

Conservation and Aquaculture Research and Development Project for *Glossogobius giuris* (Biyang puti) in Naujan Lake (Goby Project)

Description:

The Institute of Fisheries offers a Bachelor of Science in Fisheries, preparing graduates to enhance and increase aquatic wildlife populations while addressing community and industry needs. The program enhances student practical skills and industry readiness through hands-on training in food processing techniques like smoking, bottling, canning, and baking. It fosters community engagement and learning by conducting at least four community training sessions per semester. Additionally, the program aims to develop the food processing center into a valuable income-generating facility for the university by producing and selling processed food products, supporting both academic and economic objectives to ensure sustainability and growth within the institution.

Reproductive Biology of *G. aureus*

This study aims to address and identify the reproductive biology of the Naujan White Goby for aquaculture potential in inland fisheries. This also provides knowledge on the community on the cycle of the species on the lake.

Instructional Materials produced:

BACKGROUND

White Goby, *Glossogobius giuris* (Hamilton, 1822), locally named *biyang puti*, is an amphidromous fish native to Naujan Lake. It is famous for its *daing na biya*, which may fetch price from Php 800-1000 a kilo depending on the season. However, reports from the fishers and several unpublished and published studies suggest that this species is rapidly becoming overfished. Signs include a reduction in catch volume and early maturation of smaller fish.

This IEC material aims to provide information about the anatomy of White goby of Naujan Lake. However, the taxonomic identification of the species was based only on the morphological diagnostic characters in FishBase. MinSU is conducting an ongoing study to resolve the taxonomic identity issue through a molecular approach.



FUNDED BY:

Department of Science and Technology – MIMAROPA (DOST-MIMAROPA)
Mindoro State University (MinSU)

IMPLEMENTED BY:

Institute of Fisheries
Mindoro State University
Bangabong Campus
in Collaboration with
MinSU Center for Environmental Studies (MCES)



ANATOMY AND MORPHOLOGY OF White Goby

Glossogobius giuris (Hamilton, 1822)



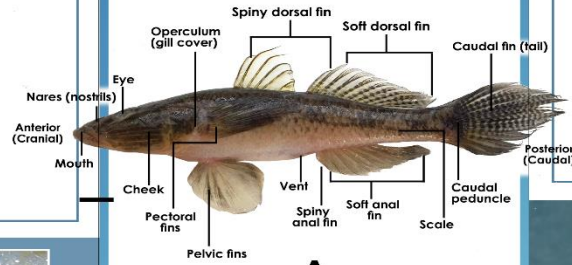
in Naujan Lake

WHAT YOU NEED TO KNOW ABOUT

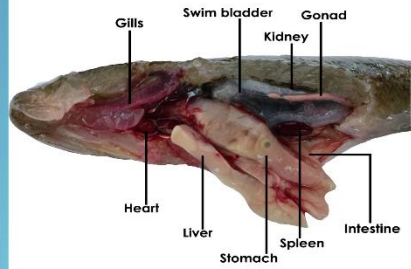
TAXONOMY

Kingdom: **Animalia**
 Phylum: **Chordata**
 Class: **Actinopterygii**
 Order: **Gobiiformes**
 Family: **Gobiidae**
 Subfamily: **Gobiinae**
 Genus: **Glossogobius**, Gill, 1859
 Species: **Glossogobius giuris**
 (Hamilton, 1822)
 Common name: **White goby, tank goby, flat head goby, bar-eyed goby,**

ANATOMY



A



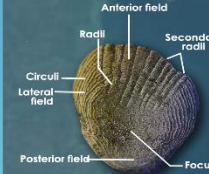
B

A. External anatomy (bar = 1cm) and B. Internal anatomy of white goby of Naujan Lake showing a full stomach.

MORPHOLOGY

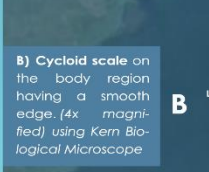
The body is brownish yellow with 5 to 6 dark and rounded blotches along the midline. Dorsal fins are light with brownish spots. Pelvic fins are grey and in thoracic position. Pectorals and caudal are grey and often hyaline. The fish has 2 separate dorsal fins; the first with 6 spines; the second with 1 spine and 8-9 branched soft fin rays. Anal fin with 1 spine and 8-9 branched soft fin rays. Pectoral fins with 18-22 branched rays. Scales in lateral series range from 29-32.

SCALE MORPHOLOGY



A) Clenoid scale on the head region with teeth-like projections. (40x magnified) using Kern Biological Microscope

A



B) Cycloid scale on the body region having a smooth edge. (4x magnified) using Kern Biological Microscope

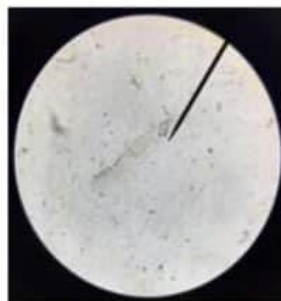
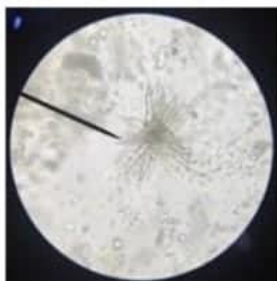
B

HABITAT

White goby can live in a variety of habitat from clear to turbid fresh water to estuarine areas with either rock or muddy bottom.

Information Dissemination:





Gut Content Analysis of White Goby

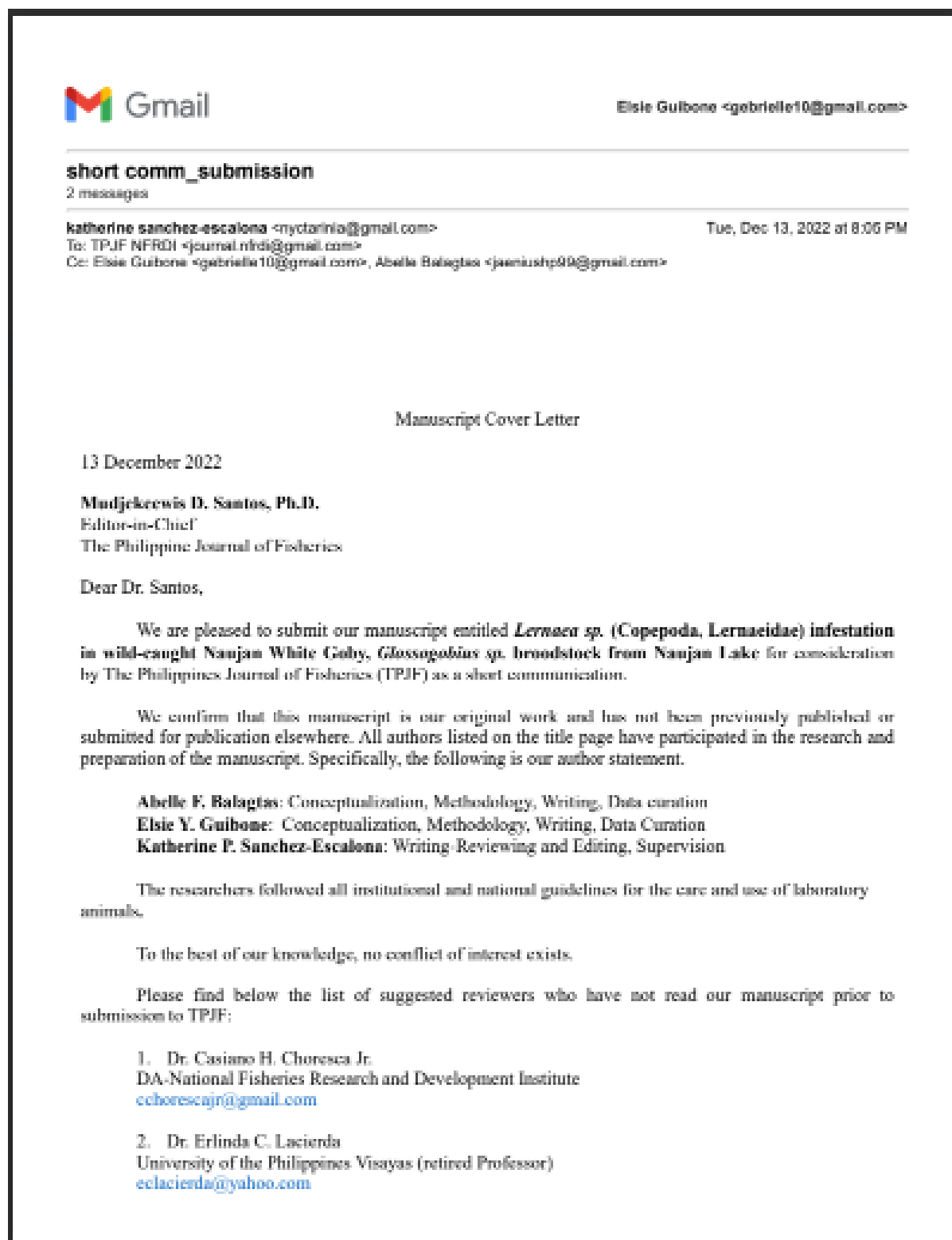


Gonadosomatic Index and Fecundity Analysis of White Goby



Fieldwork at Naujan Lake for White Goby

Publication Evidence:



Exploration of the aquaculture potentials of the Naujan White Goby Glossogobius sp.



Communication letter



Mindoro State University
Visayas, Oriental Mindoro 5105, Philippines

E-mail: msu@msu.psu.edu.ph
Website: www.msucor.edu.ph
Phone: +63 977 846 70 38

21 January 2022

DR. REYNALDO V. EBORA
Executive Director
PCAARRD

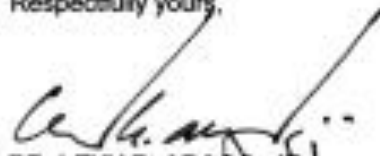
Sir:

Greetings!

It is with great honor and pride to submit to you the first Annual Progress Report of the Goby Project reflecting the achievements of the Project for 2021.

Thank you for working with us in conservation.

Respectfully yours,


DR. LEVY B. ARAGO, JR.
University President



14 February 2023

DR. REYNALDO V. EBORA
Executive Director
PCAARRD



DOST Form 7
EXECUTIVE SUMMARY FOR THE ANNUAL PROGRESS REPORT
(Attach DOST Forms 8, 9, 11, 12)

(1) Program Title: Project Title: Conservation and Aquaculture Research and Development Project for <i>Glossogobius aureus</i> (Biyang Puti) in Naujan Lake (Goby Project) Project Leader/Gender: Katherine P. Sanchez-Escalona/F Agency: Mindoro State University Address/Telephone/Fax/Email: Brgy. Alcala, Victoria, Oriental Mindoro/09155094854/myctarinia@gmail.com			
(2) Cooperating Agency/ies			
(3) Site/s of Implementation (Barangay / Municipality / District / Province / Region / Country): Base Station: Mindoro State University Victoria Campus Site/s of Implementation: Brgy. Balatasan, Bulalacao Brgy. Maasin, Bulalacao Brgy. Mansalay, Mansalay			
(4) Project Duration (number of months) 24 months		(5) Project Start Date January 2021	
		(6) Project End Date December 2022	
(7) Major Accomplishments a. Drafted S-MOA for the projects: Provincial Government of Oriental Mindoro, Municipality of Bulalacao, tripartite agreement with Municipality of Mansalay and BFARMC of Mansalay, BFARMC of Brgy. Balatasan, and BFARMC of Brgy. Maasin b. Conducted project inception meetings and consultations with the beneficiary barangays. c. Conducted social profiling for all the beneficiary communities that was used as a basis in drafting the training modules. d. Conducted entrepreneurship training in Brgy. Mansalay, and Brgys. Maasin and Balatasan in Bulalacao.			
A. Actual accomplishment of the project (via-a-vis the objectives)			
OBJECTIVES	ACCOMPLISHMENTS		
	TARGET	ACTUAL	PERCENTAGE (%)
To establish an experimental seaweed farm plot using viable laboratory-reared cultivars from PSU MSI, culture facilities, 1,000m ²	Established 1000 m2 experimental seaweed farm	All supplies for the construction had been purchased One of the three beneficiary communities has already started work i.e. net sewing, bamboo felling, collection of empty bottles as floaters.	60% 60%
To construct one (1) units of floating seaweed dryers	Constructed 1 unit floating seaweed dryer	All supplies had been purchased	50%
To select good quality seedstocks	Selected good quality seedstock	Locally available seaweed seedstock had been sourced out for planting	20%



DOST Form 7
EXECUTIVE SUMMARY FOR THE ANNUAL PROGRESS REPORT
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(2) Cooperating Agency/ies			
(3) Site/s of Implementation (barangay / Municipality / District / Province / Region / Country): Base Station: Mindoro State University Victoria Campus Site/s of Implementation: Mindoro State University Victoria Campus/Mindoro State University Bongabong Campus			
(4) Project Duration (number of months) 36 months		(5) Project Start Date January 2021	
(6) Project End Date December 2023			
(7) Major Accomplishments a. Drafted MOA with UP-Diliman Institute of Biology (UP-IB), Provincial Government of Oriental Mindoro (PGORM), and Bureau of Fisheries and Aquatic Resources – MiMaRoPa (BFAR-MiMaRoPa), Palompon Institute of Technology (PIT) for the collaborative sampling of fish in Lake Danao. Lake Danao National Park Protected Area Management Board (LDNP-PAMB), informal linkages with Barangay Bayani, Naujan, and Brgy. Malabo, Victoria for being the landing sites of specimens gathered; formed informal linkage with the Naujan Lake National Park Protected Area Management Board (NLNP-PAMB) for being the local clearing house of the project as well as the final recipient of the conservation outcomes of the project. b. Collected fish and tissue samples from Naujan Lake for the hot, dry month season (April), and fish and tissue samples from Taal Lake, Laguna Lake, and Lantao Lake. c. Initiated involvement of 4 undergraduate students in water quality study. d. Leveraged for the development of Center for Environmental Studies. e. presented 5 papers and drafted 4 papers for publication. f. Training of the Goby Team (8 people) on aquaculture protocol of big head carp as basis for the protocol development for goby.			
CERTIFIED COPY  MELGAR G. FADRIQUELAN, JR. Supervisor DATE: _____			
A. Actual accomplishment of the project (via-a-vis the objectives)			
OBJECTIVES	ACCOMPLISHMENTS		
	TARGET	ACTUAL	PERCENTAGE (%)
Administrative Preparations Staffing Contact of Linkages Purchase of equipment	Project staff hired Linkages contacted and MOU drafted Equipment delivered	All project staff hired Five (5) MOU drafted and finalized	100% 100% 80%
Discriminate white goby populations within the lake based on geometric morphometrics	Morphological segregation of Naujan Lake White Goby population	100% of the morphometric data processed 80% of the fish from other lakes collected	100% 80%

Collection of samples Sample processing Data Analysis			
Describe environmental parameters of Naujan lake related to occurrence of white goby Collection of samples Sample processing Data Analysis	Physico-chemical and biological description of selected sites within Naujan Lake	80% of the Naujan Lake plankton samples collected and analyzed 0% benthos collected 0% sediment collected	80% 0% 0%
C. Expected Outputs / EPs (Expected Outputs should be measurable.)			
	EXPECTED OUTPUTS	ACTUAL OUTPUTS	
Publications/Presentations	One (1) publication	Five (5) presentations done, four (4) papers drafted for publication	
Patents/IP			
Products			
People Services		Training of nine (9) project staff on aquaculture protocol; assisted conduct of one (1) baby thesis; had the proposal for the enhance of the MCES laboratories approved, together with the development of Natural Food Laboratory and the Aquaculture Laboratory	
Places and Partnerships	Two (2) Memorandum of Agreements signed	Five (5) Memorandum of agreements drafted and finalized.	
Policy			
(8) Risk Management Plan			
OBJECTIVES	(9) RISKS AND ASSUMPTIONS	(10) RISK MANAGEMENT PLAN	(11) ACTIONS TO BE TAKEN
Discriminate white goby populations within the lake based on geometric morphometrics.	Population of White Goby in the lake is differentiated morphologically that are either affected by environment and genetics.	Factors are intertwined that failure to determine which affects more may defeat the purpose of using the data for broodstock selection. Thus, morphological data would be used as the first basis for broodstock selection. CERTIFIED COPY <u>MILCAR G. TADROQUELAN, III</u> DATE: _____	Molecular approach would be optimized to have a good baseline on both aquaculture and restocking trajectory
Describe environmental parameters of Naujan lake related to occurrence of white goby.	Environmental parameters are related to population differentiation.		
Identify the genetic profile of <i>G. giaris</i> from Naujan Lake relative to other lakes around the Philippines.	Population of white goby in the lake is homogenous.		
Identify the appropriate conditioning parameters for <i>G. giaris</i> broodstock.	Conditioning parameters of broodstocks are dependent on the in-situ conditions.		
Look at the effect of broodstock size on breeding performance and hatching production of <i>G. giaris</i> in natural spawning and hormone-induced spawning.	Larger broodstock results to higher hatching production but no data yet on the optimum parameters by which broodstock can perform.		
		The attainment of the objectives is interdependent that the failure in the attainment of the first objective will affect the results of the latter objectives. As such, risk management plan would entail running trial experimental set-ups using known parameters and needs from known commercialized aquaculture species (i.e. <i>Slapia</i> , <i>Oryzias</i>) would be done.	Rigor would be taken in treatment design.

Study the appropriate conditions for egg incubation of <i>G. giuris</i> eggs;	Egg incubation is maximized given optimum conditions but data on the optimum conditions has to be determined yet.		
Ascertain the effects of larval stocking density on growth, survival and fry production of <i>G. giuris</i>	Larval density is inversely proportional to growth and survival.		
Growth and survival of hatchery-produced <i>G. giuris</i> fry fed diets containing different protein levels	Optimized growth is attained with optimum protein levels, however, there is no data yet on the relationship of protein level and growth rate.		
Optimization of feeding rate and frequency of <i>G. giuris</i> fry reared in nylon net cage (fipet) under brackishwater and freshwater environments	Optimized growth is attained with optimized feeding, however, there is no data yet on feeding rate and growth rate.		
(12) Problems/Concerns			
The implementation of molecular part of Study 1 is delayed due to the incompatible power supply and delay in the delivery of equipment by the supplier.			
(13) Suggested solutions to the above concerns			
Incompatible power supply - strong coordination with supply office is being done. Delivery of equipment - follow-up is regular with the supplier.			

