

## Final Report

COST Action FA1205 AQUAGAMETE

Final report of the Short-Time Scientific Mission of Ada Gorjan

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Duration of STSM: 15.9.2014 – 31.10.2014

Responsible for the final report: Ada Gorjan

### **Techniques for evaluation of skeletal quality in larval and juvenile specimens of grayling (*Thymallus thymallus*) produced from cryopreserved sperm**

In the 7 weeks period of this STSM we have achieved all the goals proposed in the workplan.

In the first week we performed an analysis of the external morphology of the juvenile *Thymallus thymallus* specimens produced in Tolmin and designed a detailed experimental protocol for further analysis. In the second week, we submitted our samples to digital X-ray and observed the resulting images to have a quantification of specimens with swim bladder developed and a radiographic image of the vertebral deformities present. In the next 3 weeks, we performed the protocol for whole mount double staining of bone and cartilage, and in the last two weeks, we observed the stained specimens and analyzed the results.

We found that the majority of fish have kyphosis or scoliosis mostly in the anterior region of the vertebral column. We were also able to connect those deformities with fusions, gaps or other deformities on the centra of vertebra (Figure 1). In the other hand, we didn't connect lordosis with any deformities on centra, so it looks like the lordosis appears like a response to kyphosis, especially when lordosis can be found only in the posterior part of vertebral column, and kyphosis in the anterior (Figure 2).

We also found a strong connection between lack of swim bladder and skeletal deformities, so if the missing swim bladder is the reason for the development of deformities, it can be a consequence of zootechnical procedures that can be improved or altered in order to mitigate that problem.

I found that the STSM visit in Faro, Portugal was very successful and, not only that I achieved some interesting results, I also bring back a lot of ideas for the future tests and analyses in order to reduce the incidence of deformed fry in our hatchery.

Figure 1 – Ventral fusion of the 10<sup>th</sup> and 11<sup>th</sup> vertebrae and complete fusion of 11<sup>th</sup> and 12<sup>th</sup> vertebrae.

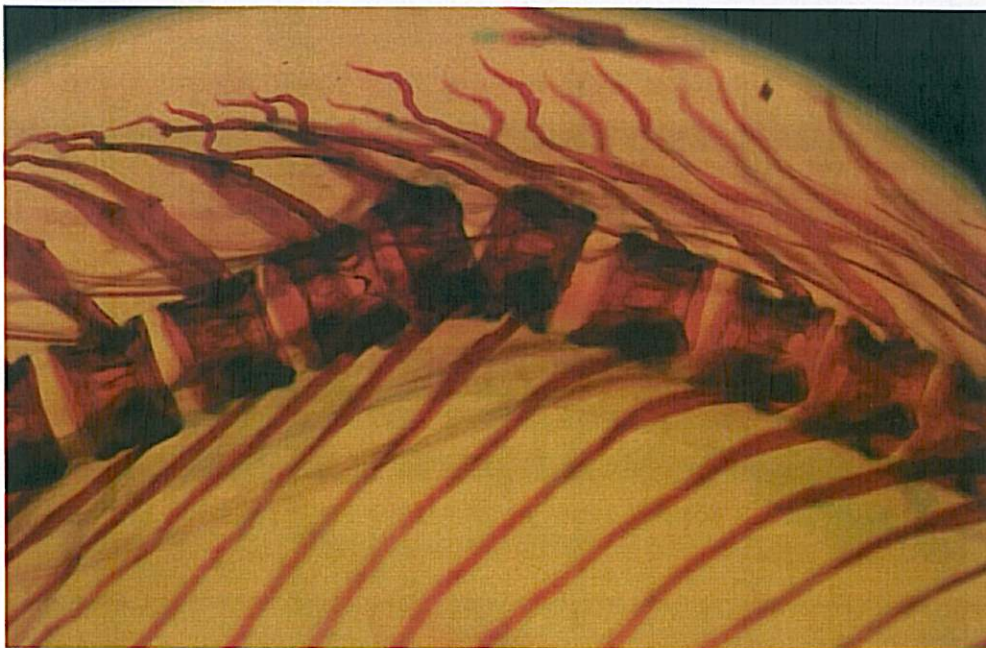
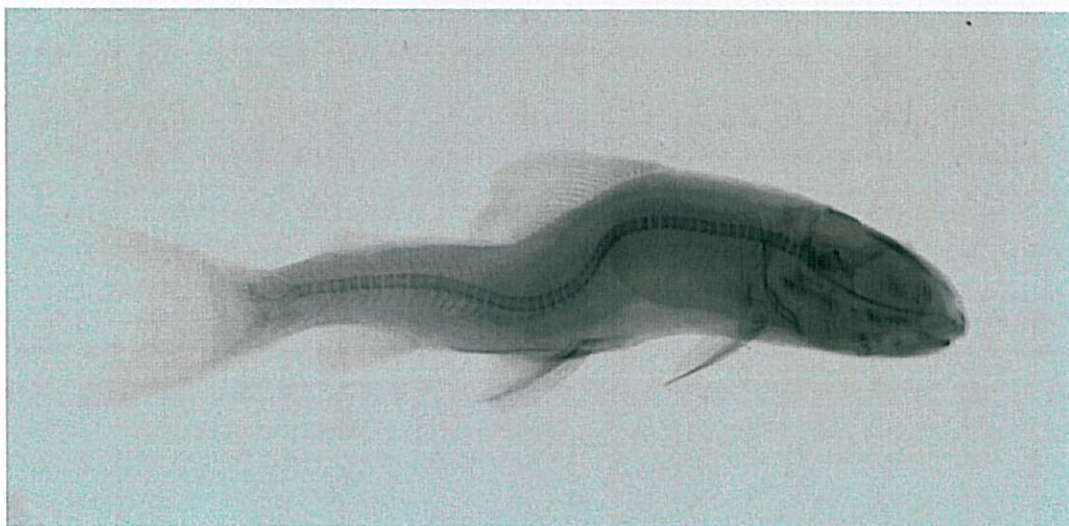
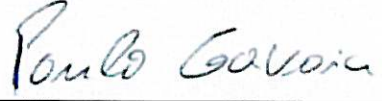


Figure 2 – Juvenile fish with lordo-kyphotic vertebral deformities, without air bladder.



  
Ada Gorjan

  
Paulo Gavaia  
(Associated researcher CCMAR)