



Diversity Workbench (DWB)

Einführung

Dagmar Triebel



Workshop aktuell

→ [UPCOMING WORKSHOPS](#)

42. Diversity Workbench Workshop am IT-Zentrum der SNSB (ZOOM online event)

Thema: Einführung und Training in [DiversityNaviKey \(DWB-DNK\)](#) und [DiversityDescriptions \(DWB-DD\)](#)

Schwerpunkt: Diagnose und [Identifikation](#) anhand strukturierter Merkmalsdaten, Bestimmungsschlüssel; Organisation von beschreibenden (Merkmals-)Daten (focus on identification keys and descriptive (trait) data)

- Die Progressive Web App *DiversityNaviKey* **wird erstmals vorgestellt**. Sie erlaubt die interaktive Identifikation von Organismen und ist ein generisches Werkzeug zur Diagnose von Klassen nach einer vorgegebenen Matrix von Merkmalen und Merkmalszuständen. Verschiedene Beispieldatensätze (u.a. auch LIAS light) sind für DWB-DNK freigegeben und werden vorgeführt.
- Das Forschungsdatenmanagementsystem (RDMS) *DiversityDescriptions* wird als System zur nachhaltigen Organisation von strukturierten wissenschaftlichen Daten im Bereich Bio- und Geodiversitätsforschung vorgestellt. Die Software ist geeignet für Mess- und Merkmalsdaten, wie sie in systematisch-taxonomischen und ökologischen Projekten sowie Projekten zur Begriffschema- und Ontologie-Verwaltung und aus der Umweltforschung anfallen. Dies umfasst auch die Verwaltung von Merkmalsmatrices mit strukturierten, diagnostisch relevanten Beschreibungsdaten, wie sie für interaktive Bestimmungsschlüssel geeignet sind.

Der Workshop wird als Maßnahme des [NFDI4Biodiversity Konsortiums](#) durchgeführt. Er bietet Software Demos und Training für Forscher*innen (e.g., Doktorand*innen, PostDocs) und Datenmanager*innen.

Online Workshop – Team

An der Vorbereitung und Durchführung des Workshops beteiligtes Team

- aus München: [Dagmar Triebel](#), [Ariane Grunz](#), [Anton Link](#), [Dieter Neubacher](#), [Wolfgang Reichert](#), [Stefan Seifert](#), [Tanja Weibulat](#), [Markus Weiss](#)
- aus Bayreuth, Universität Bayreuth: [Alexander Beckert](#), [Tonjock Rosemary Kinge](#), [Gerhard Rambold](#)
- aus Göttingen, Gesellschaft für Wissenschaftliche Datenverarbeitung (GWDG): [Sven Bingert](#)
- aus Karlsruhe, Staatliches Museum für Naturkunde und Arachnologische Gesellschaft: [Florian Raub](#)
- aus Marburg, Philipps-Universität Marburg [Bernhard Seeger](#)

Online Workshop – Programm

8. November 2021

- 11.00 Uhr Vortrag: [Diversity Workbench – Einführung](#) (Dagmar Triebel)
- 11.30 Uhr Vortrag: [DiversityNaviKey – Progressive Web App \(DWB-DNK\)](#) (Ariane Grunz)
- 12.00 Uhr DiversityNaviKey Software Demo am Beispiel LIAS (Ariane Grunz)
- 12.30 Uhr Mittagspause
- 13.30 Uhr DiversityNaviKey: Erläuterungen zu den [sechs DNK Beispieldatensätzen](#) (Tanja Weibulat)
- 13.45 Uhr DiversityNaviKey Software, selbständiges Arbeiten (Ariane Grunz)
- 14.45 Uhr Kaffeepause
- 15.00 Uhr Live-Demo: Überblick über Grundfunktionen von *DWB-DD*, Beispiel Bayernflora-Heilpflanzen-Quiz; Datenfluss zur Erzeugung einer PostgreSQL CACHEDATENBANK (A. Link); siehe auch [Introduction to DiversityDescriptions](#)
- 16.30 Uhr Vortrag und Diskussion: Konzept und geplante Umsetzung der NFDI Research Data Commons. Wie könnte DiversityNaviKey Teil einer NFDI RDC Application Layer werden? (Bernhard Seeger, Dagmar Triebel)
- 17.00 Ende

Online Workshop – Programm

9. November 2021

- 9.00 Uhr Selbständiges Arbeiten mit *DiversityDescriptions (DWB-DD)* unter Anleitung, Organisation von Beschreibungen, verschiedene Beispiele und Funktionen (Anton Link)
- 10.00 Uhr Kaffeepause
- 10.30 Uhr Selbständiges Arbeiten mit *DiversityDescriptions (DWB-DD)* unter Anleitung, verschiedene Beispiele und Funktionen (Anton Link)
- 12.00 Uhr Mittagspause
- 13.00 Uhr Live-Demo: Überblick über Funktionen von *DWB-DD II*, u.a. Import aus tabulator-separierten Tabellen und Export zur Archivierung von EML-CSV und EML-SDD files (Anton Link)
- 13.45 Uhr Live-Demo: *DWB-DD* als RDMS für morphologisch-anatomische Daten von tropischen Springspinnen der Gattung *Corythalia*; Publikation eines eigens entwickelten interaktiven Schlüssels unter www.corythalia.com (Florian Raub)
- 14.00 Uhr Vortrag/ Live-Demo: *DWB-DD* as RDMS for ethnomycological datasets from African countries (Rosemary Tonjock Kinge)
- 14.15 Uhr Vortrag: *DWB-DD* als Backend-Datenbank zur Organisation von Datentransformationen zur Archivierung und EML-SDD-Publikation: GFBio Beispiele DSMZbacdivedesc, BELMONTsurveydesc (Stefan Seifert, Tanja Weibulat)
- 14.30 Uhr Vortrag: *Diversity Workbench als GFBio und NFDI Service* + Live Demo (Sven Bingert, Anton Link)
- 14.45 Uhr Vortrag/ Live-Demo: *DWB-DD* als RDMS für Bestandsverwaltung von Mikroplastiksorten in der Forschung (Alexander Beckert)
- 15.00 Uhr Diskussion und Ende

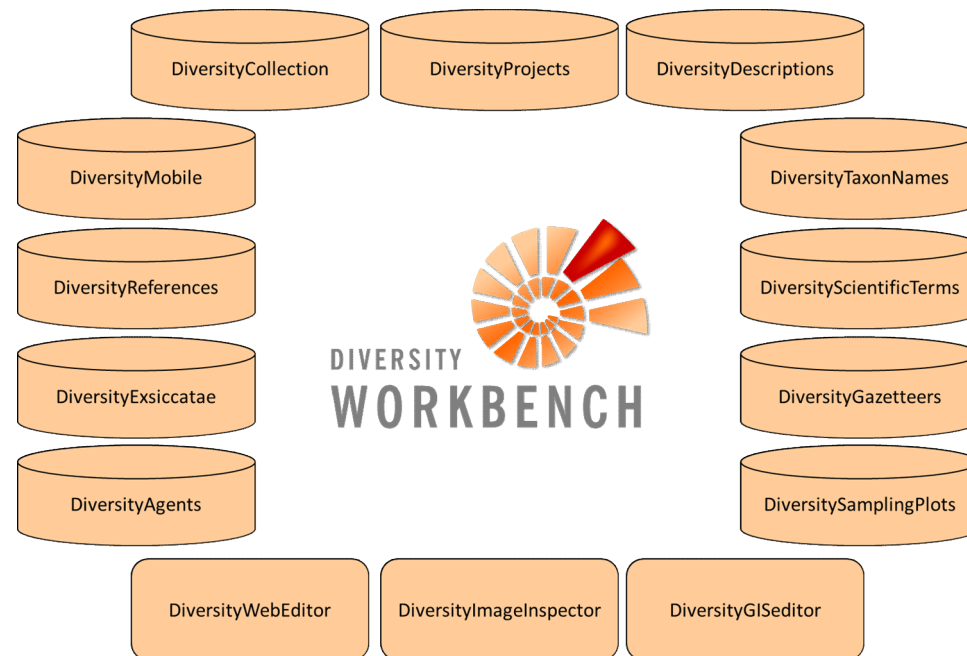
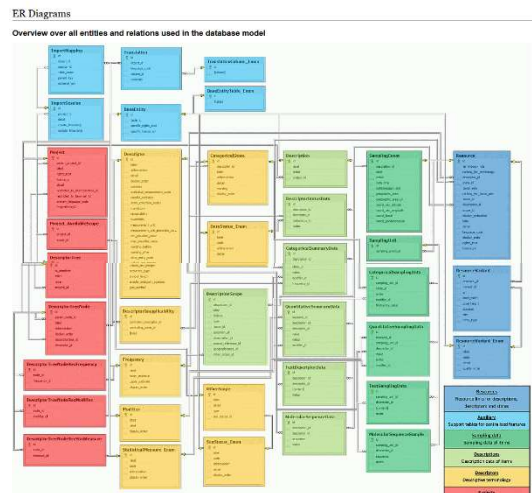
DWB – ein Set von Software Tools

- 11 SQL relationale Datenbanken zum Datenmanagement von Forschungs- und Sammlungsdaten
- Software-Implementierung vor allem an den SNSB
- Konzeptentwicklung/ Modellierung in Kooperationen mit anderen Teams

DiversityDescriptions Information Model (version 3.0.15, 11 July 2016)

Authors	G. Hagestein, A. Plank, A. Lin, G. Haidich, K.O. Thiele, 2016
License	CC BY-NC-ND 4.0
Suggested citation	G. Hagestein, A. Plank, A. Lin, G. Haidich, K.O. Thiele (2016) DiversityDescriptions information model (version 3.0.15). http://www.diversityworkbench.de
Notes	This models currently reside in MS SQL Server, so knowledge of same SQL Server LSI diagram conventions will be helpful. Reverts the screen shots below, a Microsoft T-SQL script for the generation of the tables is provided.

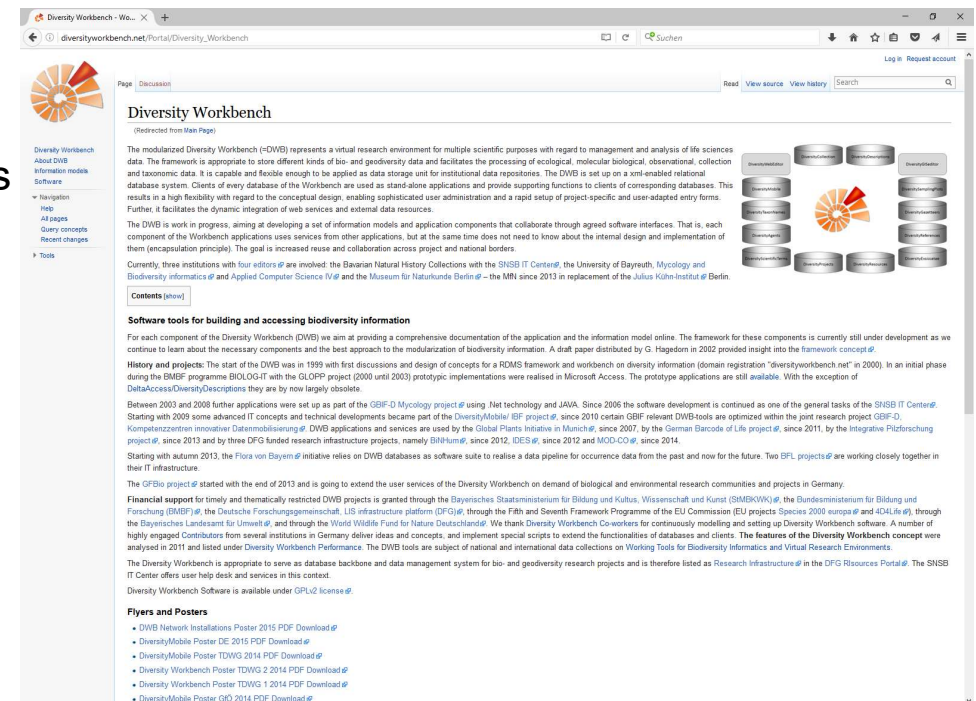
dwBD Database Scheme
This information model is available as OWL database scheme with each single data table and data column referenced as term or concept by its own stable and persistent URL.



DWB – Agile Software-Entwicklung

... seit mehr als 20 Jahren

- Software frei verfügbar unter www.diversityworkbench.net
- **Open-Source-Implementierung** mit mehr als 2,2 Mio Code-Zeilen
- Software Design, Datenmodelle und ER-Schemata innovativ und als **Open Access** publiziert
- Agile Software-Entwicklung mit Software Tests durch derzeit mehr als 30 engagierte Anwender
- Workshops seit 14 Jahren



The screenshot shows the Diversity Workbench website. The main heading is "Diversity Workbench" with a sub-heading "(Redirected from Main Page)". Below this, there is a paragraph describing the system as a virtual research environment for multiple scientific purposes, including management and analysis of life sciences data. It mentions that the framework is modularized and facilitates the processing of ecological, molecular biological, observational, collection and taxonomic data. The system is set up on an xmi-enabled relational database system. Clients of every database of the Workbench are used as stand-alone applications and provide supporting functions to clients of corresponding databases. This results in a high flexibility with regard to the conceptual design, enabling sophisticated user administration and a rapid setup of project-specific and user-adapted entry forms. Further, it facilitates the dynamic integration of web services and external data resources.

The DWB is work in progress, aiming at developing a set of information models and application components that collaborate through agreed software interfaces. That is, each component of the Workbench applications uses services from other applications, but at the same time does not need to know about the internal design and implementation of them (encapsulation principle). The goal is increased reuse and collaboration across project and national borders.

Currently, three institutions with four editors are involved: the Bavarian Natural History Collections with the SNSB IT Center, the University of Bayreuth, Mycology and Biodiversity Informatics and Applied Computer Science IV and the Museum für Naturkunde Berlin – the MNI since 2013 in replacement of the Julius Kühn-Institut in Berlin.

Contents (show)

Software tools for building and accessing biodiversity information

For each component of the Diversity Workbench (DWB) we aim at providing a comprehensive documentation of the application and the information model online. The framework for these components is currently still under development as we continue to learn about the necessary components and the best approach to the modularization of biodiversity information. A draft paper distributed by G. Hagendorn in 2002 provided insight into the framework concept.

History and projects: The start of the DWB was in 1999 with first discussions and design of concepts for a RMS framework and workbench on diversity information (domain registration "diversityworkbench.net" in 2000). In an initial phase during the BMFF-programme BIOLOG-IT with the GLOPP-project (2000 until 2003) prototypic implementations were realised in Microsoft Access. The prototype applications are still available. With the exception of DataAccessDiversityDescriptions they are by now largely obsolete.

Between 2003 and 2008 further applications were set up as part of the GBIF-D Mycology project using .Net technology and JAVA. Since 2006 the software development is continued as one of the general tasks of the SNSB IT Center. Starting with 2009 some advanced IT concepts and technical developments became part of the DiversityMobile/ IBF project, since 2010 certain GBIF relevant DWB-tools are optimized within the joint research project GBIF-D, Kompetenzzentren innovativer Datenmobilisierung. DWB applications and services are used by the Global Plants Initiative in Munich, since 2007, by the German Barcode of Life project, since 2011, by the Integrative Plizforschung project, since 2013 and by three DFG funded research infrastructure projects, namely BINHum, since 2012, IDES, since 2012 and MOD-CO, since 2014.

Starting with autumn 2013, the Flora von Bayern initiative relies on DWB databases as software suite to realise a data pipeline for occurrence data from the past and now for the future. Two GBF projects are working closely together in their IT infrastructure.

The GBF project started with the end of 2013 and is going to extend the user services of the Diversity Workbench on demand of biological and environmental research communities and projects in Germany.

Financial support for timely and thematically restricted DWB projects is granted through the Bayerisches Staatsministerium für Bildung und Kultus, Wissenschaft und Kunst (BMBWK), the Bundesministerium für Bildung und Forschung (BMBF), the Deutsche Forschungsgemeinschaft, LIS infrastructure platform (DFG), through the Fifth and Seventh Framework Programme of the EU Commission (EU projects Species 2000 europa and 4DALife), through the Bayerisches Landesamt für Umwelt, and through the World Wildlife Fund for Nature Deutschland. We thank Diversity Workbench Co-workers for continuously modeling and setting up Diversity Workbench software. A number of highly engaged Contributors from several institutions in Germany deliver ideas and concepts, and implement special scripts to extend the functionalities of databases and clients. The features of the Diversity Workbench concept were analysed in 2011 and listed under Diversity Workbench Performance. The DWB tools are subject of national and international data collections on Working Tools for Biodiversity Informatics and Virtual Research Environments.

The Diversity Workbench is appropriate to serve as database backbone and data management system for bio- and geodiversity research projects and is therefore listed as Research Infrastructure in the DFG Resources Portal. The SNSB IT Center offers user help desk and services in this context.

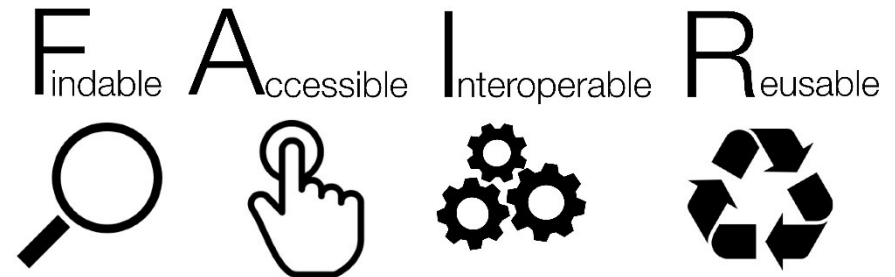
Diversity Workbench Software is available under GPLv2 license.

Flyers and Posters

- DWB Network Installations Poster 2015 PDF Download
- DiversityMobile Poster DE 2015 PDF Download
- DiversityMobile Poster TDWG 2014 PDF Download
- Diversity Workbench Poster TDWG 2 2014 PDF Download
- Diversity Workbench Poster TDWG 1 2014 PDF Download
- DiversityMobile Poster GB 2014 PDF Download

DWB – Datenmanagement

- Fokus: Erzeugung und Prozessierung von FAIR data
- DWB wird entwickelt für
 - Anwender aus den Lebens- und Geowissenschaften (**Diversitätsdaten**)
 - Datenerzeuger, die professionelle Kuration strukturierter Daten anstreben
 - Datenerzeuger, die möglichst lange eine umfassende Datensouveränität behalten wollen

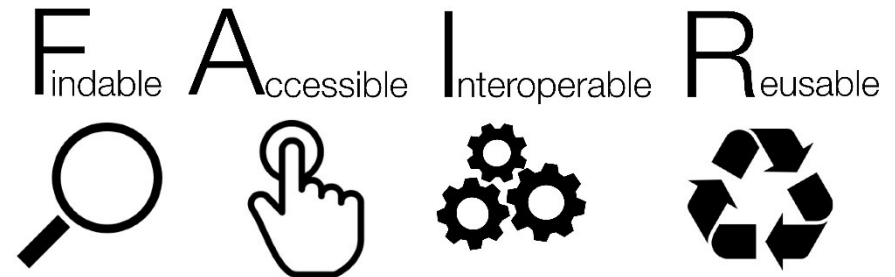


Technical documentation for the DWB core applications and rich clients [\[edit\]](#)

Name and mission of the database framework	Diversity Workbench (DWB)
Software	Diversity Workbench Suite of database applications with client interfaces and supporting data processing tools
DWB contact persons	T. Weibulat at the SNSB IT Center [edit] and GFBio e.V. [edit] , D. Triebel at the SNSB IT Center [edit]
Operating system server	MS Windows Server 2012 R2, 2016; see Info in Wikipedia en [edit] and Wikipedia de [edit]
Database system	MS SQL-Server 2012 to MS SQL-Server 2016 or MS SQL-Server Express; see Info in Wikipedia en [edit] and Wikipedia de [edit]
Clients	C# desktop applications (local clients) (and web APIs for various projects)
Operating system local clients	MS Windows 7 to MS Windows 10; see Info in Wikipedia en [edit] and Wikipedia de [edit]
GIS functionalities	DiversityGisEditor, management of geometry and geography data
GUIs for data import	Import Wizards, txt, CSV, xml in various schemes, xml/xslt, shapes in ESRI-Format
GUIs for data export/ reports	Export Wizards, txt, CSV, xml in various schemes, xml/xslt, shapes in ESRI-Format
GUI language	default: english (multilingual through translation tables)
Open access	DWB software download
Open source	DWB SVN code repository [edit] , SNSB DWB GitHub repository [edit]
Licenses	GPL v.2
Information models online	DWB data models and dwb database schemes
State of development	since 1999, ongoing
Code language, developer platform	C#, .Net Framework 4.8 (.Net Framework 3.5 for older client software); see Info in Wikipedia en [edit] and Wikipedia de [edit]
User manuals	under DWB user manuals and with the download of the respective applications in the DWB Wiki
Training	DWB workshops [edit] and Training materials for basic users, intermediate, advanced, expert users and database administrators
ELIXIR bio.tools	DWB software in bio.tools [edit] . Technical profile of DWB tools

DWB – Datenmanagement

- Fokus: Erzeugung und Prozessierung von FAIR data
- DWB stellt eigene Dienste und Inhalte zur Verfügung (cloud services)
 - Terminologien
 - Vokabularien
 - Taxonomien
 - Gazetteers
- DWB stellt Trainingsumgebungen zur Verfügung



Technical documentation for the DWB core applications and rich clients [\[edit\]](#)

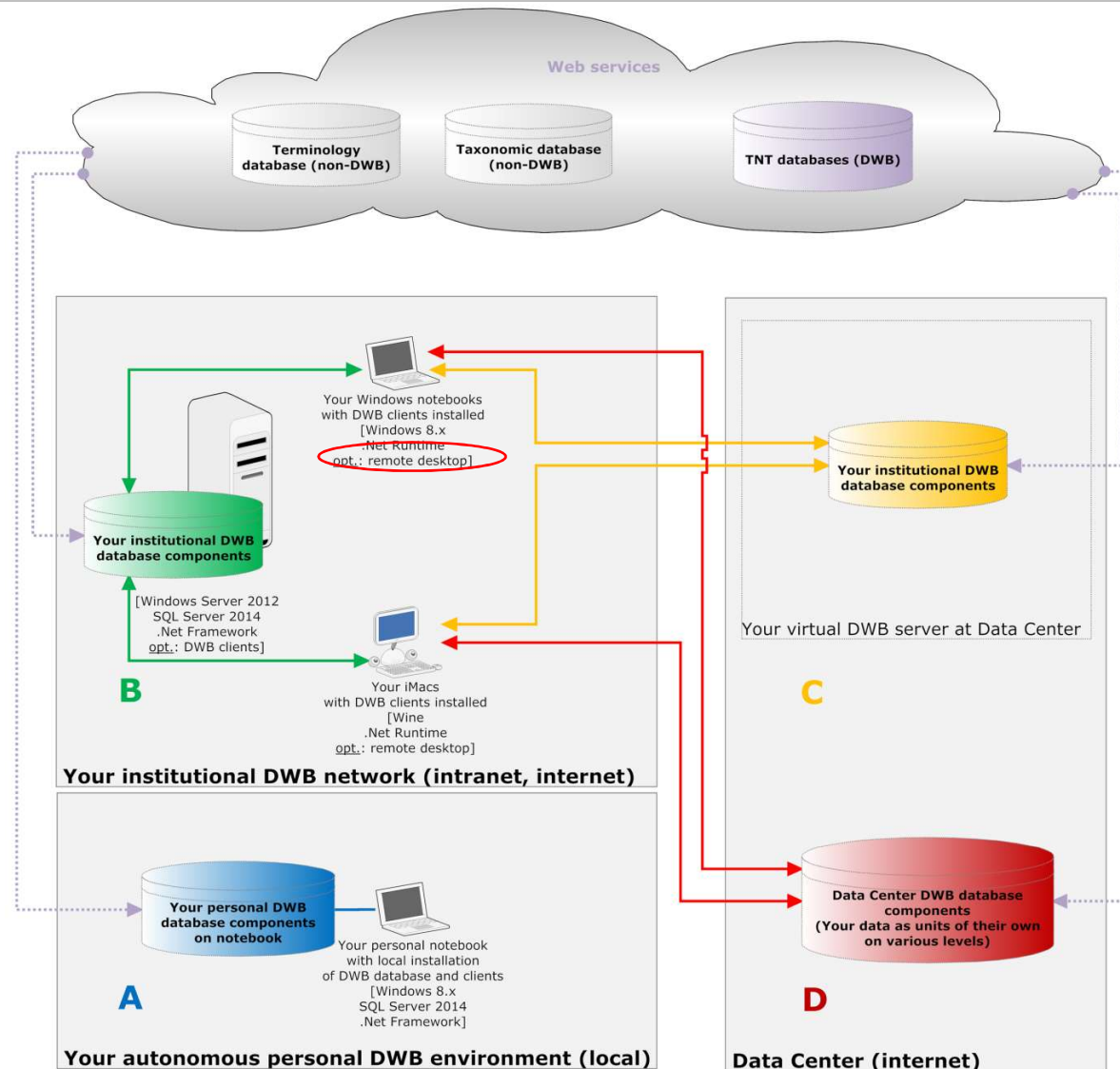
Name and mission of the database framework	Diversity Workbench (DWB)
Software	Diversity Workbench Suite of database applications with client interfaces and supporting data processing tools
DWB contact persons	T. Weibulat at the SNSB IT Center [en] and GFBio e.V. [de] , D. Triebel at the SNSB IT Center [en]
Operating system server	MS Windows Server 2012 R2, 2016; see Info in Wikipedia en [en] and Wikipedia de [de]
Database system	MS SQL-Server 2012 to MS SQL-Server 2016 or MS SQL-Server Express; see Info in Wikipedia en [en] and Wikipedia de [de]
Clients	C# desktop applications (local clients) (and web APIs for various projects)
Operating system local clients	MS Windows 7 to MS Windows 10; see Info in Wikipedia en [en] and Wikipedia de [de]
GIS functionalities	DiversityGisEditor, management of geometry and geography data
GUIs for data import	Import Wizards, txt, CSV, xml in various schemes, xml/xslt, shapes in ESRI-Format
GUIs for data export/ reports	Export Wizards, txt, CSV, xml in various schemes, xml/xslt, shapes in ESRI-Format
GUI language	default: english (multilingual through translation tables)
Open access	DWB software download
Open source	DWB SVN code repository [en] , SNSB DWB GitHub repository [de]
Licenses	GPL v.2
Information models online	DWB data models and dwb database schemes
State of development	since 1999, ongoing
Code language, developer platform	C#, .Net Framework 4.8 (.Net Framework 3.5 for older client software); see Info in Wikipedia en [en] and Wikipedia de [de]
User manuals	under DWB user manuals and with the download of the respective applications in the DWB Wiki
Training	DWB workshops [en] and Training materials for basic users, intermediate, advanced, expert users and database administrators
ELIXIR bio.tools	DWB software in bio.tools [en] . Technical profile of DWB tools

Diversity Workbench – Schnittstellen zum Datenmanagement

The screenshot displays the Diversity Workbench software interface, which is used for managing biological specimen data and taxonomic information. The interface is divided into several main windows:

- DiversityCollection v. 3.0.3.6:** Shows a list of specimens with columns for Accession number, Collection year, Country, and Locality. A table of specimens is visible, including entries like SAPM-MA-00129 through SAPM-MA-00152.
- DiversityScientificTerms v. 3.0.0.0:** Displays a hierarchical tree of scientific terms, such as Chronostratigraphy, Induan, and various geological periods like Permian, Triassic, and Jurassic.
- DiversityAgents v. 3.0.0.3:** Provides details for a specific agent, Hirtel, Hannes, Prof. Dr., including their title, given name, and affiliation.
- DiversityTaxonNames, Database: DiversityTaxonNames_Fungi v. 3.0.1.5:** Shows taxonomic information for the genus *Biatora*, including its classification, nomenclature, and a list of species like *Biatora plicata* and *Biatora sylvana*.

DWB und GFBio Hosting an der GWDG



DWB – aktuelle Zahlen I

- DWB Software Entwickler an den SNSB: **4**
- DWB Datenbanken auf SNSB Servern: **120**
- DWB Anwender geschätzt: mehr als **350**
- SMNK, SMNS, SNSB, ZFMK mit eigenen Installationen von DWB Arbeitsumgebungen für ihre Institutionen und Projekte



Zahlen und Fakten



Diversity Workbench

wurde entwickelt zur Speicherung und Verarbeitung von Bio- und Geodiversitätsdaten, nutzererprobt seit über 20 Jahren. Ist inzwischen angewachsen auf

25 Millionen Daten

über Sammlungsobjekte, Einzelbeobachtungen und Beschreibungen von Tieren, Pflanzen, Pilzen, Fossilien, Gesteinen und Mineralien in

120
Datenbanken.

● ○ ○ ← →

DWB – aktuelle Zahlen II

- Seit 2007: Teilnehmer an DWB Workshops in München (+ weitere Workshops an SMNK, SMNS und ZFMK) **570**

- UserHelpDesk, Beratung und Training am SNSB IT Center, teilweise in Kooperation mit **GFBio e.V.** und **NFDI4Biodiversity**



- Daten im GBIF Netzwerk: **> 15,5 Mio**



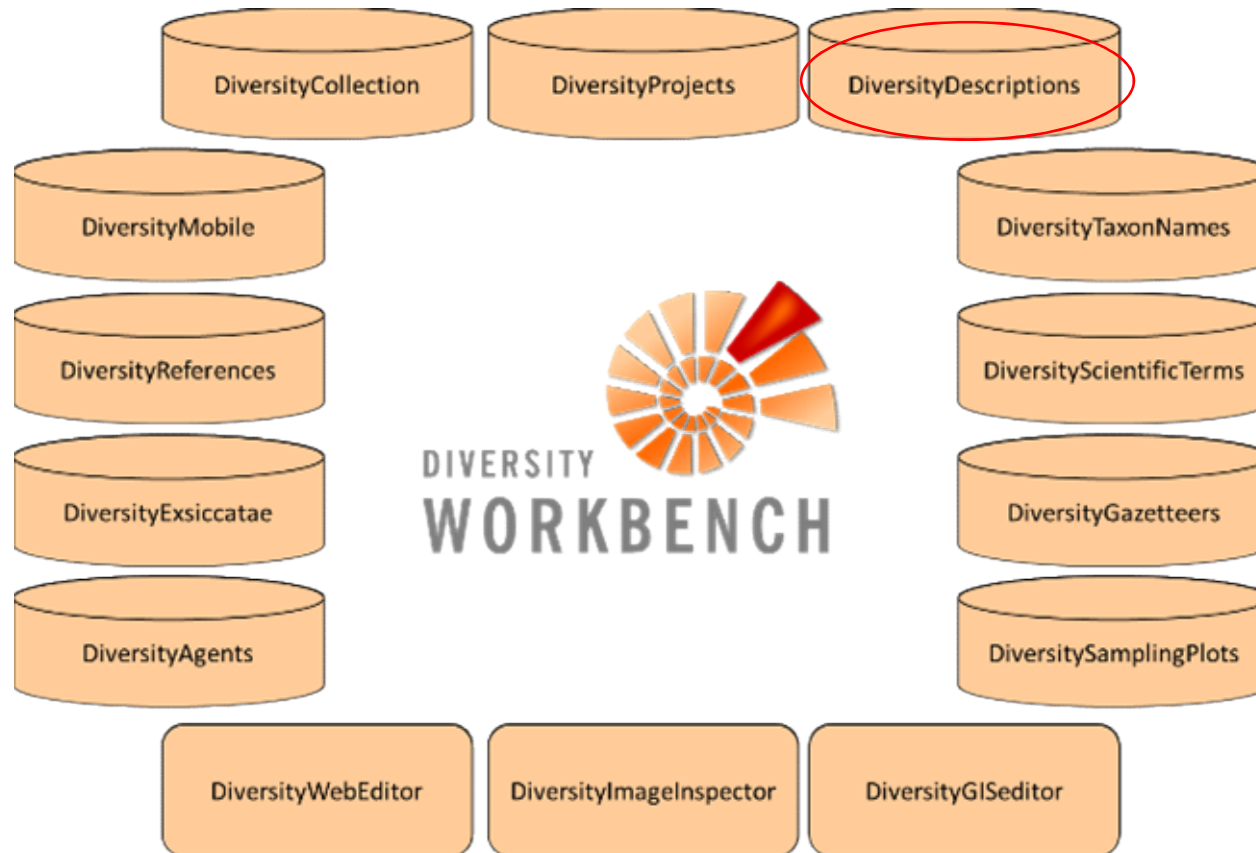
- Daten im Flora von Bayern-Netzwerk: **> 15 Mio**



- Daten im **GFBio/ NFDI** Netzwerk: **> 14,5 Mio**



DWB – DiversityDescriptions (DD)



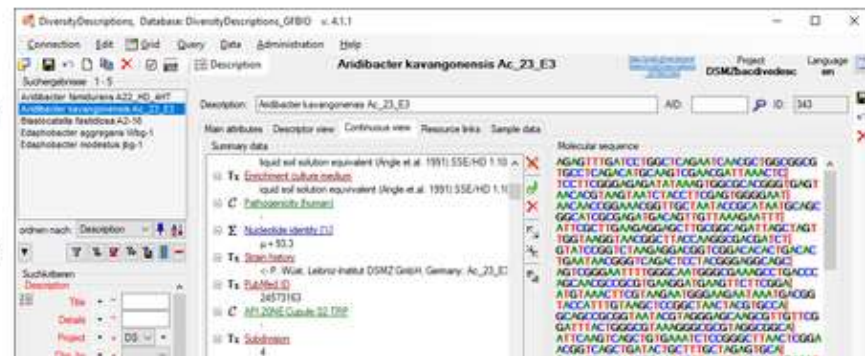
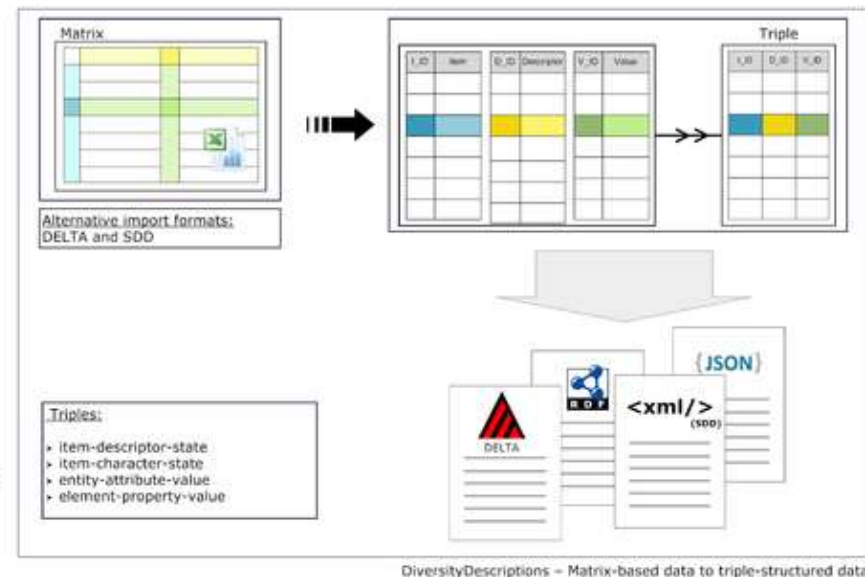
DWB – DiversityDescriptions (DD)

DiversityDescriptions

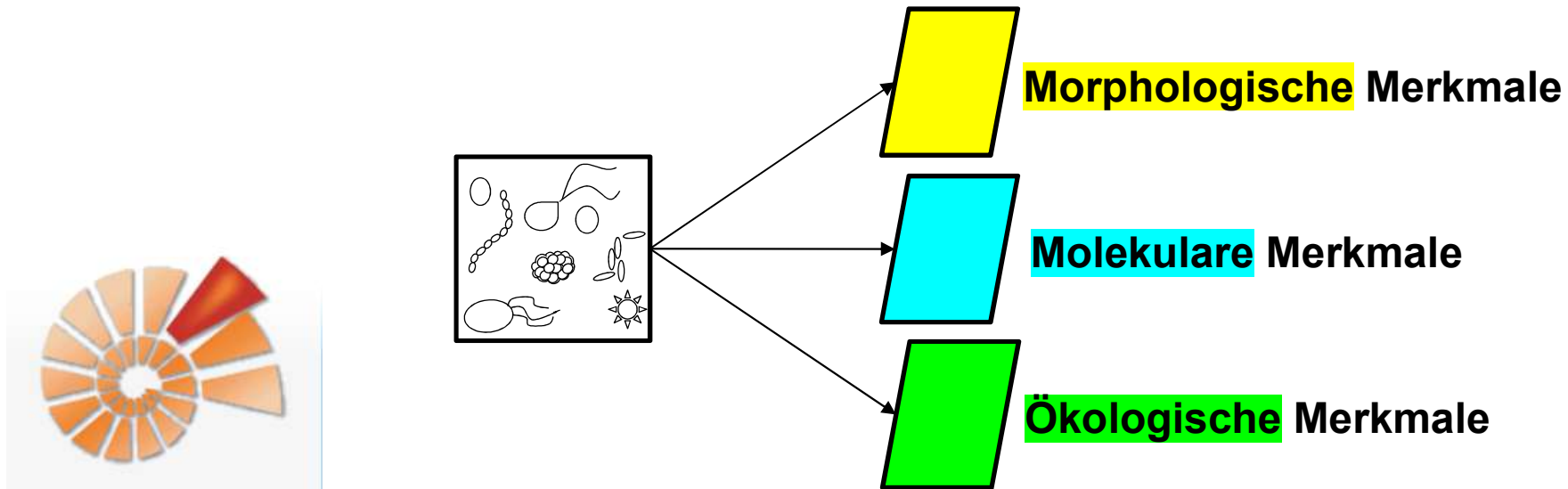
DiversityDescriptions is an application component of the database framework Diversity Workbench. It might be installed as part of a DWB environment, but also be used as a stand-alone application, e. g., in a local installation. Each DWB module is devoted to a specific data domain, but DWB-DD is much more generic and designed following the Entity attribute value model (EAV) [EAV](#), called also "open schema".

DiversityDescriptions is organising any kind of **descriptions**, descriptions of organisms, taxa and any item, element or entity, which is object of diversity or descriptive research.

- The **descriptions** are characterized by a **triple structure**, namely 'item-descriptor-state' or 'item-descriptor-value' or 'item-character-character state' or 'entity-attribute-value' or 'element-property-value'.
- The **descriptors** (= characters, attributes, properties) are not limited to morphological characters and functional traits, but could be physiological, ecological, behavioral and survey parameters, molecular descriptors and descriptors of data content schemes. Beside summary data, sample data as gained by ecological field sampling are addressed with own functions.
- The descriptor **states or values**, which build the item/description, can be generalized to one of the presently supported data types (categorical states, quantitative values and statistical measures, molecular sequence data and free-form text as a fall-back option).



DWB-DD – Beschreibende Daten



	A	B	C	D	E	F	G	H	I	J
1		Descriptor 1	Descriptor 2	Descriptor 3	Descriptor 4	Descriptor 5	Descriptor 6	Descriptor 7	Descriptor 8	
2										
3	Taxon 1	value	value	value	value	value	value	value	value	
4	Taxon 2	value	value	value	value	value	value	value	value	
5	Taxon 3	value	value	value	value	value	value	value	value	
6	Taxon 4	value	value	value	value	value	value	value	value	
7	Taxon 5	value	value	value	value	value	value	value	value	
8										

Harjes & Rambold 2020

DWB-DD – Description View

The screenshot shows the 'Description View' of the DiversityDescriptions database. The interface includes a menu bar (Query, Data, Administration, Help), a search bar, and a list of taxonomic entries on the left. The main area displays a table of descriptors with columns for 'Type' and 'Descriptor name'. A 'Query conditions' panel on the left allows filtering by 'Description', 'Title', 'Details', and 'Project'. A 'Descriptor' panel on the left shows filters for 'Categorical', 'Quantitative', 'Text', and 'Sequence'. A 'Data status' panel on the left shows a filter for 'Data status'. A 'Scope' panel on the left shows filters for 'Taxon', 'Geography', 'Specimen', and 'Reference'. A 'Status data' table is visible in the bottom right corner.

Yellow callout boxes highlight the following features:

- Objekt-Label**: Points to the search bar at the top left.
- Merkmalsansicht**: Points to the main table of descriptors.
- Textmerkmale**: Points to the 'Text' filter in the Descriptor panel.
- Identifizier**: Points to the 'Identifier' column in the descriptor table.
- Kategoriale Merkmale**: Points to the 'Categorical' filter in the Descriptor panel.
- Numerische Merkmale**: Points to the 'Quantitative' filter in the Descriptor panel.

Type	Descriptor name	
1	text	General Objekt-ID (physische u...
2	text	General Object-UUID (nur phys...
3	categorical	General Verantwortliche Person
4	categorical	General Für Statistik
5	categorical	General Stat...
6	categorical	...
7	categorical	...
8	categorical	Wirtspflanze W...
9	categorical	Wirtspflanze W...
10	categorical	Blattminen Typ
11	categorical	Galle Ontogenie Typ
12	categorical	Galle Typ
13	categorical	Galle Pflanzenorg...
14	categorical	Galle Po...
15	categorical	Galle O...
16	categorical	Galle Farbe...
17	quantitative	Galle Höhe
18	quantitative	Galle Durchmesser
19	quantitative	Galle Pflanzenorgan Höhe (s. ...
20	quantitative	Galle Pflanzenorgan Durchmes...
21	categorical	Galle Saisonalität
22	text	Erreger Art
23	categorical	Erreger organismische Großgr...
24	categorical	Erreger Arthropoden Ordnung
25	categorical	Erreger Stadium
26	categorical	Erreger Wirtswechselnd

x	ID	Status	Notes
<input checked="" type="checkbox"/>	!	To be checked	
<input type="checkbox"/>	∅	Not to be recorded	
<input type="checkbox"/>	-	Not applicable	
<input type="checkbox"/>	?	Data unavailable	
<input type="checkbox"/>	#	Not interpretable	
<input type="checkbox"/>	\$	Data withheld	
<input type="checkbox"/>	0	Missing data	

Harjes & Rambold 2020

DWB – DiversityNaviKey (DNK)

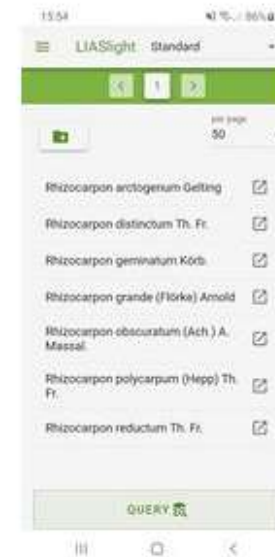
DiversityNaviKey

The software application DiversityNaviKey (DNK) is a tool primarily designed for diagnosis and interactive identification of organisms or other items as well as item groups which are part of or related to biodiversity, geodiversity or environmental research, by means of a set of pre-defined characteristics. It allows for sophisticated selection based on highly structured data sources (datasets) with descriptive data (trait data with descriptors, descriptor categorical states, descriptor values). The browser-based tool is optimized to build and run determination keys based on the consecutive selection of descriptors, descriptor states and values during the identification process.

The new application is realised as a „Progressive Web Application (PWA)“. Thus, it is platform independent and is running on every common browser (Firefox, Chrome, Edge, Safari). The pages are responsive and adjusted to the user device (desktop, tablet, smartphone). By using caching mechanism of modern browsers, like ServiceWorker and IndexedDB, the main tasks of the application will also be available in offline mode.

DiversityNaviKey is using SDD structured data sources offered via PostgreSQL cache database mechanisms and REST web services as established for DiversityDescriptions. It is the reimplementation of the well-known multi-lingual java applet/application NaviKey [↗](#) which is also an integrated part of the DiversityNavigator [↗](#) database client.

Releases under <https://divnavikey.snsb.info> [↗](#).



Was wollen wir erreichen mit diesem Workshop?

- Training der Teilnehmer
 - im Umgang mit **DWB-DNK** als interaktives Bestimmungswerkzeug am Beispiel verschiedener Datenquellen („knowledge bases“)
 - im Umgang mit **DWB-DD** zur Etablierung und Management eigener (Langzeit-) Datenprojekte („knowledge bases“)
- Erfahrungsaustausch und Diskussion
 - in Hinblick auf RDMS, **Interoperabilität** von Open Source Software und Austauschformaten
 - in Hinblick auf **Open Access** von DWB-DD-Datenquellen



→ Nationale Forschungsdateninfrastruktur (NFDI)

http://www.snsb.info/SNSBInfoOpenWiki/Wiki.jsp?page=DivWorkbenchWorkshop_42