Larvi 2005
Closing Session
Academic Impressions

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General Impressions

Larviculture is still a major bottleneck for the commercial production of new species for Aquaculture. Solving the bottleneck requires the study of rearing conditions, nutrition, broodstock quality, selection, pathology, larval behaviour, physiology…which are markedly interrelated.

A major strength of this symposium is its multi-disciplinary approach.

General Impressions

- Many quality contributions from academic and commercial participants also constitute a great success of this symposium.

Past and Present

- Substantial improvement in rearing techniques of new species has occurred (Senegalese sole, cod, cobia, halibut, etc.) basically adapting methods developed by research presented at previous Larvi meetings; almost 40 studies dedicated to technical improvements in larviculture in this symposium.
- There has been a change in the species mix. Shrimp papers are now only about 10%, while fish are dominate. Only two species of shrimp dominate within the shrimp area. Tiger shrimp are behind White shrimp because of domestication (a lesson for fish?). Fry production and disease still a problem with Tiger shrimp. More interest and progress in Crabs…

Past and Present

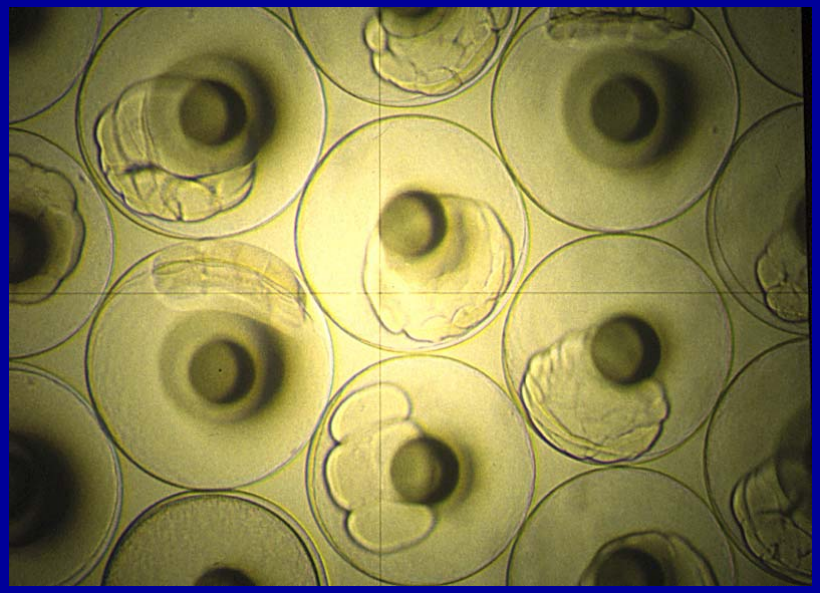
- Knowledge on larval nutrition, physiology,and live feeds has greatly improved and it is reflected in the quality of the studies…..and the enrichment products and starter diets produced by industry and labs!

- Much more information is provided now in each study on larviculture presented at the symposium, there is better control of experimental conditions, larvae composition, physiological status and metabolic processes. But there is always room to improve.

Past and Present

- Knowledge and control of broodstock quality is improving (27 studies have been presented in this symposium) despite the complexity and expense of working with broodstock. Still a lot of work is need in this field.

- Many good studies on digestive and absorptive processes and their regulation - still a lot to do here too!



Past and Present

- Considerable improvements in live prey (rotifers and *Artemia*) characterization, growth and production technology, but not so much as expected 20 years ago in copepod production!!!

- Molecular biology is increasingly being use as a powerful tool to understand biological mechanisms, ideally complementing and sometimes explaining the results obtained with more traditional methodologies, and helping us to understand the processes which cause the effects we see in larval growth, survival and health. We should try and make links from molecular responses to organism responses.

Past and Present

- Larval quality is replacing quantity as a main research target. Malpigmentation problems seem to be better controlled, but deformities and health are still unsolved problems affected by many different parameters (genetics, nutrition, environment…) and a lot of effort and coordination will be needed to solve these problems.

- Defining quality of juveniles relates to their use. Genetics, behaviour, growth rate, and appearance goals are different if for stock enhancement or commercial production. This should be taken into account.

Past and Present

- Concern and knowledge of larval health has also increased, focusing mainly on bacteria and the use of probiotics. More than 30 studies were presented in this symposium concerning health of larvae.

- Important and promising advances in vaccine development are also being researched.

- Systems engineering is also improving fish health.

Future?

- Urgent information is needed in larval health, vaccine development and selection of better performing strains
- Experiments need to get close to practical culture conditions but also control the factors which affect the studied parameter, in order to obtain valuable scientific conclusions. It is very important to standardize procedures and define conditions.
- Need to consider the interrelations among disciplines which can impact results- nutrients, environmental factors, genetic background, etc.

Future?

- Recommendations and generalizations should be carefully considered and treatments well defined. Molecular form? Interrelations? Species specificity? Environmental conditions? Timing dependant effect?, Tank size, Densities…
- We need to consider experimental design and statistical analysis. We should see replicates, confidence levels, variance and so on reported. Careful selection of controls will improve our studies.
- Definition of products tested should be more emphasized: i.e. characterization of protein hydrolisates, molecular form of vitamins produced, specific composition of immunostimulants, enrichments etc.

Future?

- Because products have improved (diets, live feeds, egg quality, rearing systems) results from the present may not be compared to the past…or the future.
- More studies are needed on feed technology, microdiet processing and development, automation of rearing techniques and so on…..
- New areas of study - **Innovation!!!** - need to be addressed in order to markedly improve larviculture of all species!

Thank You!