastriata*) known as "Gabus or Haruan" is a common freshwater fish species in South Kalimantan-Indonesia. This species is commonly found in rivers, flood plains, rice fields, irrigation canals, ponds, swamps, lakes, marshes, ditches, and estuaries (Saroware*t al*, 2010; Fahmi*et al*, 2013; Akbar, 2017). It is ability to breathe atmospheric air and that can survive in harsh environments with high water temperature, low dissolved oxygen and high ammonia contents (Marimuthu&Haniffa, 2007). It can stay alive without water as long as its gills remain moist. Rice fields have traditionally been the largest source of snakehead fish production. It is one of commercial important, freshwater fish, usually sold fresh in the markets and highly priced because of its good and delicate taste (Qin & Fast, 1998). Its high demand and market price make the species a good aquaculture candidate to culture (Saroware*t al*, 2010).

The fish is widely distributed include China, Pakistan, India, Nepal, Sri Lanka, Bangladesh, Myanmar, Vietnam, Laos, Thailand, Philippines, Cambodia, Malaysia, Singapore, and Indonesia. In Indonesia this species found in the Sumatera, Kalimantan, Jawa, Bali, Sulawesi, Madura, Flores, Maluku, Nusa Tenggara, and Papua (Akbar, 2017).

However in South Kalimantan Province-Indonesia, the culture of snakehead fish is still not common due to the lack of seed supply and knowledge of their feeding and breeding techniques. Niskolsky (1963), found that the primary problems posed in the study of the fish feeding habits, is to have a broad knowledge of the different species of prey in order to understand the qualitative and quantitative bridge between fish and their food organism. Based on Effendie (1979), one of the factors which are determines for fish growth and population is the food.

The fish feeding habits is one of fundamental in fish domestication before the fish is cultured (Akbar, 2017). For that reason, this research had been done to analyzing the relation between feeding habits of snakehead fish (*Channastriata*) and length-weight body of snakehead fish in JejangkitMuara waters, South Kalimantan.

II. MATERIAL AND METHODS

2.1 Time and Place of Research

The research had been done during June to August 2018, which was divided into two steps, that was fish sampling at JejangkitMuara water, South Kalimantan, and where as identification of fish food species in gastric of snakehead fish was done in Fish Nutriton Laboratory, Aquaculture Department, Faculty of Fisheries and Marine, LambungMangkurat University, Banjarbaru, South Kalimantan Province, Indonesia

2.2 Equipment and Material

The equipments used in this research were writing tools, dissecting set, ice box, digital camera, transparent plastic bag, ruler, analytic bean and 1 kg beam. The materials used in this research were alcohol 70%, distilled water, and formalin 4%, snakehead fish (*Channastriata*).

2.3 Procedure

2.3.1 Field Work

Snakehead fish (*Channastriata*) were collected from caught JejangkitMuara water, South Kalimantan. After collecting, the fish were measured on lenght-weight body, and then the fish were dissected to get gastric, and then be stored in formalin 4%.

2.3.2 Laboratory Work

The gastric samples were stored in formalin 4%, and then stored for 10 minutes by using running water and replaced twice to reduce formalin odor. The cleaned gastric samples which were cleaned were stored in alcohol 70% so it can be stored for a long time and can be identified in laboratory. Each gastric sample was dissected to know kind of food containing in the gastric.

2.4 Data Analyzes

2.4.1 Composition and Feeding Habits Analyzes

Food composition was included for everything in snakehead fish gastric, whereas Snakehead fish food was analyzed as follows: the gastric was opened, the contents were measured for the weight, and then the kind of food was grouped. Each kind of food was measured for the weight and be writes for the frequency in the gastric. To know the kind/species eated by snakehead fish was used Index of Preponderance by Effendie (1979).

$$IPi = \frac{Vi \times Oi}{\sum(Vi \times Oi)} \times 100\%$$

Where

IPi : Index of Preponderance one food kind

Vi : Persentage of volume of one food kind

Oi : Persentage of frekuency of one food kind

∑ (Vi x Oi) : Total Vi x Oi of food kind

2.4.2 Length-Weight Relation of Fish

Based on Khan *et al*, (2012), the relation of length-weight was analyzed by formula, as follow: $W = a L^{b}$

Where

W : The total weight (g)

L : The total length (cm)

a : The intercept

b : The regression coefficient

Based on Effendie (1979), there are 3 criteria of fish growth, that is:

If score b < 3, the fish weight growth is slower that the length growth (allometric growth, thin)

If score b = 3, the fish length growth and the fish weigh growth are balance (symmetrically isometric growth, ideal)

If score b > 3, the fish length growth is slower than fish weigh growth (allometric growth, fatty)

III. RESULT AND DISCUSSIONS

3.1. Result

During the research, 22 specimens of snakehead fish had been collected with total length about 15-31 cm and weight about 50-310 g. The dominant total length was 23-26 cm with 8 specimens or 36, 36% (Table 1). This respect was not different with the result of research by Dwirastina, (2007) which got snakehead fish specimens with total length about 15.2-32.4 cm in Musi river of South Sumatera and research results by Nurdawati *et al*, (2014)which report snakehead fish coughed in flood plain of Musi river with total length about 11-49, 5 cm.

TABLE 1
TOTAL LENGHT OF SNAKEHEAD FISH

Total Length (cm)	Length Range (g)	Frequency	Percentage (%)
15-18	16.5	3	13.64
19-22	20.5	5	22.73
23-26	24.5	8	36.36
27-30	28.5	3	13.64
31-34	32.5	3	13.64
Total		22	100

TABLE 2
RELATION BETWEEN TOTAL LENGTH AND WEIGHT SNAKEHEAD FISH

Location	Average		a	b	R^2	r	Growth Pattern
JejangkitMuara	Length (cm)	24,90909	0,8191	0,7762	0,1031	0,3211	allometric growth, thin
	Weight (g)	174,5					

IV. DISCUSSIONS

The observation results to 22 gastric samples of snakehead fish showed that the food composition of snakehead fish which was coughed in rice field JejangkitMuara village was fish (89.28%), macrophyta (2.6%) and materials which cannot be determined (8.12%). The undetermined materials were exist because of the content of fish gastrict had been broken by digestive process and time catching which was not on enough good time.

Based on Burnawi & Yanu (2015) fish (97.15%), prawn (1.73%), detritus (1.10%), and undetermined materials (0.02%). The catching results in the night were bigger than in the noon because of feeding habits of snakehead fish and there was the food in the night.

The food kinds which were gotten in gastric of snakehead fish were fish, macrophyta, and undetermined materials. The research by Marimuthu&Haniffa (2007) also got the frogs, fish, insects, tadpole, and earthworms in gastric of snakehead fish.

The fish dominated gastric content of snakehead fish. This respect because the habitat of snakehead fish in rice field JejangkitMuara village. Condition factor of *Channastriata* fluctuated affected by the difference of age, maturity, environment and food availability in those areas (Makmur, 2004).

The result of calculation from 22 samples collected and this was calculated for length-weight relation, this got the formula as follow:$W = 0.8191\ L^{0,7762}$ with value of r = 0.321092. If r value with average more than 90% in correlation grade, so length-weight relation of snakehead fish is much closed.

Based on the formula above, so it can be known that b value is 0.7762 (lower than 3) which means that the fish grow as allometric growth, thin (the fish weight growth is slower that the length growth). Muthmainnah (2013) stated that snakehead fish in swamp (Sekayu swamp and Manana swamp) South Sumatera grew with allometric growth negative with b value was 2,812 and 2,543. But, that was different with research result of Khan *et al*, (2012), that snakehead fish from Ganga river allometric fatty growth that b value is 3.1210.

The fish was the main food of snakehead fish which had high potential in this rice field. Based on Makmur&Prasetyo (2006), the fish dominated the gastric content of snakehead fish.

V. CONCLUSION

Based on the research result, it was concluded as follows feeding habits of snakehead fish caught in rice field JejangkitMuara village were fish (89,28%), macrophyta (2,6%), and materials which cannot be identified (8,12%). The fish was major food of snakehead fish. Growth pattern of snakehead fish is allometric growth, thin.

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