Russia2019_12

Mobilization of biodiversity data on soil mesofauna across European Russia biomes

FINAL ACTIVITY REPORT

Guidelines on how to complete the activity report are included in italics. You are welcome to remove the guideline text from the document before you submit the report.

Please note that once the activity report has been approved, it will be added to your project page. Therefore, we kindly ask you not to add any contact details of persons in the report unless you have permission from the person to do so.

Contents

1. Executive summary

Provide a brief explanation of the project and its implementation, the objectives achieved, lessons learned and conclusions.

The global gap in the open soil biodiversity data is particularly evident for Russia, which contrasts long traditions of soil zoological research in this country. To fill this gap for the European part of Russia, the project aimed at mobilising data on the two most abundant groups of soil-dwelling arthropods – springtails (Entognatha: Collembola) and oribatid mites (Arachnida: Sarcoptiformes). The data was compiled from the personal archives of two ecologists and taxonomic experts – Dr. Natalia Kuznetsova and Dr. Andrey Zaitsev. The project team also included two data stewards – Dr. Natalya Ivanova and Maxim Shashkov and was coordinated by Dr. Anton Potapov. The project implementation started with establishing of the data mobilization protocols using a test data set. Based on the protocols, collection of data, its standardization and publishing to GBIF was performed. Overall, 20 data sets from a range of biomes across European Russia were compiled from private archives, standardized, accompanied with detailed metadata and published to GBIF resulting in a total of 48,580 georeferenced occurrences. The data were published in the event format, allowing for community-level data analysis which is still a poorly represented data type in GBIF. The project activities increased the number of Collembola occurrences for European Russia in GBIF 100-fold, and the number of Sarcoptiformes occurrences 10-fold, successfully filling the gap in the open data on soil mesofauna biodiversity for the region. The workshop, individual consultations, and the web portal that were organised or developed during the project helped in promoting open science principles among Russian soil zoologists and initiate the data mobilisation in the community. Best practices and lessons learned are documented in the current report. The project inspired following-up initiatives and tools development, thus being important not only as an independent activity, but also as a trigger for the soil biodiversity data mobilisation and dissemination of the open data principles in Russia.

2. Contact information

Provide the name, institutional affiliation, role in the project and contact details of the author(s) of the report.

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3. The project and its objectives

A brief summary of the project to help readers understand its objectives, including, for example:

- *The project's start date and expected duration*
- *A list of project participants and description of the main stakeholders*
- *The targeted capacity needs as outlined in the project proposal*
- *The project objectives and expected deliverables as included in the project proposal*

The project is implemented during February – September 2019 and involves taxonomic experts (Dr. Natalia Kuznetsova and Dr. Andrey Zaitsev) and data ecologists (Dr. Anton Potapov, Dr. Natalya Ivanova and Maxim Shashkov).

The project aimed at aggregating and standardizing biodiversity data on the two most abundant groups of soil-dwelling arthropods in European Russia – springtails (Entognatha: Collembola) and oribatid mites (Arachnida: Sarcoptiformes). The data was accumulated by two soil ecologists and taxonomic experts (Dr. Natalia Kuznetsova and Dr. Andrey Zaitsev) from a range of biomes from the North to the South of European Russia. The project is expected to deliver 30,000 occurrences of springtails and 15,000 occurrences of oribatid mites to GBIF.

In addition to data mobilisation the project to increase awareness of the open science concept among Russian soil zoologists. To this end, a cross-institutional workshop and individual online consultations are organised and an online portal is developed.

4. Project implementation

This section should provide readers with a good understanding of the project, from the original plans to the final implementation, highlighting:

- *The activities that have been completed at the time of writing the report, and those that are ongoing or pending (e.g. longer-term evaluation, follow-up projects/meetings/training events) and your plans for their completion.*
- *How the different partners in the project have contributed to its implementation.*

4.1. Activities completed

Describe the activities that have been completed at the time of writing the report. Explain how the different partners in the project have contributed to its implementation.

The first three months of the project were predominantly devoted to the stategical planning and developing of the most efficient practices of data collection and standardization. The developed practices were tested on a trial dataset and then served as the practical guide during the final phase of the project to publish event-type data on Collembola and Sarcoptiformes communities across European Russia. The developed practices were shared during the workshop among the soil zoologists across Russia and documented in this report. Information on the project and open data principles was distributed in personal communication, individual online consultations, and open web resources.

The following steps were completed:

(1) Designing the road map of the project. Current stage of the data was revised and priorities were defined accordingly. At the initial stage, well-managed part of the data was used to develop a data standardization protocol. In parallel, continuous workflow on gathering and checking of various data from papers and excel spreadsheets were established. Further, workshop program, web page content and information distribution strategies were discussed. Discussions were done online via e-mail and *google documents* involving all participants and organized by the coordinator (Anton Potapov).

(2) Establishing the data collection and standardization protocols. For data collection, Natalia Kuznetsova and Andrey Zaitsev compiled data from personal archives in standard *excel* spreadsheets (community matrix form) with the help of volunteers and technical assistants. Spreadsheets were quality-checked by corresponding taxonomic experts (Natalia Kuznetsova and Andrey Zaitsev) for inconsistencies and corrected, if necessary. Further, the corrected tables were checked, cleaned, and standardized in Darwin core according to the GBIF template in *R* with packages *reshape*, *reshape2* and *dplyr* by Anton Potapov. Collembola and Sarcoptiformes are normally collected via soil extraction techniques. Thus, many individuals are coming from a single environmental sample (i.e., a soil core). This data type fits into the event GBIF template (https://github.com/gbif/ipt/wiki/samplingEventData#templates). One soil core was treated as 'an event' ('events' table), which was linked to the list of occurrences of species inside this soil core with their abundance ('occurrence' table). Taxonomic names were matched versus GBIF taxonomic backbone using the package *taxize*. All missing data was added from the supplied metadata or restored from personal archives. Based on the procedures, a flexible *R* script was prepared by

Anton Potapov for converting community matrices to fit the GBIF template (publicly available at http://www.soilzoology.ru/node/27). The script was used to standardize remaining data by Anton Potapov and Elizaveta Noskova. Standardized data comprised three files: (a) occurrences, (b) sampling events and (c) dataset metadata, which were delivered to an IPT administrator Natalya Ivanova, who published them in GBIF.

(3) Selection of data. Data on Collembola were collected from the personal archives of Natalia Kuznetsova for the period of 1975-2018. The data comprised both paper and digitalized sources. For development of the standardization protocol, the well-managed dataset on seasonal dynamics (1991-1997) of collembolan communities from Moscow region has been chosen. Other data sources were listed and prioritized for standardization in account to have a broad range of geographical regions and habitat types. Data on Sarcopiformes were collected from the personal archives of Andrey Zaitsev for the period of 1968-2010. The data comprised digitalized sources that were prioritized for standardization following the same principles. Data with species-level identification for both taxonomic groups have been selected. The occurrences of juvenile individuals were reported as well by linking them to corresponding supraspecific taxa (family or order).

(4) Organization of the cross-institutional workshop on GBIF and open biodiversity data principles. Program and aims of the workshop were discussed online via e-mail and *google documents* involving all participants and coordinated by Anton Potapov and Natalya Ivanova. According to these discussions, workshop was titled "Diversity of soil animals in Russia: publication and effective use of initial data" and the following main topics were selected for the program:

● Principles and advantages of the 'open science'. What is gbif.org?

● Data on soil animal diversity of Russia: state of the art and perspectives of establishing and developing of a national web-portal.

● Biodiversity data standards and data quality.

● How to search and download published data from online resources?

● How to prepare your initial data for publication?

● How to publish your data (for example, in gbif.org)?

Natalya Ivanova and Maxim Shashkov prepared learning materials and training data in account for specifics of the field of soil zoology. Distribution of the information

about the workshop was done via existing e-mail lists of soil zoologists, via personal communication and via gbif-russia community. Registration was done via online *google forms*. 17 participants from 14 soil zoological research groups from 9 regions across Russia have registered and joined the workshop. Workshop was held on 29-30 of August, 2019 and was leaded by Natalya Ivanova and Maxim Shashkov, certified GBIF consultants. Andrei Zaytsev presented idea and leaded discussion on the national soil zoological data collection. As an external lecturer, Alexei Seregin from the Moscow State University Herbarium was invited (https://www.gbif.org/dataset/902c8fe7-8f38-45b0-854e-c324fed36303). We received many positive feedbacks and see the workshop as the basis to initiate active communication among soil zoologists in Russia. Information about the workshop was distributed on public online resources (see the sources of verification section, http://www.soilzoology.ru/workshop2019).

(5) Designing the information portal for soil zoologists (http://www.soilzoology.ru). After joint online discussions between Anton Potapov and Maxim Shashkov, the following working packages were included in the terms of reference, according to the web page contents: news tray, descriptive page, description of related projects, contacts of stakeholders and web resources (databases and learning materials). The development was done by Maxim Shashkov using the Content management system Drupal 8. Web page content was prepared by Anton Potapov and Maxim Shashkov and discussed among project participants. The main mission of the developed portal is to increase the work efficiency of soil zoologists in Russia and the integration of soil zoology as a scientific discipline at the national and global levels. Specific tasks the portal is aiming at:

- Dissemination of principles of open science and open biodiversity data

- Dissemination of information on available online resources on soil fauna

- Creating a network of interactions among soil zoologists in Russia

- Compilation of the information on the state of data on soil biodiversity in Russia

- Help in standardizing and publishing data on soil biodiversity in Russia

To the date of the report, portal contains information on global online biodiversity resources, group-specific soil biodiversity resources, tools on data standardization, information about coordinators, projects and the mission of the portal.

(6) Individual on-line consultations for soil zoologists of Russia. During the project implementation, the data ecologists with strong experience in data curating and publishing with GBIF, Natalya Ivanova and Maxim Shashkov from the Institute of Mathematical Problems of Biology RAS, actively consulted the entire research team and our colleagues on the Institute of Ecology and Evolution RAS or at the Moscow State Pedagogical University. The main topics of these consultations were (1) biodiversity data standards, (2) GBIF templates, (3) registration of an organisation in GBIF. This greatly facilitated working activities within the project and also result in registration of the Moscow Pedagogical State University as a data published in GBIF (https://www.gbif.org/publisher/1158c872-239b-4d40-bfc5-53138cdf4f37). Further, Natalya Ivanova and Maxim Shashkov gave an online consultation for employees and students of Moscow State Pedagogical University (Department of Botany, Department of Zoology and Ecology). This consultation was attended by researchers that were previously unfamiliar with GBIF, including botanists Prof. Dr. Mikhail Markov and Prof. Dr. Nadezhda Klyuchnikova, an ornithologist Prof. Dr. Alexander Sharikov, a technician Valeria Makeeva and a student Maria Antipova. Information about GBIF was positively received and participants wanted to learn more about the possibility of using the database and publishing their data to it. Of particular interest was the prospect of digitization of the oldest herbarium of Moscow State Pedagogical University with the participation of students. The participants of the online consultation agreed to hold a training seminar on the GBIF and biodiversity data standards on the basis of the Moscow State Pedagogical University.

(7) Preparing the report. During the project implementation, all participants followed the road map of the project (step 1). Most of the suggested internal 'deadlines' were met. One month before the final report deadline, remaining tasks were distributed among project participants by the coordinator. Most of the tasks were successfully achieved, however, due to interfering parallel activities, such as conferences, we asked for the deadline extension. Additional 10 days were granted, which allowed us to prepare a detailed report and provide more deliverables than in was suggested in the application. Scientific report was prepared by Anton Potapov, financial report was prepared by Andrey Zaitsev, all other participants contributed with information, whenever it was needed.

4.2. Ongoing and post-project activities

Highlight ongoing or pending activities (e.g. longer-term evaluation, follow-up projects/meetings/training events) and your plans for their completion.

Project implementation inspired a number of new initiatives. The following project-related activities are ongoing:

- Developing and maintaining the http://www.soilzoology.ru portal. The portal is seen as the platform for communication and coordination of research initiatives among Russian soil zoologists. The platform will be maintained by Maxim Shashkov while other project participants and members of scientific community will be contributing information there. Platform will be developed during the following-up projects.

- The project activities and results will be advertised during the upcoming conferences in Leiden in October 2019 (https://biodiversitynext.org) and Ekaterinburg in April 2020 (http://insma.urfu.ru/en/research/itbio). The later meeting is seen as a platform for joint discussion of future open data initiatives among soil zoologists in Russia.

- The long-term project evaluation is planned via analysing the dynamics of interest of soil zoologists to GBIF and other open biodiversity data initiatives. Specifically, we run a questionnaire on the http://www.soilzoology.ru portal to collect information on the perception of the open data practices among Russian soil zoologists. We also are planning to track data use, correct existing data errors (if any) and refine information in the published datasets by updating them.

The following new initiatives were in part inspired by the project:

- During the project implementation, a new project proposal was prepared and is about to be submitted to the Russian Science Foundation. The new project aims at listing the active soil zoologists and existing data including information about the status of these data. Further, it aims to compile the easy-mobilizable data and initiate the process of digitalisation of paper archives. Finally, it will link Russian soil zoologists via a common information and data platform.

- The participants of the online consultation (see the project implementation section) agreed to hold a training seminar on the GBIF and biodiversity data standards on the basis of the Moscow State Pedagogical University in late October 2019. Among other aims, during the training seminar, prospects of

digitization of the oldest herbarium of Moscow State Pedagogical University with the participation of students will be considered.

- Developed *R* script greatly facilitated the process of data standardization (see the 'Project implementation' section). However, many soil zoologists in Russia are not using *R*. Thus, we launched a project to develop an online tool for community matrix transformation into the event Darwin core format. This tool will be openly available on the http://www.soilzoology.ru portal and could be extremely useful for soil zoologists as they work primarily with the sampling event type of data.

- Despite GBIF contain all key fields to accompany biodiversity data, soil zoologists, and especially ecologists, in many cases have specific demands for data description. This inspired us to launch another project to develop a portable DBMS that could be used to manage personal soil zoological collections. This tool will allow to convert data into the Darwin core format and thus will save a lot of efforts needed for data standardization.

- The 15 data sets on Collembola that were published and lessons that were learned during the project inspired us to launch the #GlobalCollembola initiative (https://twitter.com/AntonCollembola/status/1181130127306047488). The initiative aims at mobilizing the available data on collembolan communities from researchers around the globe and consolidate it into a database. Despite it has no explicit funding at the moment, to the date of the report, almost 100 researchers already joined the initiative.

5. Project deliverables

This section should summarize the project activities completed by the end of the project with a description of the associated outputs and deliverables. Please highlight any changes from the original plans provided in the full proposal by filling in the column 'State by final report'. You are welcome to attach deliverables to the report as annexes or to link to them.

Make sure to include details of data mobilized through the project and/or re-usable information resources or tools. Should your deliverables include data publication to GBIF, please make sure to include the project ID in the dataset metadata.

Also, please comment on the expected milestone for the final reporting as defined in the contract.

a. Data

Title of dataset	Taxonomic/ geographic/ temporal scope	Approximate number of records	Sampling methodology/protocol used (if relevant)	Geographic accuracy for most records (in m or km, or province, country etc.)	Current state (e.g. undigitized, digitized)	State by final report
Collembola communities of European Russia (collection of Natalia Kuznetsova)	Collembola across European Russia/1975-2018	30 000	Soil core heat extraction	10-1000m	ca. 95% Digitalized, not standardized	41,928 occurrences are published to GBIF in the form of 15 data sets (event data type, only occurrences of presence)

Oribatida communities of European Russia (collection of Andrey Zaitsev)	Oribatida across European Russia/1968-2010 (including unpublished and published literature data of A. Zaitsev's supervisor D.A. Krivolutsky.	15 000	Soil core heat extraction	10-1000m	ca. 95% Digitalized, not standardized	6652 occurrences are published to GBIF in the form of 5 data sets (event data type, only occurrences of presence)

b. Other deliverables

Description	State by final report
The following training events will be conducted: • At least 1 open cross-institutional seminar/workshop will be conducted at the Institute of Ecology and Evolution RAS or at the Moscow State Pedagogical University, involving soil zoologists from several institutes in Moscow and other cities. The following topics will be addressed: (1) the open-science concept, (2) data standardization, (3) the GBIF platform, (4) publishing datasets through GBIF. • Individual on-line consultations for soil biodiversity experts across Russia. The addressed topics will be as listed above. • Advertising the initiative and promoting GBIF Russia to a broader scientific audience by posting general information,	The following training events were conducted: - An open cross-institutional workshop was conducted at the Institute of Ecology and Evolution RAS, involving 17 soil zoologists from 13 institutes from 9 regions across Russia. Detailed program, participants, materials and feedbacks are provided in the 'Sources of verification' section. - Individual on-line consultations for soil zoologists at the Institute of Ecology and Evolution RAS and at the Moscow State Pedagogical University were organised. In addition, a group online-consultation was organised for several botanists and zoologists at the Moscow State Pedagogical University. More details are provided in the 'Implementation of the project'

web links and methodological materials on institutional web sites.	section. - Information on the project and the workshop was posted on the institutional web sites and on soil zoology portal that was developed during the project implementation (http://www.soilzoology.ru). Web links are provided in the 'Sources of verification' section.

Expected milestones by final report:

Milestone	Status by final report
1. All mobilized data has been published to GBIF.org 2. (All published data meet the minimum requirements outlined in the Data Quality Requirements available at http://bid.gbif.org/en/community/data-quality/) 3. At least one open cross-institutional seminar/workshop has been conducted at the Institute of Ecology and Evolution RAS or at the Moscow State Pedagogical University, involving soil zoologists from several institutes in Moscow and other cities. 4. Individual on-line consultations for soil biodiversity experts across Russia have taken place. 5. Advertising of the initiative and promotion of GBIF Russia to a broader scientific audience have taken place. 6. Best practices and lessons learned have been documented	1. A total of 20 data sets with a total of 48,580 occurrences (41,928 for Collembola and 6652 for Sarcoptiformes) have been published to GBIF.org. All data are provided in the event format, allowing for the re-use of data in community analysis. Here and below, detailed information is provided in the 'Sources of verification' section. 1. All published data accompanied with detailed metadata and all of the required and most of the strongly recommended data fields were filled. Occurrences were georeferenced, compared versus GBIF taxonomic backbone and quality-checked using IPT tools prior to the publication. Most of the records provided on the species level and accompanied with the information how the identification was done. 2. An open cross-institutional workshop has been conducted at the Institute of Ecology and Evolution RAS involving 17 soil zoologists

	from 13 institutes from 9 regions across Russia.
	3. Individual on-line consultations for Russian soil zoologists have taken place.
	4. The project activities, workshop, GBIF and FAIR data principles were advertised to a broad scientific audience via institutional web pages, personal communication and developed web portal http://www.soilzoology.ru.
	5. Best practices and lessons learned have been documented; details are provided in the 'Project implementation' and 'Recommendations and lessons learned' sections of the report.

6. Project communications

Report on the way the results of your project have been communicated and shared with the project stakeholders and broader GBIF community . Please also review the page describing your project available from https://www.gbif.org/project/6KNJbZiFijpWCogLRqxZum/mobilization-of-biodiversity-data-on-soil-mesofauna-across-european-russia-biomes. Highlight any additional documents, events, news items or links that you would like to add to your page.

Information about the project activities was communicated among colleagues within and outside Russia through the following means:

- E-mail communication among soil zoologists and gbif-russia community.

- Google documents for joint discussions

- Google forms to gather the information

- Institutional web pages for outreach

- Developed portal http://www.soilzoology.ru for soil zoological community and outreach

- Social media (e.g. Twitter) for outreach

- Personal communication during international conferences for outreach

- Project page on GBIF for outreach

For more information refer to the 'Sources of verification' section.

The following information could be added to the project page:

- Link to the developed portal http://www.soilzoology.ru.

- Download link to the R script to convert community matrices into GBIF template: https://drive.google.com/file/d/19yVYJqeMZJ5-6DLpVxeEH8nssmqAxW1_/view?usp=sharing

- Additional link to the workshop materials on the soil zoology portal can be added to the workshop page on GBIF: http://www.soilzoology.ru/workshop2019

7. Evaluation: findings and conclusions

An assessement of the overall outcomes and impacts of your project, including strengths and weaknesses in its implementation and results. Try to identify clear conclusions from your experience during the implementation of the project. If any changes have been made to the project plans please clearly indicate this in the report and the reasons for this. Also report on any feedback on the project's relevance from the partners and stakeholders

Overall, 20 data sets were compiled from private archives, standardized, accompanied with detailed metadata and published to GBIF. The data were published in the event format, allowing for community-level data analysis which is still a poorly represented data type in GBIF to date.

The number of Collembola occurrences in GBIF increased 100-fold, from 450 to 42,415 during the time of project implementation. The number of Sarcoptiformes occurrences increased 10-fold, from 608 to about 7000 (some occurrences are not yet indexed by GBIF to the date of the report). Thus, project successfully filled the gap in the GBIF data on soil mesofauna biodiversity for European Russia.

The workshop, individual consultations, and the web portal that were organised or developed during the project helped in promoting open science principles among Russian soil zoologists and initiate the data mobilisation in the community. During the project, we received many positive feedbacks from colleagues and students across Russia.

The project inspired following-up initiatives, aiming to mobilize soil biodiversity data in Russia and globally. Also, a number of tools being developed that could help scientific community to achieve this goal. Thus, the project was important not only as an independent activity, but also as a trigger for the soil biodiversity data mobilisation and dissemination of the FAIR data principles in Russia.

8. Recommendations and lessons learned

This section should be addressed to others preparing similar projects in the future. Try to identify your experiences that could help others to design and implement projects more effectively, including the best practices to adopt and the pitfalls to avoid.

The road map that was develop at the initial stage of the project, served as a good basis for the entire project implementation. The success of the project was based on the following principles:

- Having a revision of data prior to start

- Having a diverse team with a clear sharing of responsibilities

- Planning of the entire road map at the initial stage

- Basing the project on the existing examples and templates

- Using the existing IT tools and solutions as much as possible

- Using collaboration between data owners and data stewards

- Engaging the external collaborators that could share their experience

- Using the social networks established within and beyond community

Among the most intensively discussed questions was the nature of the data. Soil animals are often collected from the environmental samples, i.e. soil cores. Soil core in this case represents a sampling event. If soil core is divided by layers, each layer can represent a sampling event, but all events from one soil core should be linked together via a 'parentEventID' in order to keep the spatial link between the layers. Further, if necessary, several soil cores coming from one sampling series could be also linked together via a 'parentEventID'. Several soil cores could also be linked together by having the same 'locationID' which normally represents a sampling plot. Further information about the soil sample, including studied microhabitat or soil layer, could be added to the 'eventRemarks' column. These procedures allow to keep the overall design for most of the studies on community analysis. Some data on Sarcoptiformes was stored in the aggregated format per plot, that decreased the overall number of published occurrences for Sarcoptiformes during the project. Thus it is always preferable to keep the data in a raw format.

Another question was about the reporting of the occurrences of absence. GBIF occurrence template gives opportunity to report the absence of a species in a certain place. Although this could be useful in some cases, it seems redundant in the case if the event type of data is reported. For the event type of data, the absence of an occurrence could be restored by the listing all species in the event, that were reported in the other events from the same locality/sampling plot. Due to a high level of biodiversity in the soil and a high heterogeneity in its distribution, reporting the occurrences of absence are likely to produce a biologically incorrect information in no extensive sampling effort was performed.

9. Future plans

A description of how the partners involved will build on the results of this project in their future work. This could include future collaborative activities, such as plans to complete any unfinished project activities and how the future impact of the project could be monitored or measured.

The following activities were inspired by the project and are ongoing:

- Developing and maintaining the http://www.soilzoology.ru portal to integrate zoological research and disseminate the FAIR data principles in Russia.

- Analysing the dynamics of interest of soil zoologists to GBIF and other open biodiversity data initiatives.

- A following-up project proposal is submitted to the Russian Science Foundation aiming at listing and mobilising soil biodiversity data across Russia.

- A training seminar on the GBIF and biodiversity data standards will be organised in late October 2019 on the basis of the Moscow State Pedagogical University.

- A project to develop an online tool for community matrix transformation into the event Darwin core format was launched.

- A project to develop a portable DBMS that could be used to manage personal soil zoological collections was launched.

- The #GlobalCollembola initiative was launched aiming at understanding the distribution of abundance and diversity of Collembola globally.

- The process of data mobilisation will be continued and mobilised data will be analysed and published in a synthesis study.

The future plans, that stems from the project are in detail described in the 'Ongoing and post-project activities' section above.

10. Annex – Sources of verification

Sources of verification are for example links to relevant digital documents, news/newsletters, brochures, copies of agreements with data holding institutions, workshop related documents, pictures, etc.

PUBLISHED DATASETS

Number of occurrences is provided for each dataset since to the date of report, some occurrences are not yet indexed in GBIF. In those cases, an alternative link for verification is provided.

Collembola (41928 occurrences, 15 data sets)

Long-term dynamics of Collembola communities in a spruce forest and a meadow (1991-1997), 10474 occurrences, https://www.gbif.org/dataset/f2e0dd25-5b04-4a90-bc86-3144659d5574

Collembola communities of Darwin Natural Reserve (Russia), 5836 occurrences, https://www.gbif.org/dataset/882145dc-e998-4808-bb2e-c2bdd5c7edd0

Collembola of forested tundra in Vorkuta surroundings (1978-1979 and 1985), 1475 occurrences, https://www.gbif.org/dataset/63f758ec-cb11-4292-881c-be3a0d11f93b

Collembola of coniferous forests in the south of Arkhangelsk region, 1644 occurrences, https://www.gbif.org/dataset/17a665f3-f6fa-4a01-bc9c-72bcee86f4f8

Dynamics of Collembola communities in a spruce-linden forest with mosses and sedges by layers (1973-1977), 4709 occurrences, https://www.gbif.org/dataset/fe509a1b-3f0f-445b-8332-1d6d9ee9e2cd

Collembola of coniferous forests in the river Mezen' surroundings, Arkhangelsk region, 637 occurrences, https://www.gbif.org/dataset/20e2524f-0354-4090-ab7e-c8d7c3e953db

Collembola of spruce forests of Kola Peninsula, 1029 occurrences, https://www.gbif.org/dataset/b9d89ed1-6502-4d32-94af-a828c11048f0

Collembola of Karelia: multiscale analysis of spatial distribution in pine forests, 5205 occurrences https://www.gbif.org/dataset/45183eb4-0416-4d4f-9439-e8146f4fdc59

Collembola of the national park Smolenskoye Poozery, 305 occurrences, https://www.gbif.org/dataset/9013d641-a7e7-47b4-8d07-07ac9237ec99

Collembola of Mordovski Nature Reserve, 1838 occurrences, https://www.gbif.org/dataset/081b21bf-b603-4622-a7ce-afbcdb25ae5e

Collembola of coniferous forests of the northern part of Arkhangelsk region, 775 occurrences, https://www.gbif.org/dataset/cc2fa2ed-c65c-487f-91c4-e0b34d6d949d

Spatial distribution of Collembola in moss-lichen ground cover (Silon island, Darwin Natural Reserve), 3737 occurrences, https://www.gbif.org/dataset/0963db57-6049-4097-96e4-f94f484f9323

Long-term dynamics of Collembola communities in riparian black alder forest, 725 occurrences, https://www.gbif.org/dataset/3c273f73-9fc0-4cc7-906a-d05614b6aa40

Collembola of Prioksko-Terrasny Nature Reserve: multi-scale spatial distribution analysis in pine forests, 2336 occurrences, https://www.gbif.org/dataset/ed467fbb-664b-49b7-8d5f-911b9eb5c55a

Collembola of spruce forests of Pechora-Ilych Nature Reserve of different ages, 10474 occurrences, 1203 occurrences, https://www.gbif.org/dataset/ae330c1c-212c-47ee-8078-be7274779ff1

Oribatida (6652 occurrences, 5 data sets)

Concrete fauna of Oribatida in the main ecoregions of European Part of Russia), 5490 occurrences, https://www.gbif.org/dataset/fce64d7a-1a84-4b91-84fd-4da5b2e9a946 alternative link http://gbif.ru:8080/ipt/resource?r=zaitcevdiss

Oribatid mite communities (Acari: Oribatida) in different habitats of the Polistovsky Nature Reserve (Pskov Region, Russia), 183 occurrences, https://www.gbif.org/dataset/007f5508-4bed-4101-b7a6-dfd86c52b31d alternative link http://gbif.ru:8080/ipt/resource?r=polistovsky

Fauna and population of oribatid mites (Acari, Oribatida) in the vicinity of Kosogorsky metal works (Tula Region, Russia), 493 occurrences, https://www.gbif.org/dataset/38f2594c-d424-4ac3-a560-a69bfeb6dc3b alternative link http://gbif.ru:8080/ipt/resource?r=tula

Fauna and population of oribatid mites (Acari, Oribatida) of Sadki-Znamenskoe mansion (Moscow city, Russia), 346 occurrences, https://www.gbif.org/dataset/a02e4f7e-7450-42a2-8fc3-889672d6832e

Fauna and population of oribatid mites in Nelidovo administrative District, Tver Region, Russia, 140 occurrences, https://www.gbif.org/dataset/1b41df21-d6a7-49fe-bdf2-2ec7b6344f88

MATERIALS RELATED TO THE WORKSHOP

Announcement:

https://drive.google.com/file/d/18Rxbr8jiTMmTuVIQwnRSLJdyLYr_ddCt/view?usp=sharing

List of participants:

https://docs.google.com/spreadsheets/d/1KX-INaYVSi-CgrhN87W4-W-3gHbjtLy59A3fM-I8B3I/edit?usp=sharing

Program of the seminar:

https://drive.google.com/file/d/1DLVasB4vXERpg4r2a837PkqzCyLmT3g-/view?usp=sharing

All materials of the seminar, including presentations, info sheets and specifically designed event training data are available in the following folder:

https://drive.google.com/drive/folders/1Xh0P8-g-byCEVA8femoFtlJoEYz7GEoi?usp=sharing

or on the soilzoology.ru portal:

http://www.soilzoology.ru/workshop2019

Pictures from the seminar:

http://www.soilzoology.ru/galleries/Moscow2019-08.html

Feedback on the seminar was received via an anonymous google form, results of the feedback form are given here:

https://docs.google.com/spreadsheets/d/1yh1H3b5ksAPDvnUFenMFnfKVQAKQ93q0Gtn_9iFUkBE/edit?usp=sharing

OUTREACH TO A BROADER SCIENTIFIC AUDIENCE

A thematic web portal that aims at linking soil zoologists in Russia, distributing information on existing open data and advertising the FAIR data principles: http://www.soilzoology.ru.

Online information about the seminar posted on the institutional web pages and the soil zoology portal:

http://sev-in.ru/ru/node/1246

http://mpgu.su/novosti/479133/

http://www.soilzoology.ru/workshop2019

Posts in social networks:

https://twitter.com/AntonCollembola/status/1181935999737356290

OTHER SOURCES

R script to convert community matrices into GBIF template:

https://drive.google.com/file/d/19yVYJqeMZJ5-6DLpVxeEH8nssmqAxW1_/view?usp=sharing

or on the soilzoology.ru portal:

http://www.soilzoology.ru/node/27

Signed on behalf of the project partners   Date

10.10.2019

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