



# First Record of Snakehead Gudgeon (*Ophiocara porocephala*) in Sorong, West Papua, Indonesia

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## Authors' contributions

This work was carried out in collaboration among all authors. Author ASA conducted the sampling and performed the morphometric test. Author VRM worked as data processor and translator. Author TM worked as research initiator and systemic data processor. All authors read and approved the final manuscript.

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## ABSTRACT

**Aims:** As reported this paper, the new record of *O. porocephala* has helped to improved the knowledge of the species as it extends the distribution range.

**Study Design:** Short Communication.

**Place and Duration of Study:** This research was conducted from September to November 2021.

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Sampling was carried out in the Tampa Garam mangrove forest swamp located in Tampa Garam Village, Maldum Mes Distric, Sorong City.

**Methodology:** The morphology of fishes has been the primary source of information for taxonomic and evolutionary studies. There were numerous characters available for morphological study.

**Results:** *O. porocephala* had a horizontally and terminally wide mouth with a large enough distance from the posterior area of the eye. *O. porocephala* had ideal eye spacing with small eyelids and large corneas, two dorsal fins and an anal fin each with a distance of 1 and 22mm between the dorsal fins, the anterior dorsal consists of spines fins, while the posterior was weak fins. Fish habitat was found in mangrove areas or in estuarine areas with a salinity of 11 ppt, small fish lived in shallow areas while larger fish lived in deeper areas. The brightness of the air when the fish were isolated was 100%. Oxygen levels at 4 mg/l. *O. Porocephala* obtained during the study, consisting of gender is 1 female and unidenified. Meanwhile, the fish size in the class 10,9-225,39 cm and gonad weight is 2,62 of female fish with categorie gonad maturity is 3.

**Conclusion:** Based on the results of research, fish that live in mangrove areas are carnivorous, with large fish species having a total length of 18,4 cm and small fish less than 10 cm, further research needs to be carryout base on the feed habit and maturity of this fish.

**Keywords:** *O. porocephala*; morphometric; freshwater fish; native fish.

## 1. INTRODUCTION

Papua Island is one of the islands that have a very high level of diversity of about 30-50% when compared to other islands in Indonesia. Even when compared to rivers in Asia and Africa, the diversity is still better. A total of 1,674 species of terrestrial vertebrates and freshwater vertebrates are found in Papua and Papua New Guinea and 1,130 are endemic species [1]. In Papua, fish is an important food source [2]. Ironically, the contribution of the fisheries sector in Papua is minimal, for example, fish seekers and fish cultivators have low incomes. The destruction of the ecosystem also has a very serious impact on people's income [3].

Uncontrolled development in Papua such as environmental pollution, overexploitation among others have contributed to the destruction of the habitats of fish. Thus, biodiversity is decreasing and some species are threatened with extinction [4,1]. One of the fish found in Papua is the Gobi fish from the Gobiiformes family. Manel et al. [5], stated that due to the influence of changes or pressures, genetic diversity is estimated to be more easily lost than species diversity. To prevent species loss due to environmental changes, it is therefore necessary to conduct some research on Genetic Diversity [6]. Considering that freshwater fish are crucial in sensing changes and changing environmental pressures [7]. As reported this paper, the new record of *O. porocephala* will help- to improve- the knowledge of the species as it extends the distribution range.

## 2. MATERIALS AND METHODS

### 2.1 Description of the Study Sites

This research was conducted from September to November 2021. Sampling was carried out in the Tampa Garam mangrove forest swamp located in Tampa Garam Village, Maldum Mes Distric, Sorong City. Sampling used a seser, collected samples were documented under the name of the collection,

### 2.2 Fish Identification

The morphology of fishes has been the primary source of information for taxonomic and evolutionary studies. There were numerous characters available for morphological study. These characters were commonly divided into two categories [8]: morphometric characters were to describe the body shape and refer to measure structures such as fin length, head length, eye diameter, or ratios between such measurements. Meristic characters include almost any countable structure occurring in series, including fin rays, scales, and gill rakers. Observations of meristic characteristic based on Weber dan Beaufort (1916).

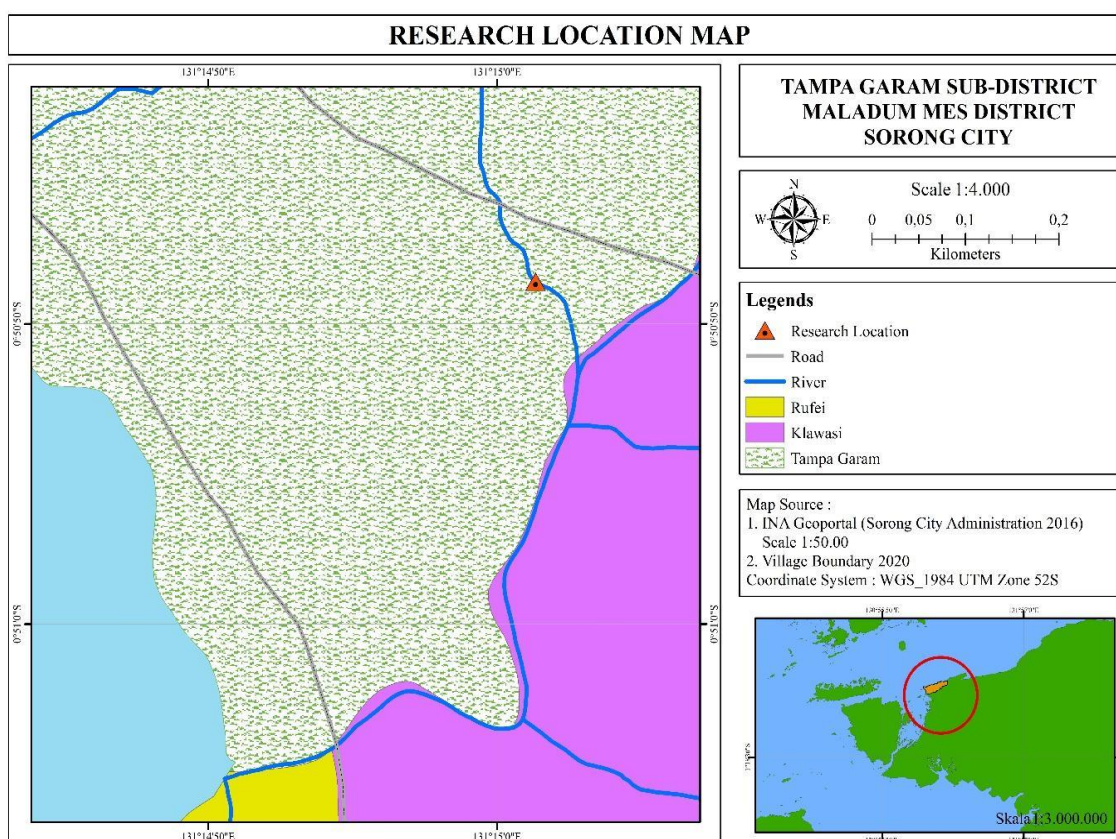
## 3. RESULTS AND DISCUSSION

**Description:** *O. porocephala* had a horizontally and terminally wide mouth with a large enough distance from the posterior area of the eye. it has an ideal eye spacing with small eyelids and large corneas, two dorsal fins and an anal fin each with a distance of 1 and 22 mm

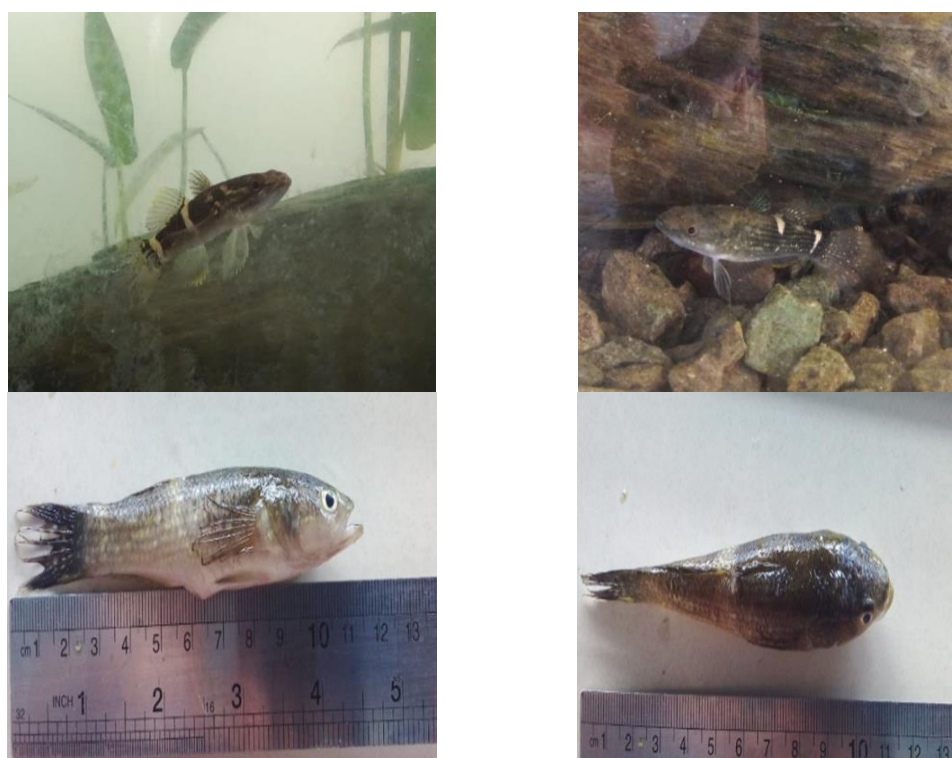
between the dorsal fins, the anterior dorsal consists of spines fins, while the posterior was weak fins. -. The smaller fish has a slight yellow tinge to the anal fin and be bright yellow when they were larger. It had an observed two white rings around the body. Larger fish has wider white rings and fewer white spots just on the underside of the abdomen near the caudal fin. The fish head was shaped like a snake with an average eye distance of 11.5 mm with black patterns and a few white spots, even though when compared to snakehead *Channa striata*, the shape of *O. porocephala* head was still thicker or not thinner. *O. porocephala* has a round caudal fin similar to the general snakehead, but there was white spots and a yellowish tint. A pair of long and strong pectoral fins, made it easier to stay still waiting for prey. The body was elongated, slightly flattened or sagitti form and no barbels were observed. *O. porocephala* female was found to have a weight of 184 grams and length of 225 cm. Gonad maturity was in developmental stage (3rd stage) with gonad maturity index indicated in 1,4%.

**Habitat:** In general, the fish species habitat was found to be in mangrove areas or in estuarine areas with an approximated salinity level of 11 ppt. Small fish species lived in shallow areas while larger fish species lived in deeper areas. The brightness of the air when the fish species were isolated was 100%. Oxygen levels at 4 mg/l, fish like to live under mangrove roots with a bit of a surprise. However, the body shape and foraging analysis of these fish species were classified as a carnivorous fish.

There were two *O. Porocephala* obtained during the study, consisting of gender one as female and unidentified species. Meanwhile, the fish size in the class 10,9-225,39 cm and gonad weight is 2,62 of female fish species with categorie gonad maturity is 3. Carnivorous fish had a terminal mouth shape and have a dense tooth structure from front to back (Nayak et al., 2021). The sex of the small fish has not been detected or the gonad tissue or organs have not yet emerged. The presence of gonads in fish as primary reproductive organs was strongly influenced by body cavity, fish weight, and kidney or liver weight (Muchlisin, 2014).



**Fig. 1. Sample Location *O. porocephala***



**Fig. 2. Specimen of *O. porocephala* caught on October 2021**

**Table 1. Fish Morphometrics Characteristic**

<b>Morphological Characteristic</b>	<b>Code</b>	<b>Ikan 1</b>	<b>Ikan 2</b>
Total Length	TL	109,9	225
Standard Length	SL	91,9	175
Head Length	HL	29,3	58,6
Head Width	HW	18,19	42,88
High Head (HD)		16,02	35,91
Eye Diameter	ED	5,8	9,2
Snout Length	SnL	9,79	18,89
Eye Distance (IW)		10,03	23,35
Posterior Anal Length	PAL	58,25	108,58
Body High (BD)		19,94	49,28
Body Width (BW)		42,02	39,6
Pelvic Length	PvL	14,3	33,45
Caudal Peduncle Depth	CPD	11,9	27
Caudal Peduncle length	CPL	17,18	44
Dorsal Basic Long Fin	DBL	D1 32,94 D2 42,90	D1 18,92 D2 31,20
Dorsal Fin High	DFH	D1 13,37 D2 23,66	D1 25,68 D2 49,85
Pectoral Long Fins	PCL	20,4	36,68
Pectoral Perior Long	PPL	29,75	54,57
Base Anal fin Lenght	ABL	20,4	55,34
Perior Dorsal Long	PDL	D1 137,11 D2 168,15	D1 75,40 D2 106,17
Lenght Upper Caudal	LUCL	12,05	23,54
Long Middle Caudal	LMCL	18,08	57,75
Long Caudal Lower	LCLL	11,96	16

*D1: 1<sup>st</sup> Dorsal fin; D2: 2<sup>nd</sup> Dorsal fin*

**Table 2. Water Quality Parameters**

Parameters	Values
Brightness (%)	100
Salinity (ppt)	11
pH	7
Dissolved Oxygen (mg/L)	4
NH <sub>3</sub> /NH <sub>4</sub> (mg/L)	1
Nitrite (mg/L)	0
Phosphate (mg/L)	2
Nitrate (mg/L)	0

**Table 3. Gonadal Maturity of *O. porocephala***

Sex	Body Weight (gr)	Total Length (cm)	Gonadal Maturity	Weight Gonad	Weight Liver
-	55	10,9			
Female	184	225,39	3	2,62	5,08

Environmental factors play a very important role in the evolution of fish bodies and organ formation, ecological degradation directly affects the behavior and populations of fish in nature (Mylonas *et al.*, 2010). According to Muhtadi et al. [9] *O. porocephala* is included in the carnivore group based on the type of food that has been found in their digestive tract which includes shrimp, crab or shellfish, the highest gonadosomatic index was 0,75% with the first size of first gonad maturity 18,4 cm total length and small fish <10 cm. Base on their size, the *O. porocephala* found in Porong River can be categorized as medium size because adult fish can reach a size of 30 cm [10-14].

#### 4. CONCLUSION

Based on the results of research, fish species that live in mangrove areas are carnivorous, with large fish species having a total length of 18,4 cm and small fish less than 10 cm, further research needs to be done regarding the feeds and feeding habits and maturity of this fish species.

#### DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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