Czech EPBRS Meeting

World Biodiversity and the European Taxonomy

Strategies in taxonomy: research in a changing world

Estonia

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National reviews guidelines

The aim of national reports and e-conference is to bring together potential users of taxonomy in Europe. The EPBRS meeting under the Czech Presidency is designed to investigate what the users of taxonomic information see as the main issues that taxonomists should focus on. Encouraging taxonomy users to participate actively in the e-conference and the meeting itself might also help to strengthen the policy bit of the science-policy interface.

The following headings will be used to structure the work of the EPBRS in the e-conference and during the meeting.

1-Taxonomic Information: Strategy and Methods

Inventory and Identification: "What is it, and how does it fit among its relatives?"

1.1 Does your country use taxonomy-based tools for biodiversity assessments and policy making? What are these tools?

YES. Floras, key-books, distribution atlases, red data book, check-lists, monitoring database of threatened species, nature observations database

1.2 Does your country have a national checklists?

YES, for all wildlife groups

When were they last revised and updated?

Most of the lists are completed permanently

Is there any national assessment of which taxa in particular lack taxonomic information?

NO

Almost 40 000 living species are thought to be represented in Estonia. So far about 23 500 or 60% of them have been found. The rest 16 500 species or 40% of biota are yet to be discovered. 8 600 species or about one fifth of Estonian biota have been assessed for their endangerment and 1 314 or 15% of them are either endangered or extinct

Did you submit a response to the GTI questionnaire on these issues?

YES

1.3 Describe 1-2 flagship projects related to bullet points below and suggest some recommendations useful for meeting as a result from these projects: Please outline any national taxonomy-based monitoring or surveys designed to establish the distribution, status and trends of any taxonomic group.

Monitoring of endangered species

Atlas of the Estonian Flora

Estonian Breeding Bird Atlas

Estonian Red Data Book

Distribution maps of Estonian fungi

1.4 Is there any coordinated effort in your country regarding bar-coding for identification or the assessment of biodiversity?

YES

1.5 Are you aware of any major efforts (or projects) in your country to integrate morphological and molecular taxonomy?

Phylogeny and distribution of selected plant species and intraspecific taxa of the the Baltic Sea region – project in University of Tartu

Taxonomy, molecular phylogenetic and ecological studies of basidio- and ascomycetes (including lichenized fungi) -- project in University of Tartu

Systematics and molecular phylogenetic studies of selected taxa of basidio- and ascomycetes (including lichenized fungi), and autecology of fungal taxa important in agriculture. -- project in University of Tartu

Hybridization of the Greater Spotted Eagle Aquila clanga and Lesser Spotted Eagle A. pomarina, and its impact: analysis by molecular markers – project in Estonian University of Life Sciences

2-Taxonomy as a basis for ecological research and sustainable management of the biodiversity

Ecological functions and services: "What does it do, and what does it interact with?"
How does taxonomic research contribute to better understanding of the functions and attributes of species, and to the management of biodiversity?

2.1 Do you know projects involving taxonomists in the understanding of ecological functioning, or the assessment of ecosystem services?

I Projects in University of Tartu, Frontiers in Biodiversity Research (FIBR) :

1. Macroecology of biological diversity

2. Phylogenetic comparative ecology

3. Coevolution, ecological interactions and biodiversity

All ecosystem studies rely on the expertise of taxonomists

2.2 What is the contribution of taxonomy in your country to the management of biological invasions?

Invasive Heracleum species are studied and repulsed.

Masters thesis: Bert Holm. 2005. Biology, distribution and deterrence of invasive *Heracleum* species. Estonian University of Life Sciences.

Eek, L. & Kukk, T. 2008 How to use invasive species http://www.envir.ee/orb.aw/class=file/action=preview/id=1090211/voorliikide+kasutamise+kasiraamat.pdf

All data about Estonian alien species are available from the taxonomy based

Database of Alien Species in Estonia http://eelis.ic.envir.ee/voorliigid/eng/

and The North European and Baltic Network on Invasive Alien Species (NOBANIS) is a gateway to information on alien and invasive species in North and Central Europe. http://www.nobanis.org/

2.3 What is the contribution of taxonomy in your country to efforts to understand the status and trends of key functional groups such as pollinators?

ESF grant project in Estonian University of Life Sciences:

Foraging behaviour of pollinators in farmland: use of bumble bee colonies for increasing the seed yield of entomophilous crops

Taxonomy, biodiversity and its conservation: "How to manage it in sustainable way?"

Describe 1-2 flagship projects related to bullet points below and suggest some recommendations useful for meeting as a result from these projects:

2.4 Are there also non-professional organisations recording biodiversity data collections (e.g. ornithologists) involved in the decision process of land use planning etc.?

YES. Estonian Ornithological Society http://www.eoy.ee/

Estonian Naturalists Society, http://www.elus.ee/?lang=eng

Estonian Seminatural Community Conservation Association http://www.pky.ee/english/

Estonian Orchid Protection Club http://www.orhidee.ee/

2.5 Are there some indicators (or red-list species) monitoring Natura 2000 sites for delimitation and management of nature reserves used in your country?

2.6 Which taxonomy-related research (standardized taxonomic metadata, delivery of checklist building tools, building expertise network) in developmental non-European biodiversity-rich countries is supported by policy-makers from your country based on your national expertise and experience?

NON

2.7 Is there a National Needs Assessment of GTI in your country? If yes, what are your specific needs, e.g. for conservation, protected areas, CITES/customs, dealing with invasive species etc?

3- Taxonomy, potential users and capacity building of experts

Open access to information: "How to find out about it?"

How does taxonomic information get from where it resides to where it is needed elsewhere in the world?

- *Bioinformatics*

3.1 To what extent is taxonomic research in your country contributing to international biodiversity initiatives and projects (e.g GTI, GBIF, PESI, EOL, Etc...)

Limited

3.2 What is the state of the art in biodiversity informatics in your country? (e.g. e-taxonomy and e-science tools)

Some efforts made in Natural History Museum of University of Tartu
The Global Taxonomy Initiative is partly covered. A national programme 'Collections of humanities and natural sciences 2004–2008' was adopted in 2004, ensuring the allocation of funds from state budget. The more than 200-year-old Natural History Museum at the University of Tartu http://natmuseum.ut.ee/390683) can be regarded as an umbrella institution for taxonomic activities in Estonia. The activities relevant to the Initiative include the creation of the Estonian Species Index (http://unite.ut.ee/est/index.php) and the related database. The Species Index is unique in that it contains all eukaryotic species of Estonia (over 22000 species at present). A new version of the ESI, which is based on published research references, is being developed in cooperation between several institutions. The version of the web-based database (PlutoF 1.0) developed by the Natural History Museum of the University of Tartu within the framework of the national programme is available.

3.3 Has there been a national assessment of best practices for taxonomic data quality and validation?

NO

3.4 Do you have any national guidelines on how to approach the proof of absence?

According to the guidelines used in Estonian Red Data Book

3.5 What are the taxonomic standards used in the databases (TDWG, Darwin core, COL, PESI, etc...)?

3.6 Could you identify the major digitization efforts for biodiversity data (e.g. collections, observations, species checklists, etc...)?

1. Most of Estonian herbaria are just in the process of digitization, lichenological collection is digitalized already (**eSamba)** http://natmuseum.ut.ee/401730
Lists of mosses and vascular plants and algae from Tartu University (TU) are also available http://natmuseum.ut.ee/388856
Digitalization of collections of Estonian University of Life Sciences (TAA) is on half-way. http://kogud.emu.ee/?do=coll&id=11

Database of fungal cultures http://erast.ut.ee/temp/cfungi/

2. The Nature Observations Database is created to enlarge people knowledge about the nature. This database has been established for everyone to insert own observations. Inserted data are used for composing species distribution atlas and others analyses. It means this database collects useful information about Estonian biodiversity. Information about observations of protected

species is sent after inspection to the Estonian Environment Register. The Nature Observations Database has a map application, where everyone can look inserted observations, borders of the Estonian protected areas and location of protected nature monuments.
http://eelis.ic.envir.ee/kaart2/index.php?topic=1&meny=ENG&subtopic=2

3. Estonian Species Registry
Estonian Species Registry is a database of Estonian and Latin names of taxa found in Estonia.
http://unite.ut.ee/est/index.php

4. Estonian Biodiversity Data Base The goal is ensuring and assessing the quality of the biodiversity data. The main activities are developing the unified Estonian species list using academic expertise on systematics of different groups of animals, plants and fungi (to ensure that the species are recognized and named correctly) and integrating biodiversity data from monitoring and field observations to the data base.

3.7 Is there any effort in your country to make taxonomic information especially identification services easily accessible and useful to practitioners?

1. Estonia is participating in KeyToNature project which enables producing identification keys also in the Estonian language.

KeyToNature: a new e-way to discover biodiversity

One of the first steps in discovering and understanding biodiversity is to identify the organisms around us. Traditionally, this has been done using paper-printed keys which enable us to correctly name an organism. Most of them, however, are "difficult" and hardly usable for educational purposes. KeyToNature is developing a range of new, much easier and paper-free identification tools, for use within schools and universities across Europe. They are available on a variety of platforms including laptops and mobile phones, some of them can be tailored to individual requirements. http://www.keytonature.eu/wiki/Main_Page The project mobilizes 14 partners from 11 EU countries, including leading centres in biology, pedagogy, education, and information technology.

2. Database of correct Latin and Estonian names of vascular plants is available via internet for everybody : Index of Estonian Plant Names (http://www.ut.ee/taimenimed/). It is improved by the Comission of Botanical Terminology of Estonian Naturalists Society. Last updated in March 2009.

3. We have also classical printed key-books of Estonian vascular plants, mosses, lichens, fungi, fishes, butterflies, birds, insects etc.

Capacity building in biodiversity-rich countries and worldwide:

3.8 Are there any policy initiatives in your country to orient capacity building in taxonomy?

NO

3.9 Are there any sources of finance or policy actions in your country dedicated to applied taxonomy (e.g. identification tools, training for parataxonomists)?

NO