

The Freshwater Prawn Research at SEAFDEC/AOD

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Research and commercial production of the freshwater prawn, *Macrobrachium* sp., in the Philippines are yet not well-developed. Although studies on *Macrobrachium* sp. (or *ulang* as it is locally known), started at the Binangonan Freshwater Station (BFS) of SEAFDEC/AQD in the mid-1980s, research efforts were discontinued soon thereafter because of: (a) inadequate technical skills; (b) problems with larval rearing and the domestication of wild stocks; and (c) the *Macrobrachium* sp. is being considered in the Philippines as a low priority species in contrast to commercially important freshwater commodities like tilapia and milkfish.

That was two decades ago and in retrospect, researches continued and the freshwater prawn in the Philippines could have been successfully domesticated and current problems concerning the limited aquaculture production of genetically depauperate non-indigenous stocks could have been resolved. With the renewed interest in the culture of alternative species like the freshwater prawn, researchers at the Binangonan Freshwater Station (BFS) started to conduct some studies on the refinement of breeding, larval rearing and culture of *Macrobrachium rosenbergii* since 2003.

The recent research studies on *Macrobrachium rosenbergii* at BFS are briefly described below:

i) Evaluation of different live food organisms as starter food for freshwater prawn larvae

This study aimed to evaluate growth, survival and post-larval production of *Macrobrachium rosenbergii* when fed different live food organisms (*Moina*, *Artemia* and a free living nematode, *Panagrellus redivivus*). Results showed that growth (measured as mean developmental stage, MDS), survival and post-larval production differed significantly among the treatments. Final body weight of *Moina*-fed larvae was higher but not significantly different ($P>0.05$) from that of *Artemia*-fed larvae. However, survival of *Moina*-fed larvae was significantly low.

Prawn larvae fed *P. redivivus* had poor survival and survived only for 8 days. Meanwhile the development of *M. rosenbergii* in this present study was faster in that 80% of the larvae reached postlarval stage after 20-25 days of rearing compared to the 34 to 36-day development period reported by Ang and Cheah (1986).

While *Artemia* is still the best natural food for *M. rosenbergii*, this study demonstrated the acceptability and potential of *Moina* as a starter feed for prawn larvae given the fact that increased body weight was observed in larvae fed *Moina*. However more work should still be undertaken to optimize the use of this and other promising alternative feeds.

ii) Farming of *Macrobrachium rosenbergii* in modular cages in Laguna de Bay

This study was conducted to determine the growth and survival of freshwater prawn in cages ($2.5 \times 1 \times 1\text{m}^3$) as affected by different stocking densities (15, 30, 60 and 90 prawns/ m^2) and availability of natural food. The effect of these parameters on the population structure of different morphotypes and the degree of heterogenous individual growth (HIG) in male FW prawns was assessed. Results showed that mean sizes at harvest after 5 months of culture ranged from 14.3 g for the highest stocking density to 26.3 g for the lowest. Mean size at harvest, daily growth rate, and size class distribution were significantly influenced by stocking density with those at the lowest stocking density showing significantly better growth and overall proportion of larger prawns. Heterogeneous individual growth (HIG) was fairly evident in all treatments.

The percentage of blue-clawed males (BC-males) was not influenced by treatment but the mean weight was significantly higher in the lower stocking densities. Survival was highest in the lower stocking densities (55.3, 54.0, 52.7, and 36.9% for 15, 30, 60 and 90 prawns m^{-2} , respectively).

Feed conversion ratio (FCR) improved with decreasing stocking density ranging from 2.1 to 3. Yield per cropping increased with stocking density and ranged from 1,874 to 4,530 kg ha⁻¹.

Production values obtained in the cage cultured *M. rosenbergii* were comparable to or even higher than those reported from pond culture. Results show that the farming of *M. rosenbergii* in cages in lakes is a viable alternative to pond culture and has the potential of improve aquaculture production in lakeshore fish farming communities.

iii) Reproductive performance of various stocks and species of freshwater prawn fed high and low protein diets

This preliminary study aims to determine the reproductive efficiency of FW prawn broodstock fed high- and low-protein diets. Thus far, two *Macrobrachium* sp. (hatchery-bred *Macrobrachium rosenbergii* and wild-sourced *Macrobrachium* sp.) are being evaluated. In collaboration with the Mindanao State University (through Dr. Dejarne), more stocks shall be collected and their reproductive traits shall be compared. This strain evaluation experiment hopes to identify stocks and/or species that can later be used in improving the present hatchery stocks of *M. rosenbergii* either through crossbreeding/ hybridization and other conventional selective breeding methods.

These plans to genetically document stocks are incorporated in a general proposal entitled “Genetic characterization, domestication and improvement of *Macrobrachium rosenbergii* in the Philippines” to be pursued further under the collaboration research.

Collection of Wild Stocks, Domestication and Propagation of *Macrobrachium rosenbergii*
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There is an expanding interest in the culture of freshwater prawn in the Philippines. This is attributed to the extensive campaign of the government, the Bureau of Fisheries and Aquatic Resources (BFAR) and some private entrepreneurs to disseminate information and seeds of the prawn nationwide.

Although freshwater aquaculture in the Philippines is still dominated by tilapia, which is an exotic fish, the profit from tilapia culture is not well appreciated except for family consumption or nutrition purposes. The freshwater prawn, an indigenous species, remains to be an important species. With freshwater prawn as an alternative species, farmers can diversify and derive higher profit from their ponds. In the Philippines, *Macrobrachium rosenbergii* stocked in 2,000 m² ponds may grow to about 45 g after four months and 90 to 100 g in seven months of culture (Rosario, 2002). The price of the species is five times higher than tilapia.

During the first Round Table Discussion on the Development of Genetically Improved Strain of *Macrobrachium* held at the Freshwater Aquaculture Development Center, Sukabumi, West Java, Indonesia in November 2003, the delegates from Thailand reported that the Philippine wild stocks of *Macrobrachium*, *M. rosenbergii rosenbergii* Philippine strain could be a better variety and therefore must be protected from contamination by non-indigenous strains. The report supports and confirms the importance of the activity of the National Integrated Fisheries and Development Center (NIFTDC) to collect live specimens of various strains of *Macrobrachium* in the country and review their performance in terms of growth and fecundity.

Geographical Distribution

In the Philippines, wild catch is available from the river tributaries and lakes in the provinces of Pangasinan, La Union, Ilocos Sur, Ilocos Norte, Cagayan, Pangasinan, Pampanga, Bulacan, Laguna, Palawan, Sorsogon, Leyte, Samar, Cotabato, Lanao, Maguindanao, Agusan and other parts of Mindanao. A survey by Agasen (2001) reported 12 species in Luzon with *Macrobrachium rosenbergii* as dominant species.

