DSI:
Digital Sequence Information

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大学等の海外遺伝資源の円滑な使用を支援

筑波大学
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PTraD Initiative

Topics

- What is DSI?
- History of DSI and Concerns
- Positions of countries at SBSTTA 2018
- Upcoming Issues at CBD COP-14, NP MOP-3

Unclarity of Digital Sequence Information (DSI) Context:

Chemical Compound Data

Protein 3-d structure Data

Genomic Sequence Data

- Base genetic sequence (DNA)?
- Processed DNA Sequence such as primers?
- Expression sequence (RNA)?
- Amino acid?
- Protein?
- Metabolites?
- Secondary metabolites?
- Secondary, tertiary information thereof out from DSI?

Your digitalized data from biodiversity?

DSI: digital sequence information

- Claims that digital sequence information is the part of biodiversity
- Specific concerns on digital sequence information can create substantial value by informatics and modern biotechnology
- Major topics at Convention on Biological Diversity and its Nagoya Protocol on ABS
- Ad Hoc Technical Expert Group (AHTEG) on Digital Sequence Information on Genetic Resources was established by decision XIII/16 of the Conference of the Parties of the Convention on Biological Diversity
- Parallel concerns for implementing Environmental Conventions such as initiatives within CBD and CITES
- **DRAFT EXPLORATORY FACT-FINDING SCOPING STUDY ON "DIGITAL SEQUENCE INFORMATION" ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE at CGRFA of FAO on April, 2018**

History of DSI Discussion at CBD

- More than one decade: Came out from the processes of negotiations over CBD COPs, and development processes of Nagoya Protocol
- Unclear: What is DSI?
- Tough: strong interventions after the adoption of NP
- Eminent: Topics formally on the table on COP after 2014 and also at NP
- Earmarked: Recent SBSTTA (**Subsidiary Body on Scientific, Technical and Technological Advice** (**SBSTTA**) of COP CBD in 2018 had a forum on DSI as one of key agenda
- Scheduled: CBD COP14 & NP MOP3 in November, 2018

Concerns

- What is DSI?
- Use of terms such over genetic resources, genetic materials and biodiversity: individual perception of interpretation of the significance of the terms
- Infinite value?: DSI can support substantially to find and produce benefits even without the original organisms: secondary and tertiary product thereof should be included in ABS issues
- Link with synthetic biology as the DSI could lead to creating a new artificial organism by modern biotechnology: a threat to biodiversity?
- Fact: More than 300,000 species of genome information openly available to support conservation studies in stead of imaginary concerns. Benefits go to mega-diversity countries to support the conservation.

No direct link with Synthetic Biology at CPB

- Again, use of terms is not well fixed and
- Scope is over-interpreted
- Synthetic biology is for contained use but yet within scope of CPB and CBD Products thereof, are not for deliberate release to the environment
- Expectation on basic research with potential to innovative applications such to energy and medical uses

Reactions from International Scientific Communities supporting CBD Mission

GBIF
Global Biodiversity Information Facility

International BARCODE OF LIFE

DSI discussion: Unlikely to support implementation of CBD if the agenda continues

Databases are in developed countries

https://www.ncbi.nlm.nih.gov

DDBJ
Swissplot
Rice etc.

International organization database also would be restricted as a large proportion is the contribution from developed countries

Positions of Countries at SBSTTA, 2018 :

- DSI is all information on genetic resources: DNA, protein, metabolites…..: every thing digitalized is DSI!!
- DSI is the major part of genetic resources: this may threat to conservation
- Databases should have traceability of users to charge ABS: database users should pay and this strikes back to users at developing countries
- Databases are used commercially and are benefit sharing subjects: You pay money if you have a database
- Needs examining the DSI related benefit-sharing mechanisms: likely waste of tax money contribution from parties
- Capacity building needs to negotiate: Already in the context of CBD and NP

Positions of Countries at SBSTTA, 2018 : continued

- DSI is not identical as genetic resources
- DSI scope must be very limited to DNA as genetic sequence information, even not cover RNA
- Use of the terms and likewise definition are not clear (nonsense in terms of basic science view and history of the use of the terms)
- With any of the potential legal control on DSI, the most suffered would be the developing countries as the most valuable DSI in databases including trade-secret ones in developed countries

Upcoming issues

- AHTEG was recommended to continue at SBSTTA
- DSI may contain biological metabolic substances by the understanding some parties
- Some national laws include DSI as equivalent as genetic resources
- Working group meeting may be held prior to SBSTTA to COP15 after the AHTEG.
- Traceability at Databases
- Comparison with existing ownership management such as digitalized music
- Survey research over parties on DSI
- Simplified processes over use of DSI out from genetic resources
- Legal compliance mechanisms of the commercial use of DSI

Summary

- DSI should be well defined
- The present understanding on DSI vary over parties and other stakeholders
- Damage on conservation is not considered much if DSI cannot be used from existing databases unless ABS is pledged.
- Information is cardinal, but only with intellectual and heavy investment processes, DSI could support with little chance to a visible commercial benefit
- It is substantial and could suffer public sector if DSI is controlled under an international legal regime