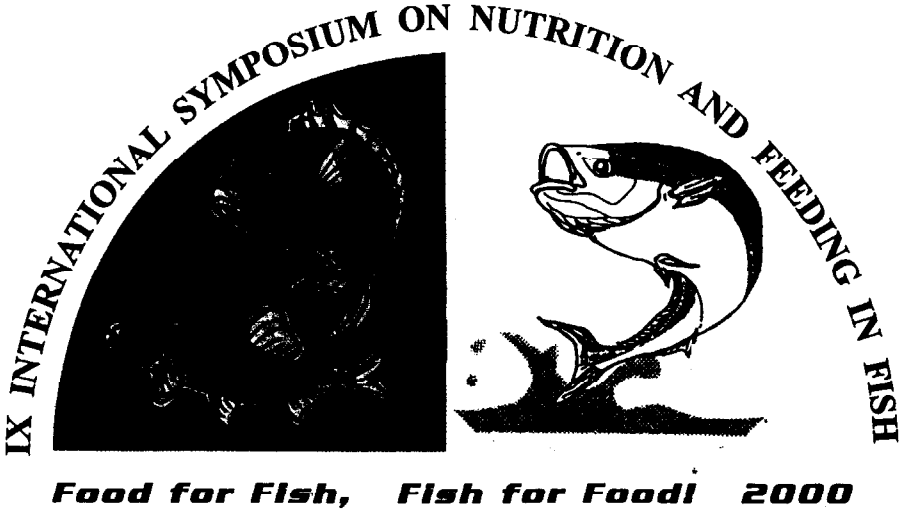
THE NINTH INTERNATIONAL SYMPOSIUM ON NUTRITION & FEEDING IN FISH



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DIGESTIVE AND NUTRITIVE UTILIZATION OF DIETARY LIPIDS IN MARINE FISH LARVAE

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Long recognized as one of the most important nutritional factors affecting growth and survival of marine fish larvae, dietary lipids still constitute a main research objective in larval nutrition. In recent years the investigations have focused not only on their effect in larval performance, but also on several aspects of lipid metabolism including the evolution of digestion and absorption processes along larval development.This presentation shows an overall view of the published information on the digestive and nutritive utilization of dietary lipids in marine fish larvae, including some recent results obtained in our laboratory which intend to contribute to a better understanding of larval lipid nutrition.

Although lipase activity is found in the digesta of marine fish larvae as early as first feeding, it rapidly increases during the first weeks of feeding being clearly influenced by dietary lipids. Accordingly, capacity for lipid absorption by intestinal epithelium has been also observed at the onset of exogenous feeding, although specific location in the different digestive tract segments differ with species. Whereas lipid absorption capacity increases along development in live prey fed larvae, this improvemment is delayed in larvae fed formulated diet. Increasing dietary phosphatidyl cholines levels enhances lipid absorption regardless its soybean or marine origin, but the latter improves hepatic lipid utilization. Enzymatic, histological and biochemical evidences suggest that marine fish larvae are able to effectively digest and absorb n-3 HUFA rich triacylglycerols, but feeding with phosphoacylglycerols, particularly if they are rich in n-3 HUFA, will allow a better incorporation of n-3 HUFA into larval membrane lipids promoting fish growth. The importance of docosahexaenoic, eicosapentaenoic and arachidonic acids is well known, but evidences for competitive interactions among them suggest that besides a minimum dietary requirement for each of these essential fatty acids, the relative ratios among them must be considered to promote larval rearing success.