1. Profile of Awardee

Name: Dr. Ma. Junemie Hazel Leonida Lebata-Ramos

Affiliation: Scientist, Southeast Asian Fisheries Development Center (SEAFDEC)

2. Outline of Research Achievements

Title of Research Achievement:

Stock enhancement of commercially important and threatened marine invertebrates in tropical areas

Outline of Research Achievements

Although stock enhancement aimed at increasing recruitments to fisheries by releasing juveniles has developed in Japan in the last few decades, it is still emergent in developing countries. Since 2006, SEAFDEC/AQD has implemented the program "Stock Enhancement for Threatened Species of International Concern", in response to heightened public interest in environmental protection and resource conservation. To develop and disseminate stock enhancement technologies for tropical invertebrate species, Dr. Lebata-Ramos has conducted studies on mud crabs *Scylla* spp., abalone *Haliotis asinina*, giant clam *Tridacna gigas* and angelwing clam *Pholas orientalis*.

The results of her research works revealed the basic requirements for stock enhancement, such as the need to 1) gather baseline information on the wild population and/or fisheries of the species prior to stocking, 2) produce healthy juveniles for release in the hatchery, 3) know the most appropriate environmental conditions for the release animal, 4) determine the most appropriate tag for the species to be released in order to properly identify recaptures, and 5) condition hatchery-bred animals prior to release to improve survival in the wild. From her findings, she concluded that stock enhancement can be an effective tool in addressing declining fisheries resources. Moreover, Dr. Lebata-Ramos aims to establish protocols and guideline for stock enhancement of other invertebrates, especially the endangered and heavily exploited species.

Dr. Lebata-Ramos has published the results of her work on clam biology, mud crab population and stock enhancement in international peer-reviewed journals and has co-authored several papers on stock enhancement and invertebrate biology and ecology.

Main Publication and Patents

(1) Growth and survival of hatchery-bred giant clams (*Tridacna gigas*) in an ocean nursery in Sagay Marine Reserve, Philippines. *Aquaculture International* DOI 10.1007/s10499-009-9272-4, 2009

(2) Evaluation of hatchery-based enhancement of the mud crab, *Scylla* spp., fisheries in mangroves: comparison of species and release strategies. *Marine and Freshwater Research*, **60**, 58-69, 2009

(3) Baseline assessment of fisheries for three species of mud crabs (*Scylla* spp.) in the mangroves of Ibajay, Aklan, Philippines. *Bulletin of Marine Science*, **80**, 891-904, 2007

3. Reason of Awarding

The awardee has revealed the basic requirements for stock enhancement, not only by releasing juvenile invertebrates in natural rivers, but also by evaluating the impacts of released juveniles on wild species in order to establish a new stock-enhancement technology suitable for tropical invertebrate species. The outcomes of this study will contribute to species conservation and the sustainable use and harvesting of living aquatic resources. These will also help to support the livelihoods of the inhabitants of coastal areas. The awardee's joint research project with Japan has enabled us to expect further progress on this issue.

1. Profile of Awardee

Name: Dr. Amos Adeyinka Onasanya

Affiliation: Associate Researcher, Africa Rice Center (AfricaRice)

2. Outline of Research Achievements

Title of Research Achievement:

Molecular and pathotyping characterization of blast, rice yellow mottle virus, bacterial leaf blight and African rice gall midge in West Africa

Outline of Research Achievements

Dr. Onasanya helped contribute to the development of promising rice varieties for West Africa, such as *O. glaberrima* accessions, *O. sativa indica*, *O. sativa japonica* and new interspecific lines between *O. sativa* and *O. glaberrima* (NERICA), by characterizing their resistance to major biotic stresses (RYMV, Blast, BLB and AfRGM) prevalent in rainfed and irrigated environments. Since several yield losses to these major biotic stresses have been reported, the knowledge of population structures in RYMV, Blast, and BLB pathogens and AfRGM biotypes in West Africa is a prerequisite into the development of efficient and durable resistance rice varieties.

His research led to the development of a molecular diagnostic tool for rice gall midge species, *Orseolia,* in West Africa which could not have been possible with morphological technique alone. New cultivar screening methodology using insect vectors identified in the research revealed natural field screening condition for the effective control of RYMV. The new serotyping method is cheap and can be easily used by NARS along with the new antibodies developed. RYMV in Gambia, two pathotypes in Mali as well as *Magnaporthe grisea* pathogen population structure in Burkina Faso, resistance status and *Xoo* pathogen population structure in West Africa, etc. were likewise confirmed for the first time in his researches.

His main research activities conducted were under the p levels of genetic diversity project with Africa Rice Center (AfricaRice), “Integrated management of RYMV, BLB, and AfRGM in lowland ecosystem: contribution to sustainable intensification of lowland rice-based systems for enhanced livelihoods and enhancing the performance of irrigated rice-based systems in Africa”.

Main Publication and Patents

(1) Potential of insect vector screening method for development of durable resistant cultivars to *Rice yellow mottle virus* disease. *International Journal of Virology*, **4**, 41-47, 2008

(2) Enzyme polymorphism and genetic diversity in *Xanthomonas oryzae pv. Oryzae* isolates causing rice bacterial leaf blight disease in West Africa. *International Journal of Agricultural Research*, **3**, 227-236, 2008

(3) Morphological diversity and genomic DNA fingerprinting of the African rice gall midge *Orseolia oryzivora* (Diptera: Cecidomyiidae) and of two other species of African Orseolia. *International Journal of Tropical Insect Science*, **26**, 256-265, 2006

3. Reason of Awarding

The awardee, an African researcher, plays a central role in the rice pest research conducted by the Africa Rice Center (AfricaRice) in West Africa. He has established a cheap method of screening for rice yellow mottle virus (RYMV) and has shown how to effectively control RYMV in the field. He also confirmed the pathogen population structures of blast and bacterial leaf blight (BLB) in West Africa for the first time. Progress in this study is expected to produce new cultivars resistant to various disease pathogens and insect pests, thus contributing significantly to the doubling of rice production in Africa.

1. Profile of Awardee

Name: Dr. Kevin Kit Siong Ng

Affiliation: Research Officer, Forest Research Institute Malaysia (FRIM)

2, Outline of Research Achievements

Title of Research Achievement:

Spatial structure and impact of logging on genetic diversity of selected tropical tree species

Outline of Research Achievements

Dr. Ng undertakes analyses of the spatial distribution pattern, spatial genetic structure and genetic diversity carried out in two tropical tree species with contrasting breeding systems and different ploidy levels using a 50-ha demographic plot in a lowland dipterocarp forest in Peninsular Malaysia. *Shorea leprosula* is a diploid and predominantly outcrossed species, whereas *S. ovalis* ssp. *sericea* is an autotetraploid species with apomictic mode of reproduction. The impact of selective logging on the genetic diversity of *S. leprosula* and *S. ovalis* ssp. *sericea* was examined using direct comparison and simulation methods. Direct comparison of adjacent natural and logged-over stands showed reduction of genetic diversity of *S. leprosula*, but not of *S. ovalis* ssp. *sericea*. These results clearly demonstrated that a single logging event would cause the genetic erosion of *S. leprosula,* an outcrossed species. The simulation study also showed that the loss of genetic diversity was higher for Malayan Uniform System (MUS) as compared with Selective Management System (SMS). This might suggest that SMS is more orientated towards the conservation of genetic diversity.

The main merit of Dr. Ng's research is that it promotes some model species based on their breeding systems, which can be used as indicators to test the effects of the forest management systems on genetic diversity. Reducing the impact of logging activities on the genetic diversity of tree species would be important in maintaining these resources for long-term use. Based on the present study, it is conceivable that an inventive and a scientifically justifiable harvesting system can be formulated to minimize the negative impacts of logging on forest tree species.

Main Publication and Patents

(1) Impact of selective logging on genetic diversity of two tropical tree species with contrasting breeding systems using direct comparison and simulation methods. *Forest Ecology and Management* , **257**,107-116, 2009

(2) Spatial structure and genetic diversity of three tropical tree species with different habitat preferences within a natural forest. *Tree Genetics and Genome*s, **2**, 121-131, 2006

(3) Spatial structure and genetic diversity of two tropical tree species with contrasting breeding systems and different ploidy levels. *Molecular Ecology* , **13**, 657-669, 2004

3. Reason for Award

By comparing the levels of genetic diversity, spatial distributions and spatial genetic structures of two tropical tree species (Dipterocarpaceae) that have extremely different modes of reproduction, the awardee has explicitly shown the impacts of logging on tree populations of diverse ages and with different genetic diversities. The outcomes of this study are expected to be used in conducting sustainable forest management and in improving the guidelines for forest management systems in order to effectively conserve genetic resources in Peninsula Malaysia.