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Diet of Ompok hypophthalmus in Rungan Floodplain River in Palangkaraya, Central Kalimantan

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Abstract: *The aims of the research were identify prey species of Ompok hypophthalmus and its availability Rungan floodplain river in Palangkaraya. The collection of O. hypophthalmus from floodplain ecosystem were done monthly during October to November 2013 when water level decrease and December 2013 to January 2014 when water level increase. In the same time of O. hypophthalmus, an analysis of benthos availability in water ecosystems were performed. A total of 183 stomachs of O. hypophthalmus were collected and analyzed systematically. Prey species was identified and the percentage was calculated. The most common prey were shrimp, insect, juvenile fish, and other unidentified prey. The prey species compositions were varies monthly. In October 2013, prey species was dominated by shrimp (61%). In November, the prey were fish juvenile (44%). Insect was dominant in the stomach of O. hypophthalmus which was collected during December (54%). In January, fish juvenile was found dominant in the stomach of O. hypophthalmus (60%). The different of stomach composition was affected by food availability and season. Annelids, insect, and Trichoptera was abundance in December (12.130 ind/m^2).*

Keywords *- floodplain biodiversity, conservation, Ompok hypophthalmus*

I. Introduction

Floodplain in tropical Asia is one of the hot spot of global biodiversity (Dudgeon, (2000). Ecologically, a floodplain is the area which is often found around a river which is experiences occasional flooding. Floodplain area has been identified as one of the most fertile area for agriculture [1] [2]. Throughout the globe, many floodplains have been converted in agricultural field. It has been reported that floodplains in tropical regions has been converted intensively. The importance of floodplain for biodiversity conservation however rarely discussed. Flood plain area is important for numerous living creature, ranging from invertebrates to vertebrates fauna. Floodplain is an important habitat for wildlife because floodplains provides abundance resources which area needed by wildlife [3].

Global climate changes have been identified as one of the factor of recent climates anomaly. This situation leads to the numerous phenomena such as intensive flooding, long dry periods, flooding, dry periods, etc. The global climates lead to numerous ecosystem integrity disturbances, including floodplains ecosystems. The riparian vegetation of flood plains contributes to the nutrient availability in floodplains ecosystems. Decomposition of organic matter from plant is sources of the nutrient for living creatures in floodplains ecosystems, namely shrimps, juvenile fish and other lake species. Nutrient in floodplain ecosystem is important to support living creature. The lower concentration of nutrient lead to the species decrease which is potential to extinction [4]. The conservation of nutrient in floodplain ecosystem therefore is considered important.

Kalimantan is one of the important tropical islands in the world. There are numerous ecosystems in Kalimantan, ranging from lowland tropical forest to mountain forest. In Kalimantan Island, floodplain is important habitat for numerous rivers creatures. In central Kalimantan, floodplains ecosystem is an important habitat for Ompok hypophthalmus. Ompok hypophthalmus is reported to be restricted to Indonesia, especial Java and Barito River [5]. Economically, these species was considered important.

According to Sulistiyarto, et al 2007 Palangkaraya city has about 40,000 ha floodplain [6]. It is equal to the 16,67 % of city area. Such floodplains are an important habitat for numerous fishes, including Ompok hypophthalmus. The habitat of Ompok hypophthalmus is characterized by water with peat swamp vegetation. The swamp vegetation grows dense as an impact of organic material rich in substrate. Such situation lead to the abundance of zooplankton, fish and insect which area important as Ompok hypophthalmus died. The conservation of peat swamp ecosystems therefore important for sustainability of Ompok hypophthalmus in Palangkaraya city [7]. It is particularly important since the rapid settlement and industrial development in past few decades ago in Palangkaraya.

The availability of prey species in nature is import for the survival of the predator species. Prey species is sources of the energy and proteins for predator. The distribution and abundance of prey species affect the distribution and density pattern on predator. Large area of water ecosystem provides sufficient habitat for numerous living creature in water ecosystems. Therefore, there are opportunities for predator to select diet. The availability of prey species is the key for endemic fish conservation strategy. In Rungan floodplain however, the prey of Ompok hypophthalmus was rarely studied. The aims of the research were identify prey species of Ompok hypophthalmus and its availability Rungan floodplain river in Palangkaraya.

II. Methods

Study site

Kalimantan is important sites for biodiversity conservation. Located in the equator line, the tropical forest of Kalimantan was characterized by Dipterocarpaceae forest. In lowland area, Kalimantan rich in term of mangrove and swamp forest. There are huge and long river found in Kalimantan, namely Mahakam, Berau, Kayan (East Kalimantan), Kapuas, Mempawah, Sambas (West Kalimantan), Barito, Asam-asam, Alalak, Amandit, Barabai (South Kalimantan), Kahayan, Serunyan, Katingan (Central Kalimantan) [8]. The Rungan floodplain located at the Rungan River flow in Palangkaraya, Central Kalimantan is crucial habitat for biodiversity.

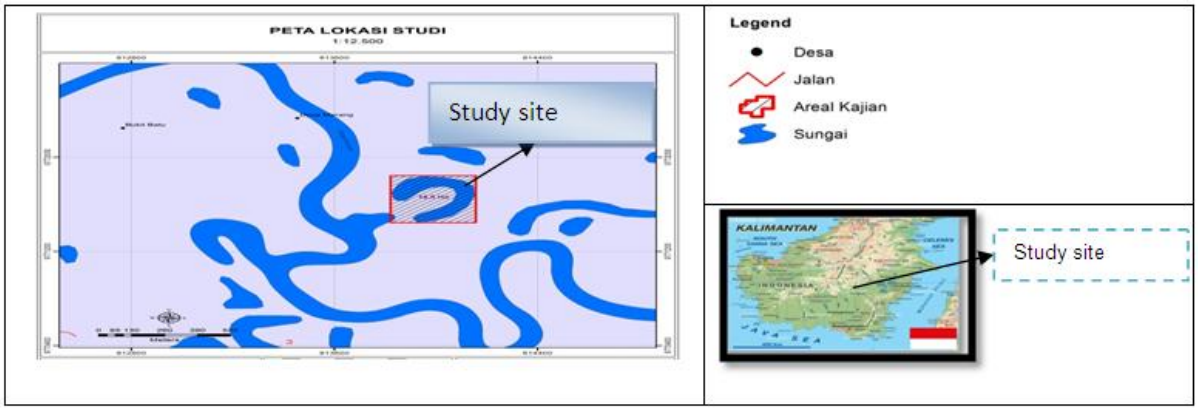

Fig. 1. The location of Rungan floodplain in Kalimantan Island.

Methods

The collection of O. hypophthalmus from floodplain ecosystem were done in two season, namely dry season and rainy season. The dry season collection was done during October to November 2013 when water level decrease while the rainy season was done in December 2013 to January 2014 when water level increase. In the same time of O. hypophthalmus collection from field, an analysis of benthos availability in water ecosystems were performed.

A total of 183 stomachs of O. hypophthalmus were collected and analyzed systematically. In the field O. hypophthalmus was collected using net. Only the mature individual was collected for the reason of the study. The stomach of each sample was separated from fish body and stored in refrigerator for further analysis. Prey species was identified and the percentage was calculated.

The prey species composition in fish's stomach was calculated following Natarajan and Jhinggran (1961) [9]:

$$Ii = \frac{Vi \times Oi}{\Sigma Vi \times Oi} \times 100$$

With		
Vi	=	Percentage of particular fish's food in stomach
Oi	=	Frequency percentage of particular fish's food in stomach
ΣVixOi	=	Number of Vi x Oi from all kind of fish's food components found stomach
Ii	=	Index of Preponderance

The benthos analysis was done to examine prey species stock in floodplain. The benthos collection was done at three point sampling, encompasses estuary, centre and upper end of Rungan River. The sample collection was done at October 2013 to January 2014. The benthos was collected using Ekman Grab ecological instrument. Samples were sifted by 0.5 mm diameter of sieve hole to isolates benthos. Collected benthos was

transferred into bottle with formalin 10 %. In laboratory, specimen were examined using standard book by Day (1967), Beesley et al (2000), Kent and Niem (1998), and Pennak (1978).

The water parameters were analyzed encompasses water temperature (C^o), water body depth (m), water pH, Dissolve oxygen (mg/l) and water transparency (cm). The observation of such parameters was used ecological standard methods. Filed data was analyzed descriptively.

III. Result and Discussion

A. Prey species composition

The sample of O. hypophthalmus has 19,1 cm in length. The average weight was about 43,7 gram. This body size of mature O. hypophthalmus found in Rungan floodplaind was similar with other location. The most common prey were shrimp, insect, juvenile fish, and unidentified prey. The prey species compositions were varies monthly. In October 2013, prey species was dominated by shrimp (61%). In November, the prey were fish juvenile (44%). Insect was dominant in the stomach of O. hypophthalmus which was collected during December (54%). In January, fish juvenile was found dominant in the stomach of O. hypophthalmus (60%). Fig. 2.

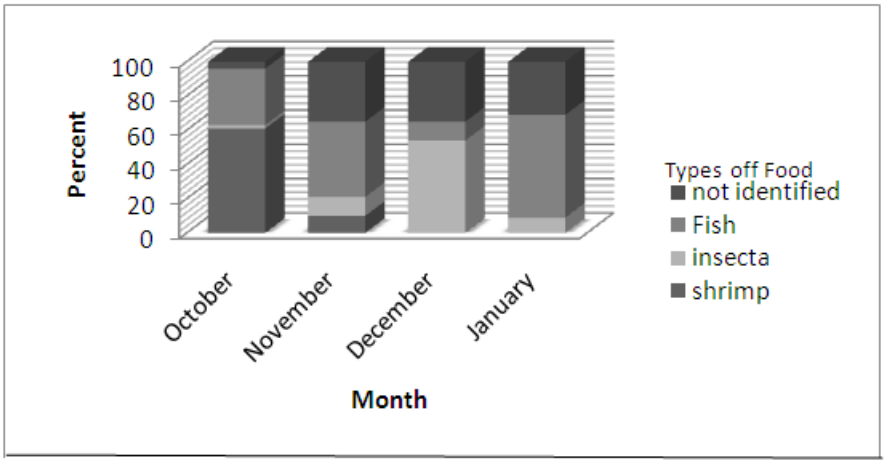

Fig. 2. Prey species composition of O. hypophthalmus .

Prey species availability and season seems to be important factor for O. hypophthalmus diet. Changes of the died composition of O. hypophthalmus is one of the reflection of species adaptation to environmental changes. In flood play ecosystem, it is common as carnivorous fish adaptation to environmental conditions. Changes can be causes by season fluctuation, pollution, nutrient in water environment, and prey availability.

Based on preponderance index, there are different percentages of diet composition at each month periods measurement. In October, shrimps were abundance (61%). It was followed by juvenile fish (33%), adult insect (2%), and unidentified died 4%. In November, died composition which was found in stomach dominated by fish was fish (44%), adult insect (11%), shrimp (10%) and identified food (30%). In December, died was dominated by adult insect (54%) and followed by fish (11%) and unidentified food (35%). In January, the dominant food was fish (60%), adult insect (9%) and unidentified food (31%) (Fig2).

O. hypophthalmus is one of the carnivorous fish in floodplain ecosystem [10]. The stomach samples from O. hypophthalmus which are collected during rainy season shows that water insect is abundance. In dry season, however, number of water insect was low. During rainy season where water level increase, O. hypophthalmus move to the river stream where water insect is abundance. O. hypophthalmus is one of the important carnivorous fishes in floodplain ecosystem [11]. Diet of O. hypophthalmus encompasses adult insect which often live and uses plant as its habitat. Adult O. hypophthalmus are fall into water because insect habitat disturbance [12]. Fish often changes their food habit following prey availability and season.

B. Died availability

The highest density of benthos was found in December (12.130 ind/m^2). It was consist of Naididae (annelids), Trichoptera and Diptera (insect), and Rhabdolaimus sp and Nygolamus sp. (Nemathods). The lowest density of benthos was found in October (2.708 ind/m^2). In such month, the benthos encompasses Diptera (insect) and Rhabdolaimus sp. (Nematodes). Benthos density in November was 4.619 ind./m^2 while in January was 169 ind/m^2. In such month, the main benthos which was found encompasses Diptera (insect), Naididae (annelids) and Rhabdolaimus sp (Nematodes) (Fig. 3).

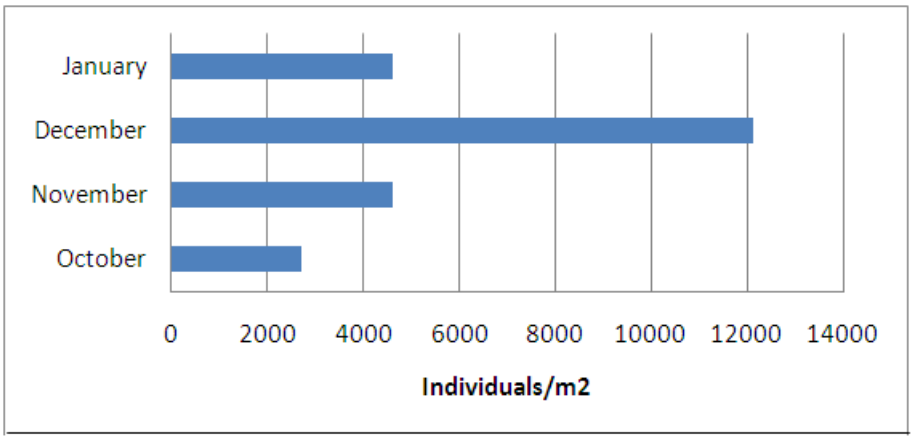

Fig 3. Density of benthos organism at Rungan flood plants

A survey by Minggawati (2010), found that in Dapur Lake in Palangkaraya city, the benthos was dominated by insects, especially Diptera, Coleoptera, and Trichoptera [11]. Insect (Diptera) was dominant benthos taxon found in Danau Takapan dan Danau Tehang, Palangka Raya city [13]. In Tundai Lake in Palangkaraya City, Insect was dominant benthos. In Rungan river floodplains, the diversity benthos was drawn in Fig. 4.

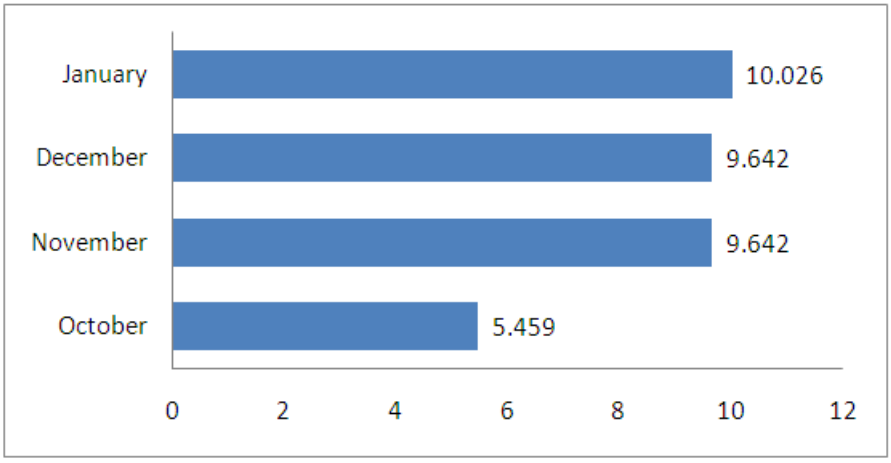

Fig. 4. Shannon index diversity of benthos during observation periodes.

Data related to water quality in Rungan floodplains was given in table 1. The fluctuation of water dept was varies following seasons in a years. The lower water deep found in Octobers related to the decrease of rain in Kalimantan. The pH, DO and temperature, however, seems to be constant. The constant abiotic factor is crucial for the survival of the floodplain creatures. Drought of the floodplain and other terrestrial and aquatic habitat is one of the serious problems. During October, species diversity was decrease significantly. It is seems related to the decrease of water depth and increase of temperature.

Table 1. Water quality at Rungan floodplain according to month observation

parameters	October	November	December	January
Water depth (m)	1.87 (±0.87)	5.28 (±1.84)	6.48 (±2.33)	4.03 (±1.06)
pH	3.65 (±0.50)	3.90 (±0.58)	3.90 (±0.58)	5.00 (±0)
DO (mg/l)	3.23 (±0.05)	3.35 (±0.10)	3.40 (±0.12)	3.45 (±0.06)
Temperature (^{0}C)	28.75 (±0.87)	27.00 (±0.05)	26.75 (±0.50)	26.00 (±0)
transparency (cm)	32.50 (±2.89)	27.50 (±2.89)	26.25 (±0.50)	25.00(±0)

From Table 1. The lowest water depth was faun at October, while the highest water depth occurs in December. The highest water level in December caused by rainy season. In Kalimantan, the rain rate in December can reach 300-400 mm [14]. The rainy season is important season for Kalimantan's biodiversity to grows and developed, including O. hypophthalmus. The high level of water during rainy season allows opportunities for numerous insect to grow. It is become the significant for O. hypophthalmus.

IV. Conclusion

The prey of O. hypophthalmus mainly consist of shrimp, insect, juvenile fish. The main diet of O. hypophthalmus in October is shrimp (61%) while in November is juvenile fish (44%). The main diet of O. hypophthalmus in December is insect (54%), while in January the main died is juvenile fish (60%). Prey availability and season seems contribute to the difference composisition of the died of O. hypophthalmus.

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