Weaning of Meagre Larvae

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Workshop on meagre (*Argyrosomus regius*) aquaculture:
Results from the DIVERSIFY project.
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Major bottlenecks for the EU aquaculture industry

- **Production of adequate numbers of juveniles**.
  - Larval rearing is not considered a bottleneck for the expansion of meagre culture.
  - Cannibalism and variable size distribution in larvae and juveniles is an increasing concern

What DIVERSIFY promised at the beginning (1)

- **Larval husbandry**
  - develop appropriate weaning protocols adapted to the development of the digestive system of the larvae

OBJECTIVES

- Assess intake of artificial diets in early growth periods and their influence on larval development.

Experimental Design

Tank = 50 L⁻¹ (x3)

Density = 50larva L^{-1}

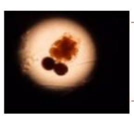
P = 16h L : 8h D

T = 23 ˚C

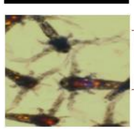
Light = ~ 500 lux.

Time: 24 days.

Feeding sequence



rotifers (10 rotifer/mL)



artemia (0.5-6 art./mL)

Ad libitum Gemma Micro 150, (Skretting)

Feed regimen strategy

2014: A, B, C, D

2015: A, C

Tanks x 3 replicates

100% 50% 50% 50 %

DIAS: 20 20 15 12

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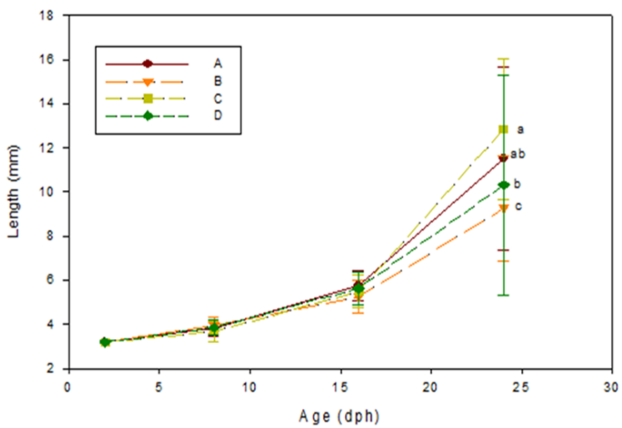
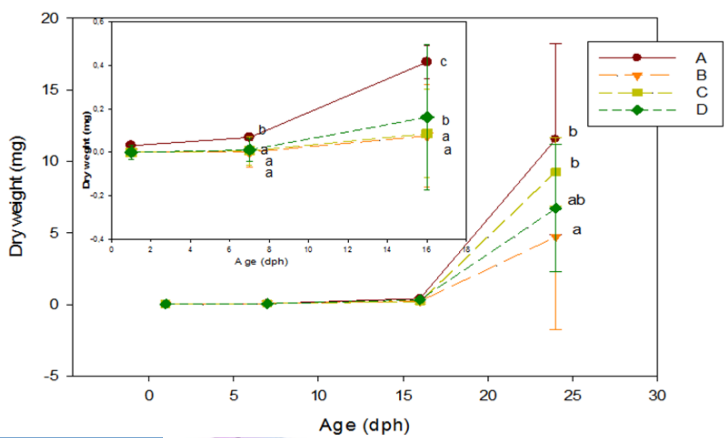
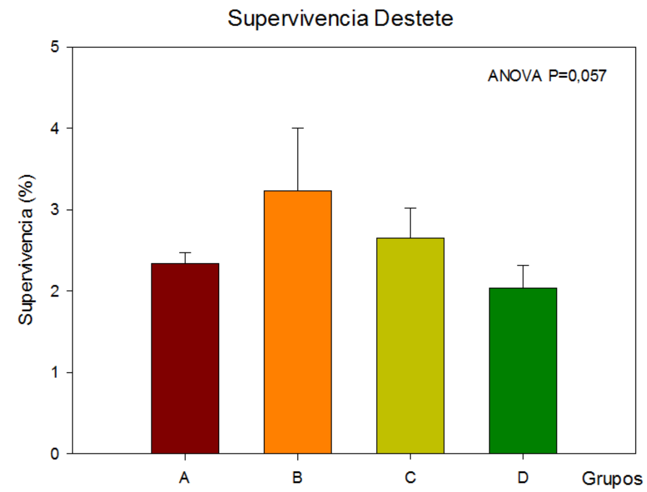
RESULTS - TRIAL 1







T	Small	Medium	Large
A	4,52 ± 0,97	16,06 ± 9,58	38,28 ± 8,41
B	1,28 ± 0,16	8,00 ± 7,69	18,67 ± 9,75
C	3,73 ± 1,55	12,27 ± 3,79	23,17 ± 5,11
D	3,01 ± 1,29	8,91 ± 3,89	26,41 ± 2,77

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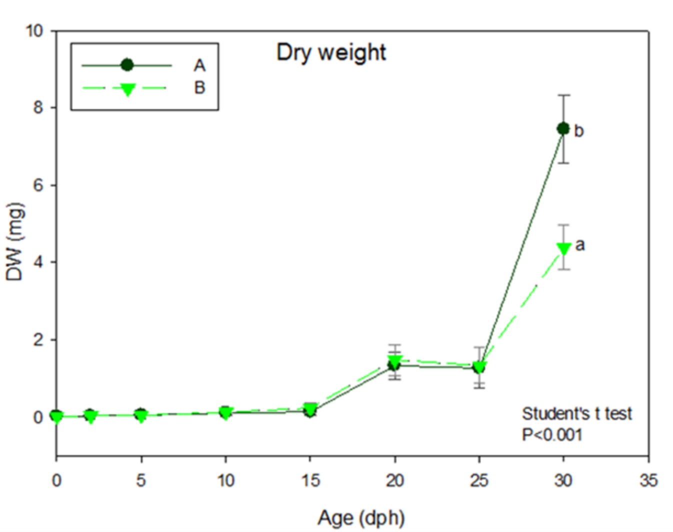
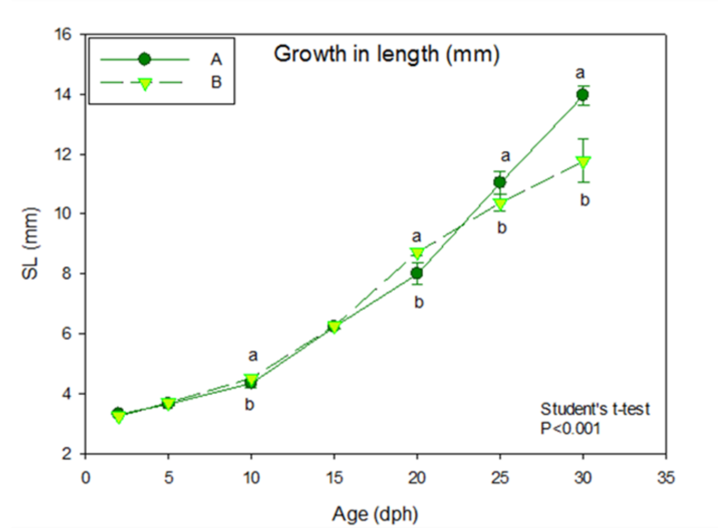
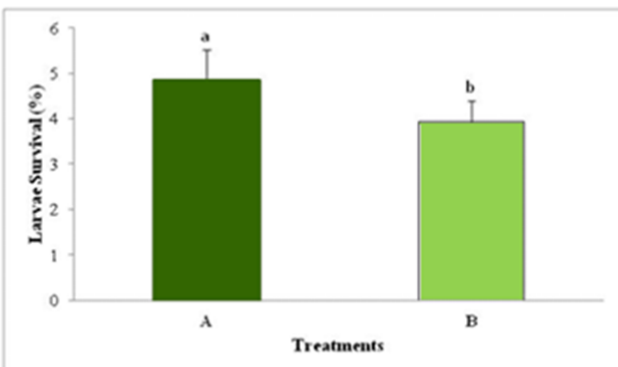
TRIAL 2







	Survival rate (%)
Group A	4,86 ± 0,65[a]
Group B	3,93 ± 0,47[b]

Student's t test P = 0,032

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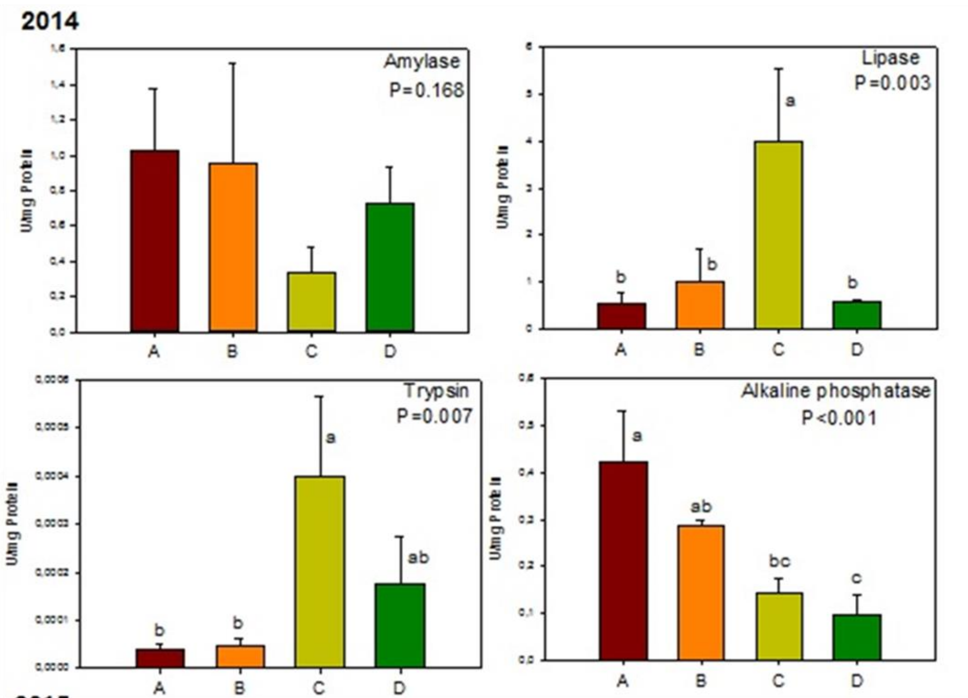
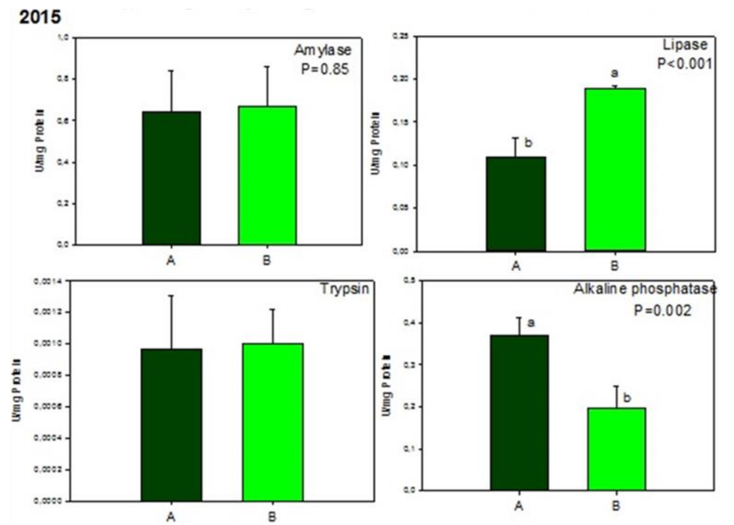
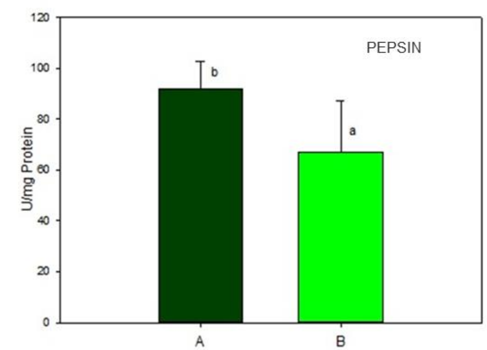
SIZE VARIATION

DIGESTIVE ENZYME TRIAL 1-2



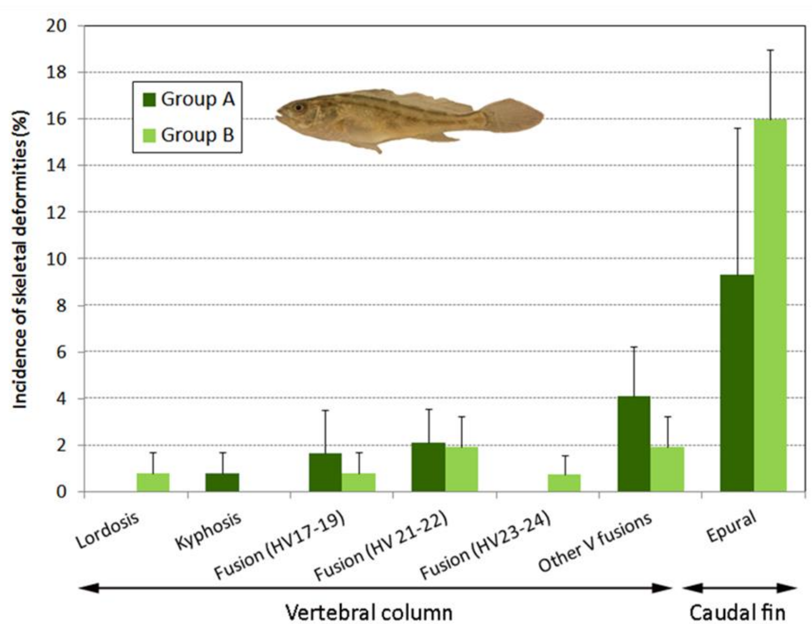


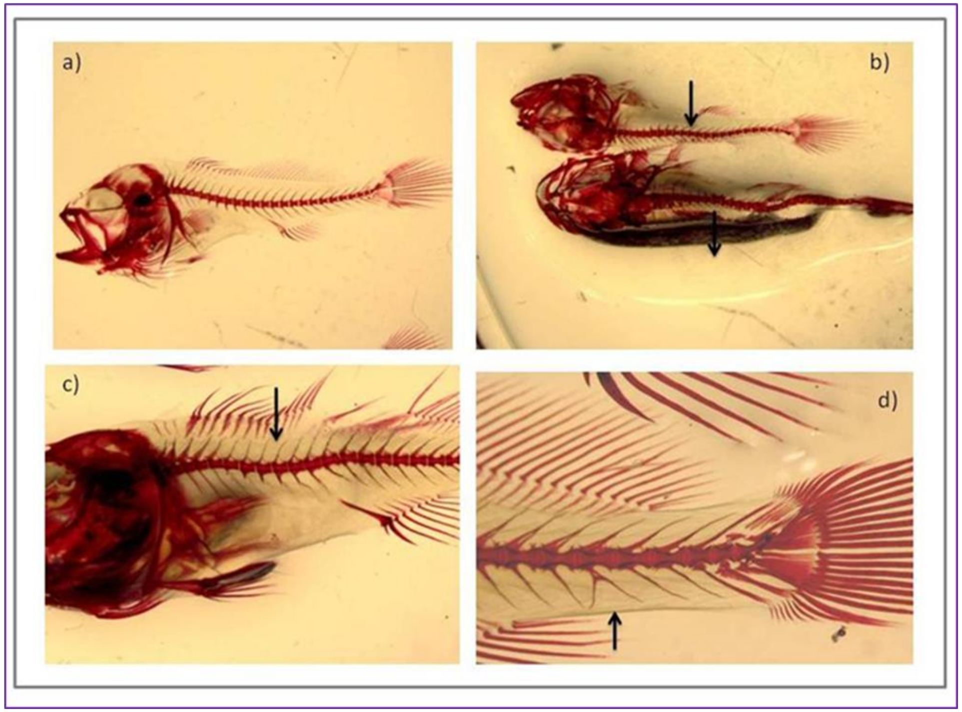


Pancreatic enzymes tended to be more active in the early weaning larvae, with a significant higher lipase activity compared to the control group.

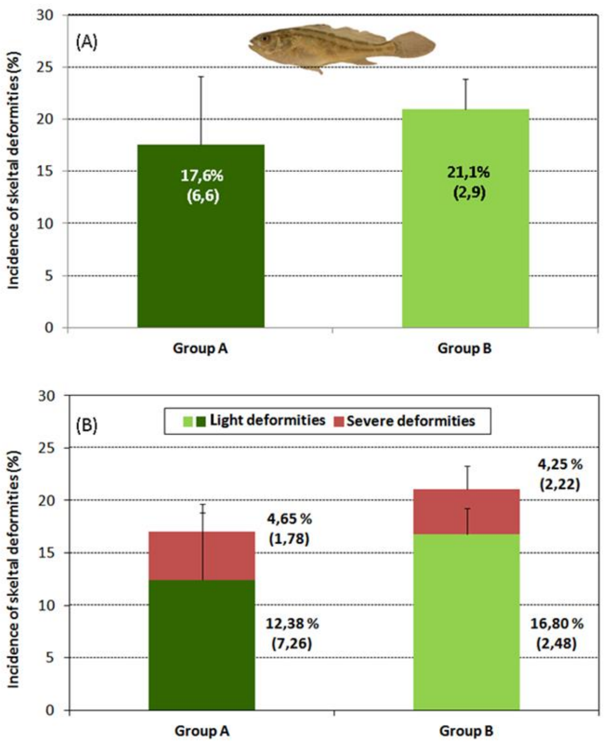
On the contrary, the capacity to digest proteins at a stomach level (pepsin activity) was significantly lower in the early weaned larvae, also coinciding with the significantly lower growth rate achieved by this group.

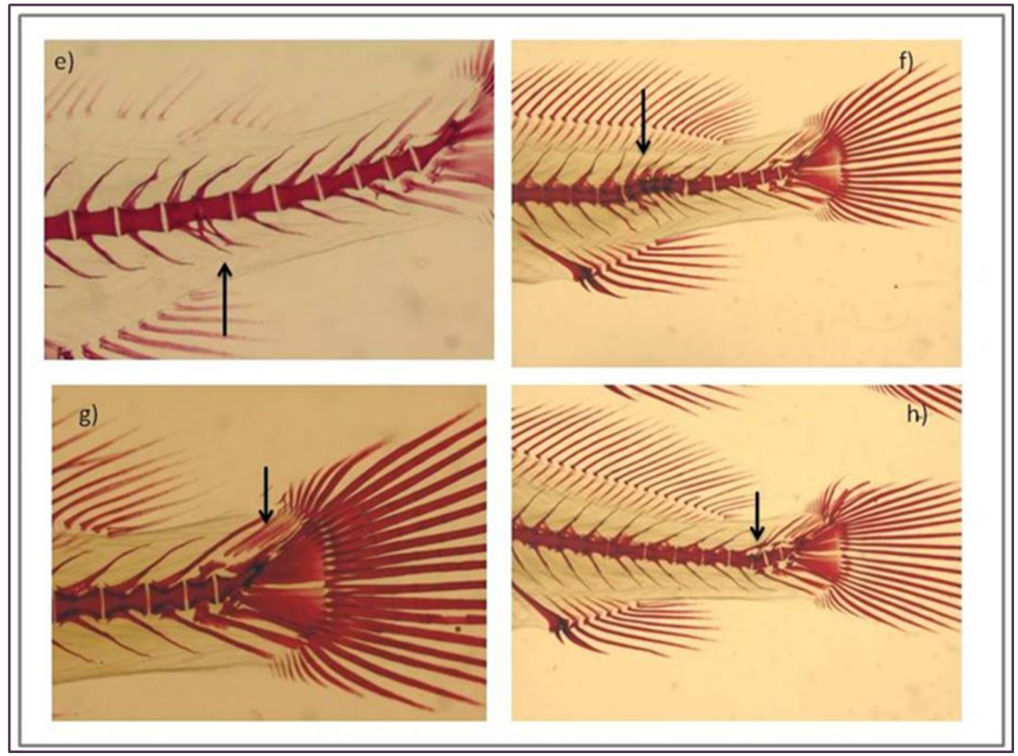
SKELETAL DEFORMITIES





Different typologies of skeletal deformities (%) found in 36 dph A. regius larvae in two different feeding regimes, considering the number of abnormal skeletal elements per fish (mean±SD). HV haemal vertebrae; EP epural





(e) Partial fusion in the haemal region 17-18 haemal vertebra (HV) and modification haemal spines (Hs). (f) Strong Fusion in the haemal region 17 to 19 HV and presence of fusion of two haemal spines closely parallels. (g) 2º Epural Modificated. (h) Torsion in caudal vertebra (23 -24 Ca V).

In this study the skeletal deformations found in the larvae cannot be considered a consequence of the feeding regime, that seems to be adequate for the larvae during ontogenetic development.

However considering that similar deformities were observed in both treatments, other factors such as the rearing environment, the genetic background and broodstock feeding should be considered.

CONCLUSION

- Meagre larvae can be weaned from live feed to artificial diet at as early as 10 dph but other important aspects for production success including larval performance and survival should be considered.

- Special care should be taken to avoid cannibalistic behavior in the rearing tanks, either reducing the light intensity, increasing larval feeding rate and daily doses, or grading the larvae periodically.