aquaculture europe 22

JOIN US IN ITALY FOR AQUACULTURE EUROPE 2022

INNOVATIVE SOLUTIONS IN A CHANGING WORLD

27-30 SEPTEMBER 2022
RIMINI, ITALY

#AE22RIM

www.aquaeas.or g

european aquaculture society

GOLD SPONSOR

BioMar

SILVER SPONSOR

US SOY

SUPPORTED BY

Consorzio Emilia-Romagna Mitilicoltori

API Associazione Piscicoltori Italiani

mipaaf ministero delle politiche agricole alimentari e forestali

Ministero della Transizione Ecologica

AMA Associazione Mediterranea Acquacoltori

SESSION SPONSOR

LALLEMAND

LALLEMAND ANIMAL NUTRITION

WELCOME MESSAGE

Welcome to Aquaculture Europe 2022 on the Italian Adriatic coast in Rimini.

The theme of the conference "Innovative Solutions in a Changing World" reflects the need for addressing the many challenges facing the sector in the coming decades. Most in land, coastal and marine water bodies will undoubtedly be impacted directly or indirectly by climate change and urbanisation, from sea acidification and warming, sea-level rise, coastal erosion, flooding, eutrophication and pollution. These will represent important sustainability challenges for current and future European aquaculture. AE2022 will provide a great opportunity for discussing new and innovative ideas to address these challenges but also identify strategies for implementing and up scaling already proven concepts and solutions.

Since moving recently from academia to industry, I can testify on the importance of capturing and translating new research into industry protocols and solutions for the benefit of the sector. What makes EAS annual events unique is bringing together scientists, industry leaders and entrepreneurs, governmental bodies and regulators from all over Europe and sharing the same passion for aquaculture. AE2022 will include a wide range of scientific sessions (32 over 3 days) and a trade show with close to 180 booths. In addition, several workshops and special events will take place; including the AE2022 Industry Forum and the AE2022 Innovation Forum - organised by The European Aquaculture Technology and Innovation Platform, the European Commission and EAS.

This year we are expecting more than 2000 attendees with more than 600 scientific abstracts received and these have been reviewed by the session chairs and integrated into an impressive programme by Maria Letizia Fioravanti and Daniel Żarski as Program co-chairs. Thank you for your hard work! I'd like also to thank our Steering and Local Organising Committees who gave their time and efforts to make AE2022 possible as for my colleagues on the Board of the EAS with several newly appointed directors. A big thanks also to our Gold Sponsors Biomar, Silver Sponsors U.S. Soybean Export Council, Session Sponsor Lallemand and Conference Support from the Italian National and Regional Governments.

This is the end of my two-year term as President. It has been a challenging period for all, but I am delighted to see the great resilience of EAS thanks to our collective efforts and welcome to our new president, Bente Torstensen. I hope you enjoy the event, the people and the science.

Herve Migaud
EAS President 2020-2022

TABLE OF CONTENTS

To find abstracts for a specific author or subject, use the pdf search features built into Adobe Acrobat.

aquaculture europe 22

ABSTRACTS

THE EFFECTS OF STOCKING DENSITIES VERSUS TANK VOLUME ON THE SKELETON OF GILTHEAD SEABREAM *Sparus aurata* IN THE HATCHERY AND PREONGROWING PHASES OF THE PRODUCTION CYCLE

Z. Dellacqua*[1,3], C. Di Biagio[1,4], A. Martini[2], M. Izquierdo[3], C. Boglione[2], A. Fabris[5]

[1] PhD Programme in Evolutionary Biology and Ecology, Dept. of Biology, University of Rome 'Tor Vergata' Via Cracovia Rome (Italy)
[2] Dept. of Biology, University of Rome 'Tor Vergata', Via Cracovia Rome (Italy)
[3] Aquaculture and Marine Ecosystems Department, University of Las Palmas de Gran Canaria Parque Cientíco Tecnológico Marino de la ULPGC. Carretera de Taliarte S/N. 35200-Telde, Gran Canaria (Spain)
[4]Laboratory of Evolutionary Developmental Biology, University of Gent, Belgium
[5] Associazione Piscicoltori Italiani, Via del Perlar 37/A 37135 Verona (Italy)
Email: zacharyjoseph.dellacqua@students.uniroma2.eu

Introduction

Gilthead sea bream (*Sparus aurata*) production is one of the main aquaculture industries in the Mediterranean, producing 258,754 tones of seafood in 2019 (FAO, 2021). However, in recent years uncertainty regarding the profitability and the economic losses have been inevitable for many production facilities due to rapid market expansion in the 1980s followed by an oversupply establishing a lower market value in the last two decades (Llorente et al., 2020). Therefore, a focus on increasing the production value rather than increasing production quantity would be a sustainable solution to improve profitability and adjust for long-term environmental and economic goals in the EU (Llorente et al., 2020).

The coupled application of Large Volumes (Ø =30-60m^3) and low densities (< 16 larvae/L) has been demonstrated (Koumoundourous et al., 2004; Boglione et al., 2009; Prestinicola et al., 2013) augment the survival rate and the morphological quality of gilthead sea bream and other Sparids. However, the separate effects of density or volume, decoupled from each other has not been investigated. This knowledge will help farmers to produce subadults of higher quality to be ongrown by modulating only one of these two factors, without any need for extra economic investment, high-tech solutions, or new tanks.

The aim of this study was to individuate which between 'large volume' and 'low density' is the main driver in attaining high quality gilthead sea bream during both the hatchery (from eggs to juveniles) and the preongrowing ($W_{average}$ up to ~55 g). The experimental design envisaged to test the effects at a commercial scale of A) larger and smaller tank volumes on seabream, stocked at the same density; and B) higher and lower stocking densities on seabream maintained in the same tank volume. The experimented tank volumes were smaller, and the densities higher than those tested in previous studies. The choice of the experimental tank volumes (500 vs 1000 L) was based on the ubiquity of these tanks in almost every Mediterranean farm. The densities we utilized were those indicated as interesting to be tested by API (Italian Association of Fish farmers).

Materials & Methods

Experimental rearing were conducted in the EcoAqua facilities at the University of Las Palmas, Gran Canaria (Spain) for the hatchery phase and at the Intituto Portugues do Mar e Atmosfera facilities in Olhão Portugal for the preongrowing phase. 3 different densities (Low Density (LD): 25 eggs/L and 5kg/m^3; Medium Density (MD): 125 eggs/L and 10kg/m^3; High Density (HD): 250 eggs/L and 20kg/m^3) were utilized for the hatchery and ongrowing phases respectively. Two tank volumes were tested for each density condition, in all the trials: 500L tanks (small volume) and 1000L tanks (large volume). Natural seawater was pumped into the systems and all of the rearing parameters were maintained the same for all of the conditions, save the volume or the density. Additionally, oxygen was maintained at above 70% SAT for both trials. Seabream were reared for approximately 2 months in each trial.

Juveniles from the hatchery phase were whole-mount stained with Alizarin red while the sub-adults from the preongrowing cycle were radiographed. Monitoring of skeletal anomalies was done for both studies using an adapted alphanumeric code to account for skeletal elements affected and region of body in which the anomaly was located Prestinicola et al. (2013). Data was expressed in a raw matrix in order to calculate the frequencies of anomaly types found over the total amount of anomalies and a binary matrix to calculate the frequencies of individuals affected by every anomaly types. All statistical analyses and graphs were done using Python and Past 4.02 (Hammer et al., 2001).

(Continued on next page)

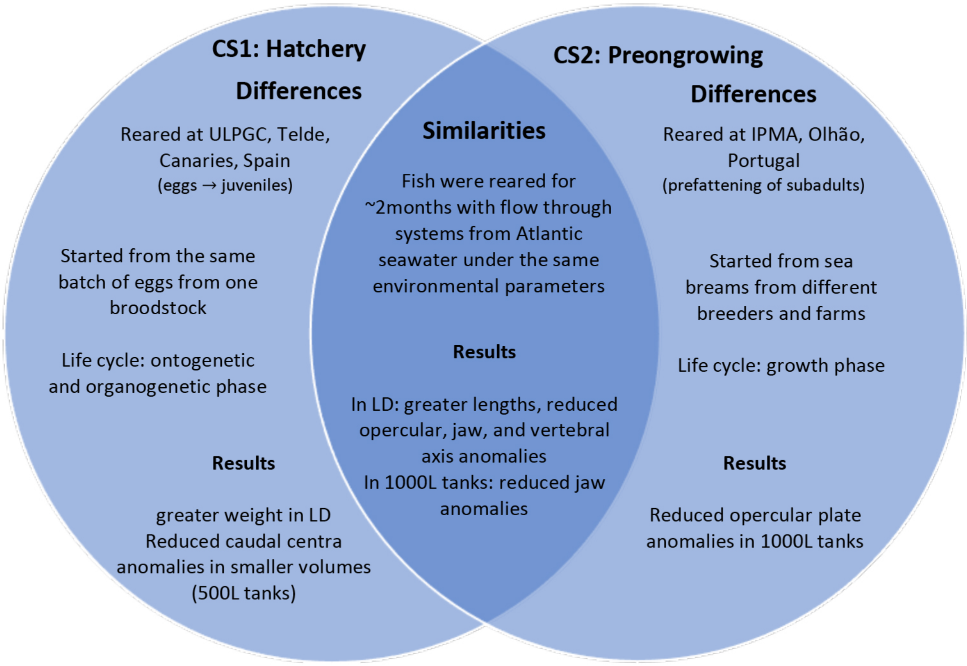

Figure 1. Venn-diagram displaying differences and similarities between the two case-studies.

Results

Strikingly the environmental parameters of varying degrees in density and volume elicited similar responses in both early juveniles and subadults.

Both experimental cycles enhanced significant greater lengths, reduced opercular, jaw, and vertebral axis anomalies in LD reared seabream, while larger volumes reduced the incidence of jaw anomalies. This outcome highlights the predominant effect of environmental drivers on skeletal plasticity in this species, regardless of notable differences in genetic origin, life-stage, and ontogenetic phases (Fig. 1).

The possible hypotheses (behavioral, chemo-physical, physiological, etc…) that can be formulated to explain this primary, more positive effect of low stocking density rather than the larger tank volume, are largely discussed.

This project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under the Marie Skłodowska-Curie grant agreement No. 766347, BioMedAqu, ETN 766347.