

Article

Natural Feed Preference *Fejervarya cancrivora* L. and *Fejervarya limnocharis* L on the West Coast of Sumatra Island

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Abstract. Anuran is an animal with a short body size, wide and stiff. The head and body are united and have no tail. Ecologically, Anuran plays an important role in the food chain as secondary consumers. It is known that all types of Anuran are carnivores with a diet such as arthropods and worms. This study aims to determine the natural food preferences of *F. cancrivora* and *F. limnocharis* on the West Coast of Sumatra Island. This research is a descriptive study which was conducted in 3 stages, namely the first stage of taking Anuran in the field, the second stage of washing the stomach and the third stage of identifying the type of feed. The results showed that the type of feed that was mostly found in the stomachs of the two frogs was the Hymenoptera order from the Insect class. The overlapping niche values of the two types of frogs in the village of Setara Nanggalo show a highly competitive tendency, the conclusion is that these two types of Anuran food have the same diet and are sympathetic populations.

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1. Introduction

Amphibians are one of the ecosystem components that have a very important role, both ecologically and economically (Darmawan, 2008). Amphibians generally consist of three orders, namely Cecilia or Gymnophiona, Caudata or Salamander, and Anuran. Cecilia or Gymnophiona is an order that has a large worm-like body shape with a clearly visible head and eyes. The second order is Caudata or Salamander, which is the only order that can hardly be found in all of Southeast Asia, including Indonesia. The closest inhabited areas of Salamanders are North Vietnam and Northern Thailand. Most types of amphibians in Indonesia, including the third,

Anuran has common characteristics from its short, wide, and stiff body size. The forelegs are smaller and shorter than the hind legs, the head and body are fused, and have no tail (Nasaruddin, 2000). Ecologically, Anuran has an important role in the food chain as a secondary consumer. All Anuran are known to be carnivores, their diet is arthropods and worms. Larger frogs or toads are also known to eat small fish, crustaceans, mollusks, younger or smaller frogs or toads, small lizards or small snakes (Iskandar, 1998).

Anuran habitat itself is quite varied depending on the type. According to Iskandar (1998), there are several types of Anuran that have habitats that are closely related to humans and several other types that inhabit secondary forests and primary forests. Anuran are found mainly in watery habitats in secondary and primary forests and several species are also known to inhabit habitats close to humans (Iskandar, 1998). In West Sumatra the diversity of Anuran itself is quite diverse (Sumarmin.et al, 2019) explaining that there are 21 types of Anuran found in Planting Wood, West Sumatra: *Duttaphrynus melanostictus*, *Fejervarya cancrivora*, *Hylarana erythraea*, *Megophrys nasuta*, *Polypedates leucomystax*, *Polypedates*, *Polypedates macrotis* *Polypedates otitophus*, *Rhacophorus pardalis*, *Pelophryne signata*, *Phrynooidis asper*,

Anuran's habitat diversity makes research on feed very important as an indicator to see the ecological function of Anuran's presence in this habitat. Kenagarian Setara Nanggalo, Pesisir Selatan District is a village with extensive agricultural activities. In the agricultural area of this village, several Anuran species are found, including *Fejervarya cancrivora* and *Fejervarya limnocharis*. which are two species of the order Anuran that are closely related and live in the same or sympathetic place in the region. Based on the description above, a study was conducted under the title Natural Feed Preference *Fejervarya cancrivora* L. and *Fejervarya limnocharis* L. on the West Coast of Sumatra Island which aims to determine the relationship between Natural Feed Preference *Fejervarya cancrivora* L. and *Fejervarya limnocharis* L.

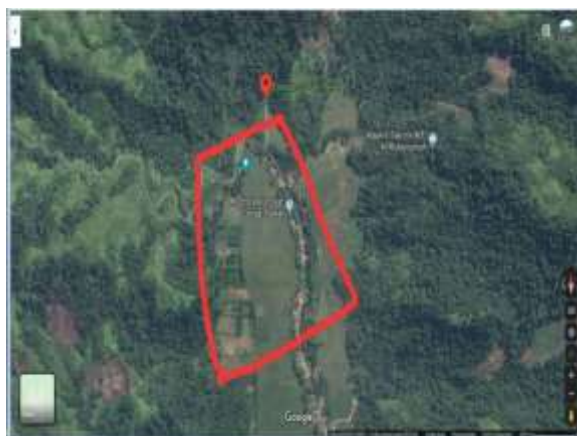


Figure 1. Setara Nanggalo Area

2. Experimental Section

This research is a descriptive study which was carried out in 3 stages, namely the first stage of collecting Anuran in the field, the second stage of washing the stomach and the third stage of identifying the type of feed.

Collecting species data by collecting specimens directly in 3 types of habitat equivalent to Nanggalo, namely residential areas, rice fields and plantation areas. While the feed data from each specimen was collected by analyzing the stomach contents using the stomach flushing method (Legler and Sullivan, 1979).

Rinse is carried out in a procedure that is safe for animals. The stomach contents of the specimen are removed by spraying water into the frog's stomach through the esophagus. Water is drained into the stomach of the specimen through a plastic tube. The water that has been put into the stomach of the specimen is then mixed with the stomach contents of the specimen by gently massaging the stomach. The contents of the water and the mixed stomach are then removed by turning the body of the specimen until the head is bowed. The stomach contents of the specimen were then filtered and stored in a 70% alcohol solution for preservation before being taken to the laboratory for identification. The stomach contents identified are the animals the frogs eat. Identification is carried out at the order level, especially insects, using the identification book Borror, Triplehorn, Jhonson (1996)

The method of counting the number of preys follows Berry's (1965) method, namely the category of prey in the stomach is divided into two:

1. prey in its full or nearly complete form
2. the body of the prey lives in the form of pieces only.

Calculation of category 2 by looking at the number of heads, the number of pairs of elytra for beetles or the shape and number of wing pairs so that the number of preys eaten by frogs can be known even though the prey is not found intact.

Analysis of the magnitude of competition between types of feed between two frogs, using overlapping values of food types with the Pianka Index, Krebs (1989 in Kurniati, 1998), namely:

$$ojk = \frac{\sum pij \cdot pik}{\sqrt{\sum pij^2 \cdot \sum pik^2}}$$

Information:

- Ojk = Pianka index for overlapping prey species eaten by types j and k
- Pij = prey ratio that I eat to type j
- Pik = prey ratio I eat to type k
- N = number of preys by type j and k

Pianka index value ranges from 0 to 1. The closer to the value 1, the bigger the overlapping niches between the individuals. Conversely, if the resulting index value is close to 0, then the overlapping of niches between individuals will decrease.

3. Results and Discussion

Table 1. The insect composition is in the frog's stomach

Class and order	Rice fields				Settlement				Garden			
	Fc	%	FL	%	Fc	%	FL	%	Fc	%	FL	%
Araneae	12	10.08	8	8.88	5	9.25	2	3.44	7	11.47	8	16.32
Hymenoptera	51	42.85	38	42.22	24	44.44	34	58.62	23	37.30	12	24.48
Odonata	5	4.20	1	1.11	2	3.70	1	1.72	-	0	1	2.04
Hemiptera	12	10.08	10	11.11	10	18.51	2	3.44	7	11.47	2	4.08
Orthoptera	9	7.56	5	5.55	1	1.85	10	17.24	3	4.91	6	12.24

Coleopteran	9	7.56	9	10	3	5.55	5	8.62	9	14.75	5	10,20
Dipteral	11	9.24	12	13.33	3	5.55	2	3.44	4	6.55	6	12.24
Dermaptera	1	0.84	2	2.22	2	3.70	1	1.72	1	1.63	3	6.12
Lepidoptera larvae	1	0.84	1	1.11	1	1.85	1	1.72	1	1.63	2	4.08
Scolopendromorpha	2	1.68	-	0	-	0	-	0	2	3.27	-	0
Architaenioglossa	6	5.04	4	4.44	1	1.85	-	0	1	1.63	2	4.08
Opisthoptora	-	0	-	0	2	3.70	-	0	3	4.91	2	4.08
Total	119	100	90	100	54	100	58	100	61	100	49	100

Description: Fc: *Fejervarya cancrivora*; Fl: *Fejervarya limnocharis*

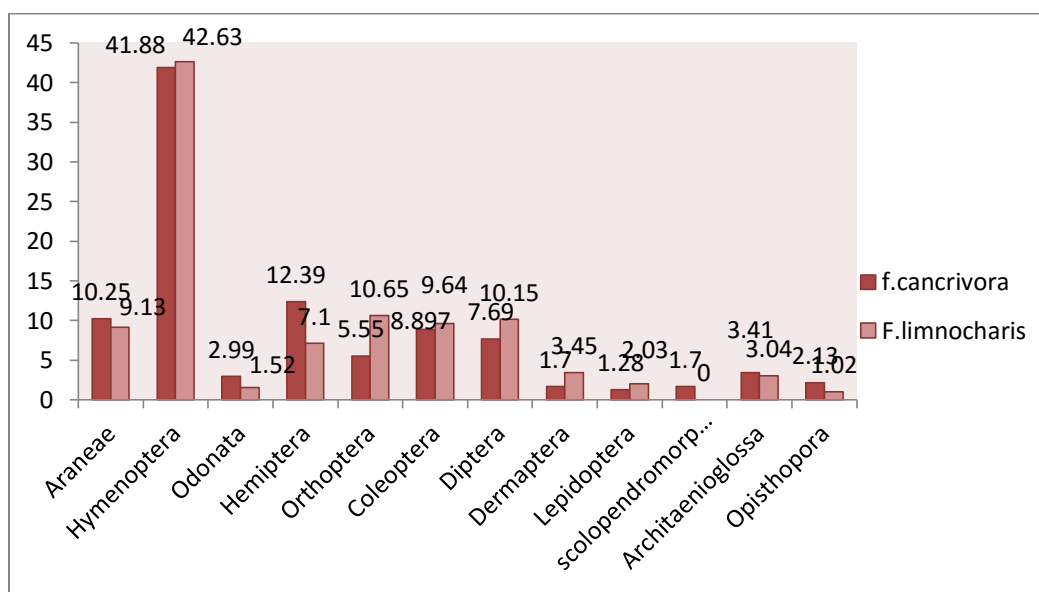


Figure 2. Percentage of insect orders eaten by *F. cancrivora* and *F. limnocharis* frogs

Based on Graph.1 above The stomach contents of *F. cancrivora* and *F. limnocharis* (10-24) were insects, spiders and earthworms, and there were several from the chilopod class and the gastropod class, each sample found was identified using a stereo microscope and an identification book. Based on the identification of samples on examination of the stomach contents, the two frogs were found the composition of frog food, especially arthropod filtration and class insects.

From table 1, it can be seen that the types of animals eaten by the two frogs from three sampling points can be seen that the types of frogs *F. cancrivora* and *F. Limnocharis* (25-34) both eat various types of food, the food that is available. in both of these frog species comes from the Hymenoptera order, where the percentage of this order is higher than other orders, reaching 42% of the total order eaten.

In the study, samples of *F. cancrivora* frogs were found as many as 108 and 76 *F. limnocharis*. The frog's entire entrails were removed by means of a stomach wash. These two types of frogs are more common in rice fields and plantations than in residential areas, this is because rice fields and

plantations are the habitat of the two frogs, besides that rice fields and plantations have relatively lower temperatures than settlements so that frogs prefer rice fields and plantations. compared to settlements.

a. The value of the niches that overlap in the two types of frogs

The overlap value of paddy fields in the two species is 0.7459. This figure shows high competition, likewise in the plantation area 0.8964 and settlement 0.9039 also shows a very high number. The high overlap of niches is due to competition between the two species, where the competition is competition for space and food, which shows that both occupy the same place and both consume the same types of food.

4. Conclusion

The types of food for the *F.cancrivora* and *F.limnocharis* frogs on the West Coast of Sumatra Island consist of 8 orders of the Insect class, namely Hymenoptera, Odonata, Hemiptera, Orthoptera, Coleoptera, Diptera, Dermaptera and Lepidoptera larvae, from the arachnid class found in 1 order namely Hymenoptera, Odonata, Hemiptera, Orthoptera, Coleoptera, Diptera, Dermaptera and Lepidoptera larvae, from the arachnid class found 1 order, namely Hymenoptera, Odonata, Hemiptera, Orthoptera, Coleoptera, Diptera, Dermaptera and Lepidoptera larvae. Araneae, from the class of chilopod found one order, Scolopendromorpha, and from the class oligochaeta found one order, Opisthopore and one order found from the gastropod class, Architaenioglosa. High overlapping niches indicate a high chance of utilizing feed from both types of frogs, both in settlements, rice fields and plantations. This shows that they are sympatric residents, where they occupy the same place with a very high pattern of competition and they both want the whole territory, but they have to share because they occupy the same place. With this research it is hoped that it can increase knowledge in science midwives and can be used as a reference in developing science in the field of ecology.

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