

ABSTRACTS

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CONFERENCE

INFORMATION TECHNOLOGIES IN
THE RESEARCH OF BIODIVERSITY

(BIT - 2018)

SEPTEMBER 11-14, 2018
IRKUTSK, RUSSIA

ТЕЗИСЫ

МЕЖДУНАРОДНОЙ НАУЧНОЙ
КОНФЕРЕНЦИИ

ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ В
ИССЛЕДОВАНИИ
БИОРАЗНООБРАЗИЯ

(BIT - 2018)

11-14 СЕНТЯБРЯ, 2018
ИРКУТСК, РОССИЯ

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ABSTRACTS OF THE CONFERENCE
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(BIT-2018)

IRKUTSK, RUSSIA, SEPTEMBER 11-14, 2018

IRKUTSK
ISDCT SB RAS

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Институт математических проблем биологии РАН –
филиал ФГУ “ФИЦ прикладной математики
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При поддержке: Глобальной Информационной Системы по
Биоразнообразию (GBIF); Отделения нанотехнологий и
информационных технологий РАН (ОНИТ РАН);
Российского Фонда Фундаментальных Исследований
(РФФИ)

ТЕЗИСЫ ДОКЛАДОВ КОНФЕРЕНЦИИ
“ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ В
ИССЛЕДОВАНИИ БИОРАЗНООБРАЗИЯ”
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Abstracts of the conference “Information Technologies in the Research of Biodiversity” (BIT - 2018). Irkutsk: ISDCT SB RAS, 2018. 120 p.

This volume contains proceedings of the Information Technologies in the Research of Biodiversity (BIT-2018). The conference tells about the latest developments in the field of integration of modern information technologies and classical research methods. New research requirements are being put forward, requiring the union of all researchers, standardization and unification of data and methods.

This volume is intended for researchers in the field of biology and computer science.

The conference was organized with the financial support of: Department of nanotechnology and information technologies of Russian Academy of Sciences; the Russian Foundation for Basic Research, Project no. 18-07-20053 Г.

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Тезисы докладов конференции “Информационные Технологии в Исследовании Биоразнообразия” (ВИТ - 2018). Иркутск : ИДСТУ СО РАН, 2018, 120 с.

Этот том содержит материалы конференции по Информационным Технологиям в Исследовании Биоразнообразия (ВИТ-2018). Конференция рассказывает о последних событиях в области интеграции современных информационных технологий и классических методов исследования биоразнообразия. Выдвигаются новые требования к проведению научных исследований, требующие координации всех исследователей, стандартизации и унификации данных и методов.

Этот том предназначен для исследователей в областях биологии и информатики.

Конференция проведена при финансовой поддержке: Отделения нанотехнологий и информационных технологий РАН (ОНИТ РАН); Российского Фонда Фундаментальных Исследований, Грант № 18-07-20053 Г.

Научный редактор: И.В. Бычков, В.И. Воронин

Редакторы: Е.Ю. Батурина, Р.К. Фёдоров, А.К. Попова

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Preface

This volume contains abstracts of the International Scientific Conference “Information Technologies in the Research of Biodiversity” (BIT - 2018) that was organized in Irkutsk, Russia, during September 11-14, 2018.

The main purposes of the conference are.

- Coordination of research interactions to digitize, standardize and publish data on biodiversity in Russia and other countries, as well as promoting and spreading modern international principles, resources and tools for working with biological data.
- Consideration of modern principles for creating and integrating local and regional information system projects for biodiversity research in Russia and other countries.
- Creation of infrastructures for implementing technological and information support to organizations seeking to exchange data and data analysis methods.
- Development of specialized software for handling biodiversity research tasks.
- Networking and exchange of experience, advanced technologies and trends in the field of distributed databases and data processing.

The main topics of the conference are.

- Global biodiversity data portals: data integration, use in knowledge generation tasks.
- Information and analytical systems on biodiversity. Virtual natural history collections.
- National data on biodiversity: the current state of digitization. Copyright issues, methods and concepts for assessing data quality.
- Theoretical fundamentals and organization technologies of the information and telecommunications infrastructures. Standards for describing digital data, processing services, etc.
- Methods, models, software systems and Web services for the analysis of biodiversity data.
- Application of remote methods in vegetation mapping and biodiversity research.

Предисловие

Этот том содержит тезисы докладов конференции по Информационным Технологиям в Исследовании Биоразнообразия (ВІТ - 2018), место и дата проведения: Иркутск, Россия, 11–14 Сентября, 2018.

Цели конференции.

- Координация взаимодействий по оцифровке, стандартизации и публикации данных по биоразнообразию в России и других странах. Популяризация и распространение современных международных стандартов, ресурсов и инструментов для работы с биологическими данными.
- Рассмотрение современных принципов создания и объединения локальных и региональных проектов информационных систем исследования биоразнообразия в России и других странах.
- Создание инфраструктур, реализующих технологическую и информационную поддержку организации обмена данными и методами анализа данных.
- Развитие специализированного программного обеспечения для решения задач по исследованию биоразнообразия.
- Обмен опытом, передовыми технологиями и тенденциями в области распределенных баз данных и распределенной обработки данных.

Тематика конференции.

- Глобальные порталы данных о биоразнообразии: интеграция данных, использование в задачах генерации знаний.
- Информационно-аналитические системы по биоразнообразию. Электронные биологические коллекции.
- Национальные данные о биоразнообразии: современное состояние оцифровки. Вопросы авторских прав, методы и концепции оценки качества данных.
- Теоретические основы и технологии организации информационно-телекоммуникационных инфраструктур. Стандарты описания цифровых данных, сервисов обработки и т.д.
- Методы, модели, программные системы и Веб-сервисы для анализа данных о биоразнообразии.
- Применение дистанционных методов в картографировании растительности и изучении биоразнообразия.

Organization

BIT-2018 is organized by Matrosov Institute for System Dynamics and Control Theory of Siberian Branch of Russian Academy of Sciences in cooperation with Siberian Institute of Plant Physiology and Biochemistry of Siberian Branch of Russian Academy of Sciences, V.B. Sochava Institute of Geography of Siberian Branch of Russian Academy of Sciences, and Institute of Mathematical Problems of Biology RAS – the Branch of the Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences. With the support of GBIF: the Global Biodiversity Information Facility and Department of nanotechnology and information technologies of Russian Academy of Sciences.

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Shashkov Maxim	IMPB RAS – the branch of Keldysh IAM RAS, Pushchino, Russia
Shumilov Alexander	ISDCT SB RAS, Irkutsk, Russia

Организаторы

Конференция ВIT-2018 организована Институтом динамики систем и теории управления имени В.М. Матросова СО РАН совместно с Сибирским институтом физиологии и биохимии растений СО РАН, Институтом географии им. В.Б. Сочавы СО РАН и Институтом математических проблем биологии РАН – филиал ФГУ “ФИЦ прикладной математики им. М.В. Келдыша РАН”. При поддержке Глобальной Информационной Системы по Биоразнообразию (GBIF) и Отделения нанотехнологий и информационных технологий РАН (ОНИТ РАН).

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Шумилов Александр Сергеевич	ИДСТУ СО РАН, Иркутск, Россия

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were collections of G.I. Langsdorf, M.M. Berezovsky, V.N. Bostanzhoglo, G.I. Polyakov, S.A. Buturlin, V.A. Khakhlov, V.M. Gudkov, as well as the material collected by Museum staff during different years. The creation of the network database with parallel access for several operators based on MySQL server became an important frontier in the work of the Section, after which many of the usual operations were accelerated and optimized notably. For the purpose of accessibility for specialists from around the world, the database is published on the official website of the Museum and in biobank of the Moscow State University. Currently, a portion of the database for the collection of bird tissue samples, which are the source for DNA extraction is being completed. In the nearest future we are planning to digitize collections of alcohol preserved materials and clutches, as well as publication of articles involving data from the electronic catalogue including the catalogue of type specimens. The work was carried out with the financial support of the RNF grant № 14-50-00029 “Scientific foundations for the creation of a National Depository Bank of Live Systems”.

Creation of Information retrieval system on the unique research collections of the Zoological Institute RAS

Oleg Pugachev, Natalia Ananjeva, Sergey Sinev, Leonid Voyta, Roman Khalikov, Andrey Lobanov, Igor Smirnov

Zoological Institute of RAS, St. Petersburg, Russia
director@zin.ru

Создание информационной системы для уникальной фондовой коллекции Зоологического института РАН

О.Н. Пугачев, Н.Б. Ананьева, С.Ю. Синева, Л.Л. Войта, Р.Г. Халиков,
А.Л. Лобанов, И.С. Смирнов

Зоологический институт РАН, Санкт-Петербург, Россия
director@zin.ru

Zoological Institute of the Russian Academy of Sciences (ZIN) — one of the oldest scientific institutions in Russia with unique scientific collections. In 2017, the Museum and the Institute celebrated their 185th

anniversary. The unique collection of the ZIN were collected by many generations of Russian and foreign zoologists throughout the territories and waters of our planet. Collected during these expeditions materials are stored in the Institute, they remain imperishable source of information on the structure and distribution of faunal diversity in space and time. The collections continue to rise. ZIN has one of the largest zoological collections in the world, with more than 60 million of storage units. In general, in the collections of the ZIN about 260 thousand species of animals, which is about a quarter of the known world fauna, are presented. There is almost all the animal species inhabiting territory and waters of Russia, for many of them the big series are stored. Several tens of thousands of type specimens of animal species stored in the collection are of exceptional value. The content of the concept of “zoological collection” in our days of rapid progress of information technologies and advances in molecular genetic studies quickly filled with new meanings. Currently, the collection is rightfully regarded as a bank of scientific information and the primary tool for basic and applied biological research. The information system should include taxonomical, type, collection, zoogeographical and bibliographic data. By using of available server infrastructure of ZIN and information system of collection specimens created (ZIN Research Collections portal, <https://www.zin.ru/collections/>), there was a possibility of selective publication of ZIN research collection data via GBIF portal (<http://ipt.zin.ru>). The scientific use of the collections and depositories of integrated information systems for faunistic biodiversity in the present context includes, as the most important modern goals, digitization of collections and publication of information in the public domain on the Internet as well as the creation of a DNA bank. Work is carried out within the limits of researches on a theme “Inventory of a biodiversity of animals and its supply with information” (AAAA-A18-118012990224-5) and partially carried out at support of grants of the Russian Foundation for Basic Research № 15-04-02971 and № 15-29-02457.

Data base “Herbarium KLGU” by IKBFU

Dmitry Petrenko, Konstantin Korolev, Sofia Gusha

IKBFU, Kaliningrad, Russia
DPetrenko@kantiana.ru