



# The greater amberjack as a potential new species for the Mediterranean aquaculture

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Workshop on greater amberjack (*Seriola dumerili*) aquaculture:  
Results from the DIVERSIFY project.  
18<sup>th</sup> September 2018, Electra Metropolis Hotel, Athens (Greece)

# DIVERSIFICATION

- European aquaculture production scheme (seabream - sea bass)
  - 12-18 months to reach 350-600 g
- Sector's demand: open new markets  
introduce new species/ products

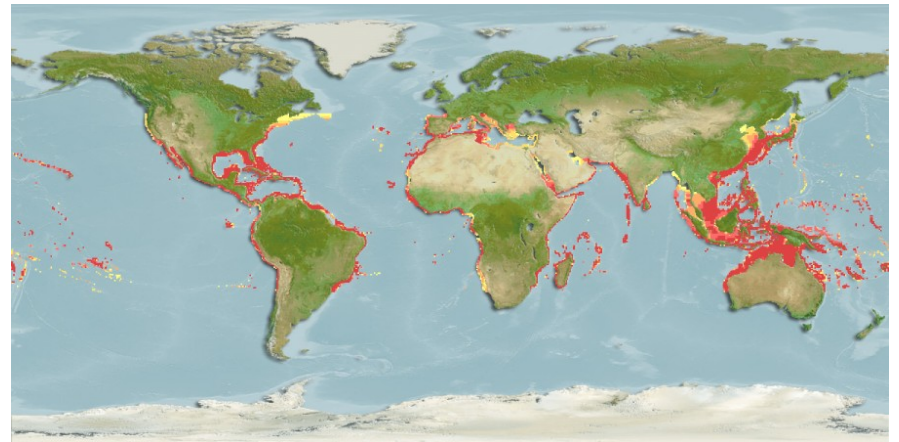
- A profitable activity is targeting products (whole fish or processed) with high added value and high export potential
- Species satisfying these criteria should have
  - fast growth
  - wide distribution and
  - solved basic biological problems

# A good candidate!



- Carnivorous
- Pelagic/ epibenthic
- Depths: 18-360 m
- Length (max) = 190 cm
- Weight (max) = 80.6 kg

- Near shore reef habitats/ open sea
- Tropical and subtropical areas of the Atlantic and Indo-Pacific Oceans
- Common in the Mediterranean Sea



- Important commercially
  - Global distribution
  - Fast growth
    - Growth rates **10x** higher than the European seabass
  - Excellent flesh quality and global market
  
- An innovative products with added value
  - Large size attained
    - marketed as whole or as processed food
    - **suitable for development of value added products**
  
- Efforts to develop/improve aquaculture methods
  - Economic potential in the EU market
  - Significant potential for exports
    - **proven potential in other markets**
    - congener species are produced commercially elsewhere



***S. lalandi***



***S. rivoliana***



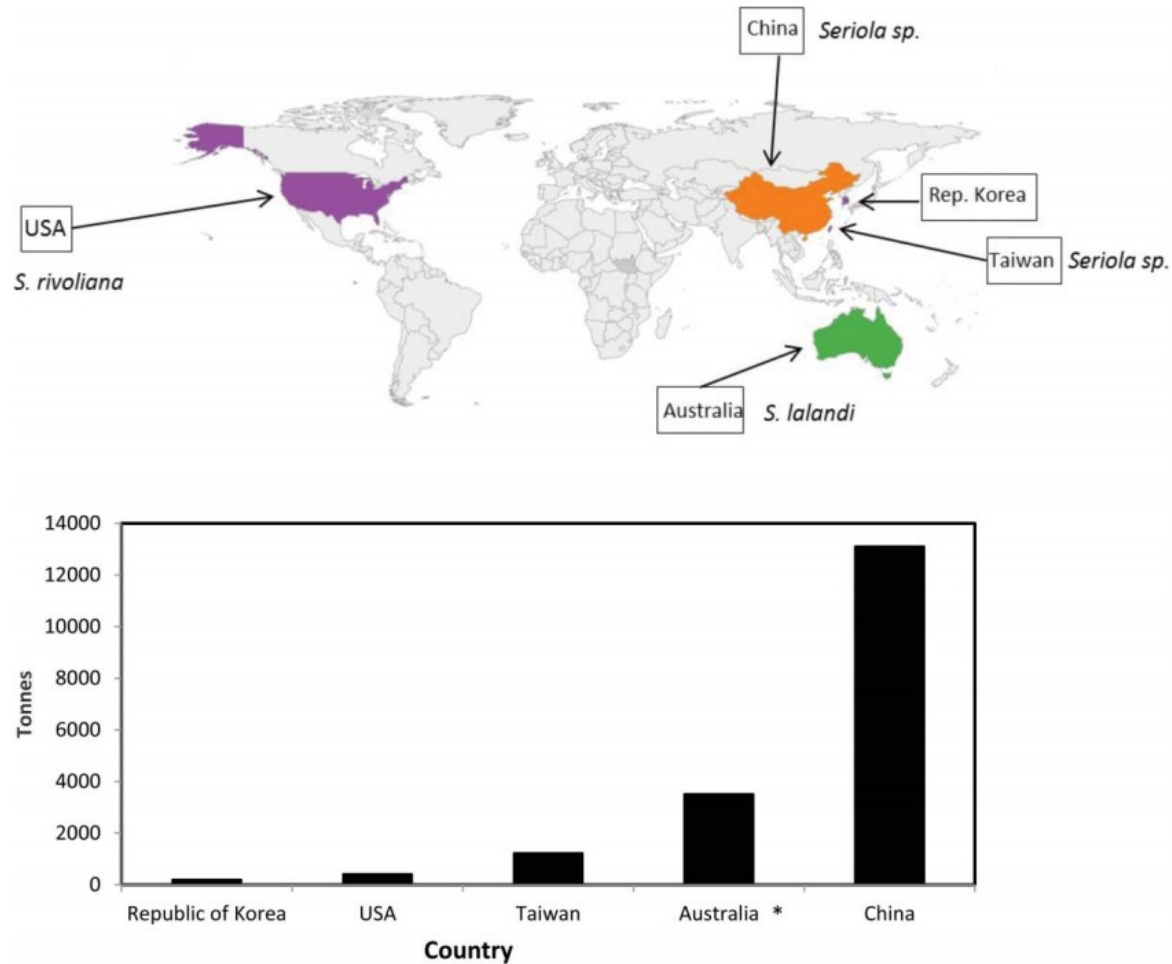
***S. quinqueriata***



***S. dumerili***



# Production of other *Seriola spp*



**Figure 1.** World production of farmed *Seriola spp* in 2012 (excluding Japan). Source: FAO. 2014. Fishery and Aquaculture Statistics. Global production by production source 1950–2012 (Fishstat). \*estimated by Miller et al. 2011.

# The product *Seriola dumerili*

- Highly appreciated
  - high quality meat and commercial value
- Worldwide catch of *S. dumerili*
  - increased 10x since 1990,
  - 3,287 t in 2009 (80% in the Mediterranean and Black Sea)
- Japan's aquaculture production
  - 2014: 38,700 t

Ichiro Nagano 2014). In 2014, aquaculture production of all *Seriola* spp. in Japan was 150,387 MT. This total includes 107,059 MT of *S. quinqueradiata*, 38,770 MT of *S. dumerili*, and 4,558 MT of *S. lalandi* (Sicuro and Luzzana 2016).

December, 5 2016  
Seafood Watch Consulting Researcher



# *S. dumerili* rearing in the Mediterranean region

- Started in the 80s with capture-based activities using wild juveniles
  - fish of ~90 g reached ~1 kg in a year, 4 and 6 kg in a period of 2 and 3 years
  - standard culture conditions in cages
  - feeding on fresh fish passing quickly to artificial feeds
- The Mediterranean production in 2016 was 500 t (FAO, 2016)
  - in Malta **hatchery-produced individuals**
  - interest exists and efforts have been made by various aquaculture companies in Spain, Greece, Italy, Turkey, etc.
- The market price (capture fisheries catches) values  $>14 \text{ € kg}^{-1}$





# Major bottlenecks for the EU aquaculture industry

## ■ Reliable reproduction

- In captivity problematic reproduction,
  - **captive-reared breeders have reproduced after hormonal treatments, and in some cases also spontaneously.**

## ■ Production of adequate numbers of juveniles.

- **Larval rearing of greater amberjack** using semi-intensive methods with limited survival,
  - improved with adaptations in feeding regime and diet quality
  - knowledge from congeners can hasten the **development of larval rearing protocols for the greater amberjack.**

## ■ Fish health: an area of concern for commercial production

- Several pathogens as potential threats
  - *Photobacterium damsella*
  - Epitheliocystis
  - *Cryptocaryon*
  - monogenean parasites
  - *Neobenedenia* spp ...



# What DIVERSIFY promised at the beginning (1)

## ■ Reproduction

- study the reproduction in captivity and in the wild
- develop spawning induction methods (GnRHa-based spawning protocols)
- appropriate broodstock diets

## ■ Larval husbandry

- develop intensive rearing protocols to improve fry production and quality
  - define nutritionally sensitive periods
  - develop appropriate feeding regimes adapted to the development of the digestive system of the larvae
  - define appropriate environmental factors (intensity and duration of light, rearing tank volume and hydrodynamics)



# What DIVERSIFY promised at the beginning (2)

## ■ Nutrition

- develop specific live food enrichments and improved weaning diets
- develop diets for grow-out in order to maximize growth potential and enhance fillet quality
- determine the influence of selected nutrients on reproductive function and performance

## ■ Health

- expand the immune gene markers for mucosal immunity
  - study the expression following antiparasite and antibacterial treatments, at different developmental stages
- develop molecular probes for the detection and early diagnosis of pathogenic Chlamydia
- identify diets that promote better larval health
- modulate juvenile resistance to parasite infection through dietary means



# What DIVERSIFY promised at the beginning (3)

## ■ Growout husbandry

- define proper feeding strategies
- define optimum rearing density
- specific thermal ranges for optimal growth and health
- develop appropriate techniques for cage rearing and management practices


## ■ Consumer market analysis

- Develop new products with physical prototypes
  - incorporating consumer, market and buying criteria
  - monitoring the quality for organoleptic characteristics
  - marketing and communication strategies, and
  - market and business models development



# ■ A technical manual for the greater amberjack

EU-7FP, DIVERSIFY 603121



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**Thank you for your participation!!**

