

## INTRODUCTION

The study of personality in animals has shown a growing interest in the last decade. The determination of personality is carried out through the concept of repeatability and, in the case of fish, when talking about personality, two clearly marked traits are attributed: proactive subjects who are those who create new routes and are in a constant state of exploration of the environment; and reactive fish that are more passive and do not face exploration and fighting episodes. The study of chronotypes in fish is of interest not only in terms of knowledge of their biological rhythmicity in their own environment, but also in terms of their fishing exploitation and how certain species have adapted to the fishermen's schedule.

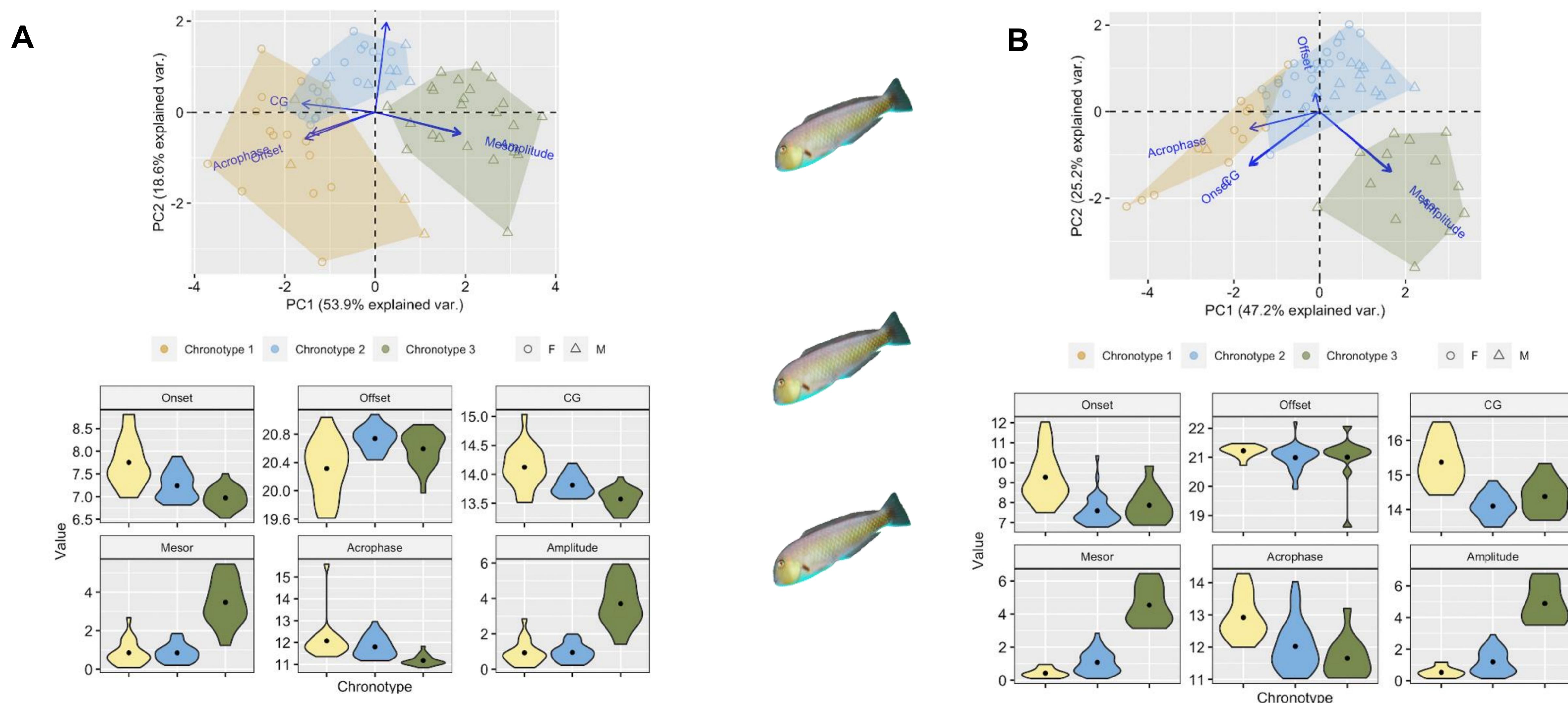
The objectives of the present study have been: 1) Define chronotypes with respect to motor activity in fish in a natural environment, and 2) Identify variations in chronotypes with respect to sex and physiological state.

## METHODS

Among the patterns that define personality, the chronotype stands out, and, therefore, an attempt was made to define different chronotypes in 68 specimens ( $\delta = 34$ ) of the marine wild fish *Xyrichthys novacula* (pearly razorfish), a species of high commercial value in the western Mediterranean. Parametric values (onset, offset, and center of gravity) were determined, as well as the main circadian parameters of motor activity (mesor, acrophase and amplitude) recorded in this species in the marine reserve of the bay of Palma (Mallorca, Spain), during the pre-reproductive (May) and reproductive period (July). To monitor the locomotor activity of the fish, the high-resolution tracking system JSATS was used.

Statistical analysis was performed using RStudio, with a general linear model for the relationship between variables, and principal component analysis and hierarchical cluster analysis were used to classify the different chronotypes.

## RESULTS



Classification of chronotypes in the pre-reproductive period (A) and in the reproductive period (B). Males are represented by triangles and females by circles. The different chronotypes are represented in colours: yellow, delayed chronotype; green, advanced chronotype; and blue colour represents the indefinite chronotype.

## CONCLUSIONS

- 1.- The subjects of *Xyrichthys novacula* in the natural environment present three different chronotypes differentiated according to the start time of their activity: advanced, indefinite and delayed.
- 2.- Considering all the specimens together, significant differences are obtained between the pre-reproductive and reproductive periods with a general tendency to delay the motor activity both in the acrophase, the Onset, the Offset and the Center of Gravity.
- 3.- In attention of sex, males show a slight advance in activity rate compared to females, both in the reproductive and pre-reproductive periods.
- 4.- The activity, understood as displacement, of males is representatively higher than that of females, regardless of the period studied.

## REFERENCES

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