

Abundance, Anatomy, and Sex Identification Brackish Lesser Thrush Eel (*Moringua microchir*) “Puyoy” in Pres. Roxas, Capiz

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Abstract — “Puyoy” or Lesser Thrush Eel (*Moringua microchir*) is a brackish eel, a delicacy in Pontevedra and Presidents Roxas in the Province of Capiz. This study was conducted to find out the anatomy, physiology, abundance and population size of “Puyoy” in Pres, Roxas, Capiz. This was conducted at four sampling sites in four barangays. A 1000m line transect and a 5x5 quadrat were used to gather data from the field in each sampling area. “Karit” was used to catch “Puyoy” as a sample specimen and was dissected to identify its anatomy and physiology. The researchers used formulas of species richness and abundance by Curtis & McIntosh (1950) to determine its abundance. Findings revealed that Ppuyoy” has an elongated, smooth, slimy and cylindrical body. Two long teeth at the upper and lower front jaw and the rest were small. The eyes are above the upper jaw. Pectoral fins were small fan-like structure and no dorsal fins and scales. Male “Puyoy” is color red and black with a length of 26-30cm and 1.5 cm in circumference. Anus from gills is 16-17cm and its tail is fan-like and the heart is red. The female is white and grayish with a length of 20-23 cm and 1.5 cm.in circumference. Anus from the gills is 10-11cm or mid-length with a pointed tail and the heart is white. Eggs were also observed during dissection. “Puyoy” spend most of their adult lives in a brackish environment. In the day, they hide in muddy surfaces and go to the ocean for forage at night. They take almost any available food, such as, benthic invertebrates like “agihis” (small bulbs). “Puyoy” were abundant in Brgy. Mandulano compares to the other three barangays.

Keywords — *Brackish eel, Anatomy, Physiology, Abundance, Dissection, Puyoy and Agihis*

I. Introduction

Eels are one of the most delicate and difficult-to-catch species in the Philippines' freshwater and brackish water. It is for this reason why eel is so pricey on the market. "Puyoy" is a brackish water eel that is a favorite delicacy in the Pres. Capiz province includes the towns of Roxas, Pilar, Pontevedra, and Panay. The fish may be found in wetlands with saltwater and all salinities in between, such as in Pres, Roxas, Capiz's Barangay Sangkal, Mandulaw, Quiajo, and Marita. It is generally obtained from brackish muddy mangrove forests along rivers that go into the sea. The fish is frequently characterized as being long, small, bony, and slimy. According to Mang Toto, one of the "manugpuyoy" (eel catchers), the fish may be captured with a "karit", taba, and tayab. The presence of "agihis" is one of the identifying markers indicating the fish is present in the

region. "Puyoy na da pag maraming agihis," they remarked. "Puyoy" favors animal-based meals such as mollusks, which may explain why it is found in areas where "agihis" is prevalent. Aling Nene, a well-known Puyoy vendor, claims to have been selling "Puyoy" since 1990. She went on to say that during the same year, "Puyoy" was abundant in the region and she could sell 10 kilograms each day. She can only sell 2-3 kilograms each day currently for unclear reasons. The "Puyoy" population is rapidly dwindling owing to exploitation, and the fish is entirely dependent on natural reproduction. Furthermore, no culture system for this fish has been built in the municipality. They are more concerned with the various techniques of preparing and marketing the fish. There are several brackish eel species, including the brackish moray eel, snowflakes brackish eel, and Indian mud brackish eel. This study's findings provide baseline data on the morphology, sex determinant, and diversity of the brackish eel "Puyoy."

Literature Review

Cao is correct. Q. et al (2018) . Eel larval output has declined dramatically in recent years owing to spawning stock losses, overfishing, growth habitat destruction and access limits, and pollution. As a result, it is very critical and urgent for the artificial manufacture of glass eels. However, the technology of artificial hatching and raising larvae is still in its early stages, and it has long been seen to be an extraordinarily difficult undertaking. One of the major gaps is an artificial environment that is far from natural for developing their osmoregulation abilities. Thus, understanding their osmoregulatory mechanisms will help to improve the breed and adapt to the changes in the environment. In this paper, we give a general review of study progress of osmoregulatory mechanisms in eels from five aspects including tissues and organs, ion transporters, hormones, proteins, and high throughput sequencing methods.

P. Vachel Gay et al. In order to assess the poorly understood state of freshwater fish assemblages, three stream sections (upstream, midstream, and downstream) of the Tayabas River in the Philippines were examined during the wet and dry seasons of 2010. A total of 1,070 individuals from 15 species, 13 genera, and 8 families were gathered for the research. Poeciliids (61.85%), gobiids (26.16%), and cichlids (5.51%) were the three categories with the greatest abundance. The diversity indices of Shannon-Weiner varied from 1.270 to 2.171. Low Simpson's dominance values (0.142-0.322) and relatively high Shannon evenness indices (0.653-0.846) were determined, indicating a very equitable distribution of niche space for dominant and non-dominant species. The most diversified fish assemblage recorded in the upstream saw a significant shift in the longitudinal gradient ($p < 0.05$). Native fish species (ten species) and stream gobiids (six species) make up the majority of the species richness. However, the downstream had the largest cumulative abundance, with a higher percentage of imported species. Additionally, compared to the dry season, the rainy season contained significantly more fish species and individuals ($p < 0.05$). Multivariate analyses were used to assess the significant spatiotemporal variations in the fish assemblage data ($p < 0.05$). Canonical correspondence analysis determined the most important environmental factors influencing fish assemblage structure to be depth (seasonal variations in

water level), plant growth, and dissolved oxygen concentrations. Additionally, anthropogenically caused habitat modification and climate stress (prolonged drought) may have a detrimental impact on the health of freshwater fish in the river. The report recommends comprehensive management plans for the river to save local fish species.

II. Methodology

The descriptive survey approach was employed in this investigation. In the Municipality of Pres, it took place in the wetlands of Barangay Sangkal, Mandulano, Quiajo, and Marita. Capiz, Roxas. is a municipality of fourth class in the province of Capiz, home to 19,676 inhabitants. Its 22 barangays cover 77.88 km² in total. Karit, net, bucket, pencil, camera, magnifying glass, dissecting equipment, and electronic microscope are among the supplies utilized in the study. Before the actual fieldwork got underway, a preliminary survey was done. The crew also conducts interviews with local "Puyoy" catchers to determine the locations. This enables the team members to become used to the region. Following input on the knowledge and preferences of the team members, tasks and responsibilities were suitably distributed. Additionally, field testing of the equipment was done. The municipal mayor and the barangay captains of Sankal, Mandulano, Quiajo, and Marita granted permission. In order to record and study the morphology and sex characteristics of seemingly frequent resident species, voucher specimens were gathered. Species were gathered utilizing fishing methods locals used to get brackish fish in the region. A "karit" was used to catch brackish eel. Four (4) sampling stations were established, one from each barangay. A line transects and a 5 x 5 quadrat was used. A 1000m line transect was laid down in each sampling station. In every line transect, five 5 quadrats (5 x 5m) were laid down with 200 meters distance from each other. Species collected were brought to the laboratory for observation of their color, measuring length, and circumference as part of sex determinants. Dissection was done to observe the different internal organs of the fish. The mouth was opened for observation of teeth using a portable electronic microscope. A lateral incision along the ventral surface towards the anus of the fish was made to observe the internal organs. Slowly remove internal organs exposing the heart, intestine, liver, and bladder. In measuring the diversity of "Puyoy" found in the 4-sampling site in Pres. Roxas, Capiz, the researcher used the formulas of species richness and abundance as introduced by Curtis & McIntosh (1950).

III. Results and Discussion

Diagnostic Characteristics. The body is smooth, slimy, and elongated, cylindrical from behind the neck and compressed along the tail with no scale. Two long teeth at the upper and lower front jaw and the rest were small. The eyes are above the upper jaw. Pectoral fins were small fan-like structures. No dorsal fins were observed just like any other genus of eel. It consists of 80 triangular shape vertebrae.

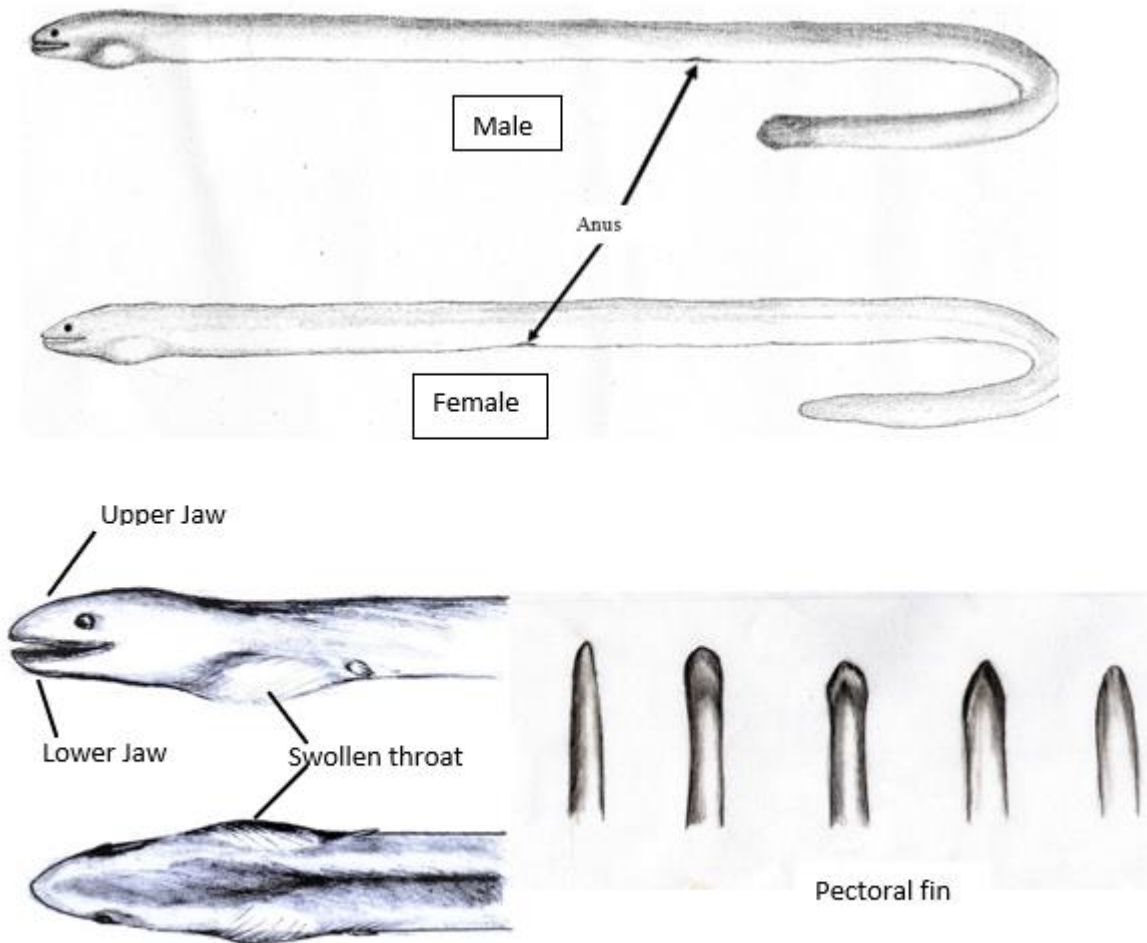


Figure 1. External Anatomy

Anatomy and Sex Determinants of brackish water eel “Puyoy”

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|---------|---|
| Heart | The blood flows from the heart to the gills and to the rest of the body. The heart is located at a little behind and below the gills. |
| Liver | The liver produces the bile. The liver of Puyoy extends from the heart to the bile. |
| Stomach | The stomach is elongated and straight from heart to the anus. No small or large intestine was observed. |
| Bil | Contains waste products of liver activity which pass out of the fish in the feces. |

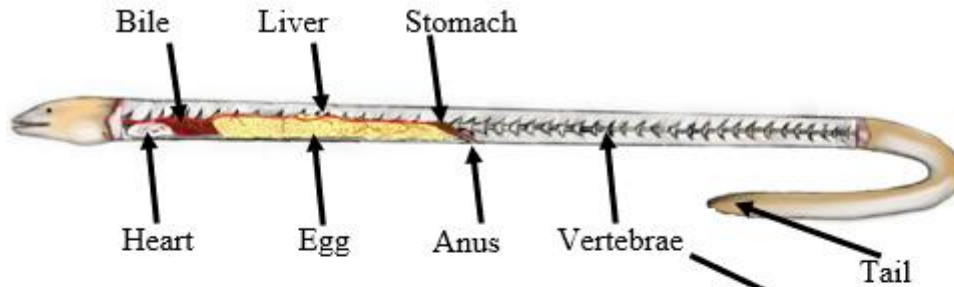


Figure 2. Female External Anatomy



Figure 3. Cross Section of Vertebrate

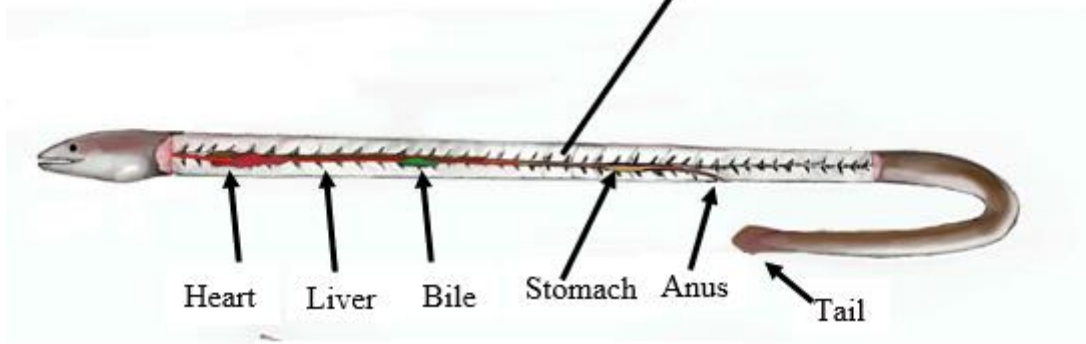


Figure 4. Male External Anatomy

Male: Red and black in color with a length of 26-30cm and a circumference of 1.5 cm. The distance of anus from gills is 16-17cm. The tail of male was fan like shape. The color of the heart is red.

Female. The female was white in color with a length of 20-23cm with a circumference of 1.5 cm. The distance of anus from gills is 10-11cm with a pointed tail. Eggs were also observed during the dissection process. The color of the heart is white.

Habitat, Biology and Fishery. “Puyoy” or brackish water eel spend most of their adult lives in brackish, muddy environment. At day they hide in muddy surface and at night they go to the ocean for forage. They take almost any available food, mainly small, benthic invertebrates like “agihis”.

Population Size, Abundance and Species Richness

A population size of 380 brackish water “puyoy” found in 4 sampling sites. 84 were found in brgy. Sankal, 105 in brgy Mandulano, 94 in brgy. Quiajo and 97 in brgy Marita. Brackish water Eel “Puyoy” has the highest abundance of 21% with a species richness of 105. Brgy. Marita

follows with an abundance of 19.4% and species richness of 97. Brgy. Quiajo has an abundance of 18.8% and a species richness of 94. Brgy. Sankal has the lowest abundance of 16.8% with a species richness of 84. This means that there were more brackish water eel “Puyoy” in the area of Brgy. Mandulano compares to other barangays.

Table 1. Abundance and species richness of “Puyoy” Brackish Water eel

<i>Sample Site</i>	<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Q5</i>	<i>Abundance</i>	<i>Species Richness</i>
<i>Brgy. Sankal</i>	15	17	14	19	19	16.8	84
<i>Brgy. Mandulano</i>	22	19	23	23	18	21	105
<i>Brgy. Quiajo</i>	16	19	21	20	18	18.8	94
<i>Brgy. Marita</i>	21	17	19	21	19	19.4	97

IV. Conclusion

Based on the findings of the study, the following conclusions were drawn: As to its characteristics the brackish water eel “puyoy” has smooth, slimy and elongated body, cylindrical in form behind the neck and compressed along the tail. No scale and dorsal fins were observed. Two long teeth at the upper and lower front jaw and the rest were small. The eyes is above the upper jaw. Pectoral fins were small fan like structure. As to its habitat “Puyoy” or brackish water eel spend most of their adult lives in brackish, muddy environment. At day they hide in muddy surface and at night they go to the ocean for forage. They take almost any available food, mainly small, benthic invertebrates like *agihis*. The male “Puyoy” is Red and black in color with a length of 26-30cm and a circumference of 1.5 cm. The distance of anus from gills is 16-17cm. The tail of male was fan like shape. The color of the heart is red.

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