

Project “Transfer of DNA Barcoding Technology for the Inventory and Monitoring of Rare and Endangered Species in Belarus and other Central and Eastern European Countries”

Minsk, 20-30 August 2018

Detail the activities implemented during the project.

The DNA barcoding training programme included the following phases:

20 August 2018. The induction workshop (the scanned programme attached).

21-28 August 2018. The training course programme, including theoretical lectures and hands-on training sessions (the scanned programme of the theoretical and hands-on training attached).

29 August 2018. The culminating workshop summarizing the training course results on mastering of DNA barcoding technology.

30 August 2018. Meeting of specialists to discuss prospective collaboration. Departure of participants.

What are the main outcomes of the project? How will these results impact the state of the biodiversity? (What social and economic benefits has this project generated?) Please annex any written relevant document.

Main outcomes.

The DNA barcoding training course included the theoretical part and hands-on training sessions.

I. Theoretical part

The theoretical underpinnings of molecular-genetic analysis of living organisms' genomes and the conceptual provisions of DNA barcoding methodology for its use in taxonomy were presented during the lectures of:

Alexey Borisenko, PhD and **Maria Kuzmina**, PhD – leading experts from the University of Guelph, Canada

Anna Moldovan – an accredited DNA barcoding trainer

Elena Kuzminova – an employee of the Republican DNA Bank of a human, animals, plants and microorganisms.

Alexey Borisenko presented detailed information on the activities of the Global Taxonomic Initiative in Canada, the background to its development and prospective activity plans. He also provided information on the areas of research carried out at the University of Guelph.

Tatiana Lipinskaya (PhD in Biology, the Scientific and Practical Centre for Bioresources, NAS of Belarus), **Elena Mikhaleiko** (PhD in Biology, the Institute of Genetics and Cytology, NAS of Belarus) and **Nina Voronova** (PhD in Biology, the Belarusian State University) read short courses on the practical use of DNA barcoding in their research and teaching.

Vitaly Semenchko (D.Sc. in Biology, NASB Corresponding Member) read a lecture “Invasive alien species in Belarus: results and perspectives of their study”, in which he noted the interest of scientists in using the proposed method of DNA barcoding for the species diversity screening of these species, their distribution monitoring and elaborating of environmental protection measures.

Tatiana Zheleznova (Advisor, the Division of Biological and Landscape Diversity, the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus) and

Elena Makeyeva (Head of the National Coordination Centre on Access to Genetic Resources and Benefit-sharing) reflected in their reports the issues related to the participation of the Republic of Belarus in such International Treaties as CITES and the Nagoya Protocol to the Convention on Biological Diversity aimed at the conservation and sustainable use of biological diversity, including access to genetic resources-related issues and traditional knowledge with regard to their use. **Elena Makeyeva** also informed the training course participants on the progress of the UNDP-GEF International Technical Assistance Project “Strengthening of human resources, legal frameworks and institutional capacities to implement the Nagoya Protocol in the Republic of Belarus” and of the activities held under the Project, including analysis of national legislation on the issues related to access to genetic resources and traditional knowledge, the inventory of genetic resources, including the DNA barcoding technique use. **Kseniya Panteley** (Research Associate of the National Coordination Centre on Access to Genetic Resources and Benefit-sharing) informed on the ongoing procedure for obtaining access to genetic resources and traditional knowledge associated with them and presented a copy of the Internationally Recognized Certificate of Compliance with the Nagoya Protocol issued for providing the potato lines developed at the Institute of Genetics and Cytology, NAS of Belarus, to the US Potato GenBank – the first experience among the countries of Central and Eastern Europe and Central Asia Region.

Taking into account that all country Parties to the Convention on Biological Diversity and its Protocols are gearing up for the next 14th Conference of the Parties to the Convention, the 9th Conference of the Parties to the Cartagena Protocol and the 3rd Conference of the Parties to the Nagoya Protocol, **Tatiana Zheleznova** as a representative of the state authority responsible for the Nagoya Protocol implementation in Belarus and **Elena Makeyeva** as the National Focal Point for access and benefit-sharing related issues and a member of the Convention Bureau of Parties informed the participants on the issues brought up for discussion by the Parties and suggested discussing and expressing their opinion on digital genetic information from the standpoint of its possible regulation with regard to information management. The workshop participants as representatives of the academic community in their countries emphasized the importance of preserving digital genetic information in the public domain as an important source of scientific information for planning and improving molecular genetic research in general. At the same time, it was noted that if digital genetic information is used to obtain commercial products and is identified as confidential, then legal regulatory and liability measures should be developed for situations that go beyond the existing measures for legal data protection.

2. Hands-on part

Hands-on activities were carried out in accordance with the plan developed by the trainers and staff assisting in implementing of learning-by-doing laboratory activities. The plan of activities is attached to the report.

PROJECT OUTCOMES

The project objective “Transfer of DNA barcoding technology for the inventory and monitoring of rare and endangered species in Belarus and other countries of Eastern Europe” was achieved – the technology was transferred by the trainers accredited at the University of Guelph, Canada, where the technology was developed, and over the past five years, many countries have been widely using it.

The project targets were fully implemented. The training course participants gained theoretical and practical knowledge on the use of DNA barcoding methodology in various areas – in scientific research, as well as in environmental protection and forensic science. A regional network of specialists who know how to use DNA barcoding technology was established both for sharing of information and experience in its use. The network also aims at developing

regional projects involving the use of DNA barcoding as one of the tools for their implementation. An important practical outcome is the replenishment of the Republican DNA Bank with the samples of animal and plant origin for their study and long-term storage, as well as the establishment of Regional Reference DNA Barcodes Libraries of aquatic animals (Scientific and Practical Centre for Bioresources, NAS of Belarus) and rare and endangered plant species (Institute of Genetics and Cytology, NAS of Belarus) to ensure the efficient institutional collaboration among the countries of Central Europe and Central Asia Region. The Resolution was adopted as a capstone document on realization of the knowledge gained and the development of plans for joint activities in the Region (attached). The course participants received Certificates of the training course completion confirming the mastered DNA barcoding techniques.

What has been the role of the CBD National Focal Points of different Parties involved in the project?

Elena Makeyeva, ABS NFP in Belarus, was involved in the project as its manager from the BBI part of the joint project conducted with IGT. At the moment, there are no IGT NFPs in Belarus, but the trainers from Canada trained under the IGT project in 2015 delivered theoretical lectures and hands-on training sessions to the participants.

Which activity or approach efficiently succeeded to foster sustained TSC and why?

Joint hands-on activities and discussion of the obtained results contributed to the creative atmosphere and active discussion of mutual interest areas of the most fruitful collaboration.

Which activities or approaches would be done differently, now that you have experienced them, and why?

Specialists should be chosen more carefully for their subsequent training from the standpoint of their professional attainment (lawyers and biologists should be trained separately) and laboratory skills.

How could this project be pursued to maintain or scale up the positive results obtained?

Positive project outcomes are reflected in the Resolution.

How could this project be replicated in another region?

This project may be replicated in any other region, where the hosting institution is properly equipped for carrying out molecular-genetic research. Experts and trainers can be invited from Guelph University, Canada, and from Belarus and Moldova, where DNA barcoding is already used as an important research/lab technical tool.

Describe the in-kind contribution of different stakeholders involved in the project and how this type of contribution could be increased in future projects.

The invited lecturers from Belarusian institutions (the Ministry of Natural Resources and Environmental Protection, the Belarusian State University, the Institute of Genetics and Cytology, NAS of Belarus, and the Scientific and Practical Center for Bioresources) and the staff of the laboratories the hands-on activities were held at contributed to the project through their participation (they spent their work hours on the project needs) and the Institute of Genetics and Cytology, NAS of Belarus, and the Scientific and Practical Centre for Bioresources provided their equipment for the rent-free use.

If the project included the participation of major groups like business, subnational and local authorities, NGOs, youth, women, indigenous peoples and local communities, what would be your advice to engage this specific group efficiently?

This project requires the participation of people with certain professional knowledge and skills in laboratory work, therefore, a clear set of selection criteria should be developed for such training courses.

In this project, women accounted for 70% of the total number of training course participants; 6.45% (2 people) – ministerial representatives; 3.22% (1 person) – private hunting farm; 16.13% – representatives of higher educational institutions.

Propose the project summary in 250 words to be published on the Bio-Bridge web portal.

Regional project “Use of DNA technologies for identification and study of invasive and rare and endangered species”.

Partner countries: Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Moldova, Ukraine

Brief description of the project proposal: DNA barcoding is a methodology for rapid and accurate identification of species by sequencing a short segment of standardized gene regions and comparing individual sequences to a reference database. In order to protect biodiversity from invasion of alien species and with a view of the conservation of rare and endangered species in the context of rapidly growing economic and biological trade relations of CEE countries, it is necessary to conduct a rapid inventory of invasive and rare and endangered species to develop an effective strategic program for the protection of biodiversity in CEE countries.