OPEN UP! Opening Up the Natural History Heritage for Europeana

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COMPONENT REPORT

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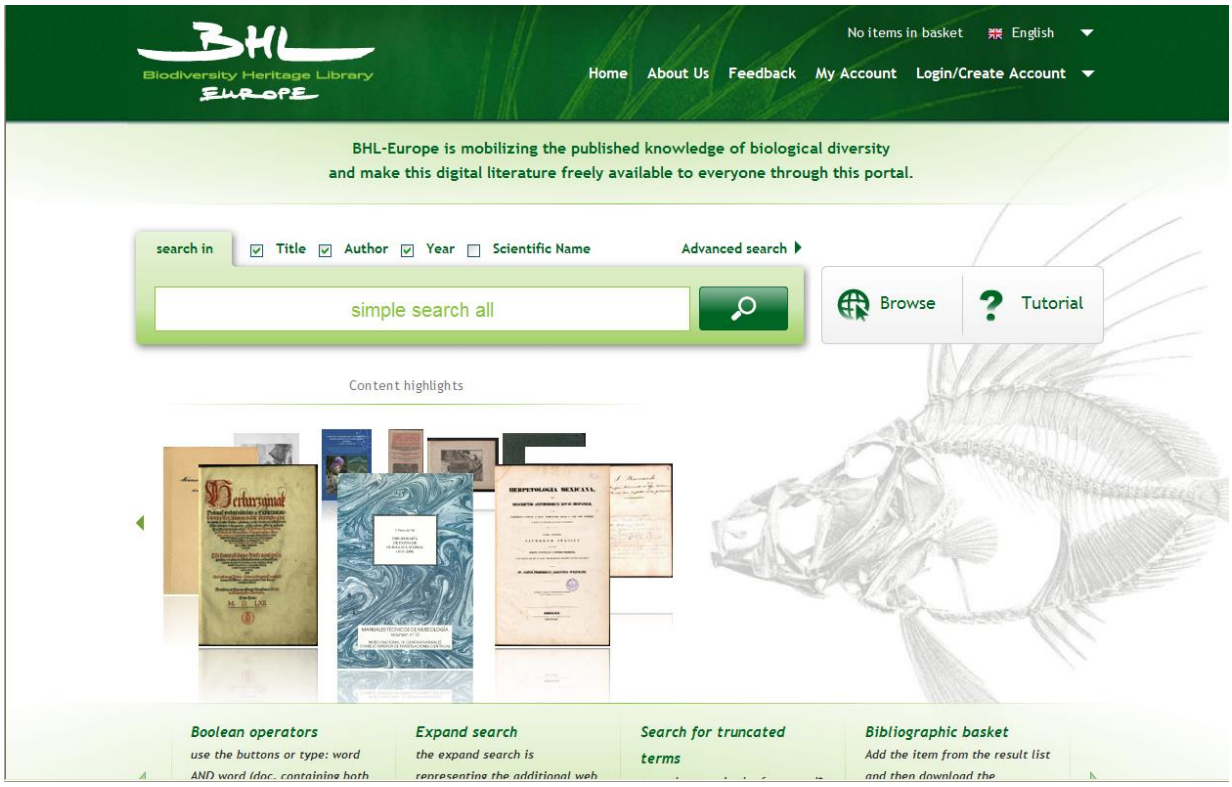
Biodiversity Heritage Library for Europe - project overview

1.1 Description of the BHL-Europe project[1]

The project Biodiversity Heritage Library for Europe (BHL-Europe) started on May 1st, 2009. It ran for three years and has been financed within the framework of the European program *e*Content*plus*. The aim of the project was to bring together existing digital collections of biodiversity legacy literature from the libraries in Europe's natural history institutions[2] into a free and openly accessible online portal at www.bhl-europe.eu (see Screenshot 1), from where it is also harvested by Europe's digital library, archive, and museum Europeana[3] (see Screenshot 2).



Screenshot 1: BHL-Europe portal

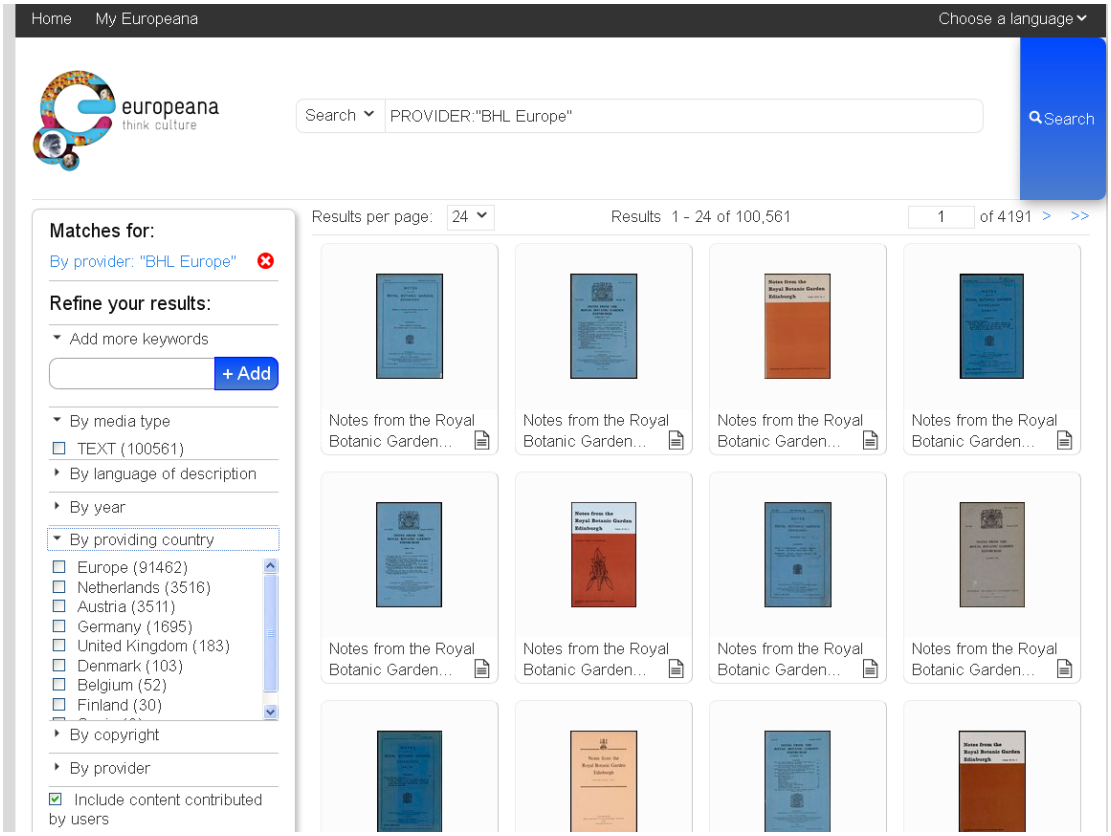
BHL-Europe – as its Anglo-American partner initiative Biodiversity Heritage Library (BHL) – facilitates open access to taxonomic literature for a variety of different users: the general public, citizen scientists and decision makers can get unlimited access to this important source of first-hand information on animals and

[1] See: Scholz 2012, Birthälmer & Hierschläger 2012, BHL-E DoW

[2] See list of participants at: http://www.bhle.eu/en/partners

[3] Europeana Portal: http://europeana.eu/

plants (including rare, original work from Darwin, Linnaeus, von Humboldt, Wallace, Cuvier, etc.) and to many beautiful and culturally-important images (botanical drawings, zoological drawings, watercolours, etc.).



Screenshot 2: BHL Europe Content on Europeana search page

1.2 General achievements

1.2.1 BHL-Europe system and portal

The BHL-Europe system and portal is the core product and outcome of the BHL-Europe project. With the Open Library Exchange Format (OLEF) schema, the Schema Mapping Tool and the Pre-Ingest Tool, it has three components that are unique for BHL-Europe to allow a customised procession of digital content and metadata according to user requirements. All these core tools and services run on a dedicated hardware infrastructure at the Natural History Museum London, which also hosts the page images provided by partner libraries. In addition, a robust multilingual portal with sophisticated search tools enables users to search for taxon-specific biodiversity information in their native language. See Chapter 3.1 BHL-Europe Portal for details.

1.2.2 Best Practice Guide[4]

The experience of the BHL-Europe project partners, gathered during the last three years, has been summarized in the form of best practice guidelines for managing digitisation projects, large and small, effectively. These Best Practice Guidelines (BPG) and Standards aim to provide the first standardised guidelines for processes used by the Biodiversity Heritage Library for Europe for the digitisation of biodiversity texts. The BPG is designed to be easily understood by all users; in particular, it is designed to guide prospective and current content providers simply and clearly through a digitisation workflow, starting with either a print or digital version of an original publication and leading to the final digitised form of that publication in BHL-Europe. The BPG always describe the minimum required standard and, where indicated, the ideal process.

1.2.3 The BHL ScanList

The BHL ScanList at http://bhl.nhm-wien.ac.at/scanlist/ is a tool to coordinate scanning efforts across biodiversity heritage organisations. It allows users to browse and search titles held by BHL-Europe and BHL member institutions and mark them for digitization and thus help avoiding duplication in digitization. The ScanList is hosted at the Natural History Museum in Vienna, the browsing and search functionality is available to all users; to upload or mark publications users need to log in.

1.2.4 The Biodiversity Library Exhibition (BLE)

The content featured in BHL-Europe is not just for scientists. The Biodiversity Library Exhibition[5] provides a virtual tour to selected collections of digital content, with additional information on the topics presented. Each virtual exhibition focuses on a specific topic and its representation in heritage biodiversity literature. For more information see Chapter 5 Biodiversity Library Exhibition – platform and dissemination channel.

1.2.5 Europeana content integration and collaboration

The majority of material in Europeana was from the arts and humanities. BHL started closing this gap by adding biodiversity heritage literature, which has both scientific value and major cultural importance.

To date, Europeana has harvested content from BHL (US) and 10 of the European content providers: LANDOE, NAT, NHM, UBER, UCPH, UH-Viikki, RBGE, RMCA, CSIC and University Library Bielefeld. More than 100.000 items can be retrieved in Europeana now using this search string: PROVIDER:"BHL Europe"[6].

As the ingest process into the BHL-Europe system is still ongoing, more content will be continuously harvested by Europeana in the future. See chapter 2.2 BHL-Europe content on Europeana for more information.

[4] Birthälmer & Hierschläger 2012: Biodiversity Heritage Library for Europe Best practice guidelines and standards http://www.bhle.eu/de/publikationen/veroeffentlichungen/biodiversity-heritage-library-for-europe-best-practice-guidelines-

[5] Biodiversity Library Exhibition: http://www.biodiversityexhibition.com/

[6] http://www.europeana.eu/portal/search.html?query=PROVIDER%3a%22BHL+Europe%22

1.3 Project participants and their responsibility[7]

BHL-Europe was coordinated by the Museum für Naturkunde Berlin, Germany, and combined the efforts of 26 European and 2 American institutions. See Appendix List of BHL-Europe Participants for participating institutions and their respective abbreviations, and role in the project. The partners for BHL-Europe included some of the most outstanding natural history museums and botanical gardens in Europe as they have large biodiversity libraries and are domain experts. After the end of the project they continue to disseminate the project's outcomes through their extensive participation in related community networks and their contacts with the target user groups. Several of the partner institutions are represented also in the OpenUp! project[8] due to their strong expertise in biodiversity informatics and related IT issues (e.g. MfN, NHM, NMP, FUB-BGBM, NAT, RMCA (MRAC), and NHMW).

The IT expertise of BHL-Europe was completed by two commercial companies (AIT, ATOS) highly experienced in the development, adaptation, and implementation of digital archives and libraries. AIT (Angewandte Informationstechnik Forschungsgesellschaft mbH) is an Austrian software and research company that currently acts as a main technology provider for the OpenUp! project (OAI-PMH interface and harvesting and transformation component, member of the Technology Management Group). The National Museum, the largest museum in the Czech Republic, as the lead of the work package Dissemination and Awareness is taking a similar role in OpenUp! to that in the project BHL-Europe. They also co-lead the OpenUp! Outreach and Dissemination Group. Most of the 28 BHL-Europe content providers are involved in content provision for OpenUp! (MfN, NHM, NMP, LANDOE, HNHM, NAT, NBGB, RMCA, RBINS, MNHN, RBGE, UH-Viikki).

2 BHL-Europe and Europeana

2.1 Europeana overview

Europeana is Europe's digital library, archive and museum[9] and just celebrated its fifth birthday. The portal acts as an interface for 30 million books, paintings, films, museum objects and archival records that have been digitised throughout Europe.

Using both its website and an API, Europeana brings together the online collections of 2,300 galleries, libraries, museums and archives from across Europe. Accordingly Europe's cultural heritage is accessible to be re-used by anyone anywhere from members of the public to those working!

Europeana has become a driving force in the world of digital cultural heritage. Main achievements were e.g. the Europeana Data Model (now adopted by the Digital Public Library of America) and of course its CC0 dedication for all metadata in 2012[10].

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[7] See: Scholz 2012, BHL-E DoW

[8] OpenUp! website: http://open-up.eu

[9] Europeana: http://www.europeana.eu/

10 Europeana Press Release: Europeana celebrates 5 years and 30 million objects. http://pro.europeana.eu/web/guest/news

2.2 BHL-Europe content in Europeana

Currently 100,561 items provided by BHL-Europe are published in Europeana[11]. These include important documents focussing on first journeys to central Africa in the 19th century (provided by RMCA[12]), the origin of species by Charles Darwin (provided by BHL-US[13]) or Systema naturae by Linné from the 18th century (e.g. provided by Humboldt University Berlin[14]).

The majority of these items are provided via BHL-US (91,462 items) to Europeana. In addition, nine further BHL-Europe content providers were selected for that round of harvest more than two years ago. The German Prototype of BHL-Europe was the technical infrastructure used to harmonise and prepare the data for the harvest by Europeana. As this was not the final BHL-Europe system yet, this entire harvest had a pilot character. It also explains the problems that a user may experience in working with the BHL-Europe data in Europeana.

For some of the providers (RBGE, CSIC, UH-Viikki, RMCA), the links going to the site of the provider (isShownAt) are broken, as the German Prototype is not responding as expected. However, the isShownBy links are still working so the user can still read the book in the bookviewer of the German Prototype of BHL-Europe. Broken links are also a problem for UCPH, where the isShownBy link is not pointing to the direct source anymore. For all other providers (BHL-US, NAT, LANDOE, UBER, UBBI), most of the links are working fine and point to the website or portal of the providers directly.

Another problem of the current BHL-Europe collection in Europeana is the rights statements that hardly reflect the actual situation. 95,320 items are labelled 'Free Access – Rights Reserved' including many public domain books provided by BHL-Europe partners. This makes the bulk of the collection not available for re-use.

The described problems will be fixed when BHL-Europe is able to be harvested by Europeana through the final system. This harvest was delayed due to the delay of the Pre-Ingest process and the processing of a sufficient amount of data in the final system. The first harvest through the BHL-Europe final system is scheduled for March 2014, when most of the content provided by the European partners of BHL-Europe is successfully processed. This harvest will delete all the BHL-Europe data in Europeana still pointing to the German Prototype of BHL-Europe. It will not delete the BHL-US data as the BHL-US data are not yet completely processed by BHL-Europe. This is planned for later in 2014 so a second harvest by Europeana will most likely be provided in autumn 2014 when the BHL-US data are available in BHL-Europe. From that time onwards, regular harvests will be provided by BHL-Europe to Europeana in order to keep the BHL-Europe representation in Europeana up to date. Broken links should not exist anymore after that time and also all rights statements should properly reflect the conditions under which the digital objects can be re-used.

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[11] http://www.europeana.eu/portal/search.html?query=PROVIDER%3A%22BHL+Europe%22&rows=24

[12] RMCA BHL-Europe content on Europeana: http://www.europeana.eu/portal/search.html?query=DATA_PROVIDER%3A%22Royal+Museum+for+Central+Africa%3B+Belgium%22&rows=12

[13] The origin of species by Charles Darwin on Europeana: http://www.europeana.eu/portal/record/08701/6D4B357F17744100FE3B5FDD56092A77E2188755.html?start=1&query=title%3A%22The+origin+of+species%2C+by+Charles+Darwin.%22&qf=PROVIDER:%22BHL%20Europe%22&startPage=1&rows=24

[14] Systema naturae by Carl von Linné on Europeana: http://www.europeana.eu/portal/record/08708/2F07F92452D2B8C88A3EBDC4355879FFB434F63E.html?start=3&query=title%3Asystema+naturae&startPage=1&qf=PROVIDER:%22BHL%20Europe%22&qf=COUNTRY:germany&rows=24

2.3 OpenUp! content on Europeana is linked to BHL

Today 1,240,570 (17 December 2013) multimedia objects were mobilized within the OpenUp! project and are visible in the Europeana Portal[15]. Additional to the available metadata, a link from each object to BHL was implemented. Thus a simple click on the link in the section "Relation"[16] gives the user information on available literature on this particular species in BHL. The ABCD concept 'full scientific name' is used as search term. In the example of the *Oenanthe fistulosa* provided by the Royal Botanic Garden Edinburgh 71 entries are available on BHL[17]. For technical background see Odo et al 2013[18].

2.4 Accessing natural history content via Europeana's API [19]

Europeana makes its data repository accessible not only through its portal, but also through its open search API. Via this Application Programing Interface, content providers and third parties can make use of the data via mobile apps or their own websites. API enables institutions to integrate their own data in Europeana in the website and customise the way it is displayed (for instance, how much information to be shown, where, and in what format).

The Royal Museum for Central Africa (RMCA) made use of the technology in a way that would allow to retrieve the content provided to Europeana and display it on their own website. In this particular example users can search for natural history content from the RMCA provided by the projects BHL-Europe and OpenUp! with one single search[20].

The script is free to be reused and would only need a few changes to fit into the website of other institutions, like adapting the search to the collections you want to, and matching the corporate identity[21]. Europeana also provides a ready-to-use search widget. The code too can be easily included into institutions' websites[22].

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[15] OpenUp! content on Europeana: http://www.europeana.eu/portal/search.html?query=*:*&qf=PROVIDER:OpenUp!

[16] Example of OpenUp! Content on Europeana with a link to BHL: http://www.europeana.eu/portal/record/11616/E___Herbarium___E00316747.html?start=1240570&query=*%3A*&qf=PROVIDER:OpenUp!&startPage=1240561&rows=12

[17] Entries in BHL for an object provided in the OpenUp! project (*Oenanthe fistulosa*) http://www.biodiversitylibrary.org/name/Oenanthe_fistulosa_L%24

[18] Odo et al 2013: OpenUp! Component C3.5.0-Integration with BHL Portal: http://open-up.eu/sites/open-up.eu/files/C350_Integration_of_BHL_Europe_Portal_AIT_v1-2a.pdf

[19] OpenUp! Manual: 9.3. Enriching user experience: Europeana's API & Widget http://open-up.cybertaxonomy.africamuseum.be/page/enriching_user_experience_europeanas_api_widget

[20] RMCA's view on their Europeana content: http://www.africamuseum.be/collections/browsecollections/europeana

[21] Europeana API script from RMCA: http://www.africamuseum.be/docs/europeana/detail.html

[22] Further information on Europeana's API and search widget can be found at: http://pro.europeana.eu/api

3 BHL-Europe – a closer look

3.1 The Portal[23]

A key access point to this digital literature is the BHL-Europe Portal, which is being made available in no less than 12 languages. The portal is giving access to content provided by European partners in 14 countries and also, to content from US and UK partners of BHL. The main purpose of the BHL-Europe Portal is to bring together important search and information retrieval functionalities to help scientists and academics navigate within the digital literature which is crucial for their research. These functionalities are presented within a very user friendly and attractive interface, which is also suitable for a wider public as well.

The portal is separated into several areas with specific functions, linked together. The main areas are: front page, advanced search, browse, result list, bibliographic page and content viewer.

The front page (see Screenshot 1 above) consists of several sections with the simple search as the focal function. The main roles of the front page are: to briefly introduce the portal to users and to enable users to do simple searches for literature. For casual or general users the front page acts as a means of attracting their attention, to explore the portal further.

The result list appears after performing a simple search, advanced search or a browse (see the separate sections below for further information on these functions). The result list is an easily navigated interface, with functions that help the user get precise search results. The result list provides possibilities to display the results in the list or table view and a modified amount of results. All results can be also filtered by an easy to navigate facet list providing a filter combination according to content type, author, language, content provider and species or genera name.

When doing an advanced search via the BHL-Europe portal, users can use Boolean operators and other structured search characters, like wildcards, brackets, forward and end word truncation. These functions are described on the hint bar on the lower part of the advanced search page. For instance, users are able to search for an exact phrase or search for a range of years. Of course, there are even more functions, e.g. search in a specific data field or search category and combined, checkbox exact term/phrase, checkbox expand search (using additional web services such as CoL, uBio, PESI and VIAF), reset button. It is also possible to save a query if logged in. Especially the expand search function using the external services makes the advanced search function on BHL-Europe very dynamic to get more precise results according to a user request.

The browse function is for users who are not sure what they are searching for or who want to scan the content available in the portal. Browse allows users to scroll through results from the five most used search categories: Title, Author, Journal title, Year and Content provider.

Browse by Title, Author and Journal title functions are linked to a Roman alphabet keypad. Browsing using these categories retrieves results where the letter selected is the first letter in the authors' name and first indexed title or journal title word listed.

The Bibliographic page is a detailed description of the digital item and is reached by clicking on the item title or the View record button in the results list, the item title in the tagging basket, or the item title in the content viewer. The bibliographic page provides a metadata overview of the item and also a possibility to download them as a summary info of the item in MODS, Endnote, Bibtex and OLEF. In case of physically

[23] BHL-Europe: http://www.bhl-europe.eu/

scanned material a bibliographic page provides the item thumbnail and also a possibility to download the item (book, article…) in various formats. BHL-Europe is providing various content types as serial/journal, section, volume/issue, article or monograph where each item has its own metadata even when it is not physically scanned as it is the case of higher hierarchy items, where a bibliographic page provides up-and-down navigation.The content viewer provides the user with several functions and possibilities to display selected books and articles. The user can choose between different view types: the one-page view, two-page view, and thumbnail view. Zooming is possible in each view.

It is possible to download pages in three formats: PDF, OCR or JPEG and in various resolutions in the case of PDF or JPEG. The entire book is also available in various formats.

The lower section of the left column shows recognized taxa on the page being looked at in the content viewer. This section is powered by uBio[24] web services.

The available search function is related to other navigation functions but it is more specific. Search in the content viewer allows searching within the OCR text of the book displayed. If the term searched retrieves positive results, occurrences of the search term in the text are indicated on the page scale.

3.2 Outreach and dissemination

BHL Europe project used and still is using several outreach and dissemination activities. On the first place the important dissemination channels are the social networks such as Blog, Facebook and Twitter. The second most important tool is a unique platform “Biodiversity library exhibition”. All these channels are designed primarily for broad public. On the third place, there are BHL-Europe Newsletter, physical events, conferences, project documentation and publications targeting specific audiences depending on the event, distribution or aim. The Newsletter and project documentation as well as news and project description are published on the project website[25].

3.2.1 Social networks of BHL-Europe

The BHL-Europe blog[26] is a communication platform primarily intended for longer posts/articles and aimed at the broad public, project partners and BHL-Europe portal users. Generally the blog informs about the project development, progress, and news. The blog also introduces project partners, related projects and also project activities such as conferences and events.

Facebook[27] is the BHL-Europe dissemination channel with the highest audience range. There are several strategies for dissemination of the BHL-Europe project on Facebook: (a) publishing images or illustrations from Europeana (OpenUp! content) or BHL-Europe directly on the Facebook page; (b) sharing posts from other related sources such as BHL, OpenUp! blogs, or posts from EoL, etc.; (c) creating questions or quizzes to encourage discussion; (d) informing about interesting meetings or news in general related to natural history or biodiversity; (e) sharing cards of individual specimens directly from the BLE platform; (f) sharing posts from our partners’ social media channels.

[24] UBio: http://ubio.org/

[25] BHL Europe: http://www.bhle.eu/

[26] BHL Europe blog: http://bhleurope.blogspot.cz/

[27] BHL Europe on Facebook: https://www.facebook.com/pages/BHL-Europe/151086001600041

Twitter[28] is the second BHL-Europe social media channel. It is mainly connected to BHL-Europe on Facebook. Thus the content of tweets is, in general, similar to that of Facebook posts. Outside original BHL-Europe tweets, tweets of our partners or other interesting tweets are picked up. The BHL-Europe hash tag is #BHLEurope.

BHL-Europe is implementing joint social media activities with related projects such as BHL and BHL nodes, OpenUp!, EoL, and Europeana to promote important events.

3.2.2 Newsletter

The BHL-Europe Newsletter informs partners and users about news from the project itself, Europeana, BHL and other related projects such as the OpenUp! project. The newsletter has eleven volumes.

The Europeana project has been mentioned in volumes number 1 (Europeana), number 2 (GALLICA, EUROPEANA and the digitalization process at the BNF), numbers 5-6 (Europeana Supports Public Domain, The Europeana Council of Content Providers and Aggregators), number 7 (5 Million Manuscripts, Films and Texts for Europeana), and number 8 (Europeana content integration and collaboration). The OpenUp! project has been mentioned in volume number 9 (OpenUp! - a new EU-funded project).

The BHL-Europe project and the BLE platform were mentioned several times in the OpenUp! Newsletters as well: Issue #2 (BHL-Europe launches the Biodiversity Library Exhibition!), Issue #3 (BLE as a Part of OpenUp! and Virtual Bridge Between Projects, Natural History Content and Knowledge) and Issue #4 (BHL-Europe portal and new BHL US / UK / Australia release, “Poisonous nature” & “Nature at your home” preview).

All BHLE newsletters are published on the BHLE project website[29].

3.2.3 Conferences and physical events

BHL-Europe was presented at various events. Some of them were project or project theme related conferences, where BHLE was presented by consortium partners. Moreover BHLE organised also several physical events, mainly related to the BLE themes[30]. Some events were also strongly related to OpenUp! and Europeana: Europeana Open Culture Conference, Amsterdam, Netherlands 14-15 October 2010; BHL-Europe Final meeting, Berlin, Germany 5-6 June 2012: presentation of the OpenUp! project. BHL-Europe and BLE have been also presented during the OpenUp! Kick-Off Meeting in March 2011 in Berlin; 1st OpenUp! Annual Meeting 2012, Paris, France 19-21 March 2012 and 2nd OpenUp! Annual Meeting in Prague, March, 2013.

3.2.4 Project website

The BHL-Europe project website[31] is also a useful dissemination channel and provides space for project description and documentation. The website is created with a simple but attractive design and is translated into 14 languages covering all languages from the project consortium and more. The website links also to the project partners’ institutions and related projects’ websites. The whole project documentation and outcomes, corporate design templates, a demonstrator and PR materials; project components, deliverables and reports; project publications and articles; presentations from events and conferences; and also case

[28] BHL Europe Twitter: https://twitter.com/BHLEurope

[29] BHL Europe Newsletter: http://www.bhle.eu/en/newsletter

[30] Physical events organised by BHL Europe: http://www.bhle.eu/en/events/carried-out-events

[31] BHL Europe website: http://www.bhle.eu/

studies of project direct impact and reuse all have been published on the project website. The project website is also an important platform for publishing the Newsletter via the subscription module. The project website is and will be hosted several years after the end of the project.

4 Global Biodiversity Heritage Library

In 2007, ten major biodiversity libraries of the USA jointly launched the Biodiversity Heritage Library (BHL) whose purpose was to make biodiversity knowledge accessible to a wide spectrum of end-users on an open access Creative Commons basis. Two European institutions were participating in the BHL project: the Natural History Museum London (UK) and the Royal Botanic Gardens, Kew (UK).

The BHL consortium[32] works with the international taxonomic community, rights holders, and other interested parties to ensure that the biodiversity heritage is made available to a global audience through open access principles. In partnership with the Internet Archive[33] and through local digitization efforts, BHL has digitized millions of pages of taxonomic literature[34], representing tens of thousands of titles and over 100,000 volumes.

The BHL consortium members digitize public domain books and journals held within their collections. To acquire additional content and promote free access to information, BHL has obtained permission from publishers[35] to digitize and make available significant biodiversity materials that are still under copyright.

Because of BHL's success in digitizing a significant mass of biodiversity literature, the study of living organisms has become more efficient. The BHL Portal[36] allows users to search the corpus by multiple access points, read the texts online, or download select pages or entire volumes as PDF files.

The BHL serves texts with information on over 150 million species names. Using Global Names Recognition and Discovery (GNRD)[37] and UBio's[38] taxonomic name finding tools, researchers can bring together publications about species and find links to related content in the Encyclopedia of Life (EoL)[39]. Because of its commitment to open access, BHL provides a range of services and APIs[40] which allow users to harvest source data files and reuse content for research purposes.

[32] BHL Consortium http://biodivlib.wikispaces.com/BHL+Consortium

[33] Internet Archive https://archive.org/

[34] BHL Scanning Process: http://biodivlib.wikispaces.com/Scanning+Process

[35] BHL Permissions http://biodivlib.wikispaces.com/Permissions

[36] BHL Homepage: http://biodiversitylibrary.org/

[37] Global Names Recognition and Discovery: http://gnrd.globalnames.org/

[38] UBio: http://ubio.org/

[39] Encyclopedia of Life: http://eol.org/

[40] BHL Developer Tools and API: http://biodivlib.wikispaces.com/Developer+Tools+and+API

A presentation on the Global Biodiversity Heritage Library by Nancy Gwinn at the BHL-Africa workshop, April 16, 2013. Pretoria, South Africa.

Since 2009, BHL has expanded globally. The European Commission's eContentplus programme has funded the BHL-Europe[41] project, with 28 institutions, to assemble the European language literature. Some of the important English language literature of Europe was already part of the BHL. It was essential that the very significant amount of biodiversity literature held in other European languages – German, French, Dutch, Spanish, and others – is also integrated and becomes far more widely accessible to users. In contrast to BHL, BHL-Europe was not funded to digitise biodiversity literature, but to make existing digital collections of biodiversity literature interoperable. Content from BHL has been ingested to Europeana via BHL-Europe.

Additionally, the Chinese Academy of Sciences (BHL-China[42]), the Atlas of Living Australia (BHL-Australia[43]), Brazil (through BHL-SciELO[44]) and the Bibliotheca Alexandrina[45] have created national or regional BHL nodes. Additionally, in April 2013, the BHL-Africa global node officially launched[46]. Global nodes are organizational

[41] BHL-Europe Portal: http://www.bhl-europe.eu/

[42] BHL-China: http://www.bhl-china.org/bhl/

[43] BHL-Australia: http://bhl.ala.org.au/

[44] BHL-Brazil: http://www.bhlscielo.org/

[45] Bibliotheca Alexandrina: http://dar.bibalex.org/webpages/dar.jsf

structures that may or may not develop their own BHL portals. It is the goal of BHL to share and serve content through the BHL Portal developed and maintained at the Missouri Botanical Garden. These projects will work together to share content, protocols, services, and digital preservation practices.

The main purpose of every node is to provide regional content that has already been scanned or to develop new scanning projects. Chinese colleagues are also engaged in the generation of Chinese OCR and in manually tagging common names. The Australian node contributes both content and technical expertise in the design of the recently re-launched BHL portal. BHL global nodes in Southeast Asia, Japan, India, Russia, and South Korea are forward goals.

5 Biodiversity Library Exhibition – platform and dissemination channel

5.1 Platform

The Biodiversity Library Exhibition (BLE)[47] is a virtual exhibition focusing on the dissemination of natural history content (literature, illustrations and images) and knowledge to the broader public via curated collections centred around a variety of themes. BLE also creates interconnections between portals/archives which provide content under public domain or variable CC licenses. It was officially launched in February 2011 as a virtual exhibition for Biodiversity Heritage Library Europe and BHL US/UK. Each virtual exhibition focuses on a specific topic and its representation in natural history literature. Recently, four exhibitions were published: “Spices”, “Expeditions”, “Poisonous Nature” and “Nature at your Home”.

The platform was developed by a team from the National Museum Prague and developers from the IT4Care Company under the BHL-Europe project. Since the BHL-Europe project’s official closure in April 2012, the development and improvement on BLE continued under the OpenUp! project in which the Prague team is also involved. Development work on BLE is still continuing and additional platform improvements are being implemented. The new version of BLE was launched on 27th of September 2012 under the same URL. At the global BHL meeting in Berlin, June 2012, project participants decided to share BLE with all possible global BHL nodes, including Australia, China, Egypt, Brazil, US and Europe (with possible participation in sub-Saharan Africa in the future), allowing these nodes to create new, interesting thematic topics, link them to variable portals including Europeana, BHL-Europe, BHL US/UK, EOL[48] etc., and use it as a dissemination tool. Once the platform is populated with a wider variety of thematic exhibitions, the potential to reach broader audiences will rapidly grow, particularly if disseminated via global partners. BLE will serve as a central repository, allowing content providers to reach new audiences, while simultaneously being promoted by a variety of BHL nodes.

As the illustrations and books are linked to the BHL and BHL-Europe portal, the pictures on the cards are linked for example with Europeana (including OpenUp! content) or EOL to show another type of open source content related to this topic. A central feature of the informative card is the “Find me in books”-function, which groups the literature related to the specific topic (spice, spice plant, expedition or geographical position). A simple click on the illustrations or books will direct visitors to the BHL or BHL-Europe portals, and the literature featuring the spice, expedition or illustration of your interest. The literature on the exhibitions

[46] BHL-Africa – Launch and Workshop: http://blog.biodiversitylibrary.org/2013/04/making-bhl-africa-reality-bhl-africa.html

[47] Biodiversity Library Exhibition: http://www.biodiversityexhibition.com/

[48] Encyclopedia of Life http://eol.org/

is also sorted in several categories: country, language and year of publishing. Last category is focusing on useful subjects as illustrations, taxonomy, medicine etc.

This website application does not just show the broad audience how the natural history content could be used, but it also has great potential in the educational sector. The interface is also very user friendly for creating new topics/exhibitions. The addition of new topics and information also expands the potential for use in the education sector, introducing the content and knowledge in attractive ways for future generations.

Description of current exhibitions:

1) The first exhibition focuses on **spices** and their corresponding literature in BHL and BHL-Europe. It contains over 52 cards of spices, each with their own illustrations, story, fun trivia and recipes.

2) The second exhibition focuses on **historical expeditions**. Currently, the exhibition features 18 expeditions from various periods of time. The illustrations or photos document the stories or interesting facts from different parts of the world.

3) The third exhibition, **Poisonous Nature**, contains over thirty cards of different taxa. Each card provides you with interesting facts, followed by a brief description of the organism and the effects of the poison on humans.

4) The fourth exhibition introduces common organisms you can find **in your home**. This one also contains interesting stories about various taxa, its description, behaviour and relation to humans.

Several new themes are under preparation and also new BLE workshops and trainings are planned to extend the variety of users and also user generated themes within the BLE platform.

5.2 BLE as dissemination channel

The Biodiversity Library Exhibition[49] is a unique platform for the dissemination of Natural History multimedia content and knowledge to the broader public and to the education sector via thematic collections. The project combines OpenUp! and other images from Europeana and the Encyclopedia of Life (EoL) with illustrations and literature of BHL-Europe and BHL-US/UK portals. BLE thus also creates interconnections between portals and archives. The BLE consortium providing the content and also technical and editorial maintenance is: National Museum in Prague; BHL-Europe active consortium; BHL US, OpenUp!; EoL; Europeana – collaboration on the themes in preparation is with the Al Akhawayn University in Ifrane, Morocco; Victoria Museum in Australia with Atlas of Living Australia team; BHL-Africa and others. Every published theme on BLE provides interesting and attractive material as trivia, practical information and stories which together with attractive illustrations and images are great material for dissemination for social media mentioned above. Because of the several content sources as Europeana, BHL, EOL, OpenUp!, it is possible to use their channels for dissemination. The highest outreach benefit of the BLE platform is that with every post via various partners' dissemination channels, it is actually promoting the whole platform with other content and partners. This platform is therewith also a tool with which BHL Europe helps to disseminate Europeana.

[49] Biodiversity Library Exhibition: http://www.biodiversityexhibition.com/

6 BHL-Europe: current status and future steps

The Biodiversity Heritage Library for Europe project had a clear vision and mission – mobilise and preserve digital European biodiversity heritage literature and facilitate the open access to this literature through a multilingual community portal, the Biodiversity Library Exhibition (BLE) and Europeana. During the project BHL Europe developed the multifunctional portal (www.bhl-europe), an ingest system, additional services using name services as CoL, PESI and VIAF, a unique metadata format "Open Literature Exchange Format (OLEF)" – able to handle bibliographic data (MODS), policy expressions IPR (ODRL), still image data (MIX) and scientific names (DwC Taxon Terms), and also BLE (www.biodiversityexhibition.com). The project officially ended in April 2012, but the vision and mission are still valid today.

At the completion of the funding, several institutions such as the National Museum in the Czech Republic, the Museum für Naturkunde in Germany, the Natural History Museum in Vienna, Austria, the Natural History Museum in London in the UK, and the Royal Museum for Central Africa in Tervuren, Belgium, continued to advance the BHL-Europe technical maintenance and the content flow. This group keeps the communication alive via regular calls and collaborates since November 2012. Content ingest started just before the end of the project and it is continuing. The BHL-Europe Portal currently has about 20,000 items representing about 1.8 million pages; new content is added daily via the ingest system. BHL-Europe still has more than 70,000 items in the pipeline ready to be processed and in March 2014 they will start to ingest the entire BHL content. There are several requests from new content providers such as the European Journal of Taxonomy or Acta Paleontologica Polonica. Additional content from new content providers is already ingested and on the portal, e.g., German botanical journals collection 1753-1914.

The National Museum in Prague also continues with BHL-Europe dissemination together with the Global BHL family via social media channels.

BHL-Europe is no longer a project but a product and service supported by the aforementioned consortium which represents the European node in Global BHL. BHL-Europe is now in the process of negotiations to become a part of the Consortium of European Taxonomic Facilities (CETAF)[50] to help mobilise even more European content, partners and possible funding.

7 BHL: Art of Life project

The Art of Life: Data Mining and Crowdsourcing the Identification and Description of Natural History Illustrations from the Biodiversity Heritage Library[51].

This project, which has been generously funded by the National Endowment for the Humanities and runs from May 2011-April 2014, seeks to liberate natural history illustrations from the digitized books and journals in the online Biodiversity Heritage Library (BHL) through development of software tools for automated identification and description of visual resources. Contained within BHL's digitized texts are millions of visual resources (plates, illustrations, figures, maps, and other images), many of which were produced by the finest botanical and zoological illustrators in the world, including the likes of John James Audubon, Georg Dionysus Ehret, and Pierre Redouté. These images are currently minimally described at a structural page level, enabling citation resolvers and human users to navigate to illustrations by page

[50] CETAF web site: http://cetaf.biodiv.naturkundemuseum-berlin.de/index.php

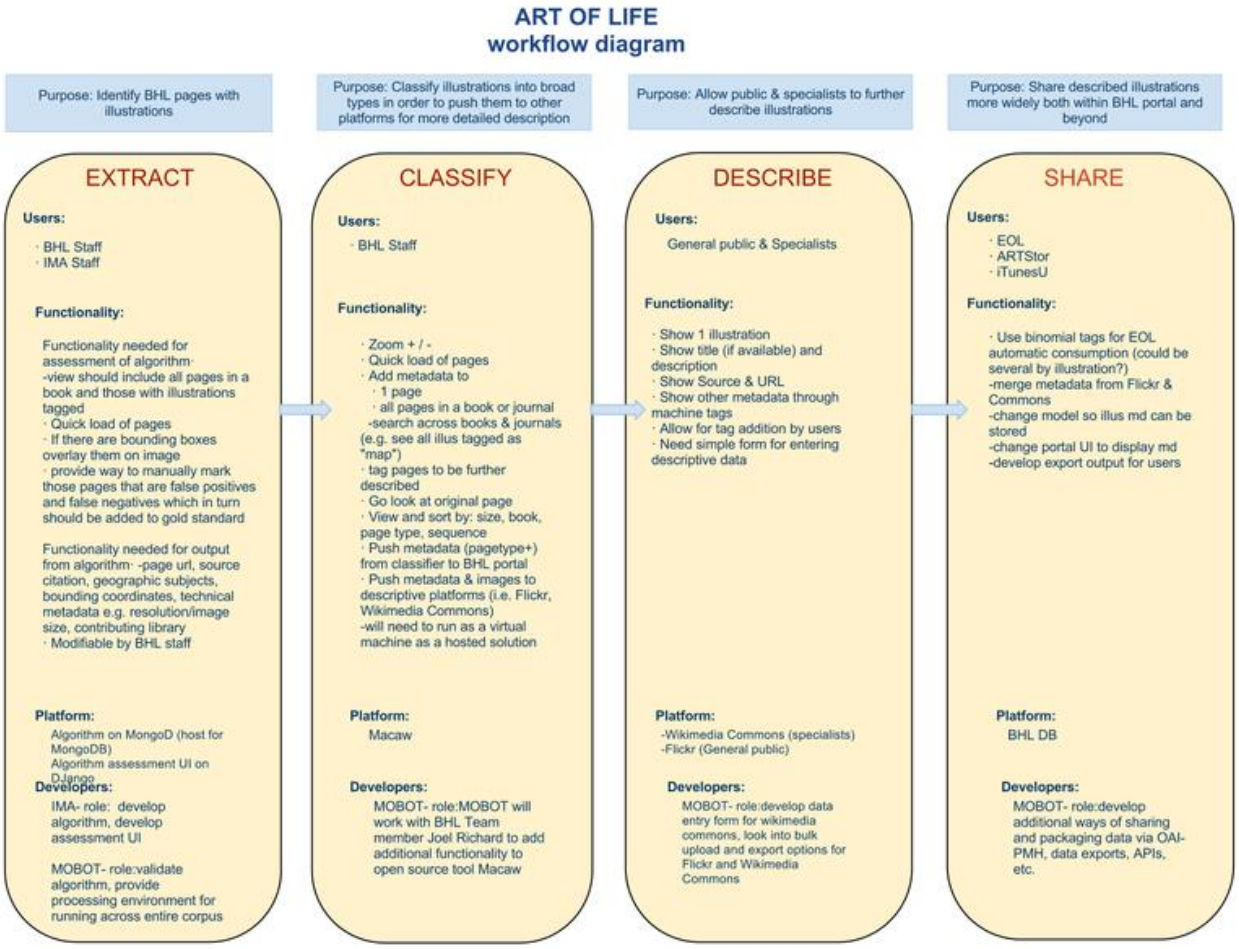
[51] Art of Life Project: http://biodivlib.wikispaces.com/Art+of+Life

numbers, but the images lack sufficient descriptive metadata to enable dynamic filtering and inquiry based on factors like image type, color content, subject matter, or even names of the organisms depicted in the images.

Through this project Missouri Botanical Garden, in partnership with Indianapolis Museum of Art, proposes to build new software tools and augment existing electronic publishing frameworks to run across the entire BHL corpus and identify the visual resources within, thereby ensuring these images are not only more useful to the current audience of scholars who consult BHL on a regular basis, and discoverable by new audiences, but also better interconnected with related materials across the Web. Scholars and educators who rely heavily on visual resources in their research and teaching (e.g. biologists, art historians, curators, historians of science) will, for the first time, be able to find and view a wealth of illustrations of plant and animal life from which to make connections between science, art, culture, and history.

Till this moment Art of Life project published on the BHL Flicker more than 87 thousand (87,263) photo streams in 1,682 sets[52]. This is an enormous amount of illustrations which will be very interesting content also for the Europeana portal data pool. And it will display the natural history domain via those amazing illustrations together with the literature. BHL-Europe, Europeana and BHL are now starting negotiations and investigations of possibilities for harvesting the BHL flicker stream and display those illustrations on the Europeana portal.

[52] BHL on Flickr: http://www.flickr.com/photos/biodivlibrary/sets/



Art of Life Work Flow Diagram

8 List of References

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EUROPEANA Press Release: Europeana celebrates 5 years and 30 million objects.
http://pro.europeana.eu/web/guest/news
Odo, Benda, Astrid Höller, Gerda Koch, Walter Koch, Gavin Malarky 2013: C3.5.0 Integration with BHL Portal
http://open-up.eu/sites/open-up.eu/files/C350_Integration_of_BHL_Europe_Portal_AIT_v1-2a.pdf

8.2 Websites

Art of Life Project: http://biodivlib.wikispaces.com/Art+of+Life

BHL Africa – Launch and Workshop
http://blog.biodiversitylibrary.org/2013/04/making-bhl-africa-reality-bhl-africa.html

BHL Australia: http://bhl.ala.org.au/

BHL China: http://www.bhl-china.org/bhl/

BHL Brazil: http://www.bhlscielo.org/

BHL Consortium http://biodivlib.wikispaces.com/BHL+Consortium

BHL Europe Project website: http://www.bhle.eu/

BHL Europe portal: http://www.bhl-europe.eu/

BHL Europe blog: http://bhleurope.blogspot.cz/

BHL Europe facebook https://www.facebook.com/pages/BHL-Europe/151086001600041?ref=hl

BHL Europe Newsletter: http://www.bhle.eu/en/newsletter

BHL Europe Twitter: https://twitter.com/BHLEurope

BHL Homepage: http://biodiversitylibrary.org/

BHL Homepage - About: http://biodivlib.wikispaces.com/About

BHL Permissions: http://biodivlib.wikispaces.com/Permissions

BHL Europe on Europeana:
http://www.europeana.eu/portal/search.html?query=PROVIDER%3A%22BHL+Europe%22&rows=24

BHL on Flickr: http://www.flickr.com/photos/biodivlibrary/sets/

BHL Scanning Process: http://biodivlib.wikispaces.com/Scanning+Process

BHL Developer Tools and API: http://biodivlib.wikispaces.com/Developer+Tools+and+API

Bibliotheca Alexandrina: http://dar.bibalex.org/webpages/dar.jsf

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Entries in BHL for an object provided in the OpenUp! project (*Oenanthe fistulosa*)
http://www.biodiversitylibrary.org/name/Oenanthe_fistulosa_L%24

Europeana's API script from RMCA: http://www.africamuseum.be/docs/europeana/detail.html

Europeana's API and search widget: http://pro.europeana.eu/api

Europeana portal: http://www.europeana.eu/

Global Names Recognition and Discovery: http://gnrd.globalnames.org/

Internet Archive https://archive.org/

Natural Europe portal: http://www.natural-europe.eu/

OpenUp! Content on Europeana: http://www.europeana.eu/portal/search.html?query=*:*&qf=PROVIDER:OpenUp!

OpenUp! Content on Europeana with a link to BHL: http://www.europeana.eu/portal/record/11616/E___Herbarium___E00316747.html?start=1240570&query=*%3A*&qf=PROVIDER:OpenUp!&startPage=1240561&rows=12

OpenUp! Homepage: http://open-up.eu/

OpenUp! Newsletter: http://open-up.eu/simpletaxonomy/term/100

OpenUp! Manual: 9.3. Enriching user experience: Europeana's API & Widget http://open-up.cybertaxonomy.africamuseum.be/page/enriching_user_experience_europeanas_api_widget

Physical events organised by BHL Europe: http://www.bhle.eu/en/events/carried-out-events

RMCA's view on their Europeana content: http://www.africamuseum.be/collections/browsecollections/europeana

UBio: http://ubio.org/

9 Annex

9.1 List of BHL-Europe Participants[53]

Institution	Abbrev.	Role
Museum fur Naturkunde - Leibniz-Institut fur Evolutions- und Biodiversitätsforschung www.naturkundemuseum-berlin.de	MfN	Project Coordinator, Work Package leader, Technology Provider, Library expert, Taxonomist/User, Disseminator
Natural History Museum www.nhm.ac.uk	NHM	Work Package leader, Content Provider, Technology Provider, Library expert, IPR expert, Disseminator
Narodni museum www.nm.cz	NMP	Work Package leader, Content Provider, Library expert, Taxonomist/User, User interface and testing, Disseminator
Europeana Foundation www.europeana.eu	EDL Foundation	Technology Provider, Library expert, Disseminator
Angewandte Informationstechnik Forschungsgesellschaft mbH www.ait.co.at	AIT	Technology Provider, Disseminator
Atos Origin System Integration	ATOS	Technology Provider, Disseminator
Freie Universität Berlin www.bgbm.org	FUB-BGBM	Technology Provider, Library expert, Taxonomist/User, Disseminator
Georg-August-Universität Gottingen Stiftung Offentlichen Rechts www.uni-goettingen.de	UGOE	Content Provider, Library expert, Taxonomist/User, Disseminator
Naturhistorisches Museum Wien www.nhm-wien.ac.at	NHMW	Technology Provider, Library expert, Taxonomist/User, Disseminator
Land Oberösterreich (Oberoesterreichische Landesmuseen) www.land-oberoesterreich.gv.at	LANDOE	Technology Provider, Content Provider, Library expert, Taxonomist/User
Hungarian Natural History Museum www.nhmus.hu	HNHM	Content Provider, Library expert, Taxonomist/User, Disseminator
Museum and Institute of Zoology, Polish Academy of Sciences www.miiz.waw.pl/en/	MIZPAS	Library expert, Disseminator
University of Copenhagen (The Natural History Museum of Denmark) www.snm.ku.dk	UCPH	Technology Provider, Content Provider, Taxonomist/User, Disseminator

[53] See: Scholz 2012: BHL-Europe, final Report

Stichting Nationaal Natuurhistorisch Museum Naturalis www.ncbnaturalis.nl	NAT	Technology Provider, Content Provider, Library expert, Disseminator
National Botanic Garden of Belgium www.br.fgov.be	NBGB	Technology Provider, Content Provider, Library expert, Taxonomist/User, Disseminator
Royal Museum for Central Africa www.africamuseum.be	RMCA	Technology Provider, Content Provider, Taxonomist/User, Disseminator
Royal Belgian Institute of Natural Sciences www.naturalsciences.be	RBINS	Content Provider, Taxonomist/User, Disseminator
Bibliothèque nationale de France www.bnf.fr	BnF	Technology Provider, Content Provider, Library expert, Disseminator
Museum national d'histoire naturelle www.mnhn.fr	MNHN	Content Provider, Library expert, Disseminator
Consejo Superior de Investigaciones Cientificas www.csic.es	CSIC	Content Provider, Library expert, Taxonomist/User, Disseminator
Universita degli Studi di Firenze (Museo di Storia Naturale) www.msn.unifi.it	MSN	Library expert, Disseminator
Royal Botanic Garden Edinburgh www.rbge.org.uk	RBGE	Content Provider, Library expert, Disseminator
Species 2000 www.sp2000.org	Sp2000	Taxonomist/User, Disseminator
John Wiley & Sons limited eu.wiley.com/WileyCDA/Section/index.html	Wiley	Content Provider, Disseminator
Smithsonian Institution www.si.edu	SIL	Content Provider, Library expert, Disseminator
Missouri Botanical Garden www.missouribotanicalgarden.org	MOBOT	Technology Provider, Content Provider, Disseminator
Helsingin yliopisto, University of Helsinki, Viikki Science Library www.luomus.fi	UH-Viikki	Technology Provider, Content Provider, Library expert, Disseminator
Humboldt-Universität zu Berlin www.hu-berlin.de	UBER	Technology Provider, Disseminator