

Czech database of lichen type material

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Abstract: LIŠKA, J. 2016. Czech database of lichen type material. – *Herzogia* 29: 814–818.

An online database of lichen type material with open access is presented. This project of the Institute of Botany, Czech Academy of Sciences, covers lichen names of all taxonomic ranks based on material collected on the present territory of the Czech Republic. The search is not restricted to Czech herbaria only; other herbaria important in this respect are also involved. The database includes the name of a lichen with its bibliographic citation. The digitized documentation includes the protologue and the deposited type specimens, i.e. the label with locality, the specimen with all accompanying documentation (e.g. notes by the collector, notes by the author of the name, further revisions) and a detailed image of the lichen in high resolution. Nomenclatural revision was performed and the kind of type annotated. Also further notes are provided concerning lectotypification, exsiccate collections, revisions and comments concerning errors in the protologue. At present, the database includes 592 names of lichens and lichenicolous fungi, almost 1,500 specimens from 19 European herbaria and nearly 4,500 pictures including protologues, specimen labels, specimens as well as detailed images of lichens. The database is accessible at <http://herbarium.ibot.cas.cz>.

Zusammenfassung: LIŠKA, J. 2016. Die tschechische Datenbank des Typen-Materials der Flechten. – *Herzogia* 29: 814–818.

Eine Internet-Datenbank mit Flechten-Typenmaterial mit freiem Zugriff wird vorgestellt. Dieses Projekt des Botanischen Instituts der Tschechischen Akademie der Wissenschaften umfasst Flechtennamen aller taxonomischen Kategorien basierend auf Material, das auf dem Gebiet der heutigen Tschechischen Republik gesammelt wurde. Die Suche ist nicht nur auf tschechische Herbarien beschränkt, sondern schließt auch andere bedeutende europäische Herbarien ein. Die Datenbank enthält die Flechtennamen zusammen mit dem bibliographischen Zitat. Die digitalisierte Dokumentation enthält den Protolog und das hinterlegte Typusexemplar in drei Fotos, das heißt das Etikett mit der Lokalität, den Beleg mit allen begleitenden Notizen (z. B. Bemerkungen des Sammlers, des namengebenden Autors, weitere Revisionen) und das hochaufgelöste Detailfoto der Flechte. Eine nomenklatorische Revision wurde durchgeführt und die Art des Typus wurde zugeordnet. Weitere Informationen und Notizen bezüglich der Lektotypifikation, Exsikkatsammlungen, taxonomische Revisionen, Kommentare bezüglich Irrtümern in den Protologen usw. wurden hinzugefügt. Die Datenbank enthält derzeit 592 Namen von Flechten und lichenikolen Pilzen, nahezu 1500 Herbarexemplare aus 19 europäischen Herbarien und nahezu 4500 Photos von Protologen, Etiketten, Belegen und Details. Die Datenbank ist unter der URL <http://herbarium.ibot.cas.cz> zugänglich.

Key words: Collection, digitized, documentation, virtual herbarium.

Introduction

Herbaria are an important part of the national cultural heritage. Such collections represent a specific value for taxonomic and nomenclatural research. However, also other aspects are important: floristic data as proof of published records, evidence of the occurrence of a particular species at a particular locality at a particular time (e.g. for comparing changes in distribution), historic documentation of activities of prominent botanists, illustrations accompanying texts, etc. Moreover, herbarium specimens can be used for purposes that differ from the original aim

of collection, e.g. for analysis of heavy metal concentrations enabling monitoring environmental pollution even in historical times.

Type material represents the most important and valuable part of any herbarium collection – it is rather like the “family silver”. Type specimens are mostly marked red (on the paper cover or label) in a herbarium or are kept in a special type collection. Both these methods have their advantages and disadvantages, and each herbarium has its own way of doing things. Unfortunately, most type material is still not recognized in herbaria. Therefore, type specimens are in the focus of contemporary work involving searching, registration and documentation all over the world. Digitization is very helpful in this process together with databases with online access. Not all specimens marked by an author or labelled by herbarium curators represent real type material in the nomenclatural sense. Therefore, active searching based on excerpts of names with their citations and primarily supported by knowledge of the protologue is necessary.

In principle, there are two approaches to presenting the results of such searches for type material. The first is to publish a list of names of species or type material referring to a country (e.g. Australia: FILSON 1996; Norway: JØRGENSEN & NORDIN 2009; New Zealand: GALLOWAY 2007), the name of a taxonomist (e.g. E. A. Vainio: ALAVA 1988, A. B. Massalongo: LAZZARIN 2000; K. Kalb: STAIGER et al. 2007; A. Vězda: HALDA & VĚZDA 2007) or the name of a herbarium collection (BP: VERSEGHY 1964; CANL: WONG 1993; UC: TAVARES et al. 1997; TNS: KASHIWADANI & KUROKAWA 2003; BRA: SLEZÁKOVÁ & PIŠŮT 2004). At present, resources of digitized specimens exist in several countries - the most common is digitized herbarium collection presented on websites of relevant institutions (e.g. UPS, ASU) as virtual herbaria. However, digitization of any herbarium is a long term process and, today, this only applies to small parts of herbarium collections. Some projects cover several herbarium collections (e.g. JSTOR database). The second approach is to compile a database covering nomenclatural data with identification numbers of type material (e.g. database of new taxa described by J. Velenovský – <http://forum.nm.cz/houby/index.php>).

Scope of and support for the Czech project

The project to build a database of type material of lichens was started at the Institute of Botany of the Czech Academy of Sciences in 2007. Any project actively searching for type specimens in a targeted way must be limited in some way as to the scope of the names involved. Therefore, three periods were set. The first one was focused on names of the species rank with their type material collected on the present territory of the Czech Republic; this part was supported by the Grant Agency of the Academy of Sciences of the Czech Republic (IAA600050712) in 2007–2009. The second one was focused on infraspecific taxa and it was supported by the NAKI programme of the Ministry of Culture of the Czech Republic (DF12P01OVV025) in 2012–2015. The third period should involve lichen names of all ranks described by Czech lichenologists and based on type material from outside of the Czech Republic. Unfortunately, the third and concluding part of the project, i.e. names described by Czech lichenologists (namely J. Nádvorník, M. Servít, J. Suza, A. Vězda and J. Vondrák) based on type material from outside the Czech Republic has yet to receive any financial support.

The database is presented on the internet with public access at <http://herbarium.ibot.cas.cz>. Information on the database, financial support, technical data and acknowledgements to herbaria staff: <http://herbarium.ibot.cas.cz/background.php>. Data are accessible at

um.ibot.cas.cz/query_go.php?f_fc=1 and a simple full text search is possible. At this moment, it includes 592 names of lichens and lichenicolous fungi, almost 1,500 specimens from 19 European herbaria and nearly 4,500 pictures including protologues (for all valid names), specimen labels, specimens as well as detailed images of lichens.

Specific features of the database

1. Taxon name (of lichens incl. lichenicolous fungi) with citation
2. Digitized protologue
3. All type material found is included, i.e. specimens from several herbaria and all kinds of type material (i.e. not only holotypes, lectotypes and neotypes, but also isotypes, isolectotypes, isoneotypes, syntypes and paratypes)
4. Individual photographs of a label, all material of a specimen and a detail of the lichen (in the case of large specimens, only one picture is available; in the case of small specimens, one detail is presented).
5. Digitization in high resolution
6. All accompanying documentation digitized (collector's notes, notes made by the author of the name, further revisions, etc.)
7. Nomenclature revision performed and the kind of type
8. Further notes on lectotypification, exsiccate collections, revisions, comments concerning errors in the protologue, etc.

Technical background

A special database with online access was designed (copyright: Botanický ústav AVČR & Vladimír Malý). This database combines both the above-mentioned approaches: nomenclature (basionym, names and citation) and identification numbers of type specimens as well as documentation, i. e. digitized protologue and type specimens in several photos: 1) envelope with label, 2) complete lichen material of a specimen with further inside documentation (notes, spores measurements, drawings, revisions etc.) and 3) details of a lichen. Digitization was performed using a professional Sinar camera in high resolution (DNG format) using X-Rite calibration standards.

Data included in the database

An excerpt of the literature produced a list of names of lichens as well as lichenicolous fungi with their citations. Invalid and illegitimate names are also included. The search is not restricted to Czech herbaria (BRNM, BRNU, PRA, PRC, PRM, OLM) only but also other herbaria important in this respect are involved. Up to now, B, BM, BP, BRA, BREM, HBG, L, M, O, S, UPS, W and WRSL have been visited. Also further type specimens outside of the Czech Republic (syntypes, isotypes, paratypes, etc.) are involved.

The main comment includes a nomenclatural revision in the sense of the actual version of the International Code (McNEILL 2012) and an evaluation of the type. Additional original notes are also an important part of the database:

- information when a name is invalid, illegitimate or a nomen novum replacing another name

- information on lectotypification or neotypification,
- information on type material in exsiccate series,
- information on errors in the protologue, i.e. orthography (e.g. name of locality, collection or number of exsiccate) and discrepancies between the protologue and type specimen label (date of collection, altitude, substrate, etc.),
- comment concerning the name of locality (e.g. old German or current Czech name),
- comment concerning a specimen (labelling, duplication, etc.).

This method and type of database yields the maximum information necessary for nomenclatural revisions and assessments of type material, as well as for possible lectotypification in most cases.

Use of the database

The primary purpose of the database is to provide a tool for taxonomists. The database might also prove useful to curators and herbarium staff anywhere in the world in helping them to recognize type material and build or enrich a type collection or database. Some additions and corrections have been made also for the Index of Fungi database and databases of several institutions.

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