



## **Apresentações Internas do CIIMAR**

**Data: 16/05/2005**

**Horário: 14:00 – 15:00**

**Local: Auditório CIIMAR, Rua dos Bragas 289**

**Coordenador: Dr. Rodrigo Ozorio**

### **Programa:**

**14:00 - 14:15 Effect of raw and gelatinized starch on growth, food utilization and hepatic glucose metabolism in European sea bass (*Dicentrarchus labrax*) juveniles**

**Paula Enes – Laboratório de Nutrição**

**14:20 - 14:35 Life history trait variation in harpacticoid copepods from polluted and unpolluted estuaries in Portugal**

**Robert Eriksson– Laboratório de Ecotoxicologia**

**14:40 - 14:55 Economic Value of Marine Ecosystems and Biodiversity.**

**Joao Coimbra - Laboratório de Ecofisiologia**

### **Resumos:**

**Effect of raw and gelatinized starch on growth, food utilization and hepatic glucose metabolism in European sea bass (*Dicentrarchus labrax*) juveniles**

**P. Enes, S. Panserat, S. Kaushik, A. Oliva-Teles**

A study was undertaken to determine the effect of dietary starch on growth performance and feed utilization in European sea bass juveniles. Data on the dietary regulation of key hepatic enzymes of the glycolytic, gluconeogenic, lipogenic and amino acid metabolic pathways (hexokinase, HK; glucokinase, GK; pyruvate kinase, PK; fructose-1,6-biphosphatase, FBPase; glucose-6-phosphatase, G6Pase; glucose-6-phosphate dehydrogenase, G6PD; alanine aminotransferase, ALAT; aspartate aminotransferase, ASAT and glutamate dehydrogenase, GDH) were also measured. Five isonitrogenous (48% crude protein) and isolipidic (14% crude lipids) diets were formulated to contain 10% raw starch (diet RS10), 10% gelatinized starch (diet GS10), 20% raw starch (diet RS20), 20% gelatinized starch (diet GS20) or no starch (control diet). Another diet was formulated with no carbohydrate, and contained 68% crude protein and 14% crude lipids (diet HP). Each experimental diet was fed to triplicate groups of 30 fish (IBW: 23.3g) on a equivalent feeding scheme for 12 weeks. The best growth performance and feed efficiency were achieved with fish fed the HP diet. Neither the level nor the nature of starch had measurable effects on growth performance of sea bass juveniles. Digestibility of starch increased with gelatinization and decreased with increasing levels of starch in the diet. Whole-body composition and plasma

metabolites, mainly glycemia, were not affected by the level and molecular complexity of the dietary starch. Data on enzyme activities suggest that dietary carbohydrates significantly improve protein utilization associated with increased glycolytic enzyme activities (GK and PK enzymes) as well as decreased gluconeogenic (FBPase) and amino acid catabolic (GDH) enzyme activities. The nature of dietary carbohydrates had little influence on performance criteria.

**Keywords:** Fish nutrition; European sea bass; carbohydrates utilization; glycolytic enzymes; gluconeogenic enzymes; amino acid catabolic enzymes; intermediary metabolism

Life history trait variation in harpacticoid copepods from polluted and unpolluted estuaries in Portugal.

R. Eriksson, M. Medina and L. Guilhermino

An organism inhabiting an area that becomes polluted must either cope with the pollution, or meet the grim destiny of death. If pollution is long-term, selection of genetically inherited tolerance might occur. Previously, genetically inherited tolerance to pollution has been evidenced and discussed indistinctly in terms of evolutionary toxicology, genetic ecotoxicology, and ecogenotoxicology, among others. Although these papers represent a significant contribution to the knowledge of the relationship between anthropogenic environmental stress and population genetics, their scope do not consider ecological risks coupled to trans-generational effects. The term Micro Evolution due to Pollution, MEdP, should not only embrace the above-mentioned terms, but also include trans-generational effects (evolutionary processes) as well as estimations of the effect on ecosystem resilience and recovery after a polluting event (ecological risk assessment). To our best knowledge, this is the first attempt in the quest for evidence of micro evolution due to pollution, MEdP, and its consequences on possible biodiversity recovery of polluted estuaries. More specifically, the aim of the present paper is to assess life history trait variation of harpacticoid copepods from two unpolluted (Mira and Minho) and one Cu polluted (Cavado) estuary in Portugal.

## Economic Value of Marine Ecosystems and Biodiversity

Joao Coimbra

The diversity of marine ecosystems provides a foundation for the quality of human life and the raw materials to enrich it. Biological diversity, or biodiversity, refers to the variety of and variability among living organisms, and among the ecological complexes of which they are a part. It covers all of living resources of the world. Living marine resources provide essential economic,

environmental and cultural benefits to humanity. The aquatic organisms we eat represent the most widely recognized economic value. Currently, FAO estimates that global capture fisheries and aquaculture production is about 150 millions MT/year. Sixteen percent of all animal protein consumed worldwide comes from the oceans. Besides food, marine living resources provide products including ornamental marine life, raw materials, and medicines. Since 1985 the value of ornamental exports has increased at a growth rate of about 14%/year. Direct uses also include non-consumptive uses such as ecotourism, recreation, and research. The 1 million jobs, US\$ 7,3 billion in tax revenues and US\$ 30 billion in wages generated by recreational fishing are many times greater than those created by corporate giants such as Ford, Microsoft or Nike. However the growth of marine ecosystem exploitation is a mixed blessing. On one hand, the intensification of marine exploitation, obviously have increased the production of valuable commodities for mankind. On the other hand, as the exploitation continues to intensify, its increasing impact on ocean biodiversity is recognized as a fundamental problem. Without sustainable management, economic potential and resilience of marine ecosystems can diminish or be lost entirely.