

Web semántica, el futuro de las bases de datos de las colecciones de historia natural y cómo “4UColl” responde a este escenario

Francisco Pando

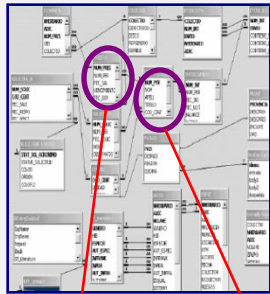


Guión



- Web semántica
- Datos enlazados
(Los dioses antiguos y nuevos)
- Cambios en la red de GBIF y en contexto mundial en esa dirección
- Lo nuevo en 4UCOLL

Web semántica: Triple storage, RDF*

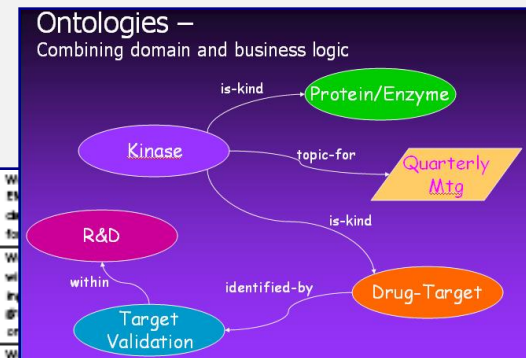


<i>Sujeto</i>	<i>Predicado</i>	<i>objeto</i>
25322	genero	Inga
25322	especie	alba
25322	pais	COL
COL	Pais largo	Colombia

XML

Especimenes	
<i>Campo</i>	<i>valor</i>
<i>Nmr_ejemplar</i>	25322
<i>genero</i>	<i>Inga</i>
<i>especie</i>	<i>alba</i>
<i>pais</i>	<i>COL</i>

Pais	
<i>Campo</i>	<i>valor</i>
<i>Pais</i>	COL
<i>Pais largo</i>	<i>Colombia</i>

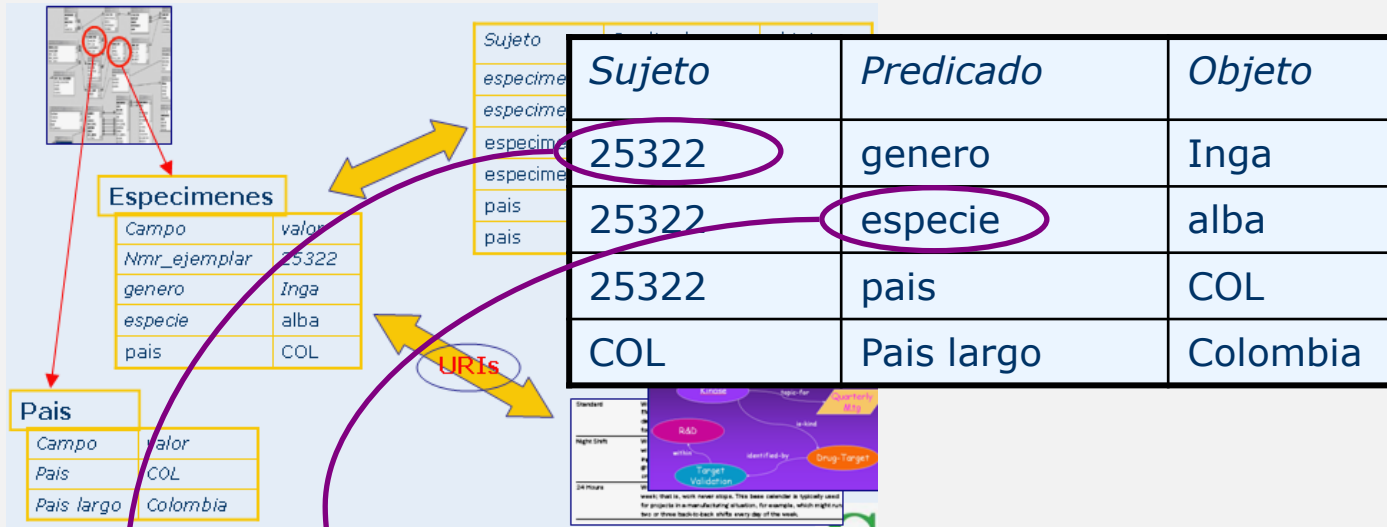


Standard	W
	th
	ck
	fo
Night Shift	W
	in
	of
	cr
24 Hours	W

week; that is, work never stops. This base calendar is typically used for projects in a manufacturing situation, for example, which might run two or three back-to-back shifts every day of the week.

*Resource Description Framework

Web semántica: identificadores únicos



• *Identificadores únicos de conceptos (ontología)*

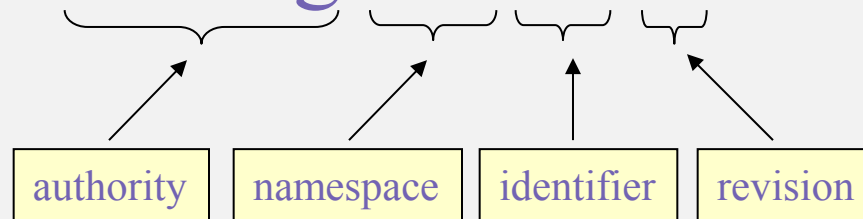
• *Identificadores únicos de objetos*

Web semántica: Identificadores únicos de objetos > LSIDs

Life Science Identifiers (LSID) son un tipo de identificadores globales

- Únicos
- Universales
- Se pueden **resolver** (esto es, los entienden las máquinas)
- Se pretende que sean **persistentes**
- Facilitar comunicación e intercambio
- Más robustos que URL
- Con metadatos
- Arquitectura que permite descubrir datos de fuentes independientes

urn:lsid:esa.org:esa:26:3



Accepted by N. Evenhuis: 14 Apr. 2009; published: 14 Jul. 2009

urn:lsid:zoobank.org:pub:E585D33C-262E-4796-A834-5FEAD656FE1F


Otros identificadores

- DOIs
 - p.ej.: <http://doi.org/10.15470/gprffz>
 - Centralizado
 - Metadatos no estandarizados

- UUIDs – 128 bit string, guaranteed unique
 - p.ej.: 58f202ac-22cf-11d1-b12d-002035b29092
 - Sin metadatos
 - Sin resolución

Web semántica: Identificadores únicos de conceptos > URIs; Vocabularios controlados

Term Name: Occurrence	
Identifier:	http://rs.tdwg.org/dwc/terms/Occurrence
Class:	
Definition:	The category of information pertaining to evidence
Comment:	For discussion see http://code.google.com/p/
Details:	Occurrence
Term Name: Event	
Identifier:	http://rs.tdwg.org/dwc/terms/Event
Class:	
Definition:	The category of information pertaining to an event
Comment:	For discussion see http://code.google.com/p/
Details:	Event
Term Name: dcterms:Location	
Identifier:	http://purl.org/dc/terms/Location
Class:	
Definition:	A spatial region or named place. For Darwin Core
Comment:	For discussion see http://code.google.com/p/
Details:	http://dublincore.org/documents/dcmi-terms/



free and open access to biodiversity data
GBIF VOCABULARIES

Vocabularies Extensions Log In Help

This site provides mapping tools for a range of community-supported Vocabularies and Darwin Core Extensions. Vocabularies act as standardized multilingual thesauri which can be accessed and edited through a user interface as well as through XML (RESTful) web services and text (TSV & CSV) files from this site. Based on internationally recognized standards (e.g. ISO and TDWG) these vocabularies form a core component of all biodiversity data and are intended to facilitate the integration and harmonization of distributed datasets such as museum and GBIF collection records, data for the EOL and databases like the EDIT Scratchpads.

Welcome

Vocabularies

List of vocabularies served and editable through this site. If you would like to be able to create a Vocabulary, request permission.

Vocabulary	Status
basisOfRecord	review
Biological status of accession	draft
Collecting/acquisition source	draft
Country	review
DCMI Type Vocabulary	review
Drupal Development Vocabulary	draft
General GBIF Glossary	draft

Extensions

This list of extensions is in development. For more information on Extensions are uniquely identified within this site using the concatenated

Title	Status	Last Updated
Audubon Core v1.0.1	draft	2011-12-22 14:03
EOL Data Object ver. 1	draft	2009-12-04 17:05
Event Attribute	draft	2009-12-04 17:05
Germplasm (0.1)	draft	2011-12-28 10:04
Germplasm Accession	draft	2011-12-28 11:27
GISIN Species Status	deprecated	2011-10-31 21:00
GNA Alternative Identifiers	draft	2010-05-31 16:53
GNA Literature References	draft	2010-05-31 16:53

Ontologías

An ontology is a way to represent knowledge, by describing the types or classes of entities within a given domain and the relationships among them. By providing standardized definitions for the terms used by scientists to represent these classes, and by defining the logical relationships among these terms, ontologies make information about content explicit for computers, allowing them to discover common meaning in diverse data sets. Thus, ontologies are an important component of many bioinformatics applications (Jensen and Bork, 2010), and they form the foundation of the semantic web (Berners-Lee et al.,

ONTOLOGIES AS INTEGRATIVE TOOLS FOR PLANT SCIENCE¹

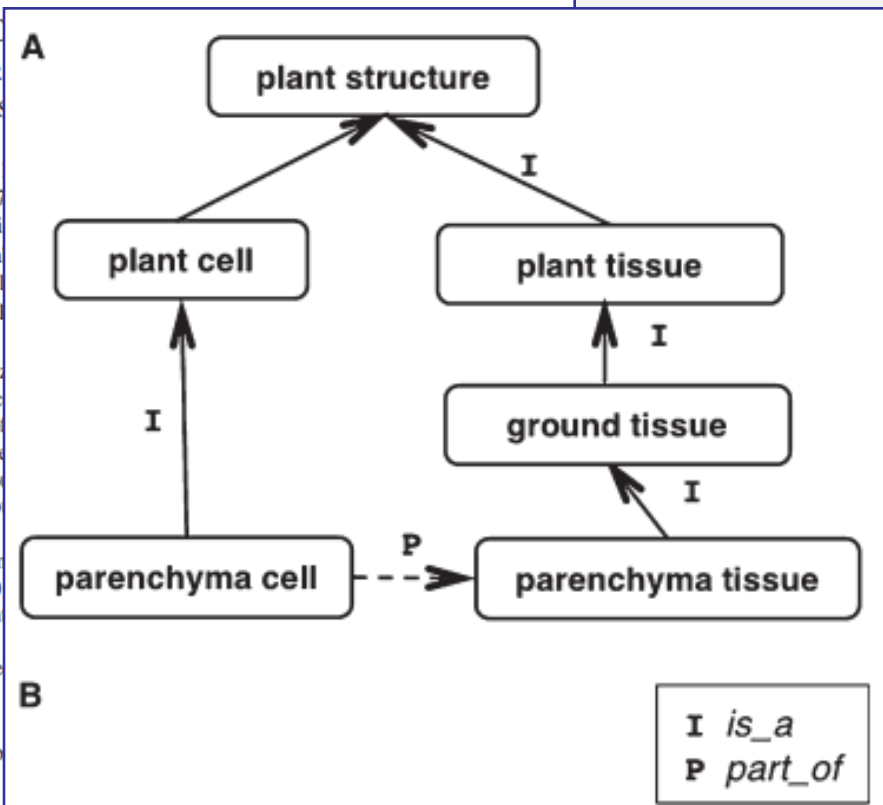
RAMONA L. WALLS^{2,9}, BALAJI ATHREYA³, LAUREL C. MARIANO⁴, MARIA A. GANDOLFO^{4,9}, PANKAJ JAISWAL^{3,9}, CHRISTOPHER STEFAN RENSING⁶, BARRY SMITH⁷, AND DENNIS W. TUCKER⁵

²New York Botanical Garden, 2900 Southern Blvd., Bronx, New York 10458-5197; ³Department of Plant Pathology, Oregon State University, 2082 Cordley Hall, Corvallis, Oregon 97331; ⁴Department of Plant Biology, Cornell University, 412 Mann Library Building, Ithaca, New York 14853; ⁵Berkeley Bioinformatics Open-Source Projects, Lawrence Berkeley National Laboratory, Berkeley, California 94720 USA; ⁶Faculty of Biology, University of Freiburg, Schleicherschloß, Freiburg, Germany; ⁷Department of Philosophy, University at Buffalo, 126 Park Hall, Buffalo, New York 14260

⁸Berkeley Bioinformatics Open-Source Projects, Lawrence Berkeley National Laboratory, Berkeley, California 94720 USA; ⁹Faculty of Biology, University of Freiburg, Schleicherschloß, Freiburg, Germany

- *Premise of the study:* Bio-ontologies are essential tools for accessing and analyzing genomic and phenomic data. Ontologies provide structured vocabularies to support computational frameworks for automated analyses and reasoning. They are a key component of modern plant science.
- *Methods:* This paper provides background on what bio-ontologies are, why they are important, and how they are developed. It includes an overview of ontologies and related resources, a detailed description of the Plant Ontology (PO). We discuss the challenges of building ontologies for plants (Viridiplantae).
- *Key results:* Ontologies can advance plant science in four key areas: (1) conservation and development; (2) taxonomy and systematics; (3) semantic applications; and (4) comparative plant science.
- *Conclusions:* Bio-ontologies offer a flexible framework for comparative plant science. As genomic and phenomic data become available for more species, ontology terms will become less centralized, while at the same time, the need for common terms is increasing, causing more researchers in plant science to turn to ontologies.

Key words: bio-ontologies; genome annotation; OBO Foundry; phenomics; plant systematics; semantic web.



Data overload is an issue for nearly every branch of plant science. The amount of data is growing larger and more complex. All this information creates

TABLE 1. Ontologies and other related resources for plant science.

Resource (abbreviation)	Domain	References
Plant Ontology (PO)	Plant anatomical entities and plant structure development stages	(Pujar et al., 2006; Ilic et al., 2007)
Gene Ontology (GO)	Cellular components, biological processes, and molecular functions	(Gene Ontology Consortium, 2009) http://www.geneontology.org/
Chemical Entities of Biological Interest (ChEBI)	Molecular entities that are natural products or are synthetic products used to intervene in the processes of living organisms	(Degtyarenko et al., 2007; de Matos et al., 2009) http://www.ebi.ac.uk/chebi/
Protein Ontology (PR)	Proteins based on evolutionary relatedness, protein forms produced from a given gene locus, and protein-containing complexes	(Natale et al., 2007; Bult et al., 2011) http://pir.georgetown.edu/pro/
Ontology for Biomedical Investigations (OBI)	Scientific investigations, including the protocols and instrumentation used, the material used, the data generated, and the types of analysis performed	(Brinkman et al., 2010) http://obi-ontology.org
Phenotypic Quality Ontology (PATO)	Phenotypic qualities (properties). This ontology can be used in conjunction with other ontologies such as anatomical ontologies to refer to phenotypes.	(Mungall et al., 2010) http://obofoundry.org/wiki/index.php/PATO:Main_Page
Plant Trait Ontology (TO)	Phenotypic traits in plants; each trait is a distinguishable feature, characteristic, or quality of a plant	(Jaiswal, 2011) http://www.gramene.org/db/ontology/search?id=TO:0000387
Plant Infectious Disease Ontology (IDOPlant)	Plant infectious diseases, pathogens, and symptoms	(Walls et al., in press) http://purl.obolibrary.org/obo/idoplant.owl
Extensible Observation Ontology (OBOE)	A suite of ontologies for modeling and representing scientific observations	(Madin et al., 2007) https://semtools.ecoinformatics.org/obo
Environment Ontology (EnvO)	Environmental features and habitats	http://environmentontology.org/
NCBI Taxonomy	Biological taxa, based on the classification of the National Center for Biotechnology Information	(Wheeler et al., 2007) http://obofoundry.org/cgi-bin/detail.cgi?id=ncbi_taxonomy
BioPortal	Source for finding, searching and querying bio-ontologies	http://biportal.bioontology.org/
Ontology Lookup Service	Source for finding and searching bio-ontologies	(Côté et al., 2006) http://www.ebi.ac.uk/ontology-lookup/
OntoBee	Source for finding, searching and querying bio-ontologies	(Xiang et al., 2011) http://ontobee.org

Ontologías hoy

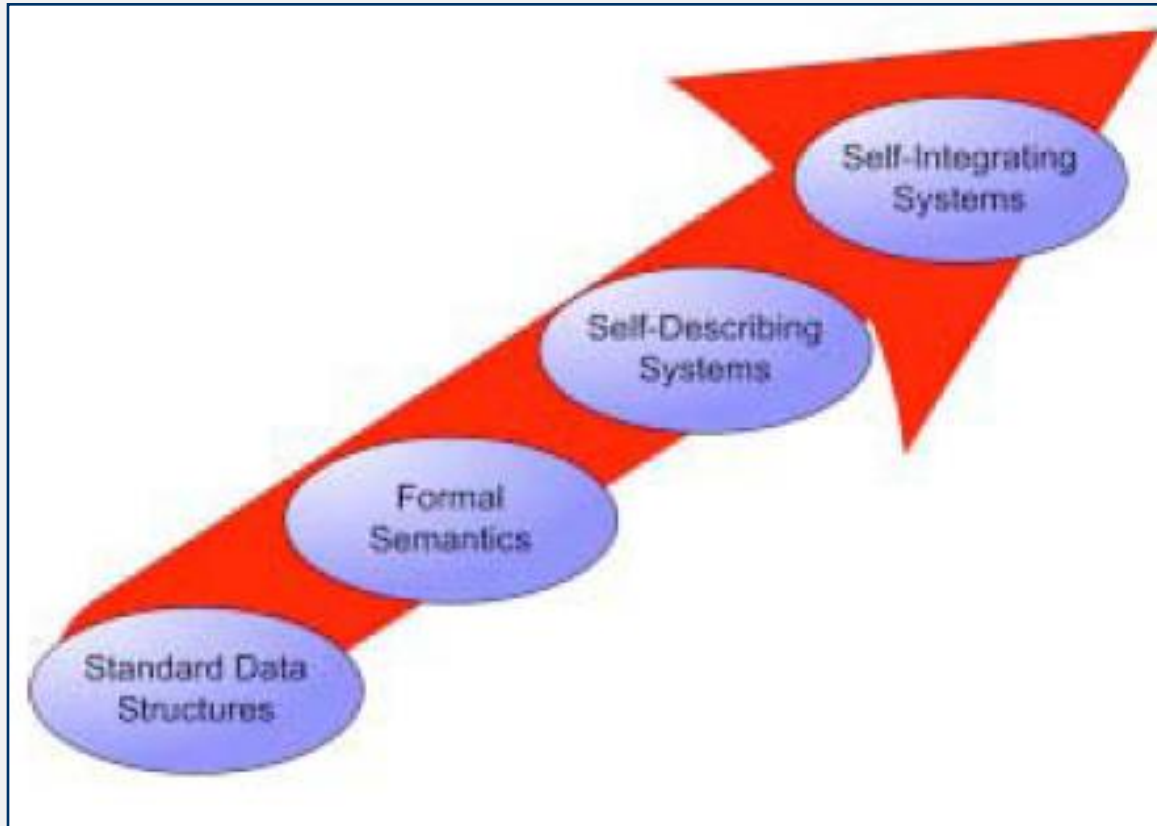
- Retos:
 - Falta de vocabularios completos que cubran grupos amplios de organismos (p.e. plantas)
 - No todas las entidades observables pueden adscribirse “limpiamente” a las categorías establecidas (p.e. que es un septo de un fruto)
 - Homologías discutibles
 - Pérdida de detalle en las generalizaciones
 - Etc.

Web semántica: navegar los datos como el metro de una ciudad



- Bases de datos conectadas por ontologías y la Web
- Conseguir que podamos inferir hechos a partir de datos distribuidos

Hacia donde vamos



La idea es que la web funciona como un único sistema de información

XML

Los contenidos se tienden a codificar usando un metalenguaje llamado XML (Extensible markup Language).

Las definiciones y relaciones se expresan usando una implementación de XML llamada XSD (*XML Schema Definition*)

XML

```
<?xml version="1.0" encoding="UTF-8"?>
<correo xmlns="http://www.ideo.es" xmlns:xsi="http://www.ideo.es"
instance="
xsi:schemaLocation="http://www.ideo.es/correo.xsd">
  <origen>alice@mfom.es</origen>
  <destino>bob@mfom.es</destino>
  <asunto>Avances IDEE</asunto>
  <texto>La IDE de Andalucía se incorporará a la IDEE en breve.</texto>
</correo>
```

❖ Documento XML

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://www.ideo.es"
xmlns=http://www.ideo.es" elementFormDefault="qualified">
  <xs:element name="correo">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="origen" type="xs:string"/>
        <xs:element name="destino" type="xs:string"/>
        <xs:element name="asunto" type="xs:string"/>
        <xs:element name="cuerpo" type="xs:string"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element></xs:schema>
```

❖ Esquema XML



BY

Web semántica en acción: “Linked (open) data”

¿Qué es Linked Data?

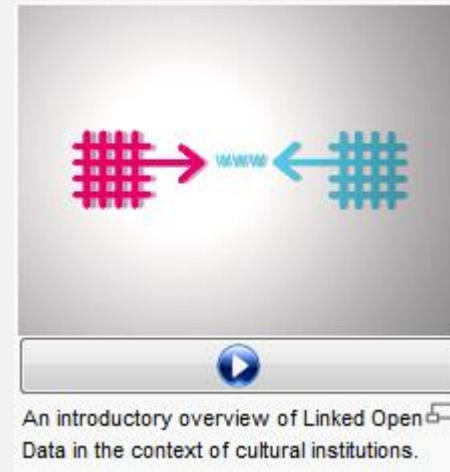
Los Datos Enlazados es la forma que tiene la [Web Semántica](#) de vincular los distintos datos que están distribuidos en la Web, de forma que se referencian de la misma forma que lo hacen los enlaces de las páginas web.

La Web Semántica no se trata únicamente de la publicación de datos en la Web, sino que éstos se pueden vincular a otros, de forma que las personas y las máquinas puedan explorar la web de los datos, pudiendo llegar a información relacionada que se hace referencia desde otros datos iniciales.

¿Cómo funciona?

Los Datos Enlazados, como parte de la Web Semántica, se basa en la aplicación de ciertos principios básicos y necesarios, que fomentarán el crecimiento de la Web, tanto a nivel de los documentos [HTML](#) (vista clásica de la Web), como a nivel de los datos expresados en [RDF](#) (vista de la Web Semántica).

1. Usar [URIs](#) para identificar las cosas
2. Usar [URIs HTTP](#)
3. Ofrecer información sobre los recursos usando [RDF](#)
4. Incluir enlaces a otros URIs



- <http://www.youtube.com/watch?v=uju4wT9uBIA>

Linked Data and the Charm of Weak Semantics

Introduction: The Strengths of Weak Semantics

by Thomas Baker and Stuart A. Sutton

Linked Data and the Charm of Weak Semantics

EDITOR'S SUMMARY

Logic and precision are fundamental to ontologies underlying the semantic web and, by extension, to linked data. This special section focuses on the interaction of semantics, ontologies and linked data. The discussion presents the Simple Knowledge Organization Scheme (SKOS) as a less formal strategy for expressing concept hierarchies and associations and questions the value of deep domain ontologies in favor of simpler vocabularies that are more open to reuse, albeit risking illogical outcomes. RDF ontologies harbor another unexpected drawback. While structurally sound, they leave validation gaps permitting illogical uses, a problem being addressed by a W3C Working Group. Data models based on RDF graphs and properties may replace traditional library catalog models geared to predefined entities, with relationships between RDF classes providing the semantic connections. The BIBFRAME Initiative takes a different and streamlined approach to linking data, building rich networks of information resources rather than relying on a strict underlying structure and vocabulary. Taken together, the articles illustrate the trend toward a pragmatic approach to a Semantic Web, sacrificing some specificity for greater flexibility and partial interoperability.

KEYWORDS

linked data
RDF

semantic networks
ontologies

Thomas Baker, an organizer of the Dublin Core Metadata Initiative, is an associate professor at Sungkyunkwan University in Seoul, South Korea. He can be reached at tb12@thbaker.org.

Stuart A. Sutton, associate professor emeritus in the Information School of the University of Washington, is managing director of the Dublin Core Metadata Initiative. He can be reached at sasutton@uw.edu.

When the meme first emerged in the late 1990s, *Semantic Web* stood for logical data processing on the foundation of World Wide Web technology. One of its roots reached back to the 1955 meme of *artificial intelligence*, with its notion “that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it.” [1, p. 12] The Semantic Web specifications developed by the World Wide Web Consortium from the late 1990s through the mid-2000s – the Resource Description Framework (RDF) and the Web Ontology Language (OWL) – were anchored in the notion of *ontology* as a “formal, explicit specification of a shared conceptualization” as supported by the field of ontology engineering.

Around 2006, Semantic Web was joined by the related, but more accessible and ultimately more popular meme of *linked data*. Starting with a cluster of databases linked to and from Wikipedia, the linked data movement took a more inclusive view of data technologies, with data serialized for Semantic Web-based interoperability as the five-star summit that providers of data in proprietary or application-specific document, database and record formats could by incremental steps ascend.

The contributions to this issue of the *Bulletin of the Association for Information Science and Technology* address, from five perspectives, how the shift to the idea of linked data at scale has changed the role of semantically precise ontologies.

As Oscar Corcho, María Poveda-Villalón and Asunción Gómez-Pérez see it, linked data has put the field of ontology engineering into a new context. Where tradition has favored heavyweight ontologies that demonstrate deep understanding of a domain and enable sophisticated inferences, the

Cambios en la red de GBIF y en contexto mundial en esa dirección

- Identificadores (UUPR)
 - Para juegos de datos
 - Para descargas
 - Para registros
- Licencias estandarizadas
- APIs

Identificadores para juegos de datos

DOI doi:10.15470/gprffz

The screenshot shows the GBIF (Global Biodiversity Information Facility) website header with navigation links for Data, News, Community, and About. Below the header is a green banner for the 'Aranzadi Ringing Scheme (bird ring-re...)' dataset, published by the Aranzadi Science Society. A white box on the right of the banner displays '304.689 Occurrences' and a 'View occurrences' button.

This screenshot shows the GBIF IPT resource page for the 'Aranzadi Ringing Scheme (bird ring-recovery data)'. The page includes a summary, download options, and a list of keywords. The DOI is displayed as 'doi:10.15470/gprffz'. The summary text states: 'This data base consists of bird ring-recovery data from the Aranzadi Ringing Scheme (Aranzadi Sciences Society, Spain). Data have been compiled since 1950. For each record, you will find the following information: species, locality (province, country, X and Y coordinates), catching method, and ring-recovery conditions and circumstances.' The download section offers three options: 'Data as a DwC-A file' (304689 records in English, 5 MB), 'Metadata as an EML file' (11 KB), and 'Metadata as an RTF file' (7 KB).

This screenshot shows the GBIF dataset page for the 'Aranzadi Ringing Scheme (bird ring-recovery data)'. It features the Aranzadi logo and a detailed description of the dataset. The DOI is 'doi:10.15470/gprffz'. The page also lists the publisher as 'Aranzadi Science Society' and the publication date as '21-may-2015'.

DOI doi:10.15470/gprffz

<http://www.gbif.es/ipt/resource?r=anillamiento-aranzadi>

<http://www.gbif.org/dataset/52f2051b-c47e-403a-8e32-04b2f2273c20>

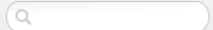
Juego de datos -- base de datos-- recurso

Identificadores para juegos de datos

DOI doi:10.15468/dlwwhz



Data News Community About



Herbarium Berolinense

and Botanical Museum Berlin-Dahlem

197.862
Occurrences

[View occurrences](#)



Data News Community About



Herbarium Berolinense

Occurrence dataset published by Botanic Garden and Botanical Museum Berlin-Dahlem

197.862
Occurrences

[View occurrences](#)

Information Stats Activity

Huge dataset

Summary

FULL TITLE
Herbarium Berolinense

DESCRIPTION
The herbarium of the Botanic Garden and Botanical Museum Berlin-Dahlem (herbarium acronym: B) is the largest in Germany and holds a collection of more than 3.5 million preserved specimens. All plant groups – flowering plants, ferns, mosses, liverworts, and algae, as well as fungi and lichens – are represented in the collections which are worldwide in scope. Associated with the general herbarium are special collections of dried fruits and seeds, wood samples, and specimens preserved in alcohol. The collections of the herbarium are growing constantly through field research conducted by staff, and through gifts, acquisitions, and exchanges of specimens from other herbaria

DOI doi:10.15468/dlwwhz

PUBLISHED BY
Botanic Garden and Botanical
Museum Berlin-Dahlem

REGISTRATION DATE
09-mar-2007

SERVED BY
BioCAsE Installation Botanic
Garden and Botanical Museum
Berlin-Dahlem

DOI doi:10.15468/dlwwhz

PUBLISHED BY
Botanic Garden and Botanical
Museum Berlin-Dahlem

REGISTRATION DATE
09-mar-2007

SERVED BY
BioCAsE Installation Botanic
Garden and Botanical Museum
Berlin-Dahlem

Botanical Museum Berlin-Dahlem (herbarium B) holds a collection of more than 3.5 million preserved specimens, including flowering plants, ferns, mosses, liverworts, and algae, as well as fungi and lichens – all represented in the collections which are worldwide in scope. Associated with the general herbarium are special collections of dried fruits and seeds, wood samples, and specimens preserved in alcohol. The collections of the herbarium are growing constantly through field research conducted by staff, and through gifts, acquisitions, and exchanges of specimens from other herbaria

DOI doi:10.15468/dlwwhz

<http://www.gbif.org/dataset/85714c48-f762-11e1-a439-00145eb45e9a>

Identificadores para descargas

GBIF Global Biodiversity Information Facility

Data - News - Community - About -

Institut Botanic de Barcelona, BC

Occurrence dataset published by Botanical Institute of Barcelona (IBB-CSIC-ICUB)

Information Stats Activity

Download activity over the last 30 days

20.103 download events in total

DOWNLOAD [doi:10.15468/dl.kl6wx8](https://doi.org/10.15468/dl.kl6wx8) 5th November 2015

RECORDS 13 records from this dataset included at time of download

QUERY TAXON *Acer platanoides* L.
GEOREFERENCED true
SPATIAL ISSUES false
query latest data

GBIF Global Biodiversity Information Facility

Data - News - Community - About -

Occurrence download

doi:10.15468/dl.kl6wx8 5th November 2015

71.036 Occurrences

Download

Download details

IDENTIFIER [DOI: doi:10.15468/dl.kl6wx8](https://doi.org/10.15468/dl.kl6wx8)

CITE AS GBIF.org (5th November 2015) GBIF Occurrence Download <http://doi.org/10.15468/dl.kl6wx8>

QUERY TAXON *Acer platanoides* L.
GEOREFERENCED true
SPATIAL ISSUES false

SIZE 11.0 MB

FORMAT DwCA

STATUS Succeeded
query latest data

502 datasets contributed data to this download

IDENTIFIER [doi:10.15468/wrqjia](https://doi.org/10.15468/wrqjia)

CITATION UK National Biodiversity Network: Botanical Society of the British Isles - Changing Flora of Glasgow 1982-2000

DATASET Institut Botanic de Barcelona, BC

RECORDS 13 records from this dataset included at time of download

IDENTIFIER [doi:10.15468/pff0t6](https://doi.org/10.15468/pff0t6)

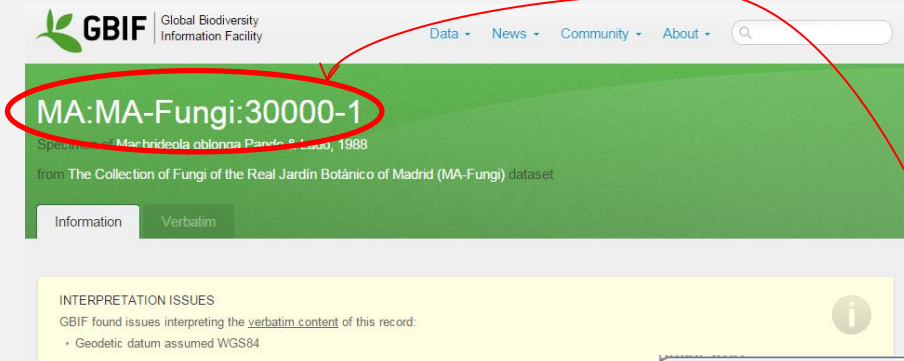
CITATION Botanical Institute of Barcelona (CSIC - Ayuntamiento de Barcelona): Institut Botanic de Barcelona, BC

DATASET VFD-H: Rheingau: Pferdeweide Loock

RECORDS 1 records from this dataset included at time of download

IDENTIFIER [doi:10.15468/ntrb3](https://doi.org/10.15468/ntrb3)

Identificadores para registros



GBIF Global Biodiversity Information Facility

MA:MA-Fungi:30000-1

Specimen of *Marasmius obovatus* Pando & Lobo, 1988

from The Collection of Fungi of the Real Jardín Botánico de Madrid (MA-Fungi) dataset

Information Verbatim

INTERPRETATION ISSUES

GBIF found issues interpreting the [verbatim content](#) of this record:

- Geodetic datum assumed WGS84



GBIF Global Biodiversity Information Facility

GBIF 85254856

Specimen of *Phymoscolopendrium* (L.) Newman recorded on 20-ene-2007

from CeDoc de Biodiversitat Vegetal: BCN-Cormophyta dataset

Information Verbatim

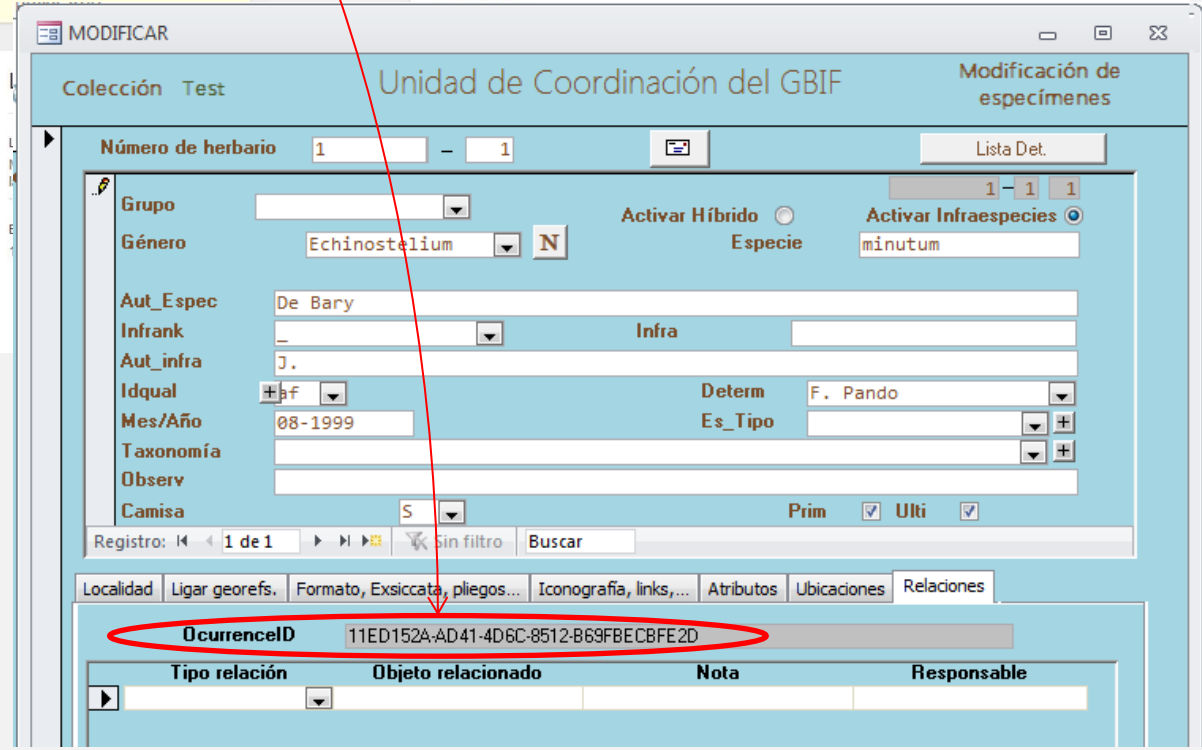
<http://www.gbif.org/occurrence/85254856>

Location



<http://www.gbif.org/occurrence/78504121>

- Quitar el humano
- Hacerlos persistentes
- Hacerlos semánticamente agnósticos



MODIFICAR

Colección Test Unidad de Coordinación del GBIF Modificación de especímenes

Número de herbario 1 - 1

Lista Det.

Grupo [dropdown] Activar Híbrido Activar Infraespecies

Género *Echinostelium* N Especie *minutum*

Aut_Espec De Bary

Infrank [dropdown] Infra [dropdown]

Aut_infra J.

Idqual [dropdown] Determ F. Pando

Mes/Año 08-1999 Es_Tipo [dropdown]

Taxonomía [dropdown]

Observ [dropdown]

Camisa S Prim Ulti

Registro: 1 de 1 Sin filtro Buscar

Localidad Ligar georefs. Formato, Exsiccata, pliegos... Iconografía, links... Atributos Ubicaciones Relaciones

OcurrenceID 11ED152A-AD41-4D6C-8512-B69FBECBFE2D

Tipo relación	Objeto relacionado	Nota	Responsable
[dropdown]	[input]	[input]	[input]

Licencias estandarizadas



[CC0](#), licencia de uso universal, sin ningún tipo de restricciones.

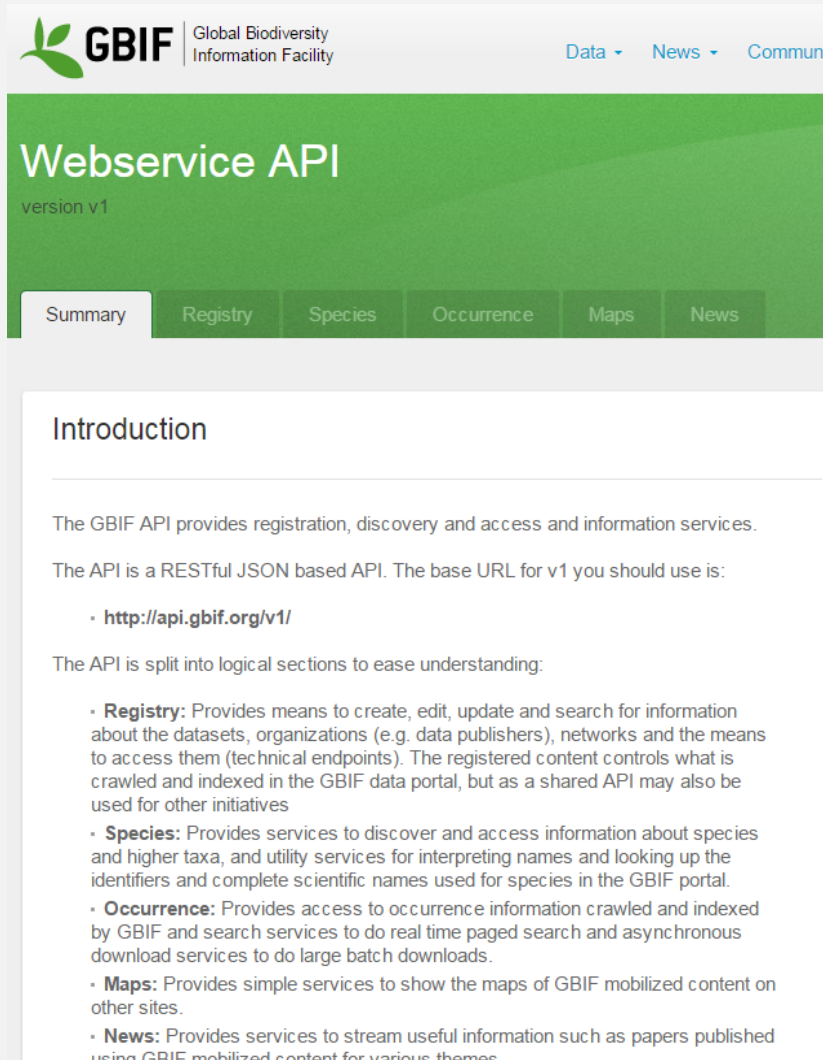


[CC-BY](#), se permite copiar, redistribuir o editar el material, pero siempre citando adecuadamente la fuente e indicando los cambios realizados.



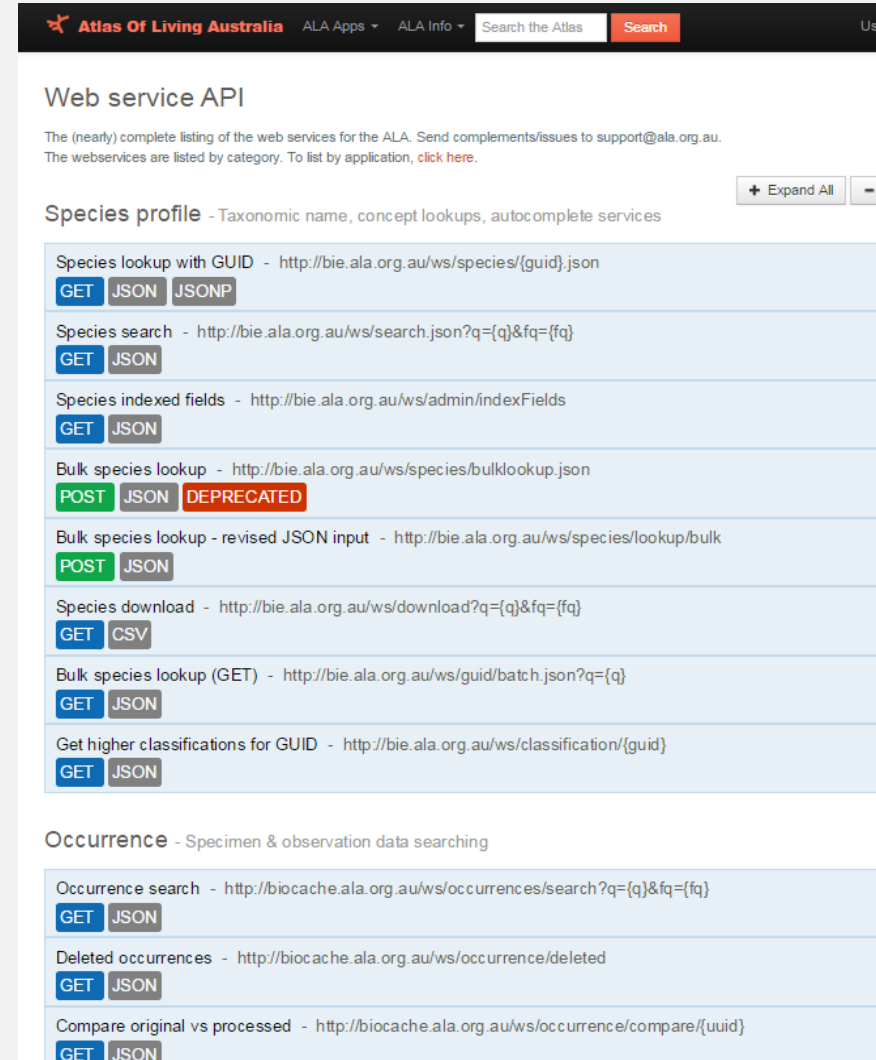
[CC-BY-NC](#), igual que en el caso anterior pero únicamente para uso no comercial.

APIs



The screenshot shows the GBIF (Global Biodiversity Information Facility) WebService API developer page. The page has a green header with the GBIF logo and navigation links for Data, News, and Community. The main heading is "WebService API" with "version v1" below it. A navigation bar contains tabs for Summary, Registry, Species, Occurrence, Maps, and News. The "Introduction" section explains that the GBIF API provides registration, discovery, and access services. It states that the API is RESTful and JSON-based, with a base URL of <http://api.gbif.org/v1/>. The API is divided into logical sections: Registry (for creating, editing, and searching datasets), Species (for discovering and accessing species information), Occurrence (for searching and downloading occurrence data), and Maps (for displaying GBIF content on maps). News services are also mentioned for streaming information like published papers.

<http://www.gbif.org/developer/summary>



The screenshot shows the Atlas Of Living Australia (ALA) Web service API page. The header includes the ALA logo, navigation links for ALA Apps and ALA Info, a search bar, and a search button. The main heading is "Web service API". Below this, there is a brief description of the API and a link to expand all services. The "Species profile" section lists various API endpoints with their methods and response formats:

- Species lookup with GUID - <http://bie.ala.org.au/ws/species/{guid}.json> (GET, JSON, JSONP)
- Species search - <http://bie.ala.org.au/ws/search.json?q={q}&fq={fq}> (GET, JSON)
- Species indexed fields - <http://bie.ala.org.au/ws/admin/indexFields> (GET, JSON)
- Bulk species lookup - <http://bie.ala.org.au/ws/species/bulklookup.json> (POST, JSON, DEPRECATED)
- Bulk species lookup - revised JSON input - <http://bie.ala.org.au/ws/species/lookup/bulk> (POST, JSON)
- Species download - <http://bie.ala.org.au/ws/download?q={q}&fq={fq}> (GET, CSV)
- Bulk species lookup (GET) - <http://bie.ala.org.au/ws/guid/batch.json?q={q}> (GET, JSON)
- Get higher classifications for GUID - <http://bie.ala.org.au/ws/classification/{guid}> (GET, JSON)

The "Occurrence" section lists endpoints for specimen and observation data searching:

- Occurrence search - <http://biocache.ala.org.au/ws/occurrences/search?q={q}&fq={fq}> (GET, JSON)
- Deleted occurrences - <http://biocache.ala.org.au/ws/occurrence/deleted> (GET, JSON)
- Compare original vs processed - <http://biocache.ala.org.au/ws/occurrence/compare/{uuid}> (GET, JSON)

<http://api.ala.org.au/>

¿Y después?

- RDF

```
-<rdf:RDF>
- <rdf:Description rdf:about="http://www.product/cd/S10_1678">
  <ID rdf:datatype="http://www.w3.org/2001/XMLSchema#string">S10_1678</ID>
  <Model rdf:datatype="http://www.w3.org/2001/XMLSchema#string">1969 Harley I
  <Qty rdf:datatype="http://www.w3.org/2001/XMLSchema#string">12</Qty>
</rdf:Description>
- <rdf:Description rdf:about="http://www.product/cd/S10_1949">
  <ID rdf:datatype="http://www.w3.org/2001/XMLSchema#string">S10_1949</ID>
  <Model rdf:datatype="http://www.w3.org/2001/XMLSchema#string">1952 Alpine F
  <Qty rdf:datatype="http://www.w3.org/2001/XMLSchema#string">21</Qty>
</rdf:Description>
- <rdf:Description rdf:about="http://www.product/cd/S10_2016">
  <ID rdf:datatype="http://www.w3.org/2001/XMLSchema#string">S10_2016</ID>
  <Model rdf:datatype="http://www.w3.org/2001/XMLSchema#string">1996 Moto Gt
  <Qty rdf:datatype="http://www.w3.org/2001/XMLSchema#string">11</Qty>
</rdf:Description>
- <rdf:Description rdf:about="http://www.product/cd/S10_4698">
  <ID rdf:datatype="http://www.w3.org/2001/XMLSchema#string">S10_4698</ID>
  <Model rdf:datatype="http://www.w3.org/2001/XMLSchema#string">2003 Harley-I
  <Qty rdf:datatype="http://www.w3.org/2001/XMLSchema#string">12</Qty>
</rdf:Description>
```

<http://community.gbif.org/pg/search/?tag=rdf>

Lo nuevo en 4UCOLL

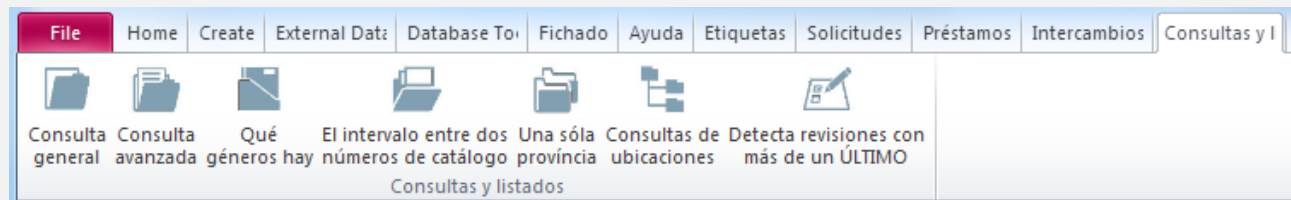
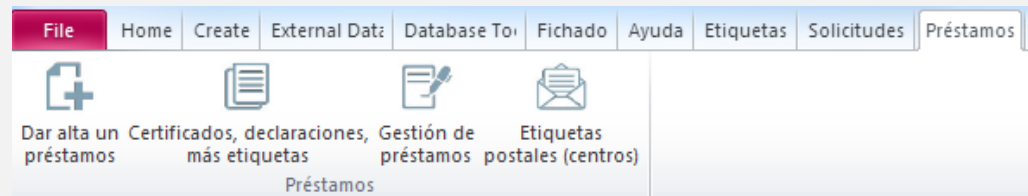
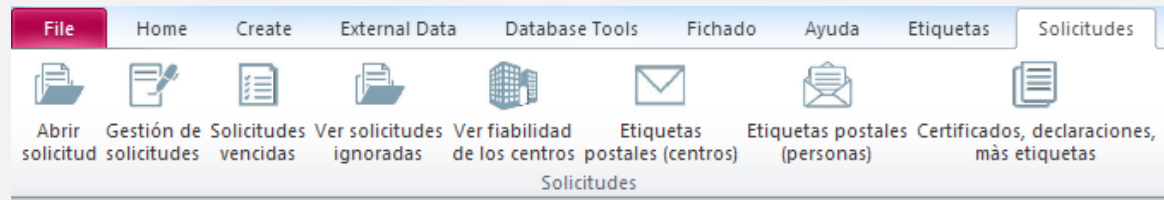
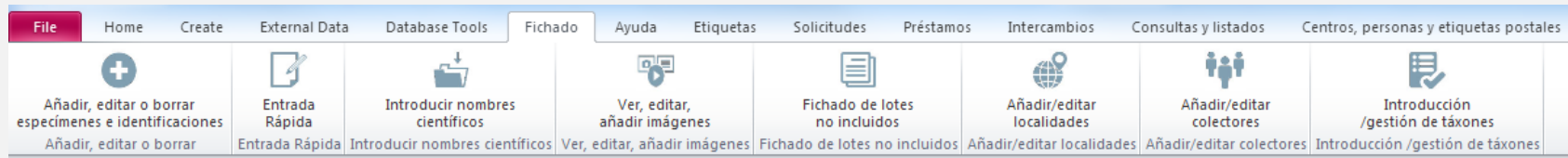
1. Soporte para web semántica: identificadores persistentes: PURLS, UUIDs
2. Soporte para cumplir con el Protocolo de Nagoya
3. Nueva interfaz, navegación por “Ribbon”
4. Soporte para códigos QR
5. Exportación de datos en Darwin Core Archive
6. Múltiples mejoras en toda la aplicación

Soporte para cumplir con el Protocolo de Nagoya

- 1.- Los **ejemplares** catalogados reciben un **identificador** único, global, persistente y resoluble, que permite su **referencia** y su **trazabilidad** hasta el origen.
- 2.- La aplicación permite asociar a cada **ejemplar** o lotes de ejemplares documentación; en este contexto, **PICs, MTAs MATs**.: pdf, hiperenlaces, imágenes...
- 3.- Las **hojas de envío** de material por las que se transfiere e intercambian ejemplares entre instituciones llevan un **texto de referencia** sobre como manejar y referenciar el material de acuerdo con Nagoya y las recomendaciones de CETAF:

<https://www.cbd.int/abs/submissions/icnp-3/EU-Taxonomic-practices.pdf>

Nuevo interfaz, navegación por “Ribbon”



Soporte para códigos QR

Hortus Regius Matritensis (MA-Fungi)

Battarrea stevenii (Libosch.) Fr.

ESP. Córdoba: carretera Comarcal 437 km 2,8; 30SUG4092; 05/10/1994; S. Capello, Det.: S. Capello.



MA-Fungi 35883

Exportación de datos en Darwin Core Archive

Internet

Exportaciones a Internet

1.- Seleccione el formato de Internet:

para KML

para Darwin Core Archive

2.- Filtrar excluidos:

Filtrar

3.- Exportar datos:

Exportar

Ver historial de exportaciones

Configurar acceso a datos de Internet

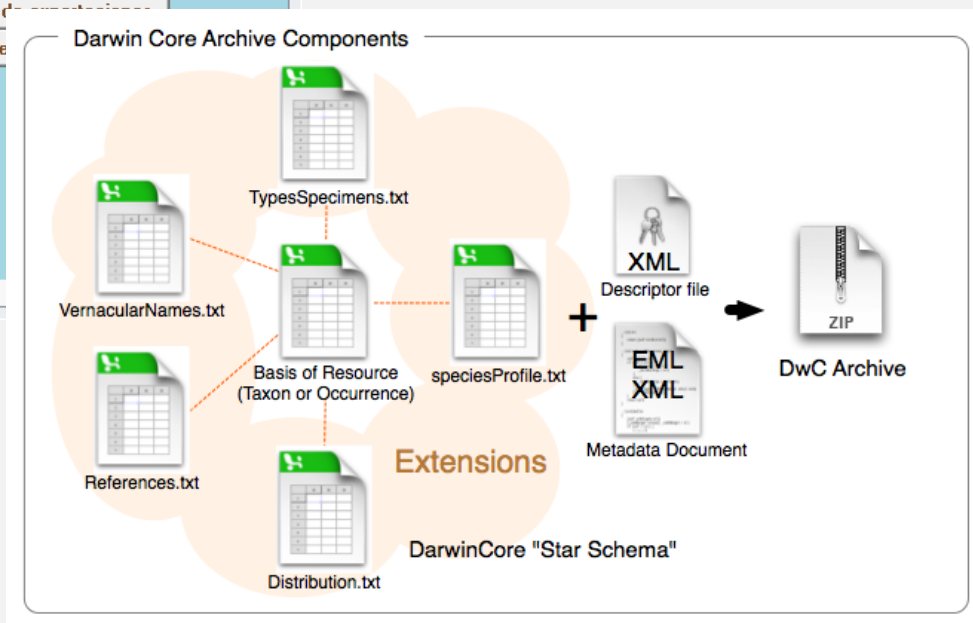
Generar Xml para purl.org

PURL genérico

PURL HZF para internet

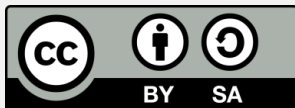
PURL sin página web

Crear Xml para purls



Francisco Pando

Unidad de coordinación, GBIF España
Real Jardín Botánico - CSIC
Claudio Moyano 1, 28014 Madrid, Spain
pando@gbif.es
www.gbif.es



<http://creativecommons.org/licenses/by-sa/3.0/es/>

GBIF-ES es el Nodo Nacional de Información sobre Biodiversidad patrocinado por el [Ministerio Español de Economía y Competitividad](#), gestionado por el [Consejo Superior de Investigaciones Científicas](#).

