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BFAR-NIFTDC collected live wild stocks of the species from Bulacan, Palawan, Bicol, and two provinces in Mindanao from Year 2002 and domesticated them at the Center. Due to limited space and manpower, the strains found to be inferior in growth performance were discarded.

Testing of Local Strains

One local strain of *Macrobrachium* (BFAR 1) collected from Mindanao was tested to have better performance than the old strain used by the Center (BFAR 0). With the BFAR 0 as benchmark, the larval rearing period of BFAR 1 is shorter by 8 to 13 days. The normal rearing period of BFAR 0 is 45 to 50 days, whereas BFAR 1 only requires 37 to 40 days. The larval rearing period is much shorter during hot months. The size of BFAR 1 larvae are bigger by 25 %. The survival rate of the larvae during rearing has improved by about 12 %. Results of field trials on growth performance are still being evaluated.

There were more than 200,000 postlarvae produced and distributed to the farmers for culture by BFAR-NIFTDC from October 2003 to present. From 100 breeders collected from the wild, the Center is now using 500 F2 and F3 breeders.

One problem encountered in the use of another local strain (BFAR 2) is the early release or detaching of eggs from the female breeders.

The basic problem encountered by BFAR-NIFTDC in the collection and use of local strains is the proper identification of species. It is therefore recommended that the collaborating countries should establish uniform guidelines and references in order to solve the problem.

Literature Cited

Rosario, W. R. 2002. Culture of Freshwater Prawn (*Macrobrachium rosenbergii*) in Earthen Ponds, BFAR-NIFTDC Extension Paper, 3pp.

Freshwater Prawn Program of BFAR

Dr. Melchor M. Tayamen of BFAR NFFTC.

The giant freshwater prawn (*Macrobrachium rosenbergii*) is one of the indigenous prawns found in many parts of the country. Locally known as *ulang*, it is a hardy species that is easily farmed. On the average, farmed *ulang* weighs from 30 to 100 grams, which translates to 10 to 25 pieces per kilo. This is very much comparable to the medium to large or jumbo sizes of brackishwater tiger shrimps or *sugpo*. In the wild, *ulang* grow as much as 500 g and sells at 300 to 350 pesos/kg (\$1=P55.50), however, the quantity harvested is limited and is dependent on its seasonality.

Despite the development of both hatchery and grow-out technologies for *ulang*, there is really no significant commercial production in the country yet, except in BFAR-operated hatcheries in Muñoz and in Dagupan. To date, the only private *ulang* hatchery is MBL Farms producing up to 150,000 PL or post-larvae per run (45 days), although there are entrepreneurs trained in Muñoz who are also operating small backyard hatcheries for prawns.

With the emerging global market on this giant freshwater prawn coupled with improved technologies, it is but imperative to speed up the development of the industry in the country. However, the industry is faced with problems and constraints that include:

- Insufficient breeders

- Insufficient supply of post-larvae or PL for stocking
- Limited market supply
- Limited funds for interested stakeholders
- Insufficient information
- Inadequate promotion of technology transfer
- Very few skilled and/or trained technicians
- Research and development of *ulang* hatchery and grow-out are still wanting new technologies

Potentials

Macrobrachium rosenbergii or *ulang* is one of several indigenous freshwater prawn species in the country. *Ulang* abounds in rivers, lakes and other tributaries in the Philippines. It is known as *udang* in the provinces of Ilocos, Cagayan and other parts of Northern Luzon, *kising-kising* in Pangasinan, *paje* in Palawan and Zamboanga, *padao* in Cotabato, *kalig* (big) and *urang* (small) in Leyte, *budsang* in Bicol and *ulang* in most parts of the country including Bulacan, Laguna, Zambales and others.

Considered as the world's largest, it is one of the emerging shrimp products in the global market. As a high value crop, *ulang* is exported in frozen form to the US and the European markets where its large size and comparatively lower price than the tiger shrimp makes it a popular aquatic item. When whole, it is also regarded as specialty item and are often sold live for display in aquarium tanks.

With the country's extensive inland resources about 250,000 hectares in all of the lakes, rivers and reservoirs; 106,328 hectares of freshwater swamplands and 14,531 hectares of freshwater fishponds, *ulang* grow-out has a very large potential. Although finfish such as tilapia and *bangus* dominate the farmed species in these areas, catfish, mudfish and freshwater prawn are also harvested.

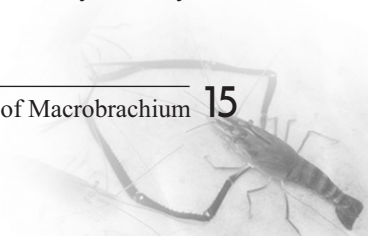
Development of Technology

The culture of *ulang* was introduced in the 1970's in Asia as well as in other parts of North and South America. In the 1990s, an ASEAN-EC-Aquaculture Coordination Development Program was implemented by BFAR and one of its components is the breeding of giant freshwater prawn in glass aquaria, and later on in tanks. These pioneering studies on *ulang* production were conducted at the National Freshwater Fisheries Technology Center (NFFTC) in the Science City of Muñoz, Nueva Ecija. In the later part of 1998, BFAR had successfully mass-produced the post larvae or PL stage of this species. In 2001, the hatchery of the *ulang* was further improved and finally a protocol for its commercial hatchery was established in Muñoz and later on at the National Integrated Fisheries Technology Development Center in Bonuan, Dagupan City, Pangasinan.

Since then, BFAR continues to introduce various schemes to promote the technology to various stakeholders, e. g., conduct of trainings, dispersal programs and establishment of techno demo-sites for its culture with farmer-cooperator scheme. Various national trainers training for *ulang* hatchery and grow-out were also conducted to disseminate its potentials and opportunities. In addition, a Task Force for *ulang* promotion program was also created in the early part of 2004.

Production Trend

Production from the farming of *Macrobrachium rosenbergii* has expanded considerably, mainly



in Asia and also in South and North America. The Food and Agriculture Organization (FAO) reported that global production of *M. rosenbergii* had risen to nearly 119,000 metric tons from only about 5,000 metric tons recorded in 1984. China, which introduced this species in 1976, contributed over 97,000 metric tons in 2000.

The FAO likewise stressed that the production statistics for this species are underestimates, because some countries have not yet clearly defined their production from more general statistical categories such as ‘freshwater prawns and shrimps’ or ‘freshwater crustaceans’.

The same is true in the Philippines in as much as most of the *ulang* sold in the local markets are caught in the wild. There is no significant commercial farming of *ulang* in the country yet, except with MBL Farms owned by a private entrepreneur who had trained on hatchery and grow-out at the BFAR and pilot projects in small ponds in Laguna.

However, with BFAR’s active promotion of *ulang* in hotels, restaurants and the public during the 1st *Ulang* Food Festival in 2003, the demand for this prawn had grown considerably. MBL Farms reported that it could no longer cope with the growing demands in Manila alone. The MBL Farm’s medium scale hatchery already produces fifty thousand to one hundred fifty thousand post larvae or PLs per run.

Business Viability

The culture of *ulang* is a profitable business venture. BFAR-Muñoz techno-demo farms show a high return on investment in both *ulang* grow-out and hatchery operations. Also, based on the feasibility studies prepared by MBL Farms, the estimated ROI could range from 63 percent to 74 percent depending upon the size of the pond area. The current market price of *ulang* ranges from 300 pesos to 350 pesos depending on the size (US\$1.00 = P55.50).

BFAR had also launched its national rice-shrimp program in 2001 to attract rice farmers into integrating *ulang* culture in their rice farms. Under this scheme, the farmer is assured of two-fold benefits: that of the same amount of rice harvest plus an additional income derived from the sale of *ulang*.

Development of Freshwater Prawn Industry in the Philippines

In spite of the development of hatchery and grow-out technologies in the freshwater prawn (locally known as *ulang*), there is really no significant commercial production of the prawn in the Philippines. This has been attributed to various constraints that include: (1) insufficient supply of breeders; (2) inadequate supply of postlarvae for stocking; (3) limited market supply; (4) limited funds for interested stakeholders; (5) lack of information; (6) limited promotion of technology; (7) inadequate skilled and/or trained technicians; (8) limited R&D on *ulang* hatchery. With the country’s extensive inland resources, *ulang* aquaculture has a very large potential.

The Philippine Bureau of Fisheries and Aquatic Resources (BFAR) continues to pursue the aquaculture of *ulang* in its NFFTC in the City of Muñoz, Nueva Ecija (central Luzon), as well as disseminate the culture’s potentials and opportunities. In 2004, BFAR established a Task Force with NFFTC as homebase for the promotion of *ulang* aquaculture program.

Various interventions have been programmed by the Task Force for *ulang* aquaculture in the Philippines. These are: (1) establishment of *ulang* hatcheries in existing EXCEL tilapia central and satellite hatcheries throughout the Philippines to produce the required prawn postlarvae; (2) establishment of hatcheries in coastal areas near the EXCEL tilapia hatcheries to increase the number of *ulang* hatcheries; (3) lease or improvement of non-performing sugpo (shrimp) hatcheries into multi-



use functions to include *ulang* seed production; (4) promotion and/or dispersal of *ulang* postlarvae throughout the country; (5) establishment of pilot techno-demo farms in collaboration with private cooperators, local government units and the academe; (6) awareness creation on the part of the fisherfolk and/or entrepreneurs on the potentials of *ulang* culture; (7) development of a code of conduct for sustainable *ulang* production; (8) refinement of the rice-prawn technology and promotion of the technology throughout the country; and (9) intensive nationwide information dissemination campaign on the economics of *ulang* aquaculture. With inputs coming from the IRAP collaborative research, the Philippines is assured of the sustainability of prawn aquaculture in the country.

Hatchery and Pond Culture of *Macrobrachium rosenbergii* in Northern Mindanao

Dr. Henry E. Dejarne of the MSU at Naawan.

The history and status of hatchery and grow-out culture of *Macrobrachium rosenbergii* is not based on a study nor a survey. Rather, it was derived mainly from his on-the-job experience and information gathered during visits of culture sites or shared by other workers in the culture of freshwater prawn in Northern Mindanao. Thus, the background information may not be as complete as it should be.

The history of *M. rosenbergii* hatchery operations in Northern Mindanao can be traced from minor or side activities in different locations by several institutions. Earlier attempts to produce postlarvae of *M. rosenbergii* in hatcheries by MSU faculty/researchers were conducted in the school laboratory hatchery of the College of Fisheries in MSU Marawi City and in the commercial hatchery facilities for *sugpo*, *Penaeus monodon*, at MSU Naawan.

At the MSU Marawi College of Fisheries, a faculty member led his group to initiate hatchery production of *M. rosenbergii* fry in the 1970s. The breeders were collected live from Kapay near Marawi City. Kapay is more than a thousand feet above sea level, and 30 m away from the oceanic waters of Iligan Bay. The larvae that were hatched were reared in freshwater and died after a week or so. A second and last batch of breeders collected from the same site hatched their eggs and the larvae were reared in brackishwater medium. The larvae survived a few days more than the first, yet they did not attain postlarval stage when mass mortality occurred.

In Naawan, a series of trials on the larval rearing of freshwater prawn in the late 1970s and early 1980s was part of a project that mainly included a study on the biology and ecology of the species in two prawn grounds in the municipalities of Tambulig and Siay, Zamboanga del Sur. The natural habitat of *M. rosenbergii* in Tambulig is located in the innermost portion of Panguil Bay in Northwestern Mindanao. On the other hand, the prawn habitat in Siay is in Sebuguey River that empties into Illana Bay facing the Celebes Sea.

Live berried females from the two study sites mentioned were transported to Naawan and held in wooden tanks until the eggs were hatched. The larvae were reared in brackish and green water medium and fed *Brachionus*, *Artemia*, and strained fish flesh throughout the rearing period. Unfortunately, not a single larval rearing trial was successful.

Hatchery trials to culture freshwater prawn postlarvae were also conducted by a faculty member in 1994 at the Multispecies Hatchery of the Dipolog School of Fisheries in Zamboanga del Norte. A few postlarvae were produced in about a year, but the school administration decided to discontinue this activity.

Present Status of Hatchery and Pond Culture

In March 2004, eggs of some *M. rosenbergii* breeders from the Misamis Occidental Aquamarine

