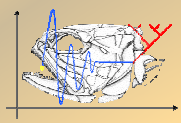
Sound production and sexual dimorphism in sonic apparatus of *Ophidion rochei* (Teleostei, Ophidiiformes)



Kéver L. [1] **& Parmentier E.** [1]

[1]Laboratory of Evolutional and Functional Morphology of the University of Liege (Belgium),
Corresponding author: Loic.Kever@ulg.ac.be

Introduction

Ophidiiformes display a high diversity and complexity of sound producing mechanism. In addition, the sonic appartus often shows an important sexual dimorphism. The influence of these differences on the characteristics of the call still unknown. The habitat of *Ophidion rochei* is limited to shallow water (0 to 200m) of the Mediterranean and the Black Sea. In this study, females were recorded for the first time, allowing a first comparison with the sounds and mechanism of the males.

Material and methods

I) Males and females were carrefully dissected under a binocular microscope coupled to a camera lucida to compare their sonic apparatus. II) Sounds were recorded in the Adriatic Sea (May and July 2010 in Split, Croatia) using an hydrophone (DSG, Loggerhead), and following features of the sounds were measured: call duration, number of pulses and pulse period.

Results and discussion

I) Sonic apparatus

In both sex, anterior vertebrae and ribs are higly modified for sound production. As an example, the neural spine of the first vertebra (NR, Fig. 1) is free to move anteroposterioly on the vertebral body.

These structures show a sexual dimorphism: a) swimbladder plate and neural rocker are broader in males, b) first ribs are broader in females and c) the rocker bone is absent in females.

Figure 1: Lateral view of the skull, the first vertebrae and the first epineural ribs of an *O. rochei* male (*right*) and female (*left*). NR: neural rocker, 1st ER: 1st epineural rib, SP: swimbladder plate and RB: rocker bone.

All the specimens (males and females) dissected exhibit three pairs of sonic muscles but they show also a sexual dimorphism: a) Dorsal muscle is more developped in males whereas ventral and intermediate muscles are bigger in females. b) Ventral muscle insert on the rocker bone in males and directly on the swimbladder in females.

Figure 2: Lateral view of the skull, the first vertebrae, the first epineural ribs and the sonic muscles of an *O. rochei* male (*right*) and female (*left*). DM: dorsal sonic muscle, IM: intermediate sonic muscle, VM: ventral sonic muscle and RB: rocker bone.

II) Sound recordings

According to the sex , the sounds of *O. rochei* are completly different (Fig. 3 and 4).

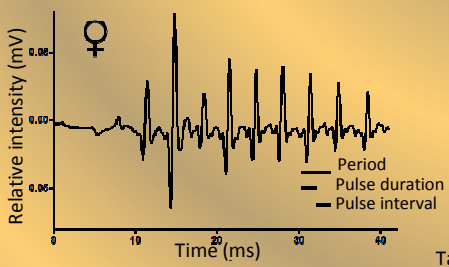


Figure 3: Typical sound of *O. rochei* females

Females	Mean	Males
60 ± 50 (n=21)	Call duration (ms)	4500 ± 1500 (n=21)
8 (n=21)	Pulse number	38 (n=21)
6 ± 0,5 (n=165)	Pulse period (ms)	126 ± 36 (n=775)

Table 1: Comparison of sounds produced by *O. rochei* males and females

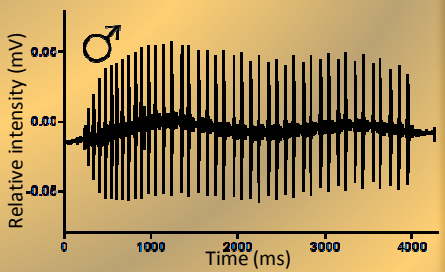


Figure 4: Typical sound of *O. rochei* males

Conclusions & Perspectives

This work clearly highlights the fact that the sexual dimorphism of the sonic apparatus involves the production of completely different kind of sounds.

Deeper investigations on sonic muscle physiology and fish ethology are required to understand this complex system communication.