



MNS Celebrates Fish Conservation Month

S. Santander

In line with the country's celebration of the "Fish Conservation Month", the UPV Museum of Natural Sciences of the College of Fisheries and Ocean Sciences held a Seminar on Marine Ecosystems, Resources, and Conservation on October 23, 2007 at the Pidlaoan Hall of the CFOS. This activity aimed at educating the young generation on the importance of the marine resources and its conservation; and to develop in them the good stewardship of these resources.

Researchers and coastal resource management practitioners from UP Diliman- Marine Science Institute (MSI), Bolinao Marine Laboratory, who came to Iloilo City to participate in the National Symposium in Marine Science were invited as speakers for the occasion. The volunteer lecturers include Dr. James Guest, Mr. Dexter de la Cruz, Mr. Francisco Paciencia, Jr., and Ms. Sheila Mae Santander discussed "Coral Reef Restoration", "Mangrove Ecosystem and Restoration", "Seagrass Conservation", and "BML Conservation Studies", respectively.

The seminar was attended by approximately 140 high school students from different academic institutions all over the province and city of Iloilo.

Students from different highschools around Iloilo attend the seminar



Museum holds Coastal Clean-up Day

S.Santander

The UPV Museum of Natural Sciences of the College of Fisheries and Ocean Sciences carried out the Coastal Clean-up Day on September 29, 2007.

Patterned after the Center for Marine Conservation (the organization who initiated the International Coastal Clean-up), this event aims to: 1) increase awareness on marine debris crisis and its adverse impact on the people and the environment, 2) remove debris from the shores, waters and waterways and gather information on the debris collected per area covered, 3) endorse the formulation of resolutions and ordinances for marine environmental protection and conservation with the use of the information gathered, and 4) articulate the importance of a clean, healthy and sustainable marine environment.

Despite a very rainy day, 35 volunteers participated in the UPV-MNS Coastal Clean-up 2007. The volunteers were composed of UPV undergraduate and graduate students, faculty and staff together with some members of their family.

The activity covered the beach area in front of the University of the Philippines Visayas wet and dry laboratory which extends from the hatchery building going to the Marina Beach Resort. This is estimated to be about 500m². The garbage collected were composed of plastic food wrappers, containers and toiletries.



UPV Chancellor Glenn D. Aguilar participates in the Coastal Clean-up 2007

MNS to Award Museum Volunteers

S.S.Garibay

The Museum Volunteer Program, which was launched by the Museum of Natural Sciences in October 17, 2005 has been very fulfilling. This volunteer program aimed to develop and nurture student's sense of stewardship and responsibility in the museum activities. Since it was launched in 2005, a remarkable increase in the student's participation in the museum activities was observed.

We are glad to announce that for Y2007, two students and one staff will be added in the list of MNS volunteers. The office of the museum welcomes the participation of Mr. Victor Marco Emmanuel Ferriols, Mr. Flord Nicson Calawag and Ms. Marie June Esprela. Mr. Ferriols and Mr. Calawag, both graduating students of CFOS, have been in close coordination with the Museum concerning student related activities such as exhibits and museum guiding for visitors. Ms. Esprela is an Extension Specialist of the Institute of Aquaculture who is always supportive to the museum activities. The three are joining Ms. Edna Abunal and Mr. Cornelio M. Selorio, Jr., who had been serving the museum as volunteers since 2005.

Certificates of Recognition for their commitment to the office as Museum Volunteers will be awarded during the Student Council Week in February 2008.



The vanishing species of endemic freshwater fishes in the Philippines

Marianne Hubilla-Travis

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The world has about 30,141 species of fish belonging to 538 families. More than 10% of these fishes are found in the Philippines. About 315 species of fish in the Philippines are found in freshwater habitats; 70% of which are native, 15% are endemic, 13% are introduced while 2% are questionable or not established. In addition to other endemic species of aquatic flora and fauna, makes the Philippines the center of aquatic diversity in the world in tandem with Malaysia and Papua New Guinea hosts a total of 15% endemic freshwater fishes.

Among the fish families, the Family Cyprinidae is the largest with 2,669 species. This is also the fish family that contains almost 60% of the total endemic freshwater fishes in the country. The list of endemic freshwater fish species in the Philippines is available at Fishbase (2007) and IUCN (2007). The majority of these endemic fish are found in the lakes and rivers of Mindanao, Palawan, Luzon and Mindoro. About 48% of the total endemic species are in the Red List of the International Union for the Conservation of Nature (IUCN). The IUCN's highest category for threatened species (except Extinct and Extinct in the Wild categories) is Critically Endangered followed by Endangered, Vulnerable, Near Threatened, Least Concerned and Data Deficient. About 64% of the endemic species listed in the IUCN Red List fall under the Critically Endangered species category. These are the freshwater fishes in the country that are currently in danger of becoming extinct.

Although, 52% of the total endemic species are not listed in the IUCN Red List, it doesn't mean that they are not in danger of becoming extinct. In most cases, the populations of these endemic species are also endangered, but many of them have not been surveyed, yet. Probably, this is due to the lack of funding and researchers to perform the task. The IUCN therefore, could not determine and specify the exact status of their population.

A number of explanations are emerging regarding the cause of the vanishing population of endemic freshwater fishes in the country. For instance, in Lake Lanao, Lanao del Sur, the bodies of water are isolated with 18 species of commercially important endemic freshwater fishes. The introduction of Nile tilapia *Oreochromis niloticus* coupled with overfishing and illegal fishing activities were believed to be the cause of their rarity. Same activities have caused the scarcity of endemic fishes in Taal Lake, Batangas and in Lake Buhi and Bato, Camarines Sur. In the Agusan Marsh, the endemic carp *Puntius montanoi* thrived in an open-water environment with an annual water level fluctuation. Although the carps are not commercially important in the Marsh, their population is nonetheless threatened by pollution (e.g., heavy metals from mining firms) and illegal fishing activities (e.g., electrofishing, fish poisoning). *P. montanoi* is not a target species in electrofishing and

fish poisoning; however, the non-selectivity of electrical gadgets and poisonous chemicals caused their inclusion in the catch. The invasion of common carp *Cyprinus carpio* and janitor fish *Pterygoplichthys disjunctivus* in the Marsh poses another threat to *P. montanoi*. Janitor fish invasion in Luzon also threatens the endemic fishes of Laguna de Bay, Cagayan Valley, and the lake and river systems of Manila and Central Luzon. Habitat degradation and overfishing of fishery resources threatened the other endemic fishes of Mindanao including those of Samar, Cebu and Palawan.

Generally, endemic species are non-opportunistic; that is why they are always out-competed by opportunistic non-indigenous species in terms of food and habitat. Commercially important endemic fishes in isolated areas are more prone to extinction as compared to endemic fishes with low economic value in an open-water environment. This is because they are often the target of active fishing gears. If they are confined to an isolated area, their population continues to decline because they cannot migrate to other areas to establish a new population that is free from fishing pressure and competitions with invasive species. In contrast, endemic fishes with low economic value are often threatened by habitat degradation, pollution and incidental catch (e.g., by-catch in electrofishing). If their locality is an open-water environment, they could have opportunity to migrate to other areas to establish a small population. However, if they are confined in an isolated environment, they have lower chances of establishing new populations, except if there is a heavy flood, wherein their larvae (or even the adults) can be transported to other areas with favorable living conditions.

The tragedy of the vanishing endemic species of freshwater fishes in the country is a major environmental dilemma that needs to be addressed immediately before they will completely disappear in the wild. The lax enforcement of environmental laws related to illegal fishing, pollution control, and importation and culture of non-indigenous species should be strengthened to minimize the damage that these activities are causing the country. Conservation measures are needed now to save our endemic freshwater fishes from extinction. Saving them today is just like preserving them for our future generations.

MOLECULAR TAXONOMY: A MODERN APPROACH TO SPECIES IDENTIFICATION

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With the plethora of organisms here on earth, have you ever dreamed giving a name even to a single organism? I once dreamed of that and until now I am hoping that someday one organism will bear my name. With the bewildering number of organisms waiting to be identified, my dream is not impossible.

The Swedish botanist Carolus Linnaeus provided the basic foundation of the science of taxonomy through his system called binomial nomenclature. Through the years, taxonomy proved its dynamic nature. The use of physical similarities and differences by Linnaeus for identification, and the inclusion of the over-all form, structure and genetic diversity of the organism gave rise to numerical taxonomy in the 1960s. The 1970s gave rise to the cladistic approach in the identification of by focusing on the branching points and relatively recent characteristics that are common to the species being studied. Molecular biology flourished in the 1990s which paved way to the advent of molecular taxonomy.

Living organisms contain DNA, RNA and protein. It follows that closely related ones will show high similarity in their molecular structure and components and those that are far apart will show high degree of dissimilarity.

Some of the most widely used molecular techniques used in taxonomic identification are representational difference analysis, consensus sequence-based polymerase chain reaction like amplified fragment length polymorphism (AFLP), restriction fragment length polymorphism (RFLP), random amplification of polymorphic DNA (RAPD) and the use of microsatellite markers, and complementary DNA library screening. There are still other molecular techniques available.

With these molecular techniques, slight differences in population genetics can be determined. Genetic bottlenecks and even the date of a last common ancestor can be traced. Molecular

techniques made it possible to analyze divergence at particular genes of different species. Genetic profiling of species can help taxonomists understand more the diversity, distribution, rarity and and objective. It helps in resolving taxonomical problems at family, genera, species and subspecies level which confronted taxonomists for the past years.

According to Guarro, Gene and Stchigel (1999), the basic aims of molecular studies in biodiversity are tracking the probable course of evolution, recognizing defined taxonomic identity, and monitoring outbreaks of subspecific entities with respect to the mode of reproduction.

We say that these molecular techniques for identification and classification are substitutes to the conventional and classical way of doing it. The traditional ways of classifying organisms will forever be part of taxonomists' life. However, they've got a new ally. Thanks to molecular taxonomy!

Reference: Guarro, J., J. Gene and A. Stchigel. 1999. Developments in Fungal Taxonomy. Clinical Microbiology Reviews. p.454-500.

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Knowing and Preserving the Cnidarians

S.S. Garibay

Cnidarians got their name from cnidocytes, which are specialized cells that carry stinging organelles called cnidocysts. The word cnidaria comes from the Greek word "cnidos" which means "stinging needle" (Wikipedia). They are sessile or free-swimming. Common representative of this group include the jellyfishes, sea anemone, corals, hydroids and sea fans. They usually possess long tentacles with stinging organelles that help them in capturing their prey. The cnidarians have digestive cavity with one opening, which is the anus. Collection and preservation of these animals are usually carried on for research and museum related studies concerning its taxonomic classification.

Many Cnidarians have few preservable hard parts; however, corals have calcified hard parts and are commonly found as fossils. Corals are also important indicators for "health" of the marine environment in modern oceanographic ecology studies. This organism has such a narrow tolerance that it "dies off" very quickly after being exposed to toxic contaminants from sediment runoff from land development, warming from El Niño types of events, and other human sewage pollution.

Cnidarians are very interesting animals not just for their aesthetic appeal but for the fact that they are also deadly predators. Loss of reef biodiversity is serious but one that should not be overlooked is the value of cnidarians as potential sources of biopharmaceuticals. Many soft corals produce antifouling or antibiotic agent, some of which are of interest to drug companies. They also have therapeutic uses (Mackie, 2002).

Other cnidarians like jellyfishes also serve as food to some aquatic animals, hence their presence in an environment also requires our attention.

For research and museum purposes, collection of cnidarians should be done with utmost care. Drifting organisms like jelly fishes can be collected with tow nets or buckets. Other organisms like sea-anemone which are found in rocks can be dugged out with the use of chisel. Some are sand burrowers and can be dugged out with a small trowel. Stony coral collection is prohibited under the Philippine Fisheries Code of 1998 (Rep. Act 8550, Sect. 91, 92 and 97) and the Convention of International Trade in Endangered Species (CITES) of World Fauna and Flora. Hence, the collection of such specimens are useful only for research and instructional purposes as reference specimens.

Jelly fishes are fixed directly in 10% formalin for a few days before they are transferred in 70% alcohol for the final storage. Sea anemones have to be anaesthetized prior to preservation in 10% formalin. Stony corals are cleaned with brush to remove sand and dirt, then soaked in sodium hydroxide for one day rinsed in tap water, and allowed to dry. After these procedures, the animals will be ready for display or for examination.

References: Mackie, G.O. 2002. What's new in cnidarian biology? Can.J.Zool.80.1649-1653.; www.wikipedia.org

Message from the Dean



Congratulations to the Editorial Staff of the Mouseion, the official newsletter of the UPV - Museum of Natural Sciences (MNS), for coming up with its Vol. 4 No. 1 issue. This issue has two very interesting and highly informative articles, namely; "Molecular Taxonomy: Modern Approach to Taxonomic Identification" and "Rarity of the Rare: The Vanishing Species of Endemic Freshwater Fishes in the Philippines". To produce an issue of a newsletter would require a lot of work; from gathering of materials, writing of articles, lay-outing and other activities until it finally comes out of the printing press. The MNS staff deserved kudos for a job well done.

The Museum of Natural Sciences is a significant landmark in UPV Miagao Campus. It attracts people from all walks of life because of its varied collections of Philippine aquatic flora and fauna. The annual exhibits of the Museum has been a much awaited event which has increased public awareness of the high biodiversity of our natural resources. Through its newsletter, the UPV - MNS is able to provide information to its clientele on how to protect and conserve our rich natural heritage. The Mouseion has been an effective tool for providing our faculty, staff and students with news and articles on the activities and projects of our Museum. It is my pleasure to welcome the Vol. 4 No. 1 issue of the Mouseion and I wish more power to its Editorial Staff.

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