

Fin flickering and associated sounds in the cichlid fish *Ophthalmotilapia ventralis*: a preliminary study.

Loïc Kéver^{1,2,*}, Pascal Poncin¹ and Eric Parmentier²

¹ Behavioral biology unit: ethology and animal psychology, University of Liège, Quai van Beneden 22, B-4020 Liège, Belgium.

² Laboratory of functional and evolutionary morphology, University of Liège, Institut de Chimie bat B6c, B-4020 Liège, Belgium.

* Corresponding author: loic.kever@ulg.ac.be



Introduction

Fin flickering is defined as rapid movements of the fins. They are considered as comfort movements (e.g. removal of minor irritations) or alarm signals.

Ophthalmotilapia ventralis (Figs 1 and 2A) is a maternal mouth-brooding cichlid endemic to the lake Tanganyika (East Africa). Despite many cichlids are sound producers, acoustic behaviors were never reported in this tribe (i.e. Ectodini).

The **aim** of this preliminary study was to record and describe the potential sound(s) and sound production mechanism(s) in *O. ventralis*.



Figure 1: male *Ophthalmotilapia ventralis*
(Picture courtesy of Siegfried Loose)

Material and methods

We studied visual and acoustical behavior of five *O. ventralis* (two males and three females) reared in a 240 l tank. Sounds were recorded using a hydrophone connected to a calibrated Brüel and Kjær 2610 amplifier and synchronized with a high speed camera recording at 500 frames per second.

The pectoral girdle and fins of one specimen were stained with Alizarin red in order to visualize mineralized structures.

Results and discussion

Sounds (peak frequency and pulse duration: 562 ± 95 Hz and 14 ± 5 ms, respectively) can be emitted during caudo-rostral horizontal fin sweeps (Fig 2B) in fish that established a territory.

The proximal process of the first pectoral fin ray is articulated with the coracoid while the other rays are articulated with radials (Fig. 2C). This articulation deserves further investigations because vibrations produced in that area would be efficiently transmitted through the pectoral girdle to the swimbladder.

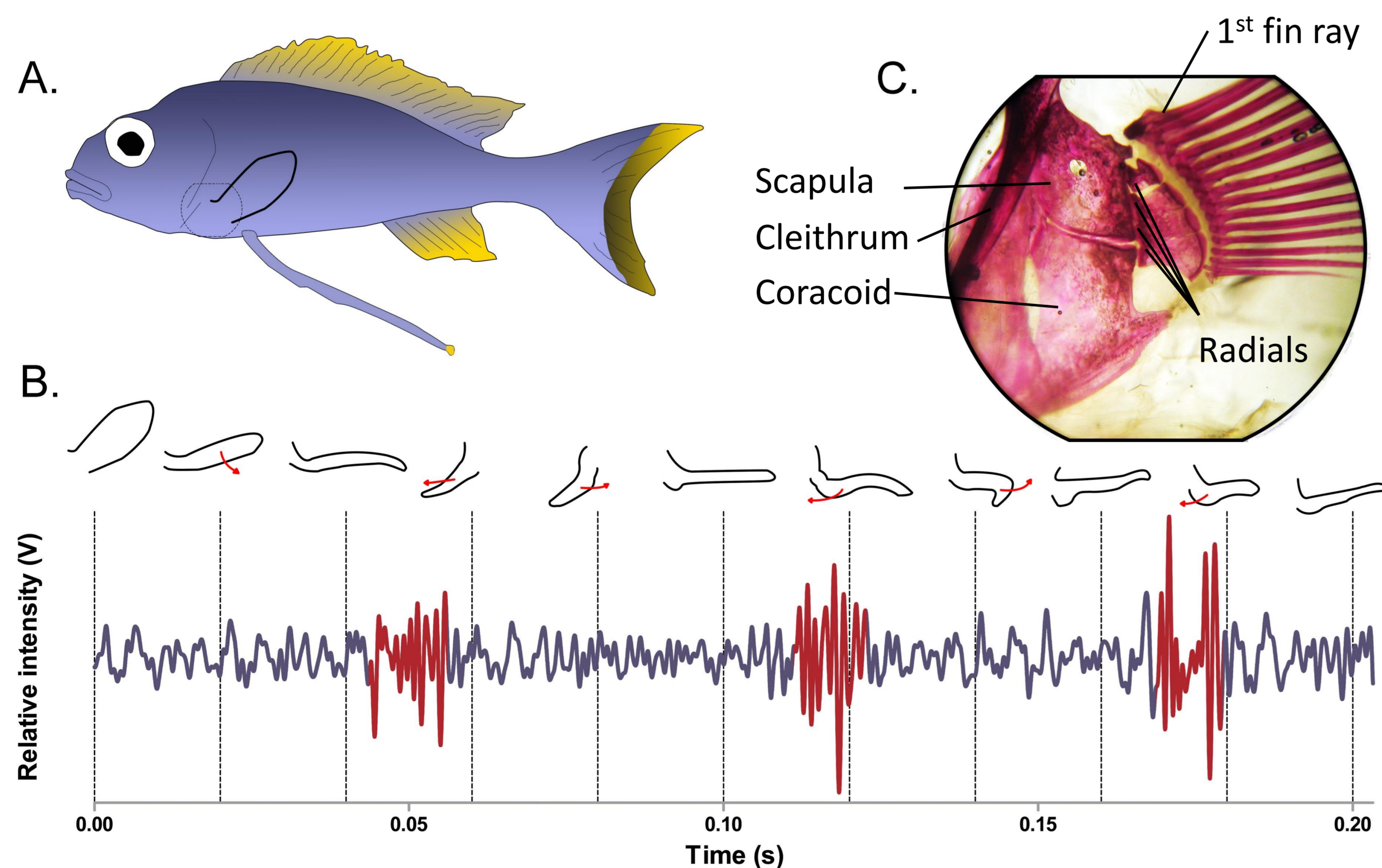


Figure 2: Pectoral fin flickering and sound production in *Ophthalmotilapia ventralis*.

A. Schematic representation of a male *O. ventralis* in a left lateral view.

Left pectoral fin is shown in the resting position.

B. Correlation between pectoral fin movements and sound production.

Left lateral view of the pectoral fin position (20 ms interval) reported from a fin flickering movie (top) and the waveform of three associated pectoral fin sounds (sounds are highlighted in red).

C. Junction between the pectoral girdle and left pectoral fin.

Perspectives

In-depth studies are required to better characterize the movements and understand which morphological traits are responsible for the sound production. Further investigations are also needed to determine if fin flickering has a role in *O. ventralis* social interactions.