

ANNEX III

APPLICATION FORM INCLUDING THE TRAINING COURSE PROPOSAL

Section 1 - Background On the Training Proposal

Project Title

Building a national and regional network for the study of alien species using DNA technologies as a great tool helping with the taxonomic impediment

Preamble

The problem of accurate identification of invasive alien species (IAS) especially at their early development stage exists in Belarus and neighbouring countries, due to lack of experienced specialists and absence of standard biodiversity survey techniques. DNA barcoding will be a standard tool for rapid and rather cheap identification of IAS that is essential for their early detection and eradication. The proposed project will help to facilitate meeting Belarus NBSAP Target 12 (corresponds to Aichi Biodiversity Target 19) and contribute to the implementation of the GTI Capacity-building strategy due to increasing awareness about new tools to study biodiversity, inter-institutional participation (including relevant national and regional institutions) and collaborative inventories of biodiversity using new methods and techniques. Moreover, this project will help inventory existing lists of alien species to fulfil NBSAP Measure 34 and achieve NBSAP Target 7 (corresponds to Aichi Biodiversity Target 9) - to minimize the negative impact of IAS of wild animals and plants on the state of native species' populations and ecological systems; to improve the mechanisms of prevention of new alien animal and plant species' invasion and lowering the damage caused to the environment. It will also provide a convenient operational framework to help advance international and Belarusian obligations under the CBD and related international framework agreements such as Nagoya Protocol.

Project Outline

General theme: detection of aquatic alien species.

Major institutions: National Academy of Sciences, Ministry of Natural Resources and Environmental Protection, universities, museums, national parks and public organizations.

- Expected duration is two weeks or 10 working days / 70 hours of training;
- Expected number of trainees is 8 (5 international and 3 local);
- Expected number of instructors and facilitators: 5-6.

Overall structure of the planned course: 50% laboratory, 25% computer time, 10% presentations, and 15% discussions, and its core modules (collections processing, DNA extraction and PCR, post-laboratory informatics, policy). General estimate of time allocation:

Days 1-3 – background information (oral presentations), meeting with laboratory team, tour of the facilities, general overview of samples collection, collections processing: databasing, imaging, subsampling (hands-on);

Days 4-7 – molecular (hands-on): tissue lysis, DNA extraction, PCR amplification, sequencing;

Days 8-9 – informatics (computer): background information, software for assembling DNA sequences, analysis of sequence data using BOLD and MEGA;

Day 10 – policy (oral presentation, discussion).

List of relevant discussion topics concerning policy – both general and specific:

- Relevant international agreements (Nagoya protocol);

- Institutional (Material transfer agreements).

The trainees will be able to analyse their materials from own collections. After the successful completion of our training activities, participants will obtain a certificate of attendance (which may have endorsement or signature from CBD-GTI). There is no Belarus Barcode of Life network yet, but the secretary of RusBOL (Nina Voronova) will be engaged in the training course as an instructor.

There is a preliminary agreement with Prof. Dr. Florian Leese (University of Duisburg-Essen), the Chair of the DNAqua-Net COST project, to participate as lecturer in the course. The DNAqua-Net project will finance this participation. The Scientific and Practical Center for Bioresources has applied to become member of DNAqua-Net.

Post-Project Follow-up Activities

- Building inter-institutional national and regional network to coordinate research activities on alien species using DNA barcoding;
- Public awareness campaigns (articles in newspaper "Navuka", info on the websites of the National Academy of Sciences and Scientific and Practical Center for Bioresources as well as in social media);
- Engaging national authorities (NFPs, Ministry of Natural Resources and Environmental Protection) to incorporate DNA-based diagnostic approaches into policy and law at local, national and international levels.

Section 2 - Logic Model

Project Objectives

1. To inventory the existing list of aquatic IAS of Belarus (potentially Ukraine, Moldova, Armenia) using DNA barcoding;
2. To establish a national/regional reference library of DNA barcodes for IAS;
3. To replenish the Republican DNA bank by new species (at least 25);
4. To help trainees to become competent users and contributors of DNA barcode data in BOLD and GenBank.

Expected Project Outcomes

1. Reliable list of alien species (excluding amphipods of Belarus that have been already barcoded) and established national reference library to help fulfil NBSAP Measure 34 and achieve NBSAP Target 7 (corresponds to Aichi Target 9);
2. Biological materials (included DNA) of analysed species deposited in the Republican Gene bank while sequences – in BOLD Data Systems (at least 10% of aquatic alien species);
3. Building a national/regional network for the study of aquatic alien species as a basis for establishing a national/regional Barcode of Life network.

Performance Indicators

1. For the training event: minutes/photos from training activities, attendance lists, presentation slide decks, testimonials from trainees;
2. For DNA barcode information: creation of BOLD projects for reference library and checklists (at least 95 records);
3. For public awareness: news on the webpages of institutions (before and after training in 2018), 1-2 popular science articles in newspapers published by the first decade of 2019 and 1-2 scientific articles in journals published by the end of 2019;

4. For post-workshop follow up activities: meetings with the Main Scientific Secretary of the National Academy of Sciences of Belarus on the establishment of Barcode of Life Center in Belarus; submitted/prepared funding applications.

Section 3 - List of Applicants and Facilitators

Lead Applicant		
Name	Tatsiana Lipinskaya	
Address	Akademicheskaya Str., 27. Minsk 220072	
Work phone	375 17 284 15 85	
Email	tatsiana.lipinskaya@gmail.com	
Country	Belarus	
Co-Applicants		
Name	Institution	Email
Elena Makeyeva	Institute Genetics and Cytology of the National, Academy of Sciences of Belarus	makeyevaelena89@gmail.com
Anna Moldovan	Academy of Sciences of Moldova	anna.moldovan@yahoo.com
Team Members		
Name	Institution	Primary Role
Helen Gajduchenko	Scientific and Practical Center for Bioresources	Event Coordinator
Victoria Golovenchik	Scientific and Practical Center for Bioresources	Training Instructor
Natalia Kazakova	Scientific and Practical Center for Bioresources	Support staff
Nina Voronova	Belarusian State University	Training Instructor
Training instructors		
Name	Area of Expertise	Instruction Topic
Tatsiana Lipinskaya	Hydrobiology and ecology. Invasion alien species and water quality assessment	General information. BOLD data submission
Anna Moldovan	Molecular biology and biotechnology	Barcoding workflows. Samples collection
Elena Makeyeva	ABS NFP and ABS Clearing House Publishing Authority, a member of the Nagoya Protocol Compliance Committee and ABS-CH Informal Advisory Committee	Policy, international agreements
Victoria Golovenchik	Cytogenetic and molecular genetic studies	Laboratory workflow
Nina Voronova	Molecular biology of aphids	Informatics

Section 4 - Background Information on Facilitators and Participants

Background of Applicants and Instructors

- T. Lipinskaya, PhD in Hydrobiology; participated in GTI training course (Canada, 2015) and scientific internships in the field of molecular biology (Canada, 2017; Poland, 2017); has experience in managing inter-institutional projects.
- Moldovan, Master degree in Applied Biological Sciences; participated in training courses on Real time PCR and Genetic Analyser (Moldova, 2014), GTI training course (Canada, 2016) and intensive course in molecular methods and data analyses (Norway, 2017). E. Makeyeva, PhD in Genetics, Head of the National Coordination Centre on Access to Genetic Resources and Benefit-sharing, ABS National Focal Point and ABS Clearing House Publishing Authority; has experience in managing inter-institutional and international projects.

- N. Voronova, PhD in Molecular Genetics was involved with the National Barcode of Life Network of Russia as a scientific secretary; the author of 39 scientific articles in the field of molecular biology; has experience in managing inter-institutional and international projects.
- H. Gajduchenko, PhD in Ecology has experience in conducting cytogenetic and molecular genetic studies and had several scientific internships in the field of molecular biology (Lithuania, Sweden, and Russia); has experience in managing inter-institutional projects.
- V. Golovenchik, a junior researcher at the Laboratory of Molecular Zoology, 1-year postgraduate student with extensive experience in molecular research.

Partners and Stakeholders

- Endorsement from national CBD Focal Point; S. Melnov - sbmelnov@gmail.com;
- Endorsement for the event from the Scientific and Practical Center for Bioresources;
- Endorsement for the event from the Institute of Genetics and Cytology;
- Endorsement from international partner (Academy of Sciences, Moldova);
- Co-financing from the BBI project (E. Makeyeva).

Trainees

Preference will be given to specialists who have experience in biodiversity conservation, plant and animal pest control programs, alien species monitoring programs. Specialists are strategically positioned (there is a molecular lab, coordination of inter-institutional or/and international projects on biodiversity monitoring or pest control) to carry on barcoding operations in their institutions after the training activities are done and to advance the country's goals under the respective NBSAPs.

Candidates should be preferably research coordinators or mid-level managers or have an intention and perspective to use new molecular techniques in the field of biodiversity monitoring.

- National parks and reserves.
- Phytosanitary and quarantine inspection offices Customs service.
- Public agency and SME UNDP.

Trainee Selection Criteria

Participants will be selected based on the timeliness and completeness of submitted documents and the relevance of the professional background of nominees to meet NBSAP Target 7 (corresponding to Aichi Target 9). Trainees should be well positioned within their home institutions to coordinate future development and implementation of the DNA barcoding technology and will have possibility for engagement of their colleagues and partners. There will be a quota for number of trainees per agency.

Expected Number of Trainees

8 trainees (5 international and 3 local)

Section 5 - Training Venue and Logistics

Hosting Institution

Scientific and Practical Center for Bioresources (SPCB), National Academy of Sciences, leading national institution in monitoring of biodiversity and ecosystems; focusing on integrated studies and scientific support of conservation and sustainable use of biological resources, as well as on elaboration of measures for mitigation of the impact of alien invasive species on native ecosystems. 8 laboratories, 5 sectors and 120 staff. Clean fiscal solvency record; 0% rate of overhead for projects where there is no salary.

SPCB will be directly responsible for project execution, including administration and financial management. 8 externally-funded projects in 2016 (3 projects founded by UNDP, 2-by Universities, 1-by CICONIA, 2-by UNDP/GEF); 3 continuing projects in 2017 (founded by UNDP and CICONIA), 1 new project founded by UNDP/GEF. Matching in-kind support will be provided from the National Academy of Sciences. 4 staff will be directly involved in the training activity and 3 – indirectly.

Training Venue

All activities including sequencing will be executed at the Scientific and Practical Center for Bioresources (SPSB) and the Institute of Genetics and Cytology(IGC) situated in the same building. Visitors will have personal desk space with internet connection. Visitors will work on their personal laptops. There is a separate space for practicing molecular techniques and working on individual research is provided.

Participants will be encouraged to have own materials for analysis. In case of absence of their own material and for general overview of sampling techniques, the Botanical Garden near the training location will be used for sampling. Fresh field-sourced materials will also be available. Microscopes (5), camera (1), insect boxes and tissue arrays will be used.

During the laboratory work, the necessary reagents, instruments and equipment of the laboratory will be provided for use (DNA extraction reagents, sample tubes or 96-well plates, PCR reagents, gloves, pipette-dispensers, centrifuge, thermostat, thermal cycler, gel-like visualization system, vortex mixer).

For bioinformatics analyses, personal laptops will be used. Real data obtained during the training course will be analysed. CodonCode trial version will be used for sequence assembly/analysis, MEGA - for post-processing of sequence data, BOLD - for storage and data analysis.

Training Activities

Tentative period of training is May- July.

Day 1. Introduction. Meeting with laboratory team, tour of the facilities. Overview of DNA barcoding and BOLD Systems (T.Lipinskaya)

Day 2. General overview of samples collection, collections processing: databasing, imaging, subsampling (Live demo. A. Moldovan)

Day 3. Subsampling. Tissue lysis. DNA extraction (V.Golovenchik)

Day 4. PCR amplification (V.Golovenchik)

Day 5. PCR amplification, sequencing (V.Golovenchik)

Day 6 and 7 – Free time

Day 8. Sequencing. Data uploading to BOLD (T.Lipinskaya)

Day 9. Informatics: background information, assembling DNA sequences (presentation, practical work on computer: A. Moldovan, N.Voronova).

Day 10. Analysis of sequence data using BOLD and MEGA (presentation, practical work on computer: A. Moldovan, N.Voronova).

Day 11. Informatics (T.Lipinskaya, H.Gajduchenko). BOLD: Submission and managing data (T.Lipinskaya).

Day 12. Policy (oral presentation, discussion: E.Makeyeva). Use of DNA barcoding for biodiversity monitoring; eDNA and metabarcoding (F.Leese). Discussion with potential collaborators. End of the training.

Project Logistics

- Selected participants will receive invitation letter, necessary information for travel, accommodation, meals and necessary documents for transportation of

biological material. Post-workshop communication will be conducted to have feedback and opinions about the training;

- All transportation (flights and airport shuttle) will be arranged by SPCB staff for international participants. Possible, cheapest direct flights to Minsk will be booked. Ground transportation to/from Minsk will be arranged through public transport;
- Few flats with 3 bedrooms or individual rooms in hotel will be rented for international instructors and trainees;
- Meals (per-diem allowance);
- End-of-project reporting (including financial report) will be done no later than 2 months after training;
- Post-project follow-up communication and updates/reporting will be done in a few months after the training to know about progress in development /building capacity /using of DNA barcoding in trainee's institutions;
- Relevant publications, including Web presence will be provided.