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### SHORT COMMUNICATION

## First Record from the Libyan Coast of *Parophidion vassali* Risso, 1810 (Ophidiiformes: Ophidiidae)

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**Abstract:** This research presents the first recording of a rare species of fish from Libya. A specimen of *Parophidion vassali* approximately 108.1 mm in length was identified using the characteristics of the otoliths. The specimen was recovered from the contents of the stomach of a lizard fish (*Synodus saurus*) collected from the coast of Benghazi, eastern Libya, during November 2021.

#### Anahtar kelimeler:

*Parophidion vassali*  
Libya  
Otolit  
Nadir tür

#### *Parophidion vassali* Risso, 1810 (Ophidiiformes: Ophidiidae)'nin Libya Kıyılarından İlk Kaydı

**Öz:** Bu çalışmada nadir görülen bir balık ilk defa Libya'dan bildirilmiştir. Yaklaşık 108.1 mm uzunluğundaki bir *Parophidion vassali* otolit özelliklerine bakılarak tayin edilmiştir. Bu örnek, Kasım 2021 tarihinde Libya'nın doğusundaki Bingazi kıyılarında yakalanan bir kertenkele balığının (*Synodus saurus*) mide muhteviyatından elde edilmiştir.

### Introduction

Ophidiidae are benthopelagic fish found in all oceans' tropical and subtropical regions. They inhabit soft substrates in shallow seas to depths of over 1,000 m below the surface, there are approximately 200 species found all over the world. (Nielsen *et al.*, 1999; Golani *et al.*, 2006). Subfamily Ophidinae, which includes three species: *Ophidion barbatum* (L. 1758), *Ophidion rochei* (Muller, 1845), and *Parophidion vassali* (Risso, 1810), recorded in the Mediterranean Sea (Capape *et al.*, 2016; Bradai, 2000; Othman *et al.*, 2020).

*Parophidion vassali* is a species that resembles an eel. It can be found in coastal *Posidonia oceanica* meadows and shallow rocky-sandy habitats (Capape *et al.*, 2016; Pergent *et al.*, 2012). However, it is thought to reside in deeper waters up to 600 m (Matallanas and Casadevall, 1990). It is one of the fish that depends on vocal communication, and there is a difference in the sound-producing apparatus between males and females (Eric *et al.*, 2022). It has an elongated body, a brown backside, and a white belly, with pelvic fin rays that extend below the eye and reach the base of the pectoral fin, and fins that lack spines (Nielsen *et al.*, 1999; Capape *et al.*, 2016).

### Material and Methods

On November 13, 2021, one specimen of *P. vassali* was found in the stomach contents of an Atlantic lizardfish (*Synodus saurus*; TL: 23.6 cm, TW: 88.1 g) collected by fishermen from the port of Benghazi city (32° 36' N, 20° 03' E). The head region was dissected, and the right and left otoliths were removed from their capsules, cleaned, dried, and the photographs were captured using a digital camera (Olympus, model NO. C-7070) attached to a dissecting microscope (OPTTECH, model SZ). Only the left otolith was used for measurements and weighed to the nearest 0.0001 g (OW, g) by using a sensitive balance (Ohaus Adventurer SL, model Adventurer Pro AS214). Otolith length (OL, mm), height (OH, mm), and area (OA, mm<sup>2</sup>) were measured to the nearest 0.1 mm using image processing (Digimizer software, version 4). The percentage of otolith length out of the standard length of the fish (OL/SL %) was calculated. Four indices of otolith shape were calculated as follows: ellipticity, roundness, aspect ratio, and rectangularity (Tuest *et al.*, 2008). The equation  $O_R = 1000 * OA * SL^{-2}$  was used to determine the relative size of otoliths, according to Lombarte and Cruz (2007).

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**Figure 1.** Sample of *Parophidion vassali* (Risso, 1810) with otolith

## Results and Discussion

There are many traditional methods used to identify and separate fish species, including external body characteristics such as body shape, scale indicators, and color patterns (Strauss & Bond, 1990). Gills: number of gills and length of the arc (Azab *et al.*, 2019). In addition to vertebrae; size, shape, and orientation of the dorsal and ventral zygapophysis, etc., show very large differences between species (Granadero and Silva, 2000). In this study, we relied on otoliths, or ear stones, which are calcareous structures in the inner ear of fish that aid in hearing and balance. These structures are widely used in species differentiation (Wakefield *et al.*, 2014) and are most commonly used to identify prey, determine their size, and obtain data on paleodiversity (Pierce and Boyle, 1991; Nolf, 1985). There are several identification keys for otoliths that can be used to separate species (Reichenbacher *et al.*, 2017; Tuest *et al.*, 2008; Smale *et al.*, 1995; Nolf, 1985), and the Analysis of Fish Otolith Shape (AFORO) website also provides an open catalog of otolith images and allows species identification from otolith images (Lombarte *et al.*, 2006).

In this research, as a result of the sample being affected by digestive materials, the otolith was relied upon to confirm the classification of this species. The standard length of the sample is about 108.1 mm. The *P.vassali* otolith is oval in shape and thickness, 3.210 mm in length, 2.317 mm in height, and 5.430 mm<sup>2</sup> in area (Table 1). The sulcus was shallow and heterosulcoid. The ostium is oval and large compared to the shorter cauda. According to the value of the relative size of the otolith, 0.464, it is classified as medium-sized. The ratio of otolith length to standard length is about 2.96%. Schwarzhans and Aguilera (2016) showed that there is a high degree of similarity in otoliths between *P. vassali* and *P. schmidtii* in several aspects,

including the thick oval shape of the otoliths and the long, shallow sulcus. With the difference that the sulcus in *P. vassali* is slightly wider. Four indicators of shape were calculated, as shown in the table. The highest values for Roundness > Aspect ratio > Rectangularity > Ellipticity; were 71.288, 1.3854, 0.7302, and 0.1615, respectively.

**Table 1.** Otolith parameter and shape index of *Parophidion vassali*.

Measurements	Left
Otolith Length, OL	3.210 mm
Otolith Height, OH	2.317 mm
Otolith Area	5.430 mm <sup>2</sup>
Otolith Weight	0.0179 g
OL/SL%	2.96%
Otolith relative size	0.464
Ellipticity	0.16157
Roundness	71.28862
Aspect Ratio	1.385412
Rectangularity	0.730212

*P. vassali* is an uncommon endemic fish in the Mediterranean Sea. It was initially described by the French scientist Antoine Risso in 1810. It was first recorded in Lebanese waters through a single specimen found in the stomach of *Scorpeana scorpa* (Mouneimné, 1977). In addition, it was recorded in several other locations in the Mediterranean Sea, including Tunisian waters (Capape *et al.*, 2016), Portugal (CARNEIRO *et al.*, 2020), and the Adriatic Sea, which represents the northern arm of the

Mediterranean Sea (Lipej and Dulcic, 2010). Based on the latest updated list of bony fish species recorded from Libya (Elbaraasi *et al.*, 2009), this is the first record of *Parophidion vassali* in Libyan waters.

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## Conflict of Interest

The authors declare no conflict of interest

## Author Contributions

Eman Alfergani contributed to sample collection and measurements; all authors contributed to manuscript writing and language review.

## Ethics Approval

This research did not need ethical approval.

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