

# DIVERSIFY-Exploring the biological and socioeconomic potential of new/emerging fish species for the expansion of the European aquaculture industry



Co-funded by the Seventh  
Framework Programme  
of the European Union



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# 37 partners:

**20 Research/Universities**  
**9 Small Medium Enterprises**  
**2 Large companies**  
**5 Professional associations**  
**1 NGO**



**- Enhancing the EU aquaculture through  
species diversification**

**2013-2018**

**11,8 million €, EU-7FP**

# Problem with Mediterranean species



- Small (plate size), difficult to prepare, w/bones
- Consumers prefer fillets, steaks, ready-to-cook
- Growing fish larger is limited / inefficient (>3 y!)





# Choice of new/emerging species



greater amberjack



Pikeperch (fw, RAS)



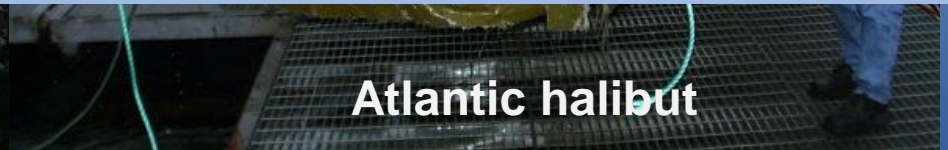
grey mullet  
(omnivorous, euryhaline)



wreckfish



Atlantic halibut



# Bottlenecks of the six species



- **meagre** (*limited genetic variation, nutrition health*)



- **greater amberjack** (*reproduction, juvenile production, parasites*)



- **wreckfish** (*broostock availability, reproduction, juvenile production*)



- **Atlantic halibut** (*reproduction, juvenile production, health*)



- **grey mullet** (*reproduction, larval rearing, nutrition*)



- **pikeperch** (*juvenile production*)





# Socioeconomics bottlenecks

- perception of aquaculture products
- market demand, buyer preferences
- new product development, value adding
- market development



# Meagre



- Genetic characterization of existing broodstocks in Europe, genetic linkage map and QTL analysis
- Development of methods for selective breeding (*in vitro* fertilization, paired spawning)
- Feeding behaviour to improve grow-out in cages
- Systemic granulomatosis and its relation to nutrition, immune system characterization



# Greater amberjack



- Development of broodstock management and spawning induction methods, first spawning of F1 stocks
- Larval rearing methods and production of juveniles
- First commercial on growing trials in sea cages
- Health management (parasites) and immune system characterization

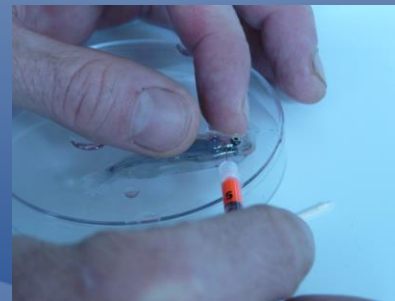




# Pikeperch



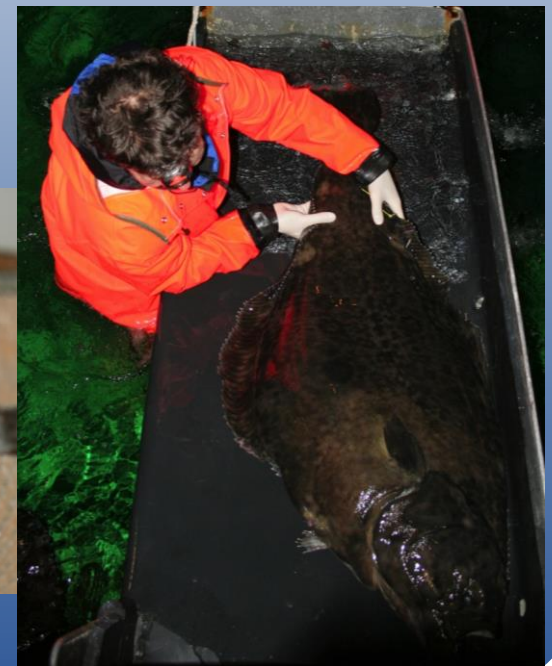
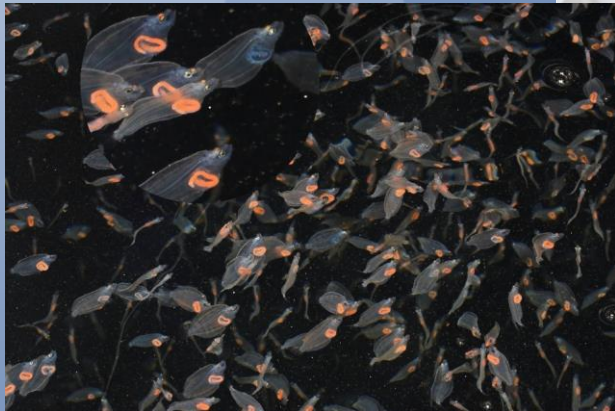
- **Genetic variability of cultured broodstocks and comparison with wild populations for future breeding selection programs**
- **Effects of various environmental factors (light intensity, water renewal rate, water flow direction and tank cleaning timing) on larval rearing of pikeperch**
- **Behaviour traits during early development**



# Atlantic halibut



- Optimize ovulation kinetics and stripping
- Larval rearing using ongrown *Artemia*, early weaning and improvement of juvenile quality
- Production of VNN capsid protein for vaccine development



# Wreckfish



- Reproductive cycle in captivity
- Induction of spawning (tank and strip spawning)
- Development of broodstock diet
- Larval rearing (still no success past 28 dph)





# Grey mullet



- Development of hormonal therapies to enhance gametogenesis
- Induction of spawning
- Environmental and nutritional aspects of larval rearing, weaning to herbivorous diet



# Socioeconomics

- Identification of consumer segments for the candidate fish species
- Organoleptic characterization
- Production of ideas and value-added products, and testing them with consumers
- On line supermarket trials





# Dissemination - magazine articles





# Dissemination – [www.diversifyfish.eu](http://www.diversifyfish.eu)



www.diversifyfish.eu



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NEWS

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Summary

Partners

Species

Research Area

Meagre (*Argyrosomus regius*)  
Greater amberjack (*Seriola dumerili*)  
Pikeperch (*Sander lucioperca*)  
Atlantic halibut (*Hippoglossus hippoglossus*)  
Wreckfish (*Polyprion americanus*)  
Grey mullet (*Mugil cephalus*)

## DIVERSIFY INFORMATION

**PROJECT TITLE:** Exploring the biological and socio-economic potential of new species for expansion of the European aquaculture industry (DIVERSIFY).

The fish species to be studied include **meagre** (*Argyrosomus regius*) and **greater amberjack** (*Seriola dumerili*) for warm-water marine cage culture, **wreckfish** (*Polyprion americanus*) for warm- and cool-water marine cage culture, **Atlantic halibut** (*Hippoglossus hippoglossus*) for marine cold-water culture, **grey mullet** (*Mugil cephalus*) a euryhaline herbivore for pond/extensive culture, and **pikeperch** (*Sander lucioperca*) for freshwater intensive culture using recirculating systems. Research will be carried out in the scientific disciplines of Reproduction and Genetics, Nutrition, Larval husbandry, Grow out husbandry, Fish health and Socioeconomics (including final product quality).

The project DIVERSIFY is funded under the 7th Framework Programme of the European Commission (7FP-KBBE-2013). This 5-year long project (2013-2018) is coordinated by Dr. Constantin C Mylonas of the Institute of Marine Biology, Biotechnology and Aquaculture (IMBBC), one of the three institutes of the Hellenic Center for Marine Research (HCMR), and has a total budget of 11 million euro for its 5 year duration.



New species for EU aquaculture

PROJECT  
SUMMARY

More info



PARTNERS

Learn more

www.diversifyfish.eu



NEWS

ABOUT DIVERSIFY

SCIENTIFIC ARTICLES

DISSEMINATION

INTRA

MEETINGS & ACTIVITIES

AE 2017- DIVERSIFY



## DIVERSIFY SCIENTIFIC ARTICLES

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### REPRODUCTION & GENETICS

**ORIGINAL ARTICLE**  
The observed oogenesis impairment in greater amberjack *Seriola dumerili* (Risso, 1810) reared in captivity is not related to an insufficient liver transcription or oocyte uptake of vitellogenin  
Chrysanthos Pousis<sup>1</sup> | Constantinos C Mylonas<sup>1</sup> | Carolina De Virgilio<sup>1</sup> | Genesia Galatioti<sup>1</sup> | Nikolaos Sotiriou<sup>1</sup> | Letizia Passarini<sup>1</sup> | Rosa Zupa<sup>2</sup> | Maria Papadaki<sup>1</sup> | Ioanna Fakalidis<sup>1\*</sup> | Rosalia Ferrel<sup>3</sup> | Aldo Corrieri<sup>4</sup>

Pousis, C., Mylonas, C.C., De Virgilio, C., Gadaleta, G., Santamaria, N., Passantino, L., Zupa, R., Papadaki, M., Fakiridis, I., Ferrel, R., Corrieri, A., 2017. The observed oogenesis impairment in greater amberjack *Seriola dumerili* (Risso, 1810) reared in captivity is not related to an insufficient liver transcription or oocyte uptake of vitellogenin. *Aquaculture Research*, in press.



[pousis\\_2017\\_ar\\_in\\_press.pdf](#)  
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## Access to

- Current updates, newsletters
- Presentations from all annual meetings
- Scientific articles (currently 21)

# Species-specific knowledge transfer workshops

[www.diversifyfish.eu](http://www.diversifyfish.eu)



- One day workshop for each species
- Presentations from DIVERSIFY work, but also outside
- Open to all stakeholders, first come-first served (60-100 persons)
- Free of charge (no registration costs)
- Spring-Fall 2018

For information  
consult our website

**Species Workshops  
2018**



# Species-specific knowledge transfer workshops

[www.diversifyfish.eu](http://www.diversifyfish.eu)



- Grey mullet (B. Koven, IOLR), June 2018 Bari, Italy
- Greater amberjack (N. Papandroulakis, HCMR), May 2018-Athens, Greece
- Pikeperch (P. Fontaine, U Lorraine), May 2018 Nancy, France
- Wreckfish (B. Alvarez, IEO), July 2018 Vigo, Spain
- Atlantic halibut (B. Norberg, IMR), Sept 2018 Bergen, Norway
- Meagre (A. Estevez, IRTA), October 2018-Barcelona, Spain

**Species Workshops  
2018**





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