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Mangrove community structure survey

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DENR-SUSIMO project site in Carles, Iloilo, Philippines

Mangrove community structure survey

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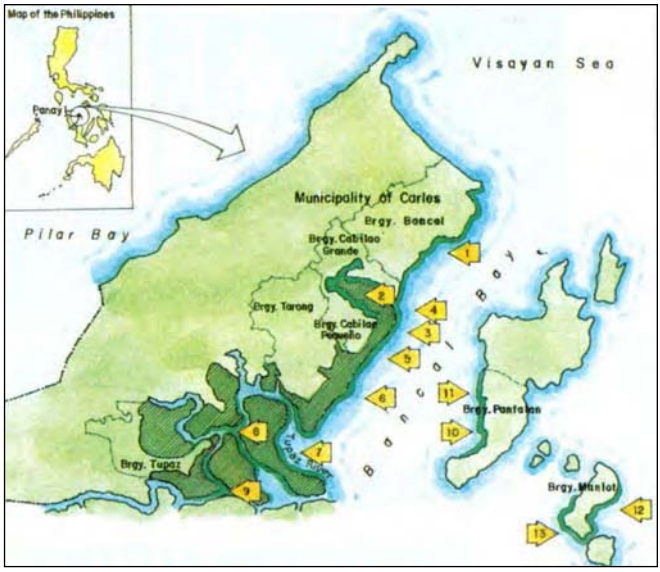
Carles is one of the major sources of marine and aquacultured fish in Iloilo province, producing 80,300 mt in 2002. The municipality is located in the north-east tip of Panay Island (see map). The territorial waters of Carles take a large portion of the Visayan Sea and its coast has 1,539 hectares of fishponds.

The importance of mangroves in capture fisheries, aquaculture and the lives of coastal residents manifests in the activities of the *Northern Iloilo Mangrove Rehabilitation Program* mainly funded by the Japan Bank for International Cooperation (JBIC). This program is managed by the Sub-Project Site Management Office (SUSIMO) of the Department of Environment and Natural Resources (DENR) with the active participation of its beneficiary, the MACABATA-ARM Inc. (which stands for Manlot, Cabilao, Bancal, Tarong Association for the Rehabilitation of Mangroves Inc.), a people's organization registered with the Securities and Exchange Commission on January 2001 with 366 members. As per DENR-JBIC project agreement, the mangrove rehabilitation project covers 53 1 hectares that is now replanted with *Rhizophora mucronata.*

With this on-going rehabilitation and involvement of the local people, baseline information on the characteristics of the mangrove community and the people living in the coast need to be established - one of them is an assessment of the mangrove community structure of the project site. This information is useful for further studies, including valuation of resources, and the estimation of the costs and benefits from rehabilitation and conservation of mangroves. These studies comprise the SEAFDEC/AQD-JIRCAS socio-economics project on sustainable aquaculture systems.

The seven mangrove-fringed coastal barangays of Carles were chosen as study site. On April 2003, the authors of this article conducted a mangrove community structure survey (MCSS) in 13 selected sites in five mainland barangays and two island barangays in Carles (see map). The MCSS aims to qualitatively describe the species composition, community structure and plant biomass of mangrove forest.

Below is a photo-essay of field activities involved in MCSS following the methods of English et al. (1994).



Map of Carles, Panay Island

Highlights

- ✓ The 13 sample sites for the MCSS shown on the map on this page altogether listed 18 mangrove species dominated by *Avicennia marina,* locally called 'miapi'. Other major species are *Sonneratia alba, Ceriops decandra,* and *Bruguiera cylindrica* (table at right).
- ✓ *Rhizophora mucronata* (photos at right), the species being planted to rehabilitate mangroves in Carles, was only moderately found during the survey, as were *A. rumphiana* and *Camptostemon philippinensis.*
- ✓ Species locally known as dungon, bantigi, nilad/ sagasa, piagaw and tawalis were least found during the survey.
- ✓ A site in Brgy Cabilao Grande recorded the highest species diversity with impressive 14 species sighted, including *Aegiceras floridum, Osbornia octodonta,* and *Pemphis acidula* that are rarely found in Panay.

General inspection of the study area to determine the location of representative sites, aside from references to maps. Thirteen sites were identified to represent the (a) seven barangays covered by the study area; (b) various environmental parameters such as low, mid and high intertidal zones; and (c) main forest types according to tree species.

Setting of corner markers for 10 m x 10 m quadrat that is a sample representative of each site.

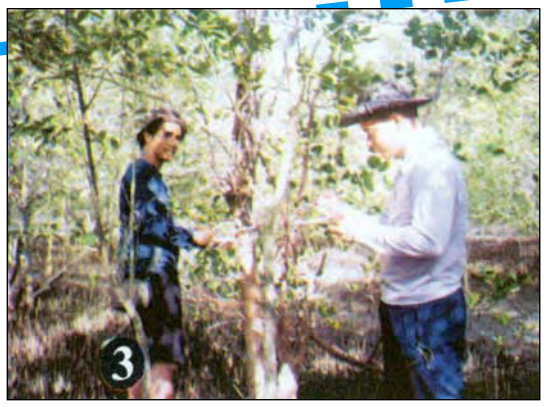
Mangrove species identified during the mangrove community structure survey (MCSS) in Carles, Iloilo, April 2003

Local name (Ilonggo)	Scientific name
saging-saging	*Aegiceras floridum*
miapi	*Avicennia marina*
miapi	*Avicennia officinalis*
bungalon	*Avicennia rumphiana*
pototan	*Bruguiera cylindrica*
baras-baras	*Ceriops decandra*
gapas-gapas	*Camptostemon philippinensis*
tungog	*Ceriops tagai*
alipata	*Excoecaria agallocha*
dungon	*Heritiera littoralis*
tabao	*Lumnitzera racemosa*
tawalis	*Osbornia octodonta*
bantigi	*Pemphis acidula*
bakhaw-lalaki	*Rhizophora apiculata*
bakhaw-babae	*Rhizophora mucronata*
pagatpat	*Sonneratia alba*
nilad/sagasa	*Scyphiphora hydrophyllacea*
piagaw	*Xylocarpus mekongensis*

- ✓ Sites located between inlets and fishpond dikes recorded high species diversity, for example, the above mentioned site in Brgy Cabilao Grande and two other sites in Brgy Tupaz and in Brgy Manlot.
- ✓ The site in Brgy Tarong (right, top) is distinguished by the abundance of *A. marina* seedlings even though the mature trees are dying. This at least indicates the likelihood of replacements if at least a few seedlings survive.
- ✓ Other interesting sites include those which are characterized by a wide strip of mangroves like the intertidal area in Brgy Pantalan with big *S. alba* and *A. marina* trees; and naturally-growing *R. mucronata* trees and saplings (right, middle).

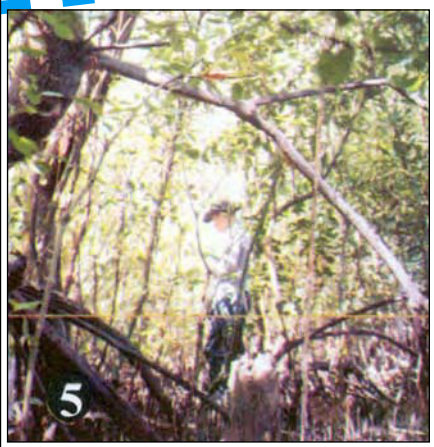
- ✓ The site at the mouth of a river, in tidal streams along fishpond dikes, in Brgy Tupaz is a 20 m-wide mangrove belt (right, bottom) that is also characterized by naturally growing *R. mucronata* trees and saplings.

- ✓ There are other mangrove species found in the survey area but not listed in the sample quadrats. These include *R. stylosa, Xylocarpus granatum,* and *Nypa fruticans* or nipa that is commonly used as roofing. Mangrove associate species that are locally called 'roma', 'dapdap', 'bancal' and 'talisay' are also often abundant in back mangal areas. They were not within the quadrats in the 13 sample s i t e s . p a g e 18



Identification and counting of trees. Measuring the tree girth at 1.3 m height

Identification and counting of saplings.



Identification and counting of seedings.

Recording of data on slate boards, which would be analyzed using established MCSS parameters.

plant biology such as the origin and evolution of plastids and mitochondria, again, using marine algae as models. In addition, the group has initiated a project on the genetic structure of kelp populations in the English channel, a topic that bridges knowledge in genetics with oceanography.

Dr Kloareg is also the head of a joint laboratory in St. Malo, France, where he is able to pursue the development and use of oligosaccharides as an alternative approach to disease control in both marine and agricultural crops. Dr Kloareg considers phycopathology a new science in mariculture.

Philippines

Novel fish products from Lake Buluan

Ever heard of *Paksiw na Bangus* in cans? No? How about *Tilapia Escabeche, Spicy Tilapia, Sweet and Sour Tilapia,* and *Tilapia in Oil* all conveniently canned and ready to eat? If you are not into canned stuff how about *Tilapia Chorizo, Bangus Chorizo, Tilapia Chicharon* and *Bangus Chicharon?* All these products and more were on display at the booth of the EGM Agri Food Industries (EGMAFI) of Buluan, Maguindanao during the recently concluded 7th Meeting of the BIMP-EAGA Working Group on Fisheries Cooperation held in Puerto Princesa City. The other EGMAFI products displayed were *Tilapia Fillet, Bangus Fillet, Tilapia Belly, Bangus Belly, Bangus Chicharon, Bangus Tocino* and *Tilapia Tocino.* Samples for tasting laid out at the booth were crowd drawers.

The fresh fish used for the products were all grown in the fertile waters of Lake Buluan without any artificial fertilizers, chemicals, pesticides and antibiotics enabling the company to promote the processed fish as "Organic Products for a Healthier You!" Furthermore all the products are Halal certified. This means the products have been prepared in adherence to approved Islamic standards and can be sold in all Muslim countries.

That this is so is not surprising since the founder of the company is a Maguindanao who also happens to be the mayor of the municipality of Buluan. Mayor Esmael Mangudadatu is a young and amiable entrepreneur who is fondly called Mayor "Toto" by his constituency. According to the company brochure, EGMAFI is obliged and committed to produce all kinds of Halal products. The company was established in 1990 in Barangay Maslabing, Maguindanao in the Autonomous Region of Muslim Mindanao (ARMM). Its primary concern initially was the raising of bangus and tilapia in cages and pens in Lake Buluan. It is only recently that it branched out into processing to widen its market. According to Bureau of Fisheries and Aquatic Resources (BFAR) Region XII Director Sani Macabalang, EGMAFI set up its processing plant in General Santos City with technical assistance from BEAR. - WG YAP

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✓ These findings, which indicate modest yet declining diversity of mangroves in Carles, reinforce the need for their protection and management. This is not only in view of the importance of mangroves as habitat for fish and shellfish juveniles that replenish the stocks for capture fisheries and aquaculture (a major livelihood for many coastal communities), but also for the fact that Carles is one of the few remaining areas in Panay where rare mangrove species could still be found.

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AQD publications ... from page 11

cess. The socialization of children into fishing reinforces the gender division of labor and space in the coastal zone.

Sumagaysay-Chavoso NS. 2003. Nitrogen and phosphorus digestibility and excretion of different-sized groups of milkfish (*Chanos chanos* Forsskal) fed formulated and natural food-based diets. Aquaculture Research 34 (5): 407-418

Abstract. This study determined the digestibility of nitrogen and phosphorus, and the excretion rate of different-sized groups of milkfish fed a commercial diet, a SEAFDEC formulated diet or lab-lab (natural food-based diet). Fish (31.2-263.0 g) were stocked in 12 units of 300-L fibreglass tanks filled with aerated seawater The postprandial total ammonia-nitrogen (TAN) and phosphate (PO_4-P) excretion of fish were estimated from changes in TAN and PO_4-P concentrations in water for 24 h. Digestibility was determined from the nitrogen, phosphorus and Cr_2O_3 content of the diets, and pooled faeces after the fish had been fed diets marked with chromic oxide. TAN excretion rate (mg TAN kg^{-1} fish day^{-1}) was significantly lowest ($P<0.05$) in medium to very big fish fed the lab-lab diet (60.8-124.4) and highest in small and medium fish fed the SEAFDEC diet (333.3-331.6) and small fish fed the commercial diet (280.1). Regardless of size, fish fed lab-lab excreted (mg PO_4-P kg^{-1} fish day^{-1}) significantly lower PO_4-P (36.2) but did not differ with fish fed the commercial diet (64.8). Excretion rates decreased exponentially as fish weight increased but positively increased with feed ration. Excretion pattern of milkfish revealed two peaks: the first peak occurred 6 h after feeding and the second peak at 18 h for TAN and 21 h for PO_4-P, coinciding with the start of the daylight hours. TAN and PO_4-P excretion accounted for 20.5-34.6% of total N consumed and 18.7-42.6% of P consumed respectively. Approximately 27.9-42.5% of N consumed and 47.2-58.5% of P consumed were lost as faeces. Total nutrient losses were lower using the lab-lab diet (0.31 g N and 0.14 g P kg^{-1} fish) compared with the formulated diets (0.47-0.48 g N and 0.17-0.19 g P kg^{-1} fish); the losses decreased per kg of fish as fish size increased. Results suggest that the diet and size of fish influence wastage of N and P to the environment with greater losses in small fish and when artificial diets are used. Such measurements will provide valuable information for the preparation of N and P budgets for milkfish in grow-out systems. ###