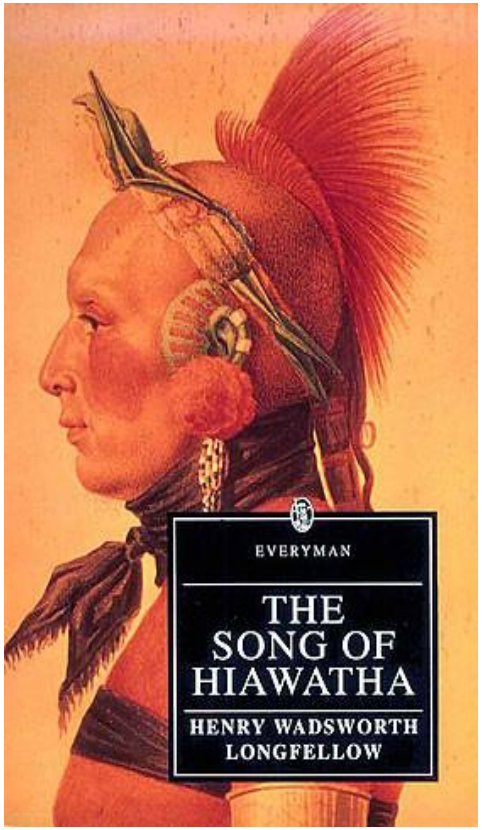
Trivia: my full name and its meaning ☺

Mudjekeewis= ruler of winds

Dalisay = pure

Santos = saint



Mudjekeewis in PH

Know ye worms that crawl in the bowels of the earth
that this

CERTIFICATE OF SOLO FLIGHT

announces and affirms that the supplications of

2LT JOHN LORENZO "WILDCAT 425" M EGAR O-17197

to the great god Mudjekeewis had been granted last 15 September 2014.
For that particular moment in his wretched life, alone in a T-41 Aircraft with Tail Number 040,
he left Terra Firma and soared through the polluted atmosphere,
then came back in one piece.

given this 15th day of October 2014 at Bulwagang Maykulot,
Fernando Air Base, Lipa City

Follow me @

mudjiesantos@gmail.com

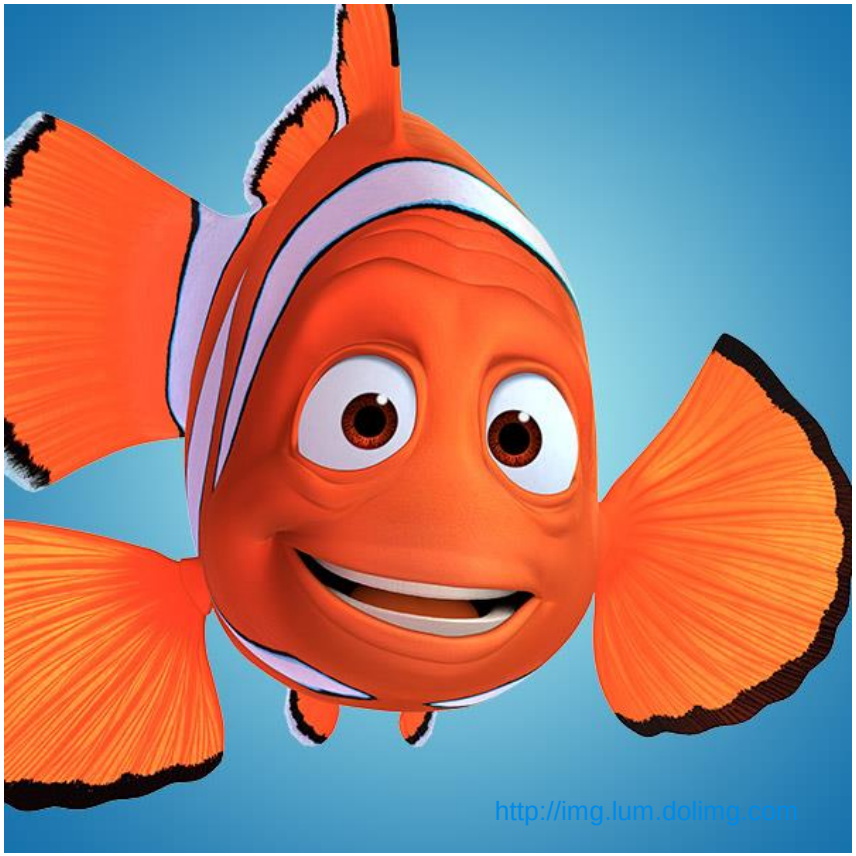
/Mudjekeewis Santos

@mudjiesantos

www.nfrdigfl.weebly.com


showbizgeek.com
Finding Nemo, Dory and their friends:
Looking at PH Marine Biodiversity through the DNA Lens

Talking points …

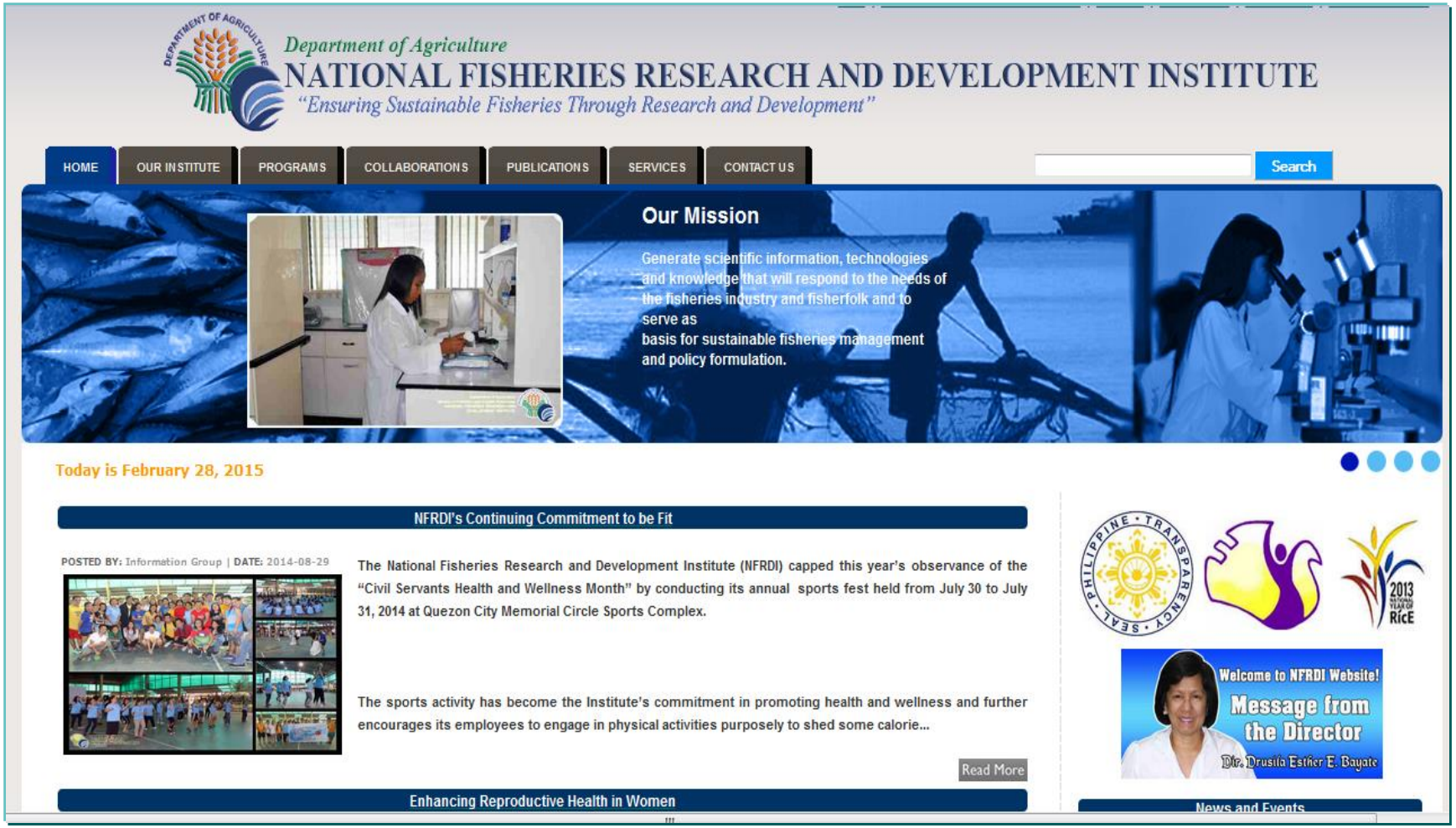


- About us
- PH Marine Biodiversity
- DNA Barcoding
- Our findings (last 5 yrs)
- Way forward

www.bfar.da.gov.ph

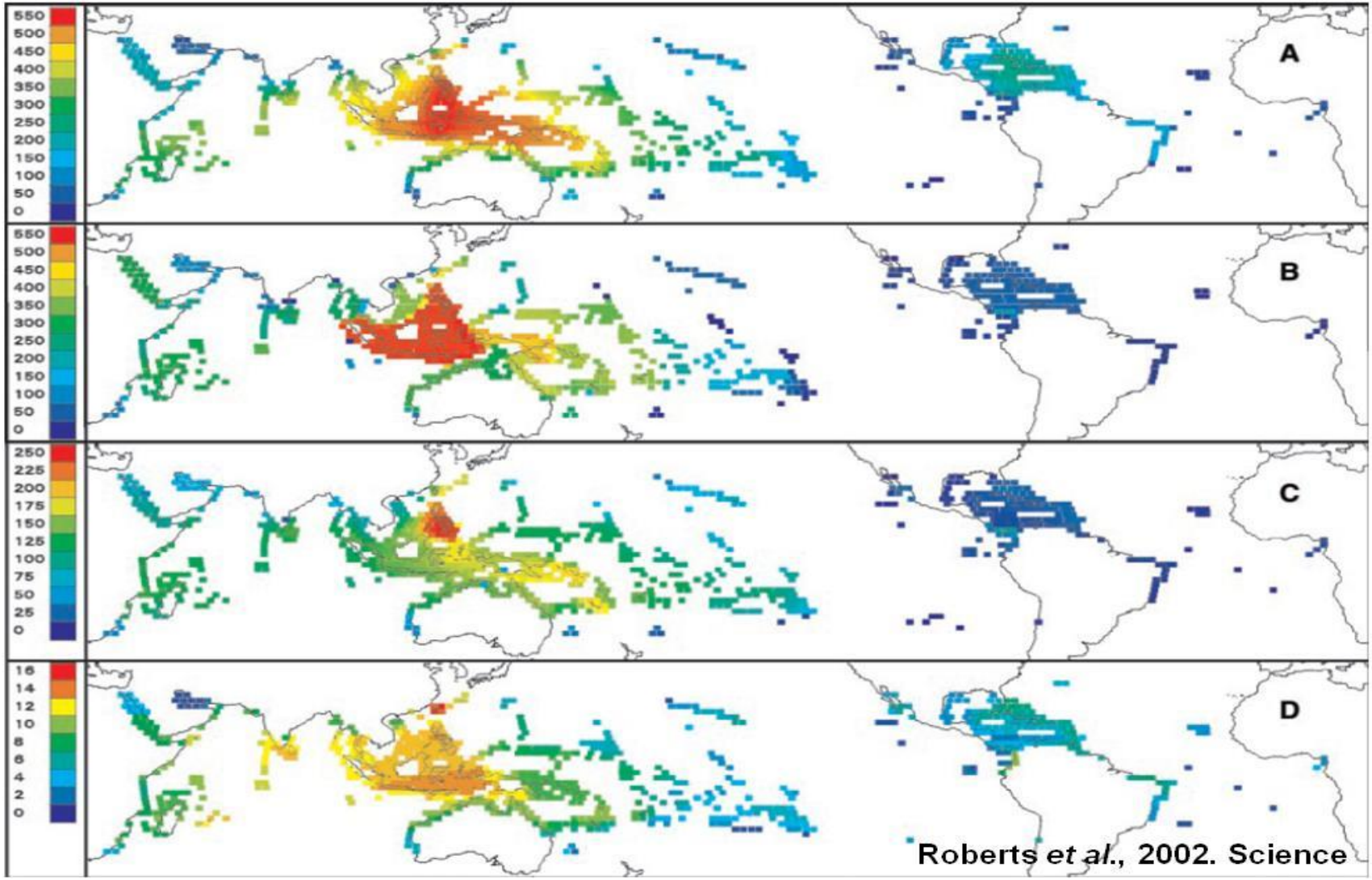
… manages fisheries and aquatic resources of PH

www.nfrdi.da.gov.ph



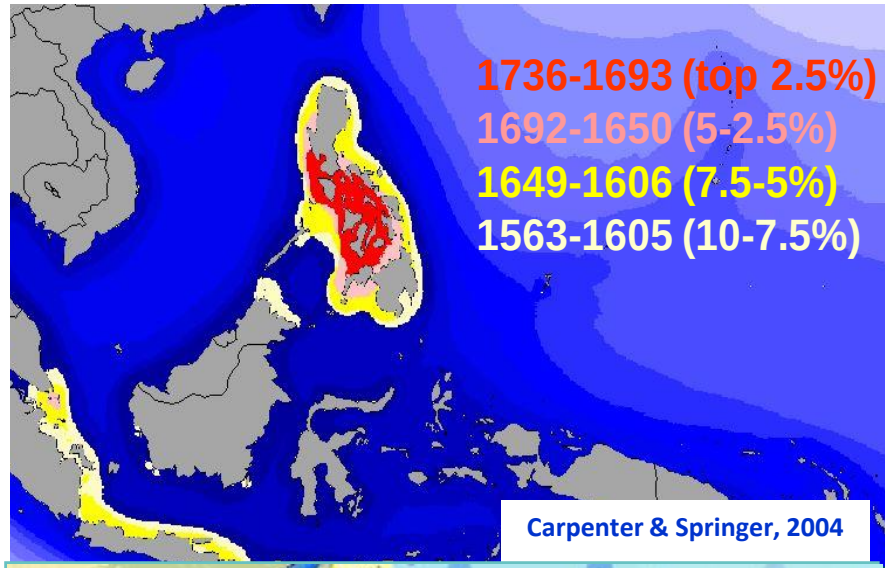
… research arm of BFAR

Philippines: Epicenter of marine biodiversity in the world (?)

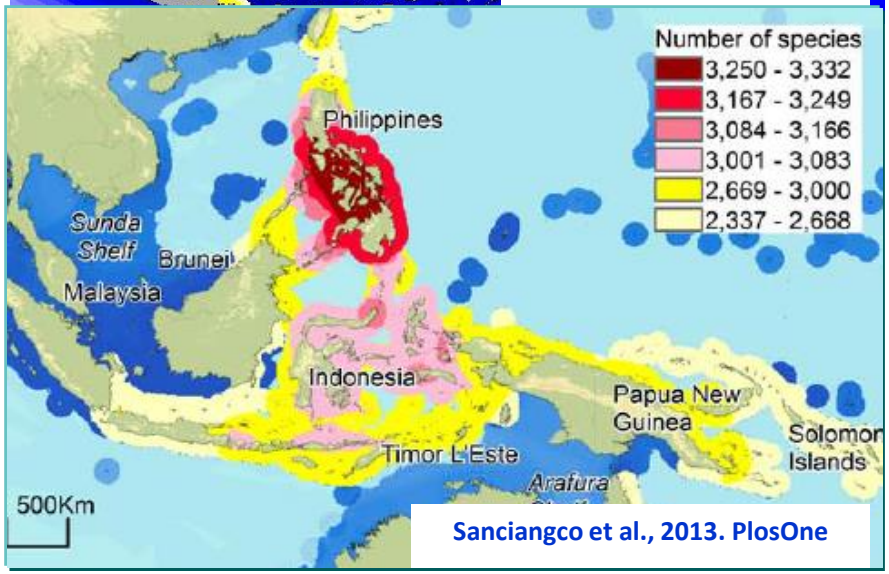


Philippines: Epicenter of marine biodiversity in the world (?)

- Philippines host to the highest number of marine organisms per area.



Carpenter & Springer, 2004



Sanciangco et al., 2013. PlosOne

Hottest of the hotspots for marine conservation !!!

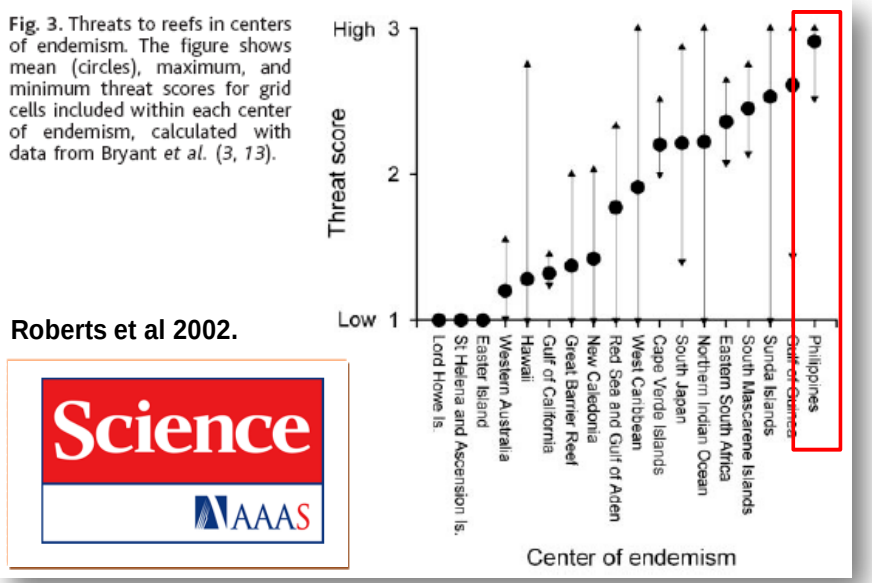


Fig. 3. Threats to reefs in centers of endemism. The figure shows mean (circles), maximum, and minimum threat scores for grid cells included within each center of endemism, calculated with data from Bryant *et al.* (*3*, *13*).

Roberts et al 2002.

Science
AAAS

"Hottest of the Hotspots"

Resource/ Habitat	Status	Source
Corals	*Degraded state*	BFAR-NFRDI-PAWB. 2005. BINU
Seaweeds	*Unknown (except declining seed source)*	-do- GTZ. 2009.
Seagrasses	*Heavily stressed*	BFAR-NFRDI-PAWB. 2005. BINU
Mangroves	*Degraded state*	-do-
Invertebrates	*Declining trend*	-do-
Demersal fishes	*Declining trend*	-do-
Small pelagic fishes	*Declining trend*	-do-
Tunas	*Stable trend (except Bigeye tuna)*	WCPFC. 2009
Sharks and rays	*Declining trend*	NPOA Sharks. 2009
Marine turtles	*Threatened*	BFAR-NFRDI-PAWB. 2005. BINU
Marine Mammals	*Threatened*	IUCN Red List. 2009

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GFL

National Fisheries Research and Development Institute
Genetic Fingerprinting Laboratory
Philippines

GFL Labrats

Established in 2009 by Dr Mudjekeewis D. Santos, the Genetic Fingerprinting Laboratory (GFL) under the Department of Agriculture – National Fisheries Research and Development Institute (DA-NFRDI) started housing the genetic researches of the institute. With a research assistant and three on-the-job-training Biology students, the laboratory as headed by Dr Santos, has since then grew to a good number of research assistants and laboratory technicians in its four years of existence. With an aim of providing genetic data to better understand and improve the Philippine fishery and aquaculture setting, GFL focuses on generating baseline DNA databases which contain profiles of the commercially important as well as endemic and CITES-listed aquatic organisms found in the country.

The GFL has contributed in resolving the cryptic *pigak*, *Mesopristes cancellatus*, which has been previously known to be endemic only in Rio Grande de Mindanao and neighbor rivers in Cotabato, but was found out to be inhabiting in Abra River in Luzon. It has also contributed in

FISHCODES Project

??????????

DNA Barcodes

"**DNA barcoding** is a taxonomic method to identify a species using a short genetic marker, the cytochrome c-oxidase 1 (CO1) gene, found in an organism's mitochondrial DNA".

DNA Barcodes

THE ROYAL SOCIETY

Received 29 July 2002
Accepted 30 September 2002
Published online 8 January 2003

Biological identifications through DNA barcodes

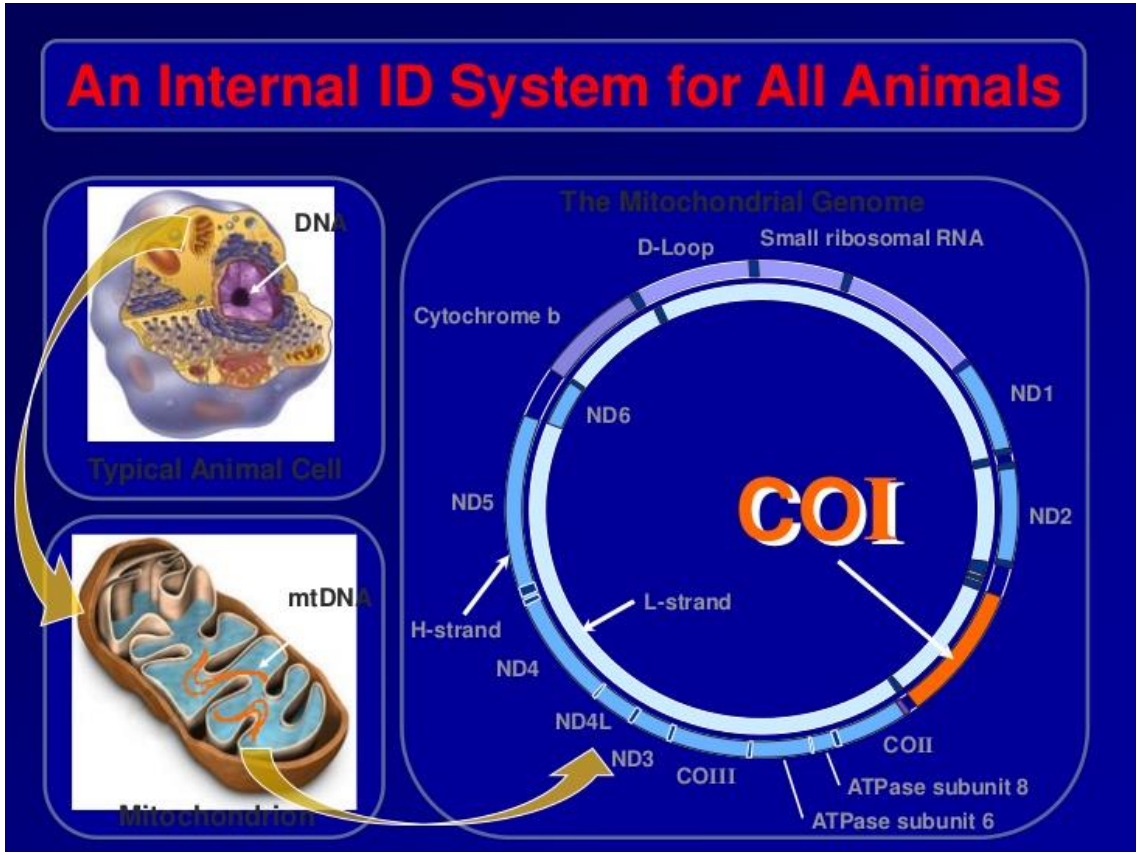
Paul D. N. Hebert*, Alina Cywinska, Shelley L. Ball and Jeremy R. deWaard

Department of Zoology, University of Guelph, Guelph, Ontario N1G 2W1, Canada

Although much biological research depends upon spec
We are convinced that the sole prospect for a sustainab
of systems that employ DNA sequences as taxon 'barc
cytochrome *c* oxidase I (COI) can serve as the core of a
we demonstrate that COI profiles, derived from the low
ordinarily assign newly analysed taxa to the appropriat
species-level assignments can be obtained by creating c
based upon the analysis of a single individual from each
100% successful in correctly identifying subsequent spec
system will provide a reliable, cost-effective and acces
identification. Its assembly will also generate importan
the rules of molecular evolution.

Keywords: molecular taxonomy; mitochondrial DNA;

CO1 = DNA fingerprint



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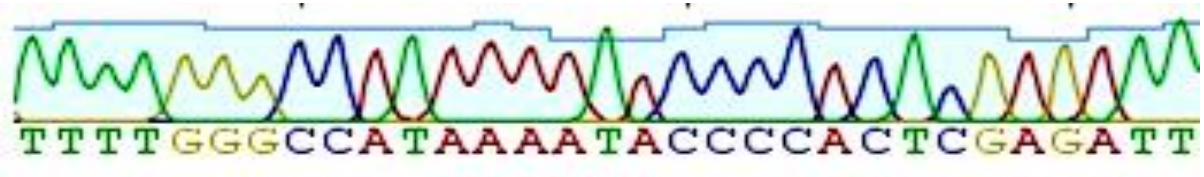
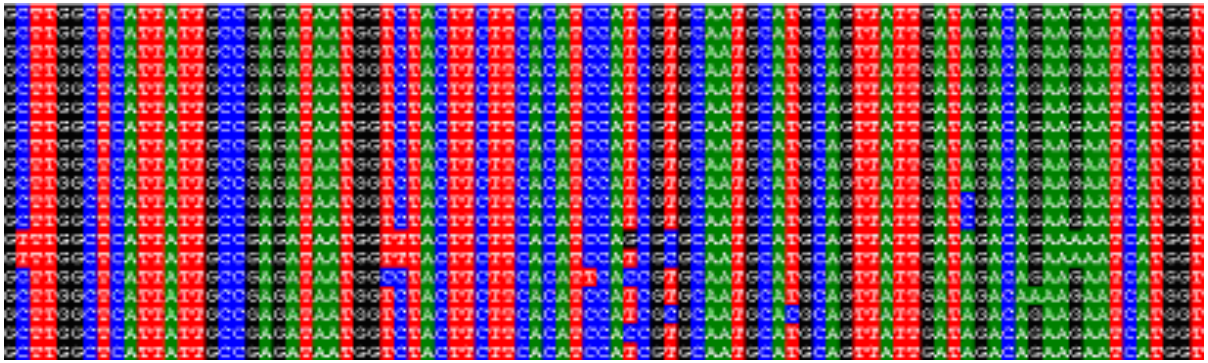
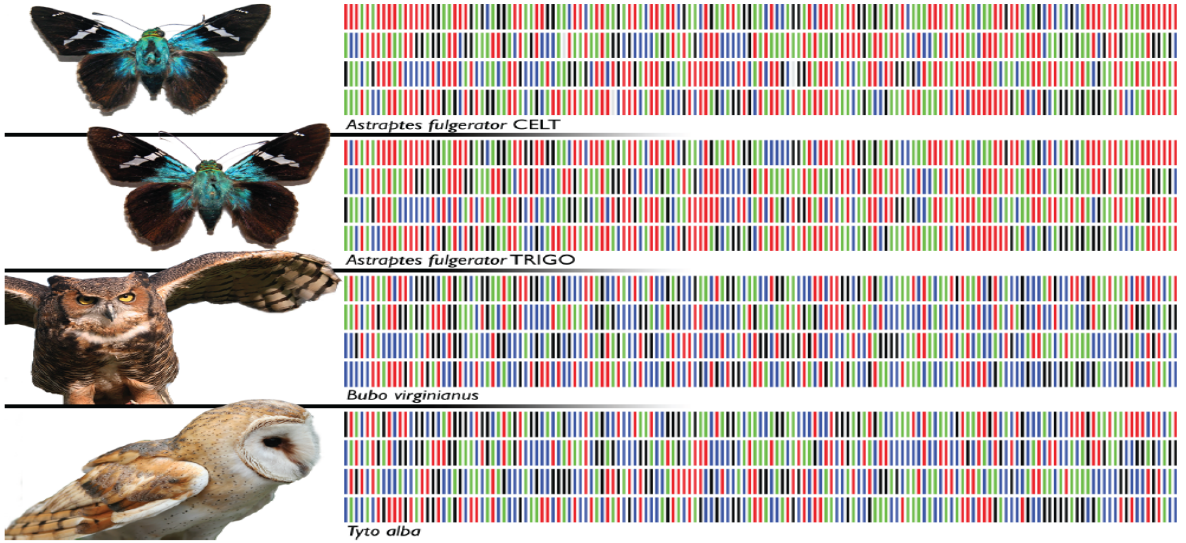
globaltimes.cn

Cytochrome c-oxidase 1 gene

CO1 = DNA fingerprint







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Building a Bioliterate World
What would it be like to live in a bio-literate world - a world where you could know, in minutes, the name of any animal or plant - any time, anywhere? And not just its name but everything about it - what are its habits, is it endangered, is it dangerous, should it even be there or is it an invader from somewhere else?
How could we use that knowledge to protect our planet's biodiversity and promote human health and well-being?
The International Barcode of Life project (iBOL), the largest biodiversity genomics initiative ever undertaken, is unlocking the door to that world by creating a digital identification system for life.
Start
• Breaking News for Monday, Aug 6, 2012 •
iBOL announces governance changes, sequencing charges
The iBOL project is changing its governance structure and introducing partial cost recovery for sequencing at its core facility in Guelph.
Read more
40 new reptile species found on Madagascar
A major DNA barcode study of Madagascar reptiles has uncovered 40 new species of snakes, skinks, chameleons and geckos.
Read more
Philippines adopts barcoding to regulate fish trade
The National Fisheries Research and Development Institute is now using DNA barcoding to promote food safety and crack down on seafood fraud.
Read more
Barcode IDs new moth species invading Italy's vineyards
A team of Italian and Dutch scientists have used DNA barcoding to identify a previously unnamed leafminer moth that is infesting vineyards across northern Italy.

Award from IBOL 2015

6TH INTERNATIONAL BARCODE OF LIFE CONFERENCE

AWARD OF EXCELLENCE

This is to certify that

Mudjekeewis D. Santos

Has been awarded the Travel Award for Excellence in Socio-Economic Applications of DNA Barcoding with support from the International Development Research Centre (IDRC) and the 6th International Barcode of Life Conference. The conference took place at the University of Guelph in Guelph, Ontario, Canada, from August 18-21, 2015.

6th International Barcode of Life Conference
Barcodes to Biomes

IDRC CRDI

Biodiversity Institute of Ontario
BIO
Established 2005
University of Guelph

PAUL D. N. HEBERT
Director, Biodiversity Institute of Ontario
Scientific Director, International Barcode of Life

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… feeling ☺


GENETIC FINGERPRINTING LABORATORY
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First record in PH … shocking !!!

Bali sardine, *Sardinella lemuru*

Willette et al., 2011. Journal of Applied Ichthyology

First record in PH … only in the North

Taiwan sardine, *Sardinella hualiensis*

Willette et al., 2011. Journal of Fish Biology

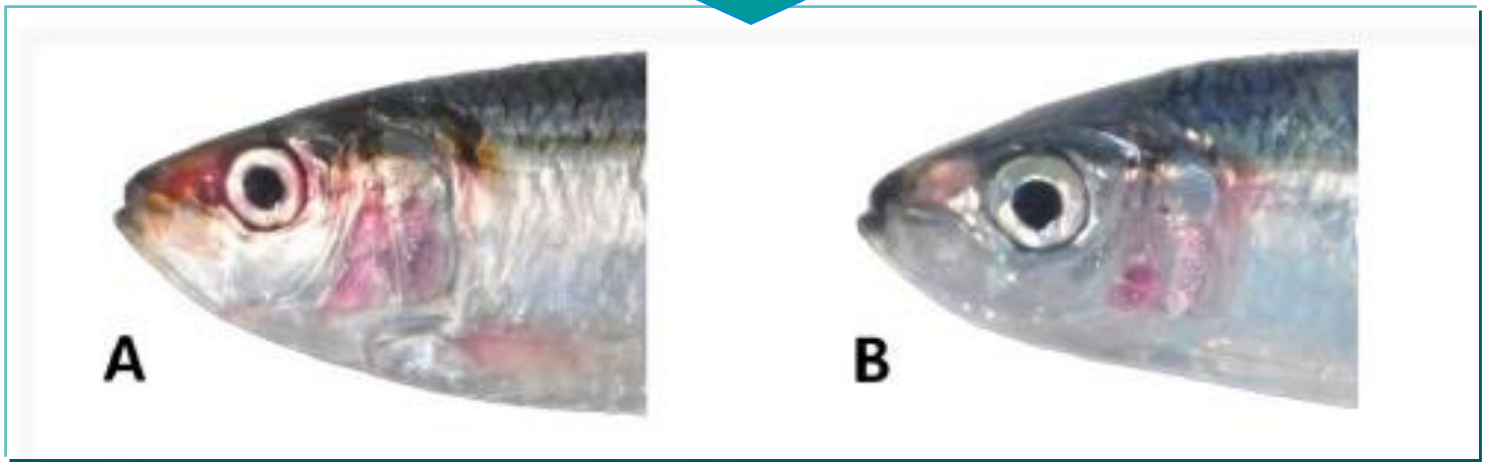
Mystery solved … origin of "Tawilis"

"Tawilis", *Sardinella tawilis*

Taiwan sardine, *Sardinella hualiensis*

Untangled … cryptic sardines

Goldstripe sardine, *Sardinella gibbosa*



Sardinella gibbosa sp.1 *Sardinella gibbosa* sp.2

Thomas et al.. 2014. PlosOne

First record in PH … rare and protected

Noah's Giant Clam, *Tridacna noae*

Lizano et al., 2014. Philippine Science Letters

First record in PH … rare and protected

Derinyagala's Beaked Whale, *Mesoplodon hotaula*

Lacsaman aet al., 2015. Marine Biodiversity records

First record in PH … commercially important but threatened

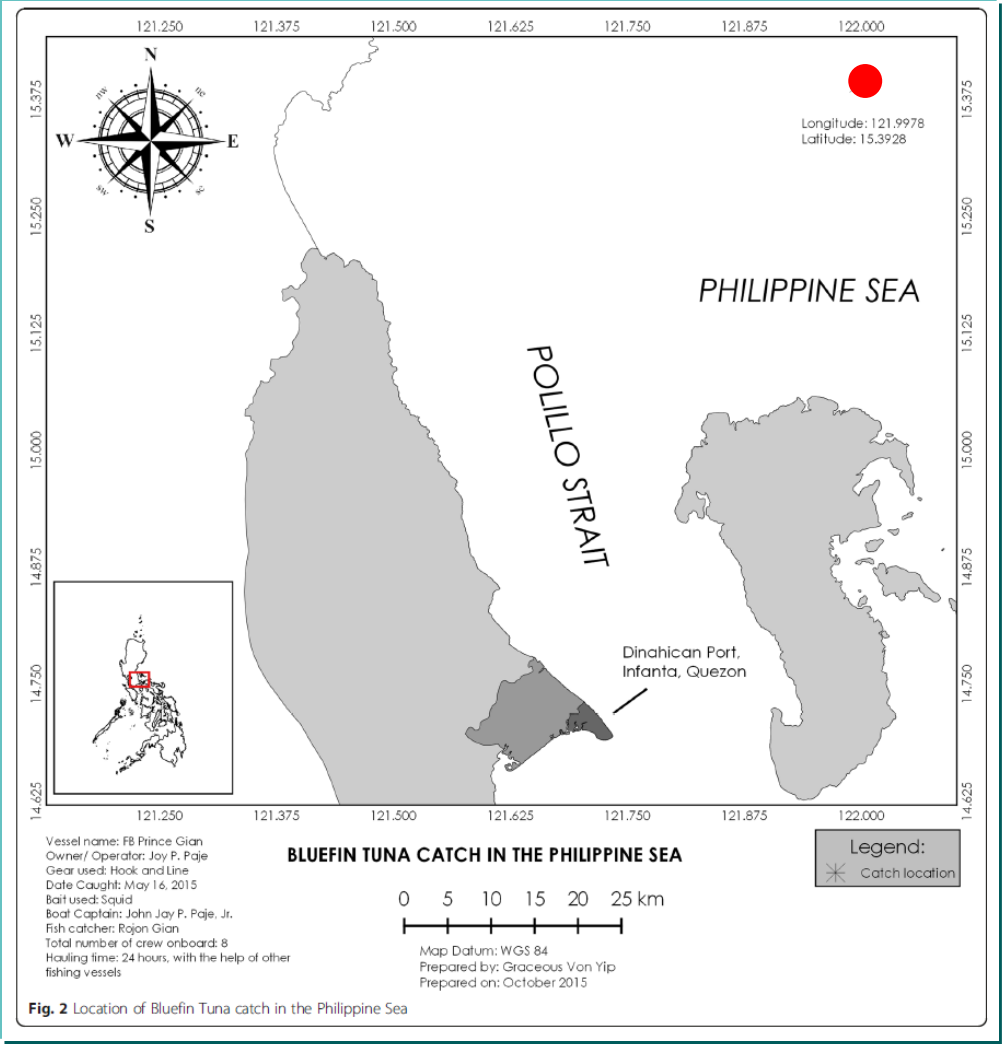


Fig. 2 Location of Bluefin Tuna catch in the Philippine Sea

Pacific bluefin tuna, *Thunnus orientalis*

Sarmiento et al., 2015. Marine Biodiversity Records

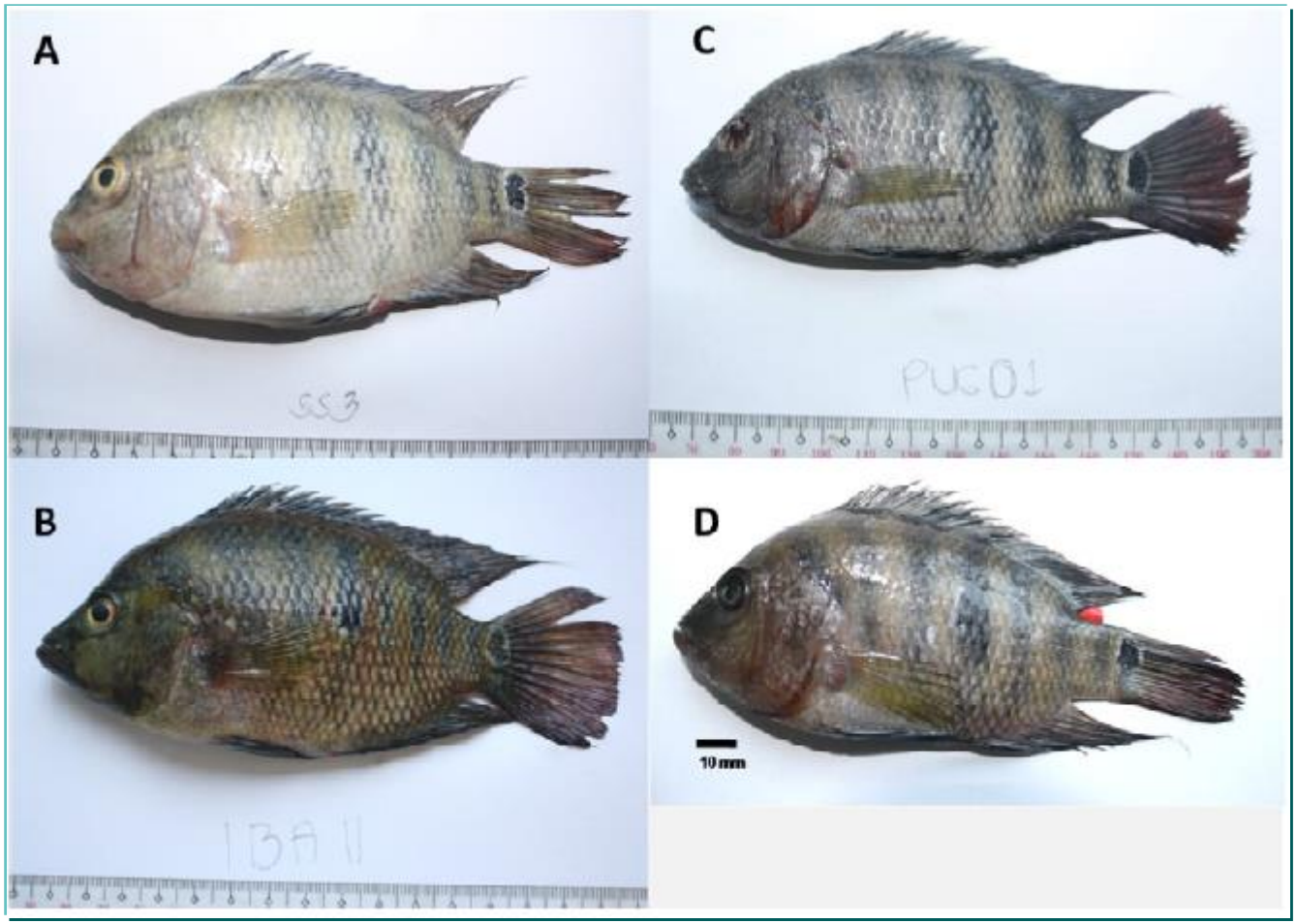
First record of ray from PH found in illegal wildlife trade

Asis et al., 2014. Mitochondrial DNA

First record in Manila Bay … invasive tilapia

Black chin tilapia, *Sarotherodon melanotheron*

First record in Manila Bay … invasive tilapia



Mayan cichlid, *Cichlasoma urophthalmus*

New fish species from Iloilo

Zootaxa 3911 (2): 287–293
www.mapress.com/zootaxa/

Article

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A new fish species of the subfamily Serraninae (Perciformes, Serranidae) from the Philippines

JEFFREY T. WILLIAMS[1] & KENT E. CARPENTER[2]

[1]*Division of Fishes, Department of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, 4210 Silver Hill Road, Suitland, MD 20746, USA. E-mail williamsjt@si.edu*
[2]*Department of Biological Sciences, Old Dominion University, Norfolk, Virginia 23529, USA. E-mail: kcarpent@odu.edu*

- discovered 2014, reported 2015
- from fish market in Iloilo
- endemic in PH

Abstract

A new species of serranine fish is described from the Philippine Islands. A single specimen of a new species, *Chelidoperca santosi*, captured by fishermen working in Palawan waters was discovered in the public fish market in Iloilo City, Panay, Philippines. Two additional specimens of the new species, also from the Philippines, were subsequently discovered in the collections of the Museum Victoria, Australia. The new species is currently known only from the Philippines and is characterized by its distinctive coloration with a row of four small dark spots on the snout (two in front of each eye) and two dark spots on the chin (one on each side of the symphysis of the dentaries), a white anal fin with six large yellow spots separated by broad white interspaces and a narrow yellow distal border, caudal fin with narrow yellow bars and a yellowish distal margin and no dark spots, and a combination of meristic and morphological characters.

Key words: *Chelidoperca santosi*, perchlet, Serranidae, Philippines, endemic

Chelidoperca santosi
(Williams & Carpenter, 2015)

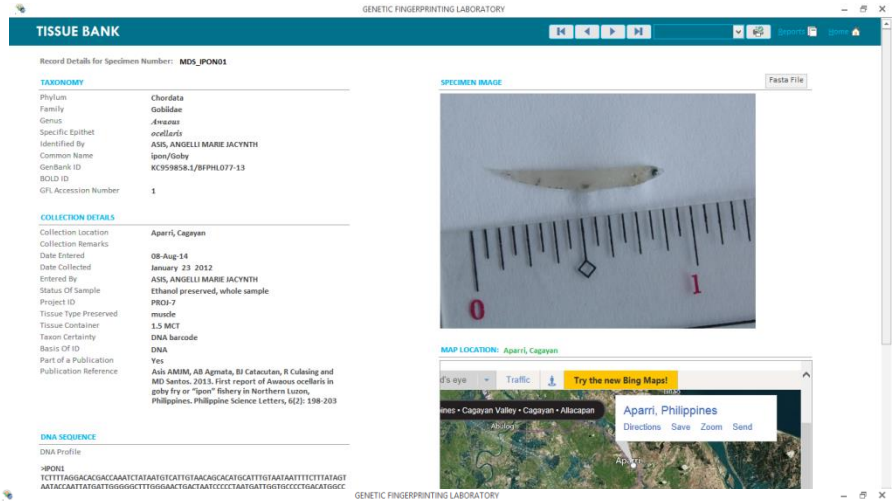
"Pogi perchlet"

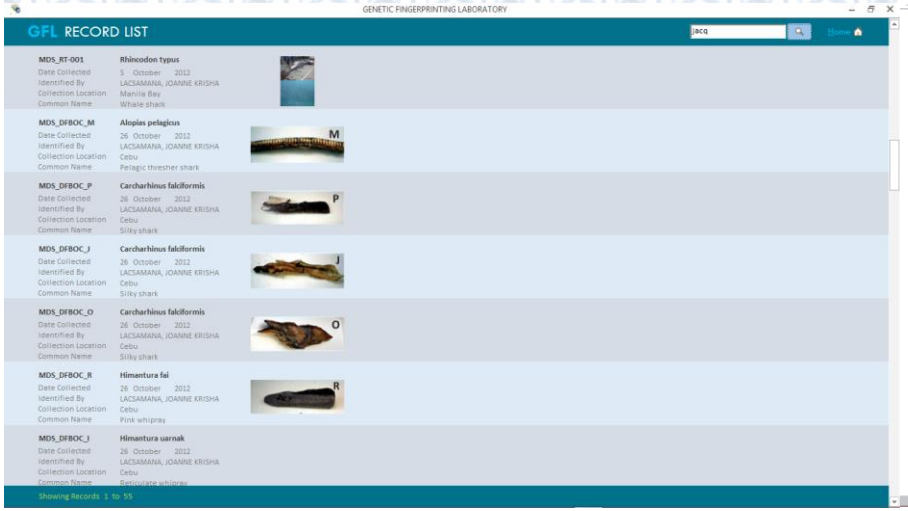
Etymology. The species is named *santosi* in honor of Mudjekeewis Santos of the NFRDI-BFAR, Manila, our Philippine colleague and collaborator, without whose assistance the discovery of this colorful perchlet would not have been possible, and in recognition of his many contributions to the advancement of science in the Philippines. The common name is based on the Tagalog word *pogi* meaning handsome in reference to its striking fresh coloration.

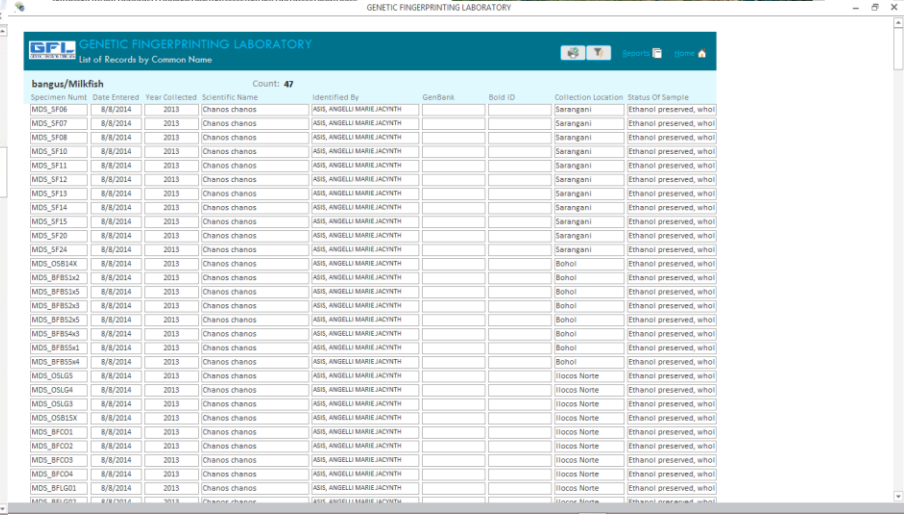
Another new fish species from Aurora and Sta. Ana, Cagayan

"Labahita"

NFRDI-GFL Database







Alava et al., 2009

Latest Record for Fish in PH

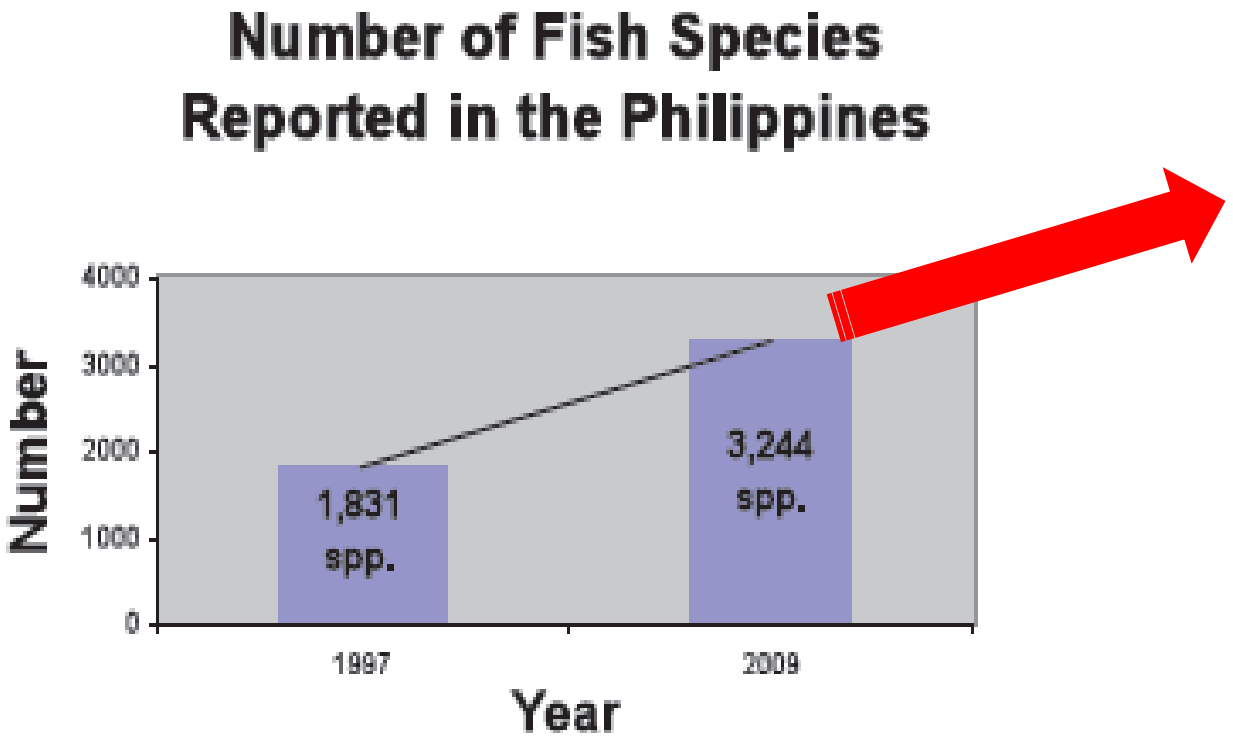
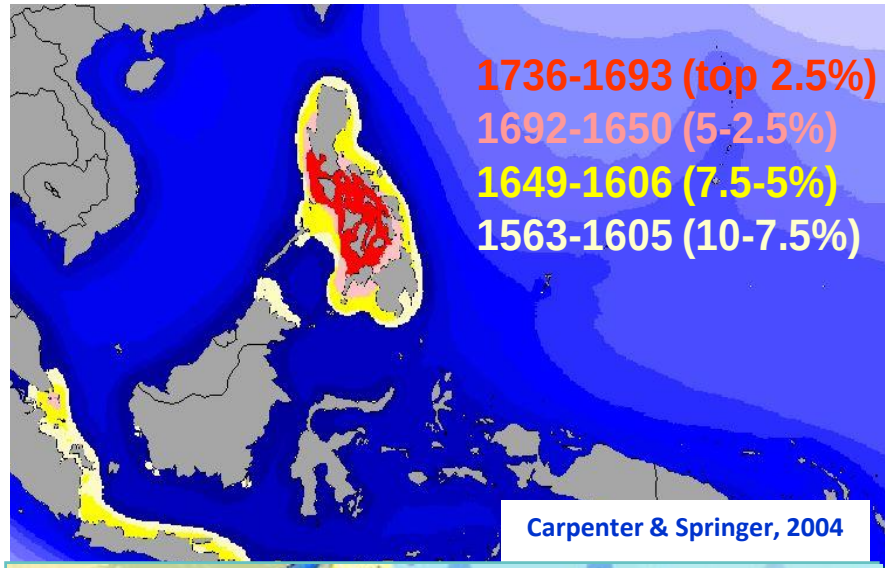


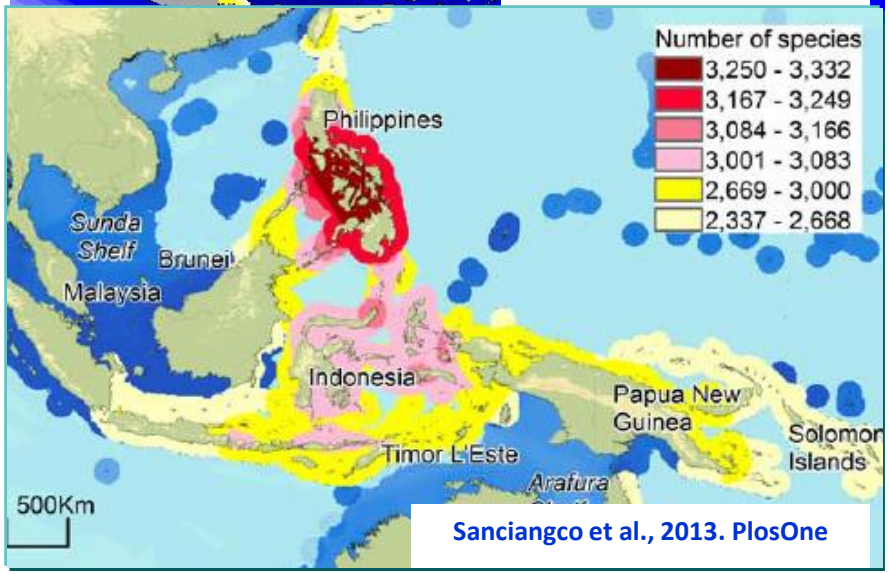
Figure 1.1. Number of fish species reported in the Philippines in 1997 and 2009. (Sources: DENR 1997; Froese and Pauly 2009).

Alava et al., 2009

Epicenter of marine biodiversity in the world INDEED !!!



Carpenter & Springer, 2004



Sanciangco et al., 2013. PlosOne

- *Philippines host to the highest number of marine organisms per area.*

DNA Barcoding o' Philippine Fish:

First Record of Marine Species in a Biodiversity Hotspot

Mudjekeewis D. Santos, Minerva Fatimae H. Ventolero, Angelli Marie Jacynth M. Asis, Apollo Marco D. Lizano, Joanne Krisha M. Lacsamana, Billy Joel N. Catacutan, John T. dela Peña, June Feliciano F. Ordoñez, Jacqueline Marjorie R. Pereda, Jom Acebes and Darell Blatchley

The recently discovered endemic marine fish species in Iloilo City, the Pogi Perchlet, *Chelidoperca santosi* *Williams and Carpenter, 2015*

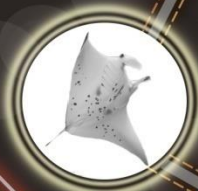
The first report on the presence of invasive species blackchin tilapia, *Sarotherodon melanotheron* in the coastal waters of Manila Bay *Ordoñez et al. 2015*

The occurrence of the invasive Central American Mayan cichlid, *Cichlosoma urophthalmus*, is also confirmed for the first time in Bulacan *Ordoñez et al. 2015*

First direct evidence of the presence of mobula ray, *Mobula japonica* sampled from an illegal shipment of dried shark meat and bones *Asis et al., 2014*

The first record of rare and protected beaked whale, *Mesoplodon hotaula* stranded in Compostela Valley *Lacsamana et al., 2015*

The first report of recently resurrected endangered giant clam *Tridacna noae* *Lizano and Santos, 2014*



First record of the rare reef manta ray, *Manta alfredi* in Bohol (2015) *Photo by: Y. Lee*

DNA Barcode

Genetic Fingerprinting Laboratory
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Graphical Design by:
Michael John R. Mendiola

Why bother ???

"A healthy marine biodiversity means a healthy fishery that is resilient to climate change."

... Doc Pogi ☺

Thank you !!!

NFRDI

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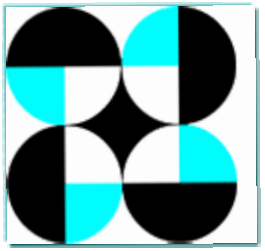

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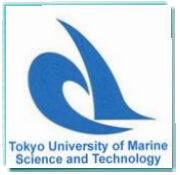

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