

# STUDY OF THE SOMATOTROPIC HORMONES EXPRESSION DURING THE EARLY DEVELOPMENT OF THICK LIPPED GREY MULLET (*Chelon labrosus*)

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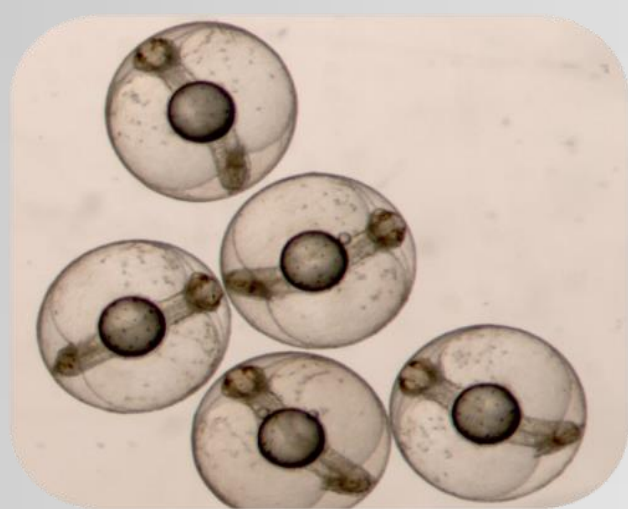
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## 1. Introduction

- Mullets are considered interesting species for sustainable aquaculture due to their herbivorous/omnivorous feeding habits. Among all the mullets found in the Iberian Peninsula, *Chelon labrosus* is of higher commercial interest due to its faster growth rate. Besides, on the contrary to most of the mullets in which the aquaculture depends on the natural environment, the production cycle of this species has been closed in captivity either by induced or natural spawning.
- Hatched larvae go through a series of molecular, biochemical and morphological changes during growth and development to juveniles. Thus, some of the processes involved in larval development are subjected to endocrine control, including the growth hormone (GH) and insulin-like growth factor I (IGF-I) pathways.
- With the purpose of deepening the knowledge of the possible factors involved in the early development in this species, early expression patterns of the *gh* and *igf1* genes were studied during the first 92 days post hatch (dph).

## 2. Material and methods



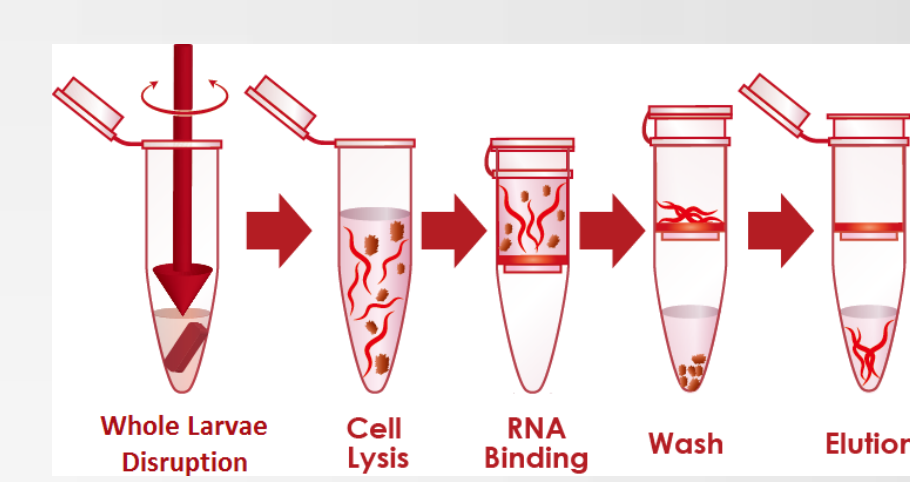
Fertilized eggs were obtained from natural spawning in captivity



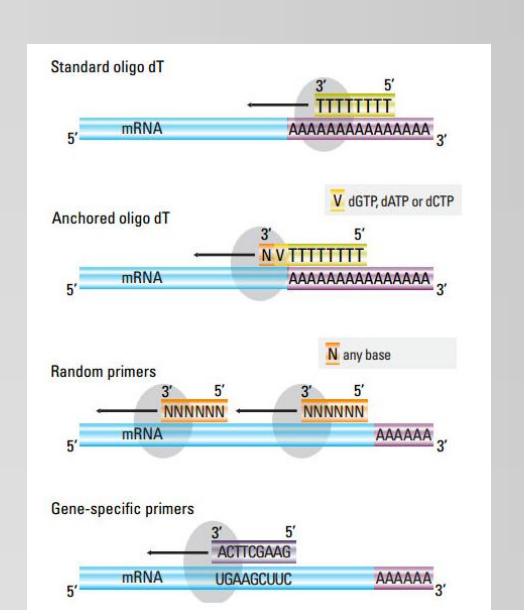
Larvae were cultured under optimal conditions

Sampling points (dph)	Ontogeny events
3	Before mouth opening
4	Mouth opening
9	
21	Slow growth period
28	
36	
43	Fast growth period
50	
57	
63	
71	
78	Slow growth period
83	
92	

14 Sampling points were chosen according to major ontogeny events



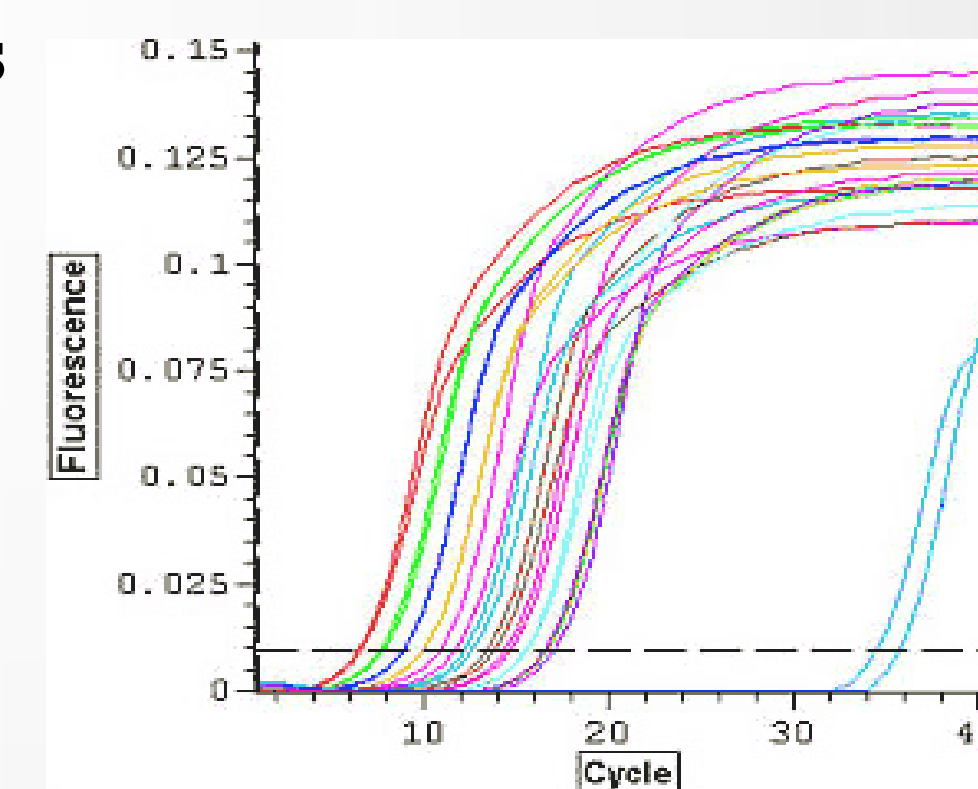
Total RNA extraction from whole individual larva



cDNA synthesis



Real time PCR

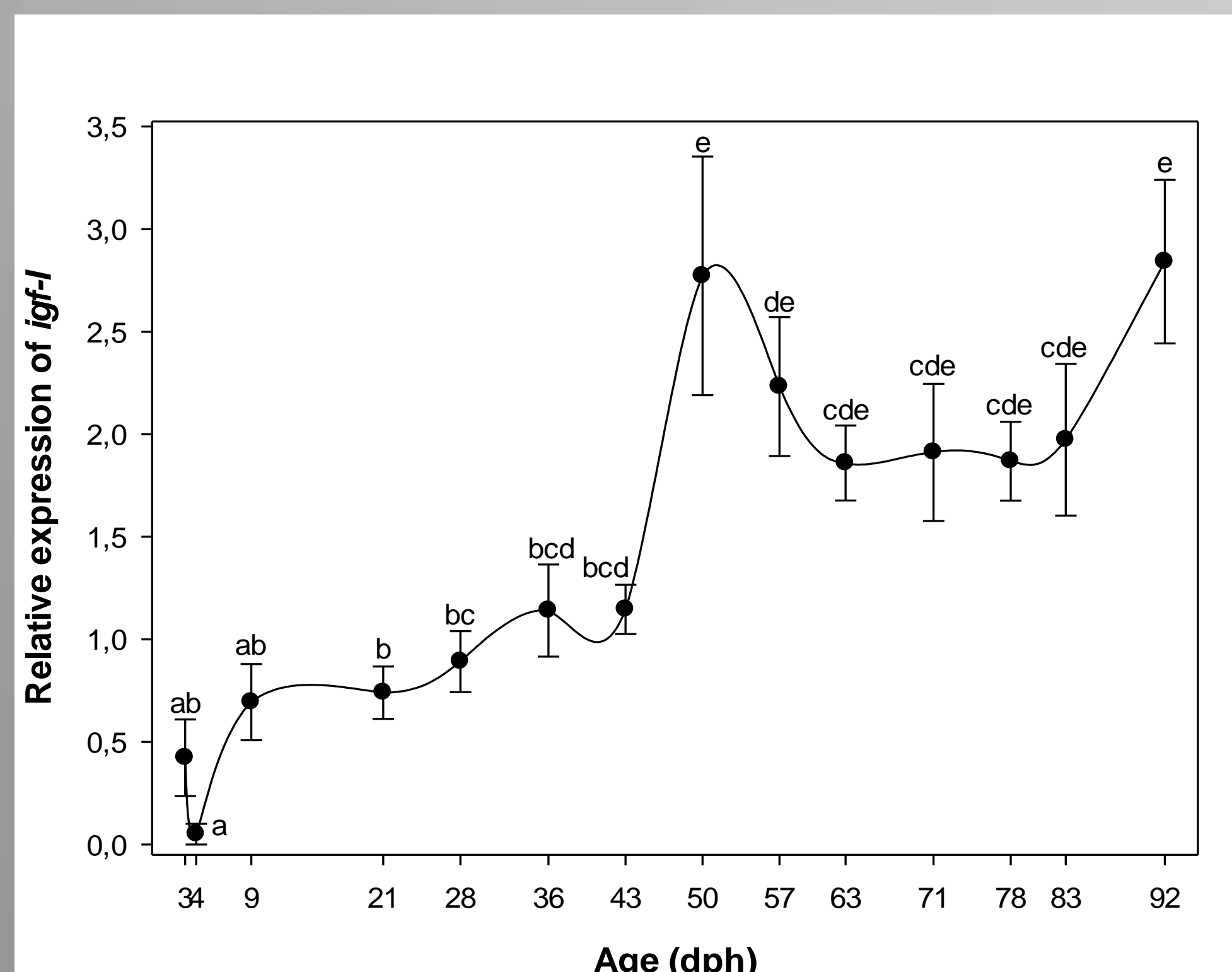
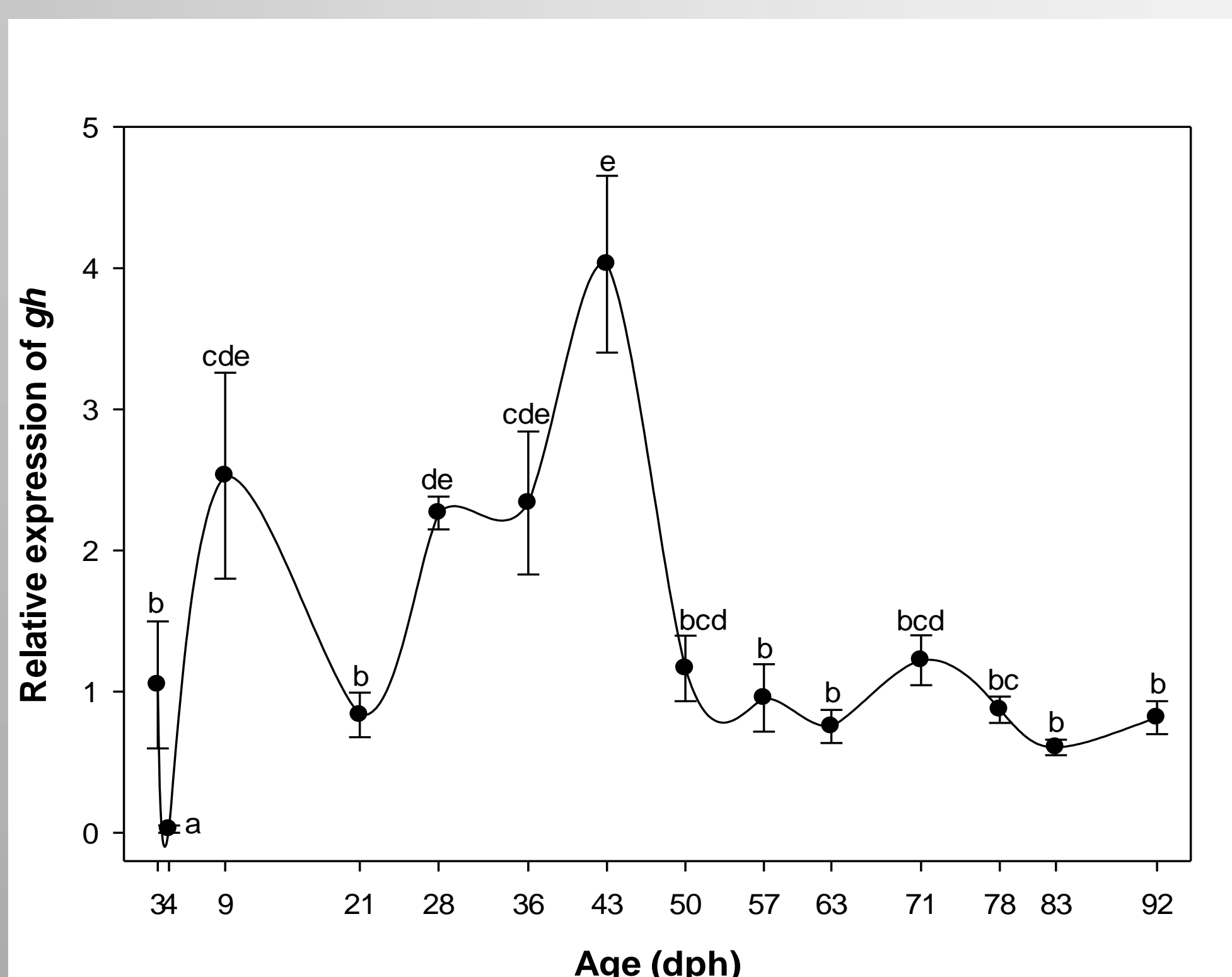


mRNA expression

### Statistical analysis:

- ✓ Log 10 transformation of data
- ✓ One-way ANOVA to determine significant differences between sampling points
- ✓ Post-hoc Tukey test

## 3. Results



## 4. Discussion

- Early detection of *gh* and *igf1* transcripts (at 3 dph), which has been previously reported by other authors in different fish species, underlines their crucial role during early growth and development.
- Larval development during the first weeks is characterized by organogenesis and a high rate of growth. The *C. labrosus* maximum growth rate observed at 22-54 dph (Sarasquete et al., 2014) largely coincides with the high *gh* (21-43 dph) and the onset of the rising period of *igf1* expression (50 dph) observed in this study. The high detected levels of *igf1* can be linked to the numerous processes involved in changing from larval to juvenile stage.
- In the present work, *igf1* showed a significant up-regulation at about the middle of the metamorphosis period (50 dph) and lasted till the end of the study. This up-regulation occurs simultaneous to the decline of *gh* expression levels. This is consistent with the hypothesis that the IGF-I synthesis acts as a modulator of a negative feedback mechanism to inhibit GH production.
- Considering that at early stages, GH and IGF-I are produced in many different peripheral tissues, we can suggest that *gh* and *igf1* are expressed in an independent manner during the first 50 days of life, while the GH/IGF-I axis starts to be functional afterwards.

### References

Sarasquete, C., Ortiz-Delgado, J.B., Martos-Sitcha, J.A., de las Heras, V., Yúfera, M. y Martínez-Rodríguez, G. 2014. Ontogeny and functional histochemistry of the digestive and visual systems and other organs during the larval development of the thick-lipped grey mullet, *Chelon labrosus*. Scientia Marina. 78(4): 473-491.

### Acknowledgment

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