

ANNEX III

APPLICATION FORM INCLUDING THE TRAINING COURSE PROPOSAL

Section 1 - Background On the Training Proposal

Project Title

Hands-on Training Course for Wildlife Enforcement Officers and Researchers on Identifying Collected and Confiscated Wildlife Specimens Using DNA Barcoding

Preamble

The Philippines is an archipelago with a rich biodiversity and high species endemism. The country is also a biodiversity hotspot, the decline of species attributed to habitat loss and overexploitation. Wildlife enforcement officers (WEOs) are tasked to monitor and apprehend poachers. But high biodiversity and scarce taxonomic experts impede WEOs in identifying collected or confiscated specimens rapidly and accurately to species level.

With DNA barcoding, WEOs can,

1. Have a means for identifying a specimen even without taxonomic knowledge.
2. Identify specimens that have little taxonomic keys, or wildlife body parts that have already been processed.
3. Establish a barcode database specific to their geographic area, making the Philippine barcode database comprehensive.

The project will enable stakeholders to address NBSAP Target #10 on reducing and controlling key threats to biodiversity, as well as Aichi Targets 9 and 12. Specifically, DNA barcoding can 1) strengthen WEOs capabilities of pursuing and prosecuting offenders by providing a reliable tool for species identification of confiscated specimens, results of which can be presented as evidence; and 2) help monitor and control invasive alien species (IAS) by producing a barcode database of IAS. The project is also in line with Action #3 of the capacity-building strategy for the GTI, where the participants are able to generate DNA barcodes from their own region.

Project Outline

The training will be done on two batches of participants

Batch 1 - Metro Manila and Luzon Island participants

Batch 2 - Visayas and Mindanao Island participants

Each batch will have 10 participants, ideally composed of 4 participants from Higher Education Institutions (HEIs) with plans to establish DNA barcoding labs; and then 6 participants from Department of Environment and Natural Resources (DENR) and other WEOs. The training will be ten days per batch and will be facilitated by 9 training instructors. Each participant will be encouraged to bring five animal (preferably endemic) tissue specimens from their own collections. Plant tissues may also be brought but would be limited to one specimen only.

Modules and composition

1. 13 hours Collections management (50% presentation, 40% Hands-on lab work, 10% museum visit and museum live-demo data basing)- collection, data basing, processing, imaging, specimen tissue sampling for DNA work.
2. 12 hours Molecular lab work (15% presentation, 85% Hands-on) - DNA barcoding and other molecular tools, DNA extraction, PCR amplification, and DNA sequencing (Note: sequencing run in the Philippine Genome Center takes at least 3 days).

3. 18 hours bioinformatics (15% presentation, 85% hands-on computer work) - introduction to online databases, sequence assembly (participants' samples and/or test data), submission of sequences and other data to BoLD, sequence analysis using software (including online tools in BoLD).

4. 21 hours International, National and Institutional Policy (30% presentation, 40% discussion) - Lab and health safety, Philippine Biodiversity, CITES, NBSAPS, Wildlife Act, Laws and Regulation for collection, wildlife DNA forensics, chain of custody, application for funding. On the last day of the training, a workshop on research proposal writing for submission to funding agencies will be done. Participants will be required to write a research proposal which will be submitted to the facilitators as a requirement for them to receive their certificates of participation.

Time Allocation: Day 1 to 3 - collections and lab and health safety; Day 3 to 4 - molecular tools; Day 5, 7-8 - bioinformatics; Day 6, 9-10 - policies and research proposal writing.

Post-Project Follow-up Activities

- Develop standard operating procedures for Wildlife DNA forensics
- Establish a DNA wildlife forensics laboratory that caters to wildlife cases
- Initiate a Philippine Network for DNA barcoding
- Set-up dedicated websites for information dissemination about DNA barcoding and wildlife DNA forensics
- Engage environment law practitioners to look at the possibility of incorporating DNA-based approaches on wildlife cases into law
- Continue DNA barcoding workshops, targeting environment NGOs and environment law practitioners

Section 2 - Logic Model

Project Objectives

1. To improve capacity of WEOs in identifying specimens collected/confiscated using DNA-based approaches
2. To initiate the establishment of DNA laboratories for Luzon, Visayas and Mindanao
3. To build barcode reference libraries for regional native, exotic, and invasive alien species
4. To establish collaboration between WEOs and HEIs with established/plans to establish molecular labs within their respective regions
5. To improve capacity of participants in applying for funding for the establishment of lab, DNA barcoding projects etc.

Expected Project Outcomes

1. Participants that have the skills to establish a DNA barcoding lab, which includes technical knowledge, and ability to look for and apply for funding.
2. Establish a DNA barcoding lab each in Luzon, Visayas, and Mindanao. Labs will be hosted by DENR regional offices, or by an HEI that partnered with DENR regional offices.
3. A national DNA barcode project database hosted by the Institute of Biology, University of the Philippines, Diliman.

4. Increased public awareness of the utility of DNA barcoding in biodiversity resource management.
5. National policy will be pushed to incorporate country wide use of DNA tools and techniques in biodiversity monitoring.

Performance Indicators

1. 75% of the comments of participants from the evaluation forms will be of the highest ranks of satisfaction.
2. Submission of at least two capsule proposals that are DNA barcoding related from regional DENR offices/HEI to be funded by DENR.
3. Creation of at least two BOLD projects and submission of sequences from specimens processed during the workshop.
4. Published articles about highlights of the training in the Institute of Biology, Institute of Biology Alumni Association, and DENR website for visibility and information dissemination.
5. Results of the training presented during the Philippine Society for Biochemistry and Molecular Biology annual conference in December 2018 and to use the event as a venue to push for a national policy to use DNA barcoding for biodiversity monitoring. (Note: PSBMB is an annual conference attended by scientists and government officials).

Section 3 - List of Applicants and Facilitators

Lead Applicant

Name: Adrian Ulanimo Luczon

Address: Institute of Biology Bldg, Regidor Street, University of the Philippines, Diliman, Quezon City, Metro Manila, 1101

Work phone: '+63 2 981 8500 local 3727

Email: adrian.luczon@gmail.com

Country: Philippines

Co-Applicants

Name	Institution	Email
Ian Kendrich C. Fontanilla	Institute of Biology, University of the Philippines - Diliman	ianfontanilla@hotmail.com
Perry S. Ong	Institute of Biology, University of the Philippines - Diliman	ongperry@yahoo.com
Jonas P. Quilang	Institute of Biology, University of the Philippines - Diliman	jpquilang@up.edu.ph

Team Members

Name	Institution	Primary Role
Edwino Fernando	Forest Biological Services, University of the Philippines - Los Baños	Training Instructor
Ronniel Pedales	Institute of Biology, University of the Philippines - Diliman	Training Instructor
John Gregor Rono	Institute of Biology, University of the Philippines - Diliman	Training Instructor
Raffy Fornillos	Institute of Biology, University of the Philippines - Diliman	Training Instructor
Rachelle Pomer	Institute of Biology, University of the Philippines - Diliman	Training Instructor
Rizza Araceli Salinas	Biodiversity Management Bureau, Department of Environment and Natural	Training Instructor

Resources		
Michael Velarde	Institute of Biology, University of the Philippines - Diliman	Event Coordinator
Training instructors		
Name	Area of Expertise	Instruction Topic
Adrian Luczon	Molecular Phylogeny and Population Genetics	BoLD submission and analysis
Ian Kendrick Fontanilla	Molecular Genetics and Phylogenetics	Wildlife forensics, Chain of custody, IAS and DNA barcoding
Joans Quilang	Molecular and Population Genetics, Genomics and Fish Biology	Molecular tools and techniques, Introduction to DNA Barcoding, Introduction to online databases
Rizza Salinas	Wildlife diagnostics and surgery, Government Policies of Wildlife Protection	CITES, NBSAPS, Wildlife Act, Laws and Regulation for collection
Perry Ong	Wildlife Biology, Biodiversity Conservation, and Behavior Ecology	Philippine Biodiversity, Applying for grants
Ronniel Pedales	Genetics and Entomology	Collection management, Data basing, DNA Extraction, PCR
John Gregor Roño	Genetics and Ecology	Sampling protocols, AGE, PCR Clean-up
Raffy Jay Fornillos	Molecular Parasitology	Lab health and safety, DNA extraction, PCR
Rachel Joanne Pomer	Fish Genetics	Imaging, AGE, PCR Clean-up
Edwino Fernando	Biodiversity & Protected Areas, Biodiversity Conservation Policy and Planning, and Conservation Biology and Plant Genetic Resources	Collection management, NBSAPS, Aichi Targets

Section 4 - Background Information on Facilitators and Participants

Background of Applicants and Instructors

- Luczon is an alumnus of the GTI training course. He has an MSc in Biology, specializing in Molecular Phylogenetics, at the University of the Philippines Diliman.
- Fontanilla has a PhD in Genetics at the University of Nottingham, specializing in Molecular Phylogenetics.
- Quilang has a PhD in Biology at UP Diliman, specializing in Molecular Population Genetics.
- Ong has a PhD in Behavioural Ecology and Evolutionary Biology from Monash University.
- Fernando has a PhD in Botany in the University of New South Wales and is also the country's GTI-NFP.
- Pedales is an MSc Biology candidate and a faculty working on DNA barcoding of forensically important flies.
- Fornillos is an MSc Biology candidate and a research assistant working on DNA barcoding of parasites from snails.
- Roño is an MSc Biology candidate and a research assistant working on DNA barcoding of Philippine bats.
- Pomer is an MSc Biology candidate and a research assistant working on DNA barcoding of freshwater fishes.

- Salinas has a D of Veterinary Medicine from the UP Los Baños. They had 10 research projects that pertained to DNA barcoding work and published 20 scientific papers.

They have worked with DENR in crafting policies at the national level, particularly in Wildlife Forensics and DNA barcoding of endemic species. They helped train staff of DENR on the proper handling of biological samples and the chain of custody.

They are tapped by the DENR and other NGO's to process samples from cases involving Wildlife Forensics.

Partners and Stakeholders

This proposal is endorsed by the National CBD focal point person, Mr Bayani S. Mercado.

The Commission on Higher Education shall endorse the said workshop to higher education institutions (HEIs) in the Philippines. A formal memorandum will be issued by the Commission, which is required in order for the HEI's to allow their faculty to undertake such trainings as part of their continuing professional development, which includes setting up DNA barcoding labs. The Department of Environment and Natural Resources shall endorse this workshop to its regional officers and staff. An official memorandum from the Department is required so that the regional directors will allow their staff to participate in such trainings as part of the Department's goals to enhance the capabilities of its staff in order to protect the country's biodiversity.

Trainees

Government employees of the Department of Environment and Natural Resources. Faculty, staff and researchers based on Higher Education Institutions (Private and public) with existing molecular biology labs or have plans to establish molecular biology labs. The set up in the Philippines at the moment favour the academic institutions working hand in hand with DENR. With our current wildlife forensics program, collections and confiscated samples from DENR local offices all over the Philippines are shipped to DENR in Metro Manila and then sent to the University of the Philippines for processing. By having participants from the academe and DENR all over the country, we wish to have regional DENR offices tapping local DNA barcoding facilities doing biodiversity research in their respective areas.

Trainee Selection Criteria

Minimal qualification requirements:

A bachelor's degree in Biology, Forestry, Biochemistry, Wildlife studies and other related fields.

Must be staff of the Department of Environment and Natural Resources or a researcher from any of the higher educational institutions of the country.

With regards to screening, applicants will have to fill up and submit an application form containing a CV and a set of questionnaires. The questions would generally ask the applicants about future projects with regards establishing a DNA lab, application of DNA barcoding within their region, etc. Selection will be based on how inline their answers to the questions with the project proponents' goals and objectives are, without prejudice to gender. However, we will impose an age limit of 50 years old, in order to ensure that the trainees will have adequate time to meet our goals and objectives.

Expected Number of Trainees

20 participants, two batches of 10. Each batch will be ideally composed of 4 participants from HEIs, and 6 participants from WEOs. Each batch will be trained for 10 days.

Section 5 - Training Venue and Logistics

Hosting Institution

The Institute of Biology Alumni in UP Diliman, Inc. (UP-IBA) is a non-stock, non-profit organization that aims to support the Institute of Biology (IB) at the University of the Philippines in Diliman in many of its extension work. The members and officers of UP-IBA are alumni of the undergraduate and graduate programs of IB, a designated Center of Excellence in Biology by the Commission on Higher Education whose research mandate covers tropical biodiversity (molecules to ecosystems) and uses integrative approaches to characterize, utilize, and conserve biodiversity.

The UP-IBA will be the primary organization that will oversee execution, oversight and disbursement of funds. The IB, with its mandate of extension work, shall provide the logistical support, available facilities, and manpower, including nine staff members who will be involved in the training and three administrative staff who will help facilitate the activities. Processing of external funds by IBA requires an overhead cost of \$200.

Training Venue

The training venue will be at the Institute of Biology, University of the Philippines, Diliman. The training will use a lecture room for presentations, discussions and computer work; two molecular laboratories, two Museums and one Herbarium. A tour will be carried out at the Philippine Genome Center (PGC), just beside IB.

Collection management will be at the Herbarium, Vertebrate Museum and Invertebrate Museum of IB. Specimens to be processed will be brought by the participants, otherwise, samples that are archived at the herbarium and museums will likewise be utilized. Equipment available: microscopes, cameras, insect boxes, and consumables for the storage.

DNA extraction, PCR and AGE will be carried out at the DNA Barcoding Laboratory and the Molecular Population Genetics Laboratory. Equipment: pipettors, incubator, microcentrifuges, PCR thermocyclers, AGE kits, gel imaging system, vortex mixer, spectrophotometer and ultra-low freezers. Reagents available: DNA extraction kits, PCR kits, Gel extraction kits, gloves, disposable tips, microcentrifuge tubes, etc.

DNA sequencing will be outsourced via the PGC. Sequence assembly: STADEN

Bioinformatics analyses will be at the Institute of Biology where there will be access to internet and computers. Sequences obtained from the samples will be used for the analyses. Software to be used: MEGA, PAUP, Tree Explorer, Tree View, jModelTest and MrBayes. Sequences will be deposited in BoLD. Online querying will be done in GenBank and BoLD.

Training Activities

Day 1 - Sorting out institution logistics, introduction of participants to speakers, tour of the institution facilities, Module 4 (Lab health and safety), Module 1 lecture (collection, data basing, processing, imaging, tissue sampling).

Day 2 - Module 1 hands-on (specimen collection, data basing, processing, imaging, tissue sampling).

Day 3 - Module 1 hands-on continued (as needed), Module 2 lecture and hands-on (DNA barcoding, molecular tools, DNA extraction).

Day 4 - Module 2 lecture and hands-on (PCR amplification, DNA sequencing).

Day 5 - Module 3 lecture and hands-on (online databases, BoLD submission [pictures, geographic, morphological data]).

Day 6 - Module 4 lecture and discussion (Philippine Biodiversity, Wildlife DNA forensics and chain of custody, IAS, Laws and Regulation for collection).

Day 7 - Module 3 lecture and hands-on (sequence assembly, BoLD submission [sequences], use of BoLD tools, sequence analysis [BLAST, MEGA, etc.]).

Day 8 - Module 3 continuation as needed, Module 4 lecture and discussion (CITES, NBSAPS, Wildlife Act, IAS policies).

Day 9 - Discussions on Modules 1, 2 and 3. Module 4 workshop on writing proposals for funding agencies.

Day 10 - Presentation and submission of draft funding proposal by the participants.

Project Logistics

1. Communication -Announcement about the workshop (including invitations) will be coursed through the Department of Environment and Natural Resources as well as the Commission on Higher Education. Communications by participants and facilitators will be through email.
2. Transportation - Airfare of the participants to and from the venue will be booked by the hosting institution. Land travel by the participants and facilitators will be provided through reimbursement upon the first day of the workshop. Official receipts will be required for reimbursement.
3. Accommodation - This will be provided to participants/trainees and facilitators by the Institute of Biology through its guest rooms and dormitories.
4. Meals and Catering Arrangements - This will be handled by the Institute of Biology and will be outsourced.
5. Third-party Services - DNA sequencing shall be outsourced through the Philippine Genome Center (PGC) beside the Institute of Biology. A field trip/demo to the DNA Sequencing Core Facility of PGC will be undertaken if possible.
6. Post-project Follow-up Communication and Reporting: Facilitators will continue to communicate with participants to check on the status of their funding application
7. Relevant publications: The workshops will be covered in the Institute of Biology website. DNA barcodes from the workshop may later on be published in scientific papers.