

中国生物多样性信息学进展

Development of Biodiversity Informatics in China



中国科学院植物研究所
INSTITUTE OF BOTANY, THE CHINESE ACADEMY OF SCIENCES

MA Keping 马克平

2010-10-23 **Nagoya**



什么是生物多样性信息学

What is biodiversity informatics



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- **Digitization of baseline materials of biodiversity (Species, specimen, image, literature)**
- **New approaches for taxonomy (Delta, Lucid, SLIKS)**
- **Integration tools (LifeDesk, EOL)**
- **Mapping tools**
- **Modeling (Ecological Niche Model: Maxent, GARP, Biomapper, WhyWhere)**



重要的项目/组织

Major projects/organizations



- Global Biodiversity Information Facility : GBIF
- Catalogue of Life-Species2000: COL
- Biodiversity Heritage Library: BHL
- EDIT: European Distributed Institute of Taxonomy
- Tree of Life: TOL
- Barcode of Life Data Systems :BOLD
- Encyclopedia of Life: EOL
- TROPICOS
- Australia Virtual Herbarium: AVH
- USDA PLANTS DATABASE
- Fishbase
- ILDIS



Biodiversity Information Projects of the World

 Search

Project	Project Type
100th Meridian Boater Survey Database	Data Provider
18 Common Invasive Plants in New York State	Data Aggregator
2001 Systematic Catalog of Culicidae	Data Aggregator
399 Invasive Plants & Weeds in Canada & the U.S. (NBII-ISIN)	Data Provider
A Checklist of Mosses	Data Provider
A Pan-European Species-directories Infrastructure (PESI)	Data Standards
Agriculture Network Information Center	Data Indexer
Alaska Exotic Plants Information Clearinghouse	Data Provider
Alaska Natural Heritage Program	Facilitator
Alcoa Frog Watch	Data Provider
AlgaeBase	Data Aggregator
Alien Invader Plants in South Africa	Data Provider
Alien Invasive Species in China	Data Provider
Alien Invasive Species of Pakistan	Data Provider
Alien Plants in Ireland	Data Provider
Alien Plants in Korea	Data Provider
Alien Species in Hawaii	Facilitator
Alien Species in Poland	Data Provider
Alien Species in Swedish Seas and Archipelago Areas	Data Provider
All Birds Barcoding Initiative	Data Provider
All Catfish Species Home	Data Aggregator
All Leps Barcode of Life	Data Provider
All Species Foundation	Facilitator
Aluka	Data Indexer
Amphibian Research and Monitoring Initiative's National Atlas for Amphibian Distributions	Data Aggregator
Amphibian Species of the World	Data Aggregator
Amphibiatre	Facilitator
Amphibiaweb	Data Aggregator



More than 600 projects on BI recorded by TDWG

全球生物多样性信息网络 Global Biodiversity Information Facility : GBIF



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free and open access to biodiversity data
GLOBAL BIODIVERSITY INFORMATION FACILITY

SEARCH

Species Countries Datasets Occurrences Settings ABOUT

... free and open access to biodiversity data

The GBIF Portal: Access millions of shared data records

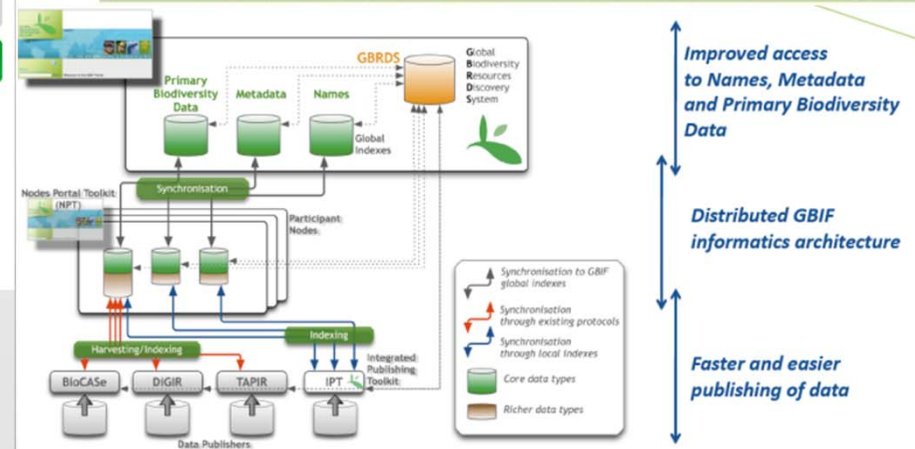
LATEST NEWS CEPDEC-TANZANIA Training Course

INFORMATICS	PARTICIPATION	GOVERNANCE	COMMUNICATIONS
<ul style="list-style-type: none"> Infrastructure Discovery/Metadata Primary Data Name Services Standards and Tools 	<ul style="list-style-type: none"> Participant Nodes Publishers Training Outreach Being a Part of GBIF 	<ul style="list-style-type: none"> Governing Board Advisory Committees Secretariat Key Documents Finance 	<ul style="list-style-type: none"> News and Events Publications Press Contact us Directory of Contacts

About GBIF | Glossary | Contact Us | [Data Portal](#)



(>174m records mapped to a 1 X 1 degree grid)



- Established in 2002, 50 countries, 40 organizations, >170 M records

生物物种名录



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Species 2000 & ITIS: Catalogue of Life

Species 2000 & ITIS Catalogue of Life

Species Checklist &
Taxonomic Hierarchy

www.catalogueoflife.org

Currently:

1,160,711 species

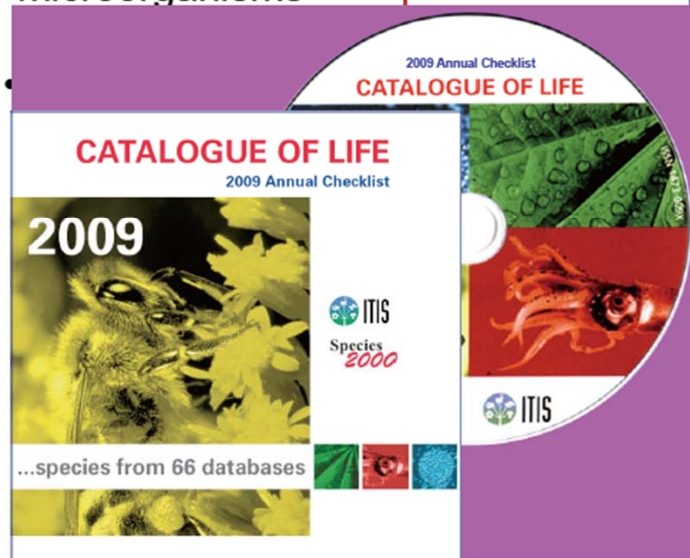
- animals
- plants
- fungi
- microorganisms

Species 2000 ITIS Catalogue of Life: 2009 Annual Checklist
indexing the world's known species

Species details

Blattodea
Species File

Accepted scientific name:	<i>Aeluropoda insignis</i> Butler 1882 (accepted name)
Synonyms:	<i>Aeluropoda gigantea</i> Butler 1882 (synonym) <i>Gromphadorhina hiljebrandti</i> Dohrn 1887 (synonym)
Common name:	flat horned hissing cockroach English
Classification:	Animalia Phylum Arthropoda Class Insecta Order Blattodea Superfamily Blaberoidea Family Blaberidae Genus <i>Aeluropoda</i>
Distribution:	Madagascar (south-central)
Additional data:	-
Source database:	Blattodea Species File Online, 1.2/3.1, 30 July 2007
Latest taxonomic scrutiny:	Deccaloni GW, 30 July 2007
Online resource:	http://blattodea.speciesfile.org/...



- 1.26 M species
- 77 databases;
- 3500 annual checklist CD distributed to 80 countries each year
- Supporting species database for GBIF, EOL, CBOL, IUCN, BHL, GenBank

生物多样性遗产图书馆 Biodiversity Heritage Library



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Biodiversity Heritage Library

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[Book of the Week: Lost and Found in the Journal de Botanique](#)
[Book of the Week: Cuvier and Classification](#)
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59.82:08 Africa Agriculture Algae **Amphibians** Anatomy Anatomy, Comparative Antiquities Arctic regions Australia Austria **Beetles** Beneficial insects
Bibliography Biology **Birds** Botany Botany, Medical Brazil Butterflies California Canada Catalogs **Catalogs and collections** Central America China **Classification** Congresses **Crustacea** Culture Description and travel Diptera Early works to 1800
Eggs Embryology England Entomology Europe Evolution Fisheries **Fishes** Floras France Frogs Fungi Gardening Gastropoda Geology
Germany Gramineae **Great Britain** Hemiptera History Horticulture Identification Illinois India Indonesia Insect pests **Insects**
Invertebrates Italy Lepidoptera **Mammals** Marine animals Massachusetts Materia medica, Vegetable Medicinal plants Mexico Microscopy **Mollusks**
Natural history New England New York (State) Nomenclature North America Norway Paleobotany **Paleontology**
Periodicals Peru Philippines Physiology Pictorial works **Plants** Pre-Linnean works Reptiles Research Science
Scientific expeditions Shells Snakes South Africa South America Sweden Switzerland United States

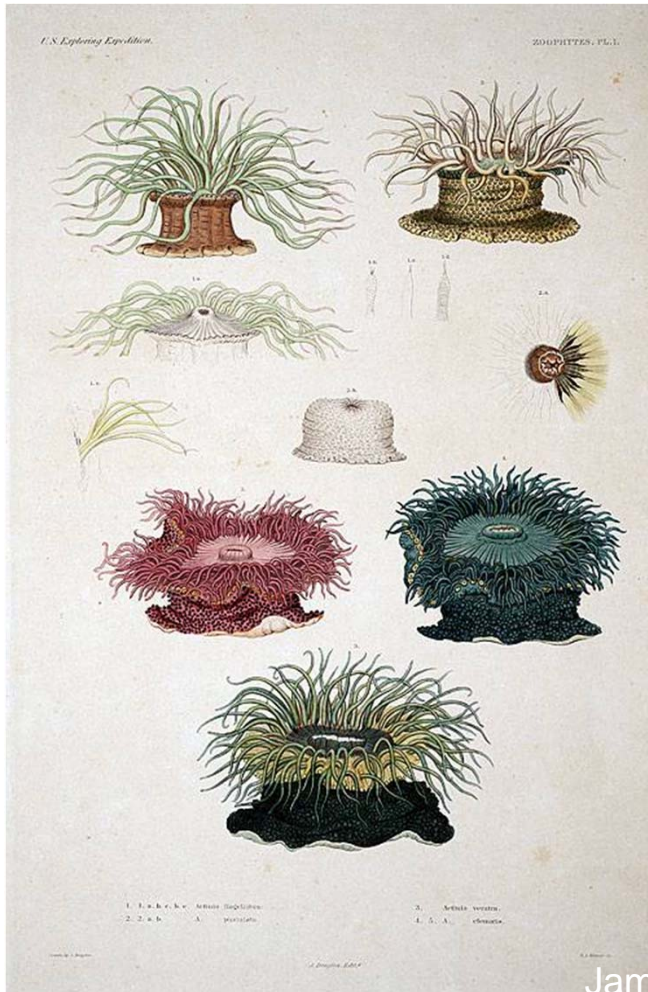
- Initiated by 10 libraries of the famous natural history museums, botanical gardens and institutes;
- Now Online: 43,528 titles, 84,505 vols, 31,744,494 pages.

Biodiversity Heritage Library

www.biodiversitylibrary.org



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- American Museum of Natural History (New York)
- Field Museum (Chicago)
- Natural History Museum (London)
- Smithsonian Institution (Washington)
- Missouri Botanical Garden (St. Louis)
- New York Botanical Garden (New York)
- Royal Botanic Garden, Kew
- Botany Libraries, Harvard University
- Ernst Mayr Library of the Museum of Comparative Zoology, Harvard University
- Marine Biological Laboratory / Woods Hole Oceanographic Institution

网络生命大百科 Encyclopedia of Life: EOL



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Opinion

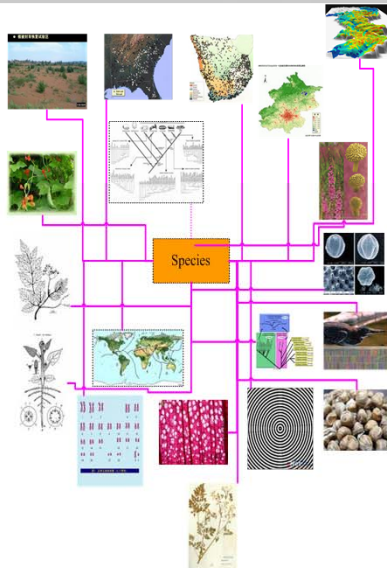
TRENDS in Ecology and Evolution Vol.18 No.2 February 2003

77

The encyclopedia of life

Edward O. Wilson

Museum of Comparative Zoology, Harvard University, 26 Oxford Street, Cambridge, MA 02138-2902, USA



HOME PREFERENCES LANGUAGE: EN FEEDBACK PRESS ROOM USING THE SITE ABOUT EOL

eol "Imagine an electronic page for each species of organism on Earth..." - Edward O. Wilson **FIND** SHOWING AUTHORITATIVE INFORMATION

Encyclopedia of Life [login](#) | [create an account](#) Names Tags Full-text

Explore

[more species](#) **11**

Gorgasia klausenitz Quéro & Saldanha, 1995 Klausenitz' garden eel	Tagetes patula L. French marigold	Halichoeres radiatus (Linnaeus, 1758) Puddingwife wrasse	Juniperus deppeana Steud. Alligator juniper	Rosa Hollandica cv.	Ophiosteira antarctica Bell, 1902

Encyclopedia of Life

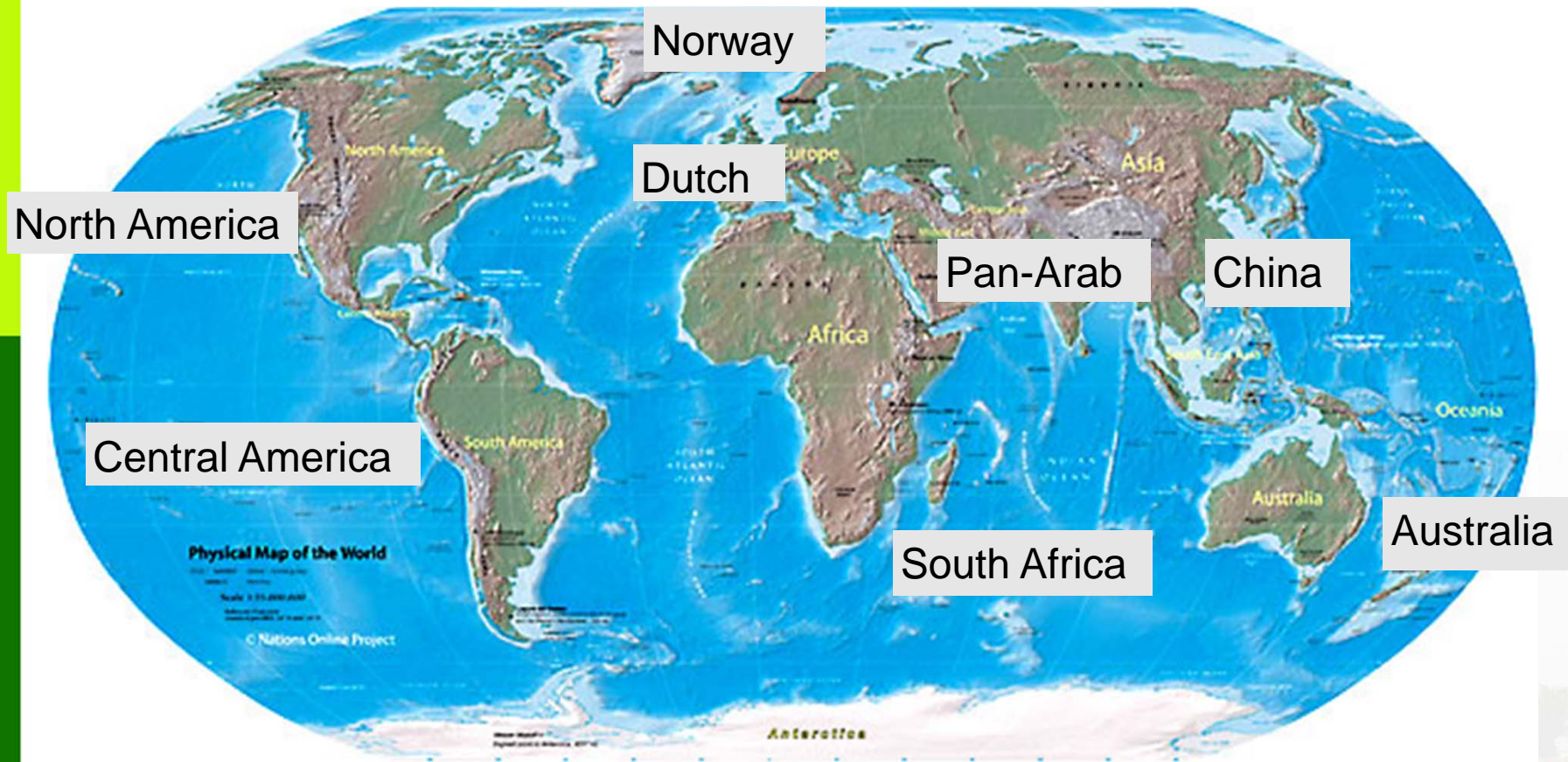
网络生命大百科的区域节点

Regional EOLs



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- Serve content in many languages
- Collaborate with international Partners



生命之树，生命条码

Tree of Life, Barcode of Life



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TREE OF LIFE web project

Explore the Tree of Life

Browse the Site

- Root of the Tree
- Popular Pages
- Sample Pages
- Recent Additions
- Random Page
- Treehouses
- Images, Movies,...

Search advanced

Learn about ...

Promachoteuthis
(a group of squid)

image info

The members of the Promachoteuthidae are mostly small, weakly muscled squids that seem to inhabit the great zone of

Barcode of Life Data Systems (BOLD)

A multi-user collaborative platform to facilitate the collection, management, and analysis of barcode data

www.boldsystems.org

Year	CyTB	COI	12S	16S	18S	NADH
2003	~10,000	~10,000	~10,000	~10,000	~10,000	~10,000
2004	~15,000	~20,000	~15,000	~15,000	~15,000	~15,000
2005	~20,000	~30,000	~20,000	~20,000	~20,000	~20,000
2006	~30,000	~50,000	~30,000	~30,000	~30,000	~30,000
2007	~40,000	~80,000	~40,000	~40,000	~40,000	~40,000
2008	~50,000	~120,000	~50,000	~50,000	~50,000	~50,000
2009	~60,000	~160,000	~60,000	~60,000	~60,000	~60,000

iBOL International Barcode of Life Project

Imagine...
a world in which you can know the name of

any animal any plant any fungus any organism

on the spot in an instant anywhere on our planet

This is the world that iBOL will build

- 5 Years
- \$150M
- 5M specimens
- 500K species

iBOL International Barcode of Life Project
Accelerating the DNA barcode library of life

Producing Barcode Data: 201?

Barcode data anywhere, instantly



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- Data in seconds to minutes
- Pennies per sample
- Link to reference database
- A taxonomic GPS
- Usable by non-specialists

Atlas of Living Australia: ALA



Welcome to the Atlas of Living Australia

The *Atlas of Living Australia* is a five-year project funded under the Australian Government's [National Collaborative Research Infrastructure Strategy](#) (NCRIS).

Its mission is to develop a **biodiversity data management system** which will link Australia's biological knowledge with its scientific and agricultural reference collections and other custodians of biological information.

This system should be:

- **Authoritative** - guiding users to the most relevant data resources and well-researched information for each species
- **Freely accessible** - delivering services, tools and content for free use by all
- **Distributed and federated** - integrating existing systems and networks to bring together the most current and complete content

The project aims:

- To integrate information on all Australian species, including data on **specimens** held by Australia's natural history collections and data from field **observations** of living organisms
- To support the management and integration of biological data from

Partners

The *Atlas of Living Australia* is a partnership between:

- CSIRO
- The Australian Museum
- Museum Victoria
- Queensland Museum
- The Tasmanian Museum and Art Gallery
- Southern Cross University
- The University of Adelaide

Grevillea magnifica, South Australia - Photograph © M.Fagg, ANBG

- With the first public release in October this year, the Atlas will provide online access to biodiversity information from museums, herbaria and biological collections, including information previously not available to the public, research, literature, observations, maps and images

You are here: Home

DataONE

Universal Access to Data about Life on Earth and the Environment

Useful to researchers, educators, and citizens

- ◆ Engaging scientists in data curation
- ◆ Supporting the full data lifecycle
- ◆ Encouraging data stewardship and sharing
- ◆ Promoting best practices
- ◆ Engaging citizens in science



News

Birds flock online Nature News

: 10, 2010

Bird

: 03, 2010

?

: 25, 2010

 | Best
ata Sets
: 20, 2010

Community

1

Apr 07, 2010

About

The Data Observation Network for Earth (DataONE) is poised to be the foundation of new innovative environmental science through a distributed framework and sustainable cyberinfrastructure that meets the needs of science and society for open, persistent, robust, and secure access to well-described and easily discovered Earth observational data. Supported by the U.S. National Science Foundation, DataONE will ensure preservation and access to multi-scale, multi-discipline, and multi-national science data. DataONE will transcend domain boundaries and make biological data available

Enabling Science

DataONE ensures the preservation and access to earth observation data spanning broad science disciplines to enable advances in science and education. For example, data on the sources and sinks of greenhouse gases can facilitate advances in climate change science and modeling, while data on land use patterns can facilitate scientific understanding of human-environment interactions at local and regional scales. Understanding the conditions under which an invasive species colonizes a new area can be used to forecast the spread of that invasive species, and understanding disturbance





Global Plants Initiative

The Global Plants Initiative is an international partnership of herbaria working to create a coordinated database of information and images of plants worldwide. With support from The Andrew W. Mellon Foundation, partner organizations, capture data and create high resolution digital images of vascular type specimens from their collections. The goal of this project is a self-sustaining resource that an international community of scholars can access via the World Wide Web.

The Global Plants Initiative began in 2003 with African plants and has evolved to include plants from Latin American and the rest of the world; 151 organizations from 52 countries currently participate, and to date its database has 1,250,000 images and associated objects, of which ~30,000 are types and other objects from Latin America. When complete, the digital library will include images of more than 2 million type specimens.

The Smithsonian Tropical Research Institute [STRI], headquartered in Panama City, Republic of Panama, is one of the main partners of the Plants Initiative. STRI coordinates the participation of herbaria from Latin America and the Caribbean; and organizes the annual meetings and other related meetings. STRI serves as liaison with the Latin America herbaria and supports them through the grant process, advising and reviewing proposals from potential partners for consideration of the Mellon Foundation. STRI has also established a Center for Digitization to support the digitization of type-specimen of smaller herbaria. STRI technicians provide training on the use of the herbscans, search for new types, labeling of sheets; mounting specimens, databases, and much more. STRI, in the collaboration of the New York Botanical Garden, the Missouri Botanical Garden and the Royal Botanic Garden, Kew, distributes herbscan and scanners to partners in the US and Latin America. We have had annual meetings in Panama, Argentina and Colombia. For further information on how to join this initiative, please contact [Gloria Jované](#) or [Nelly A. Flórez](#) or [Doreen Tinajero](#)



Partners for Plants Initiative



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PARTNERS



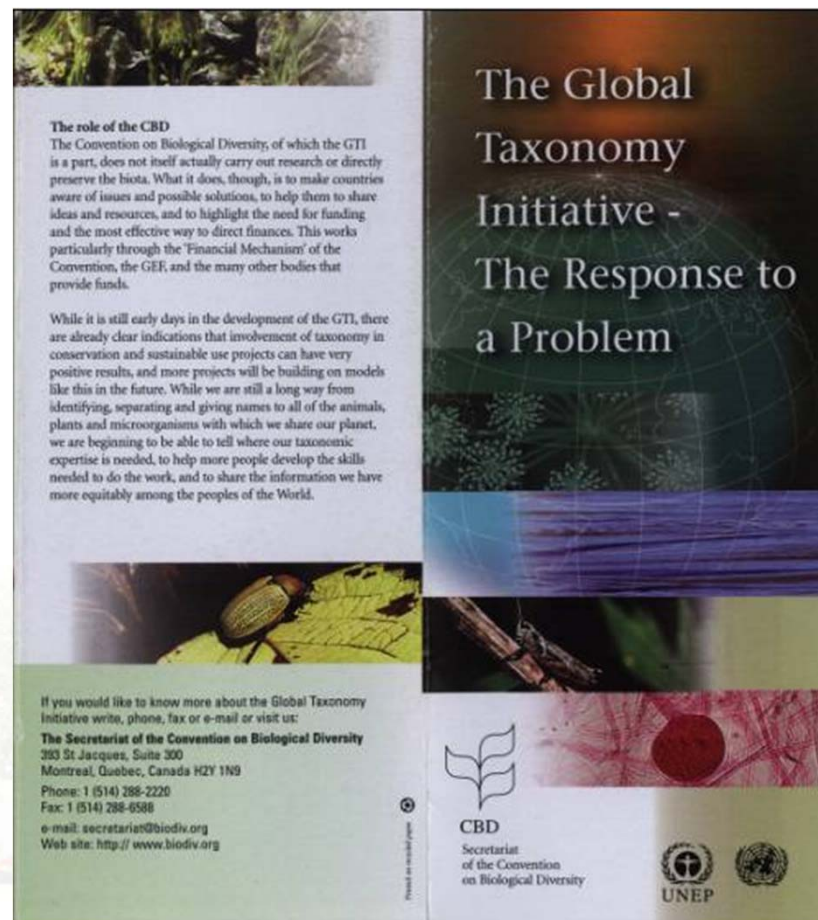
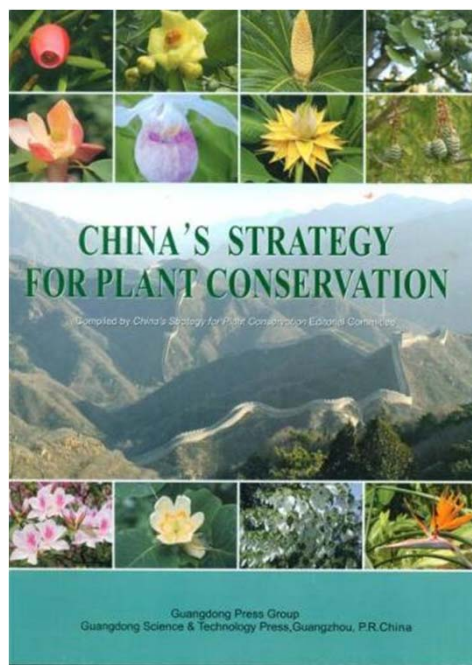
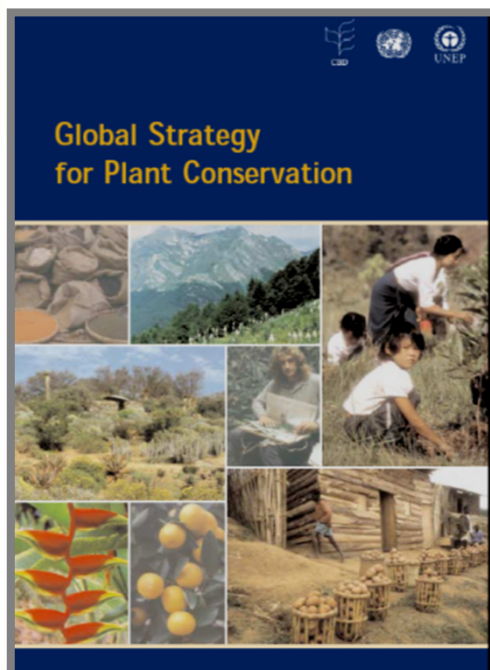
全球植物保护战略与生物分类倡议

GSPC & GTI of CBD



Understanding and Documenting Plant Diversity:

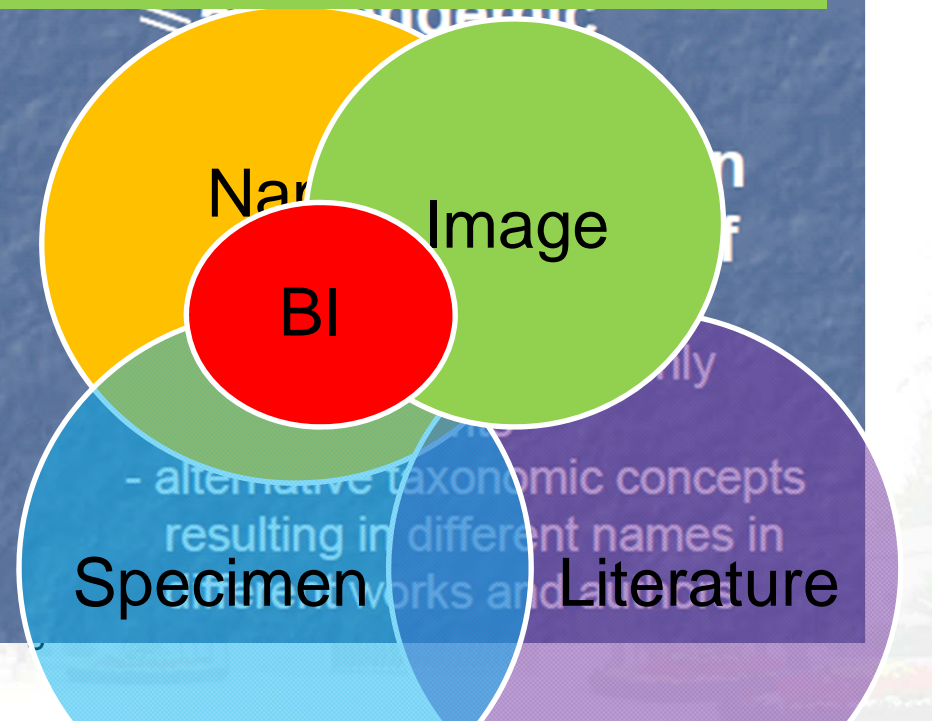
TARGET 1: A working list of known plant species, as a step towards a complete world flora



Why CVH & CNPC

- **Some key questions linked to CVH & CNPC**
- *How many species in China?*
- *Where these species located?*
- *What conservation priority activity should be put forward at regional scale?*

- **ca. 16 millions specimens** in China herbaria
 - 50-100 data elements per specimen
 - Several Kb per specimen (excl. images)



Background of CVH & CNPC



Stage	Main Activities
2006-2008: Data Collecting	1. Collect data: specimen, name, image, literature
	2. Main herbaria in China
	3. Data sharing: central and distributed ways
	4. A series of tools, standards and workflow
2009-2010: Standardization & Linkage	1. Introducing standards: Darwin Core, LSID, KML
	2. Data sharing: federated, harvesting
	3. Build the linkage among different data with LSID
	4. Take CMS+Database to build beta version of CVH
2010-: e-Science infrastructure	1. Investigation on international biodiversity e-Science infrastructure based on SOA system
	2. Design the architecture of biodiversity e-Science infrastructure in China

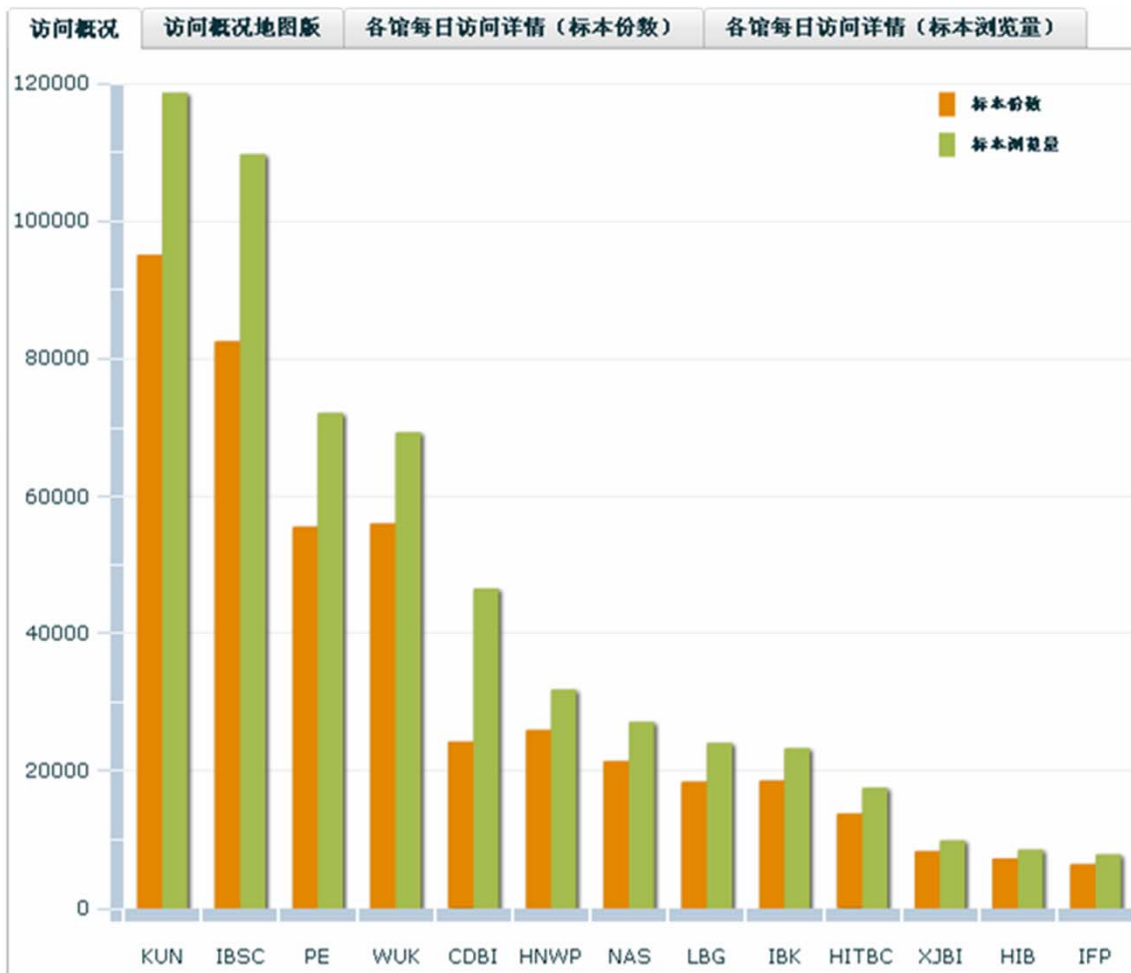
Year	Data Coverage	Records	Content	Team	Funding
1998-2002	FRPS	34,056	Taxonomic Name and Distribution	None	None
2004-2005	FOC	90,558	Synonym	Taxonomists	CAS
2007-present	Monograph, Journal, Local Flora	107,006	Reference, Common name etc.	Taxonomists, Computer Staff	MOST

- 建立持久的在线数据收集、管理和更新、维护机制
- 建立分类学专家支持系统
- 为物种2000中国节点提供长期有效的数据支持

简介

- funded by MOST, CAS, CNC-DIVERSITAS
- with the aim to integrate fragmented **inventory** and **herbarium specimen data** together, and provide internet-based services for scientific community, decision-makers and public users.

Database and Website: CVH



Copyright(版权所有): CVH 技术组. xuzp@ibcas.ac.cn,2009-11

- 29 participated institutions and herbaria
- 3.31 million specimens
- 1.8 million have been georeferenced
- 1.67 million with image, including 25,000 type specimens
- 18 local floras, 256 books
- 30,000 photos



Database and Website: CVH



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执行时间:0.014秒

馆代码 数量 标本馆名称 是否申请

6. 水杉属 *Metasequoia* Miki ex Hu et Cheng

落叶乔木，高可达35米，胸径达2.5米；大枝不规则轮生，小枝对生或近对生；冬芽卵形或卵圆形，具6—8对交叉对生的芽鳞。叶交叉对生，基部扭转成二列，线形，扁平，质柔软，无柄或近无柄，中脉上面凹下，下面隆起，两侧各有4—8条气孔线，冬季与侧生小枝一起脱落。球花单性，雌雄同株，球花基部有交叉对生的苞片，雄球花单生于枝顶或叶腋，有短梗，排成总状花序状或圆锥花序状，雄蕊约20枚，交叉对生，每雄蕊有3个花药，花丝短，花粉无气囊；雌球花单生于枝顶或叶腋，珠鳞11—14对，交叉对生，每珠鳞有5—9个直生胚珠。球果当年成熟，下垂，近圆球形，稍具4棱，有长梗，种鳞盾形，木质，顶部宽，横长斜方形，有凹槽，基部楔形，宿存，中部发育的种鳞有5—9个种子；种子倒卵形，扁平，周围有狭翅，顶端有凹缺；子叶2枚，发芽时出土。

本属在中生代白垩纪及新生代约有10种，曾广布于北美、日本、我国东北、苏联西伯利亚、欧洲及格陵兰，北达北纬82度。第四纪冰川之后，几全部灭绝，现仅存1种。

水杉 (图281)

Metasequoia glyptostroboides Hu et Cheng, 静生汇报 1:2. 154. 图版1—2. 1948; 何景, 福大汇报 3:78. 1952; 中国高等植物图鉴 1:315. 图630. 1972; 郑万钧等, 中国植物志 7:310. 图版71. 1978.

落叶乔木，高可达35米，胸径达2.5米；树干基部常膨大；树皮灰色或灰褐色，浅裂成狭长条片脱落，内皮淡紫褐色，大枝斜展，小枝无毛，稍下垂，侧生小枝对生或近对生，斜垂，排成二列，呈羽状，长4—15厘米，冬季脱落。叶交叉对生，排成二列，线形，扁平，柔软；长1—1.7厘米，宽1—2毫米，近无柄；中脉上面凹下，下面隆起，两侧各有4—8条气孔线，冬季与侧生小枝一起脱落。球果下垂，近球形，稍具4



1.球果枝; 2.球果; 3.种子; 4.雌球花枝; 5.雄球花; 6—7.雄蕊背面。

图281. 水杉 *Metasequoia glyptostroboides* Hu et Cheng

县名

省 南岳市

省 衡山县

省 利川市

省 利川市

市 万州区

数据信息

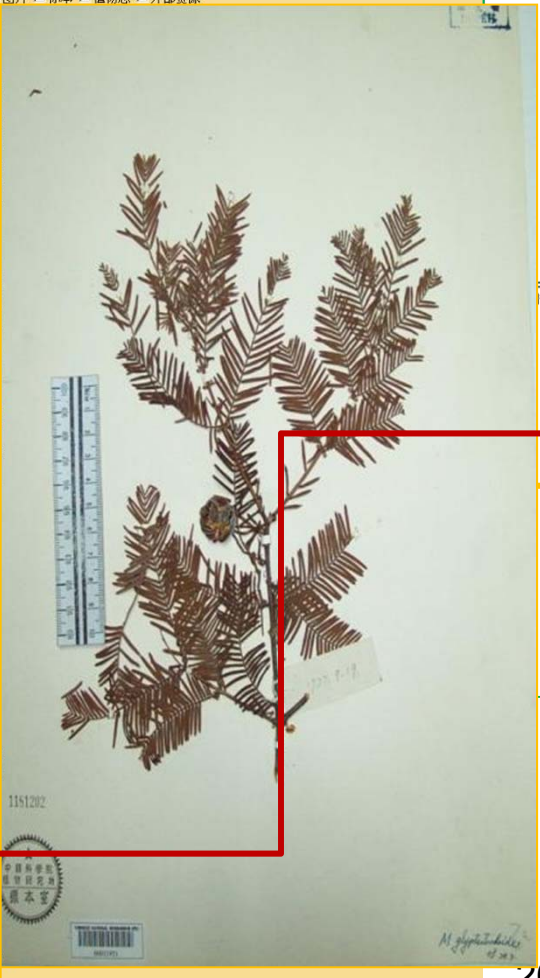
馆藏信息
标本馆: 中科院植物研究所(PE)
条形码: 00011951
标本LSID: PE_00011951
模式类型: notype
标本状态: 无花有果
(NEW: [补充或评论该记录](#))

鉴定信息
科名: Taxodiaceae
学名: *Metasequoia glyptostroboides*
鉴定人: 傅书遵
鉴定日期: 19790700

采集信息
采集人:
采集号:
采集日期: 19770919
备注:

采集地信息(评论)
采集地: 中国,湖北省,利川市,

同名标本分布在下列CVH 成员馆中
庐山植物园(LBG)
中科院沈阳应用生态研究所(IFP)
河南师范大学(HENU)
中科院植物研究所(PE)
西北农林科技大学(WUK)
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时间:0.003

2010 Shanghai

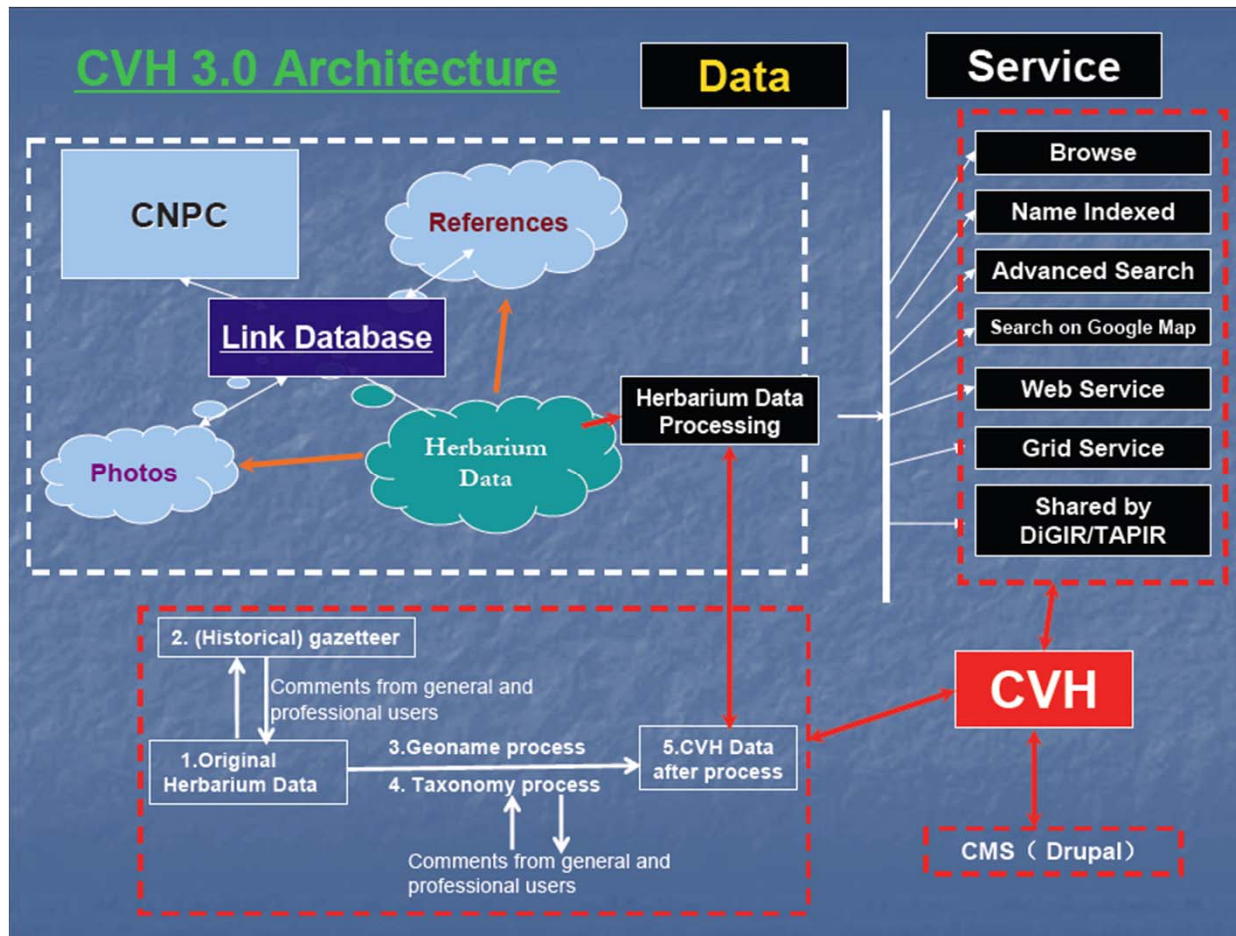
20

- 河南植物志, 卷册1, 页码: 140
- 河北植物志, 卷册1, 页码: 184
- 北京植物志, 卷册上册, 页码: 60
- 四川植物志, 卷册2, 页码: 144

Database and Website: CVH



中国科学院植物研究所
INSTITUTE OF BOTANY, THE CHINESE ACADEMY OF SCIENCES



- Data Integration
- Content Management System(CMS)
- Web Service

•1. Open source :

database(Mysql), server script(PHP), client script(Ajax, esp. JQuery);

•2. Data output: visual and geo-spatial way, Web GIS solution, Google Map and Google Earth KML;

• 3. XML+Xpath, Darwin Core

•4. Link the world:share CVH data directly from your web site; also, link to GBIF,BHL,uBio

Moving forward



中国科学院植物研究所
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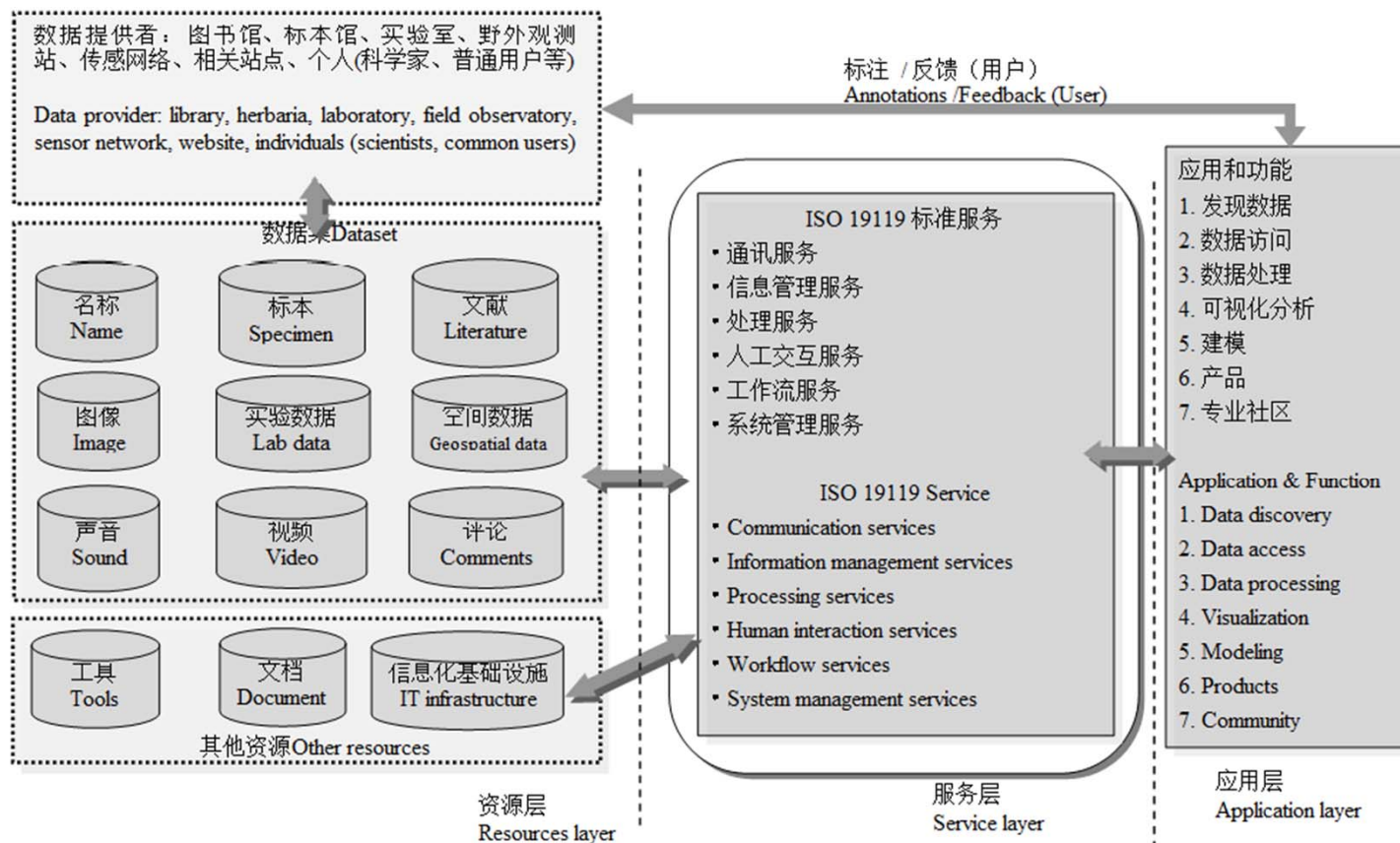


图1 中国生物多样性e-Science平台框架图
Fig. 1 The architecture of e-Science platform of biodiversity

2010/11/30

As one of supporting database for Species 2000 China Node



中国科学院植物研究所
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Catalogue of Life, China 2009 Annual Checklist



中国生物物种名录 2009版



Species 2000 China Node

Home Annual Checklist China Annual Checklist Global ChineseVer. search...

Home News Links Contact Us Search Administrator

One Million Species Symposium

Three meetings will be held at the University of Reading on the 29th and 30th March 2007 to announce the release of the Species 2000 and ITIS 'One Million Species' Catalogue of Life.

Read more...

Username: _____ Password: _____

Remember me

[Lost Password?](#)

Beijing China ICP No:05075395

Activities of Species 2000 China Node in 2007
Written by Administrator Monday, 26 March 2007

- Species 2000 China Node first workshop**

On 4th January, 2007, 18 people including the taxonomists and information technicians from Institute of Zoology, Institute of Botany and Institute of Microbiology, Chinese Academy of Sciences met in Institute of Botany, Chinese Academy of Sciences. Professor Keiping Ma, deputy director of Biodiversity Committee, Chinese Academy of Sciences, director of Institute of Botany, CAS, presided over this meeting. The groups of species, including vertebrate animal, bacterium and fungus, higher plant, were confirmed for the checklist of the first phase (before February) both in CD and database for Species 2000 China Node. The data items of each species were discussed and decided to follow the standard dataset of Species 2000. The website was launched up and maintained by Mr. Ronggui Li. After a warm discussion, some suggestion for revision was made. It is recognized that taxonomists should make more effort on building and using Species 2000 China Node.
- Species 2000 China Node Technical Meetings**

In order to solve technology problem, on 9th January, 2007, 11 information technicians from Institute of Zoology, Institute of Botany and Institute of Microbiology, Chinese Academy of Science have a meeting in Institute of Zoology, Chinese Academy of Sciences. Professor Liqiang Ji, Secretary of Biodiversity Committee, Chinese Academy of Sciences presided over this workshop. The output of the meeting are: 1. Database structure for Species 2000 China Node including website and CD should be consistent with that of Species 2000's. 2. English/Chinese Website should be established at the same time and pay more emphasis on data query function. 3. The software used in website and CD should be developed as soon as possible. The color pattern and the style of the website were also discussed in the meeting.
- The progress of Species 2000 China Node**

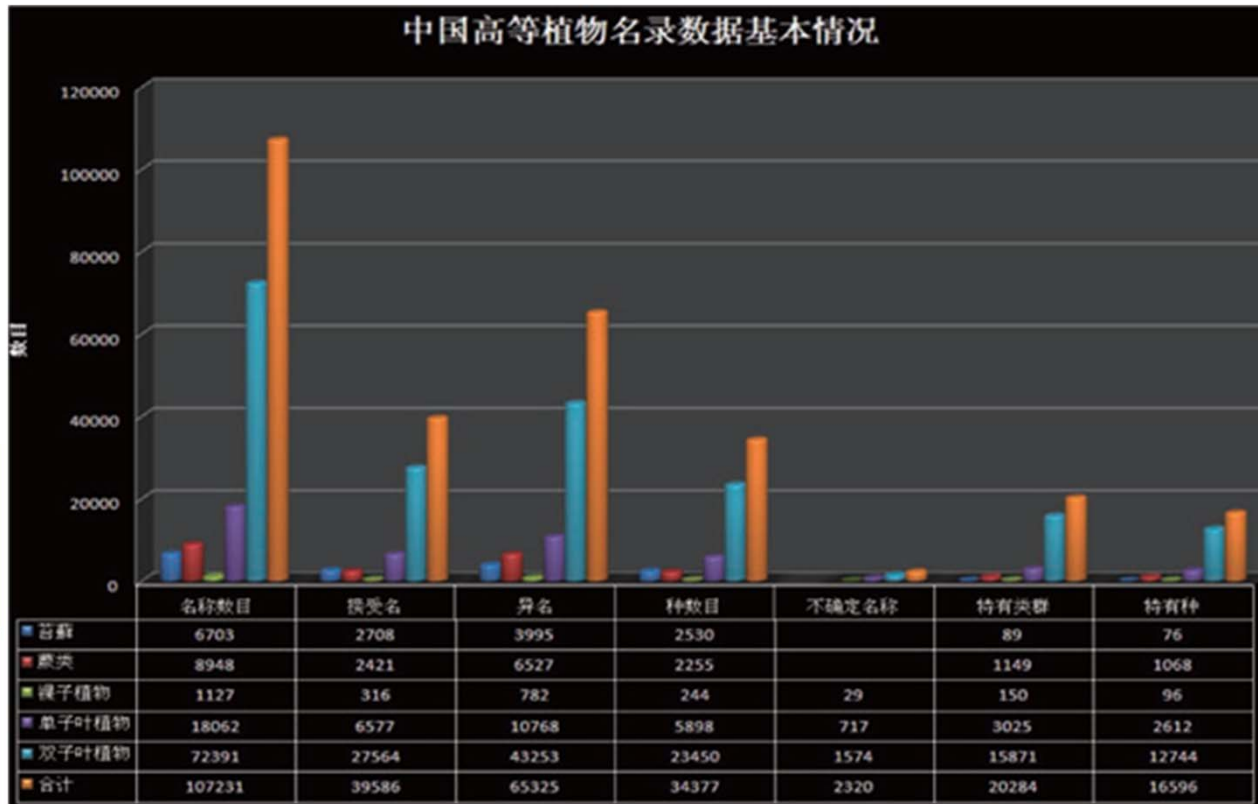
On 20th March, 2007 information technicians from Institute of Zoology, Institute of Botany and Institute of Microbiology, Chinese Academy of Science has a meeting to discuss the recent progress for species 2000 China Node. Professor Liqiang Ji, Secretary of Biodiversity Committee, Chinese Academy of Sciences has presided over the meeting. The data checking for information of mammal, fish and higher plant has been completed, and the data checking for information of bird will be finished soon according to the standard dataset of Species 2000. The website for Species 2000 China Node should be adjusted to present Chinese special features. It is suggested that the taxonomists should be encouraged to build up or update the source databases for the group or groups of species and provide more detail information about the species than studied in the field. We hope...



2010/11/30

23

Database and Website: CNPC



- Scientific name: 114,838
- Original literature: 106,886
- Chinese common name: 61,066
- Cultivated species: 1,900
- Invasive/Introduced species: 180
- Important economic plants: 4,249
- Species with IUCN category: 3,392
- Morphological description: 13,855

CNPC includes total 34,377 species found in China, which belong to 3,941 genera and 433 families. Nearly half of these species can only be found in China (16,596 species endemic to China).

Database and Website: CNPC



中国高等植物信息系统
Catalogue of Life: Higher Plants in China

首页 学名 中文名 其它信息 统计 关于

详细信息

分类树

折叠 | 展开

- 界: Plantae
 - 门: Gymnospermae
 - 纲: Coniferopsida
 - 目: Pinales
 - 科: Pinaceae
 - 属: Pinus
 - 种: **Pinus densata**

中文名

高山松 * || 西藏油松 || 西藏赤松 ||

学名

Pinus densata Mast. (1906) 杨永

形态描述

乔木，高达30米，胸径达1.3米。树干下部树皮暗灰褐色，深裂成厚片，上部树皮红色，裂成薄片脱落。一年生枝粗壮，黄褐色，有光泽，无毛。二、三年生枝皮逐渐脱落，内皮红色。冬芽卵圆形或圆锥形，先端尖，微被树脂，芽鳞栗褐色，披针形，先端彼此散开，边缘白色丝状。针叶2针一束，稀3针一束或2针3针并生，粗硬，长6—15厘米，径1.2—1.5毫米，微扭曲，两面有气孔线，边缘锯齿锐利，横切面半圆形或扇状三角形，二型皮下层，第一层细胞连续，第二层不连续排列，稀有第三层细胞，树脂道3—7（—10）个，边生，稀角部的树脂道中生。叶鞘初呈淡褐色，老则暗灰褐色或黑褐色。球果卵圆形，长5—6厘米，径约4厘米，有短梗，熟时栗褐色，常向下弯曲；中部种鳞卵状矩圆形，长约2.5厘米，宽1.3厘米，鳞盾肥厚隆起，微反曲或不反曲，横脊显著，由鳞脐四周辐射状的纵横纹亦较明显，鳞脐突起，多有明显的刺状尖头。种子淡灰褐色，椭圆形卵圆形，微扁，长4—8毫米，宽3—4毫米，种翅淡紫色，长约2厘米。花期5月，球果第二年10月成熟。

模式产地

模式标本采自四川雅江卧龙山。

网络连接

异名

= *Pinus prominens* Mast., in: J. Linn. Soc., Bot., Bot. 37(262): 417, (1906)
= *Pinus wilsonii* Shaw, in: Pl. Wilson. 1(1): 3, (1911)
= *Pinus sinensis* var. *densata* (Mast.) Shaw, in: Pl. Wilson. 2(1): 17, (1914)
= *Pinus tabuliformis* var. *densata* (Mast.) Rehder, in: J. Arnold Arbor. 7(1): 23, (1926)

其它信息

生境

海拔2600—3500米向阳山坡或河流两岸组成单纯林。其垂直分布较云南松为高，在森林的下级(即海拔3000米以下)往往与云南松、华山松混生。为喜光、深根性树种，能生于干旱瘠薄的环境。

地理分布

青海,四川,西藏,云南

分类文献

Journ. Linn. Soc. Bot. 37: 416. 1906, et in Repert. Sp. Nov. 4: 108. 1907; Shaw in Sarg. Pl. Wilson. 1, 2. 1911, pro parte; Patschke in Bot. Jahrb. 48: 658. 1913; 吴中伦, 植物分类学报5 (3): 149. 图版25. 图12. 1956; 郑万钧等, 中国树木学1: 202. 图90 (5—8). 1961; 中国科学院植物研究所, 中国高等植物图鉴1: 311. 图621. 1972.

经济用途

木材较坚韧，质较细，富树脂。可供建筑、板材等用。树干可割取树脂。可作四川西部、西藏东部高山地区的造林树种。

近似物种

本种地理分布北接油松分布区的南缘(四川西北部、青海南部)，南依云南松的北界(云南西北部、四川西南部、西藏东部)。在形态特征上，高山松介于油松和云南松之间，但更多地接近油松，因此有些植物分类学工作者把高山松作油松的一个变种，甚至错误地鉴定成油松。实则这三种松树有本质上的差异，分布区也互不相同。

中国科学院植物研究所网络信息中心网络部负责植物学相关的生物多样性信息学项目的建设。目前致力于中国高等植物名录数据库、中国数字植物标本馆、中国植物图像库、网络生命大百科全书中国高等植物数据中心的建设和开发任务。

访问记录

Live Traffic Feed

- A visitor from Beijing arrived 6 mins ago
- A visitor from Beijing viewed '中国高等植物信息系统-物种详细信息' 1 hour 26 mins ago
- A visitor from Beijing arrived 2 hours 12 mins ago
- A visitor from Beijing arrived 4 hours 12 mins ago
- A visitor from Beijing arrived 6 hours 59 mins ago
- A visitor from Japan viewed '中国高等植物信息系统-物种详细信息' 8 hours 6 mins ago
- A visitor from Columbus, Ohio viewed '中国高等植物信息系统-物种详细信息' 16 hours 1 min ago
- A visitor from Quarry Bay viewed '中国高等植物信息系统-物种详细信息' 16 hours 31 mins ago
- A visitor from Shenyang, Liaoning viewed '关于我们' 19 hours 26 mins ago
- A visitor from London viewed '中国高等植物信息系统-物种详细信息' 22 hours 14 mins ago

Real-time view · Menu



Database and Website: CNPC



<http://www.cnpc.ac.cn/taxa/details/29486>

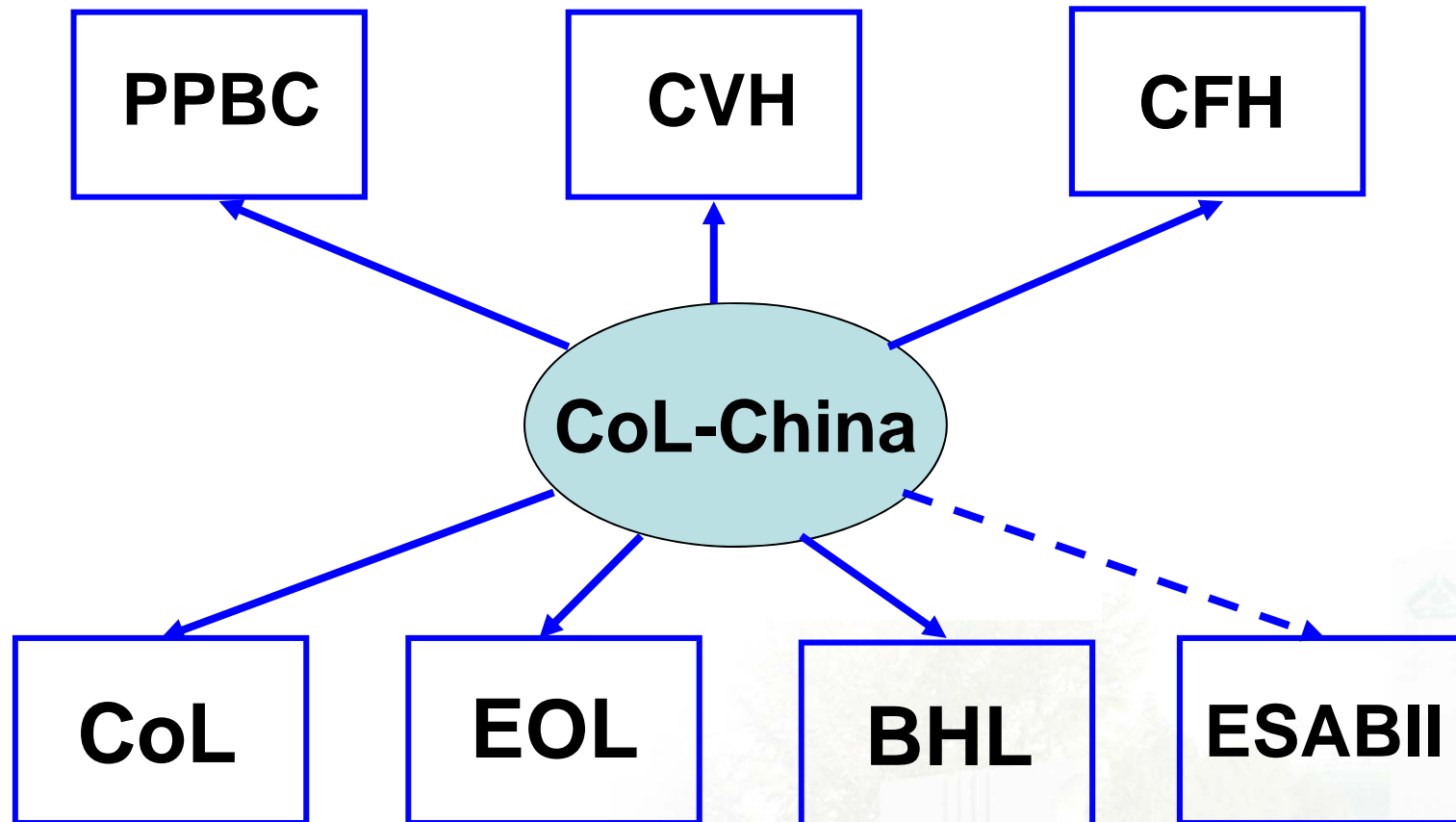
<http://www.cnpc.ac.cn/taxa/show/29486.xml>

```
- <taxon>
  <dc:identifier>29486</dc:identifier>
  <dc:source>http://www.cnpc.ac.cn/Taxa/Details/29486</dc:source>
  <dc:Kingdom>Plantae</dc:Kingdom>
  <dc:Phylum>Gymnospermae</dc:Phylum>
  <dc:Class>Ginkgopsida</dc:Class>
  <dc:Order>Ginkgoales</dc:Order>
  <dc:Family>Ginkgoaceae</dc:Family>
  <dc:Genus>Ginkgo</dc:Genus>
  <dc:ScientificName>Ginkgo biloba L. (1771)</dc:ScientificName>
  <commonName xml:lang="zh">银杏</commonName>
  <commonName xml:lang="zh">白果</commonName>
  <commonName xml:lang="zh">公孙树</commonName>
  <commonName xml:lang="zh">鸭脚子</commonName>
  <commonName xml:lang="zh">鸭掌树</commonName>
  <synonym relationship="synonym">Salisburia adiantifolia Sm.</synonym>
  <synonym relationship="synonym">Salisburia biloba Hoffmanns.</synonym>
  <dc:terms:created>2010/5/21</dc:terms:created>
  <dc:terms:modified>2010/5/21</dc:terms:modified>
  <reference>Mant. Pl. 2: 313-314</reference>
- <dataObject>
  <dataType>http://purl.org/dc/dcmitype/Text</dataType>
  <mimeType>text/html</mimeType>
  <agent homepage="www.cnpc.ac.cn" logoURL="http://192.168.70.69:8080/UserFile/eolchina/cnpc/cnpc_logo.gif" role="project">中国高等植物信息系统</agent>
  <license>http://creativecommons.org/licenses/by-nc-sa/3.0/</license>
  <dc:terms:rightsHolder>中国科学院植物研究所</dc:terms:rightsHolder>
  <subject>http://rs.dwg.org/ontology/voc/SPMInfoItems#Distribution</subject>
  <dc:description xml:lang="zh">安徽,福建,甘肃,贵州,河北,河南,湖北,江苏,江西,陕西,山东,山西,四川,云南,浙江</dc:description>
- <dataObject>
  <dataType>http://purl.org/dc/dcmitype/Text</dataType>
  <mimeType>text/html</mimeType>
```

挑战 Challenges

- **Centralized or distributed system?**
- **Foster an active and project-based community across participated institutions, not just data provider**
- **Build strong link with practical research activities**
- **Increase database supported outputs**

Connections with National and International Programmes



图库简介

中国植物图像库 (Plant Photo Bank of China, PPBC) 是专门系统收集、整理并长效保存植物照片、幻灯片、数码图片的实体库, 公众获取中国植物图片信息的平台。 [详细信息](#)

图库收录统计

已收录图片433669幅, 审核通过422815幅, 初步鉴定257239幅
分属300科, 2544属, 11301种

访问统计

2009年总访问量9400097
昨日访问量 2114IP 29325页
今日访问量 1282IP 19355页
在线人数 72人

各省图片

北京 天津 上海 重庆 河北 山西
辽宁 江苏 浙江 安徽 福建 江西
山东 河南 湖北 湖南 广东 广西
海南 四川 贵州 云南 西藏 青海
宁夏 新疆 陕西 甘肃 吉林 黑龙江 内蒙古 香港 澳门 台湾

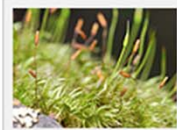
专题分类

▶ [兰科](#) [百合科](#) [杜鹃花科](#)

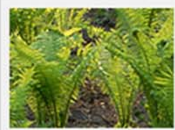
2010年3月24日



植物分类



苔藓植物



蕨类植物



裸子植物



被子植物

用户登录

用户名:

密码:

! 本版数据截止至2010年3月24日, 本版本仅供浏览, 请大家不要提交修改数据!

注册用户须知:

1. 真实身份注册, 签订协议确认身份后帐号才能得到通过。
2. 注册用户可以发表评论, 鉴定图片, 上传并管理自己的图片形成图集

发图榜

01. 徐克学 3168种 (225科, 1184属)
02. 刘冰 3146种 (224科, 1295属)
03. 陈又生 2666种 (191科, 942属)
04. 马炜梁 1787种 (234科, 1032属)
05. 尤水雄 1690种 (196科, 974属)

[>>更多](#)

最新五个鉴定

最新五条评论

王正元: 把[中华叉柱兰]鉴定为[云南叉柱兰/Cheirostylis yunnanensis



CFH首页 | CFH图库 | CFH自然标本馆图库



CFH用户指南

- 【04月18日】CFH相册及照片的共享权限设置
- 【04月18日】相册与照片的团队共享设置
- 【04月18日】推荐使用世界之窗浏览器查看CFH
- 【04月18日】有关CFH的最新信息
- 【04月18日】在CFH平台创建自己的网站
- 【04月18日】CFH图片的物种鉴定
- 【04月18日】野外调查数据坐标的计算与显示
- 【04月18日】CFH物种库的说明
- 【04月18日】图片的上传与信息批量设置
- 【04月18日】生物数字标本的概念和数字标本馆的建设

CFH更新通告

- 【06月03日】CFH论坛集成开发成功并开通
- 【05月26日】改进：允许匿名用户访问个人图库
- 【05月26日】改进：未鉴定照片显示原始名
- 【05月26日】Bug修复：批量引用的版权信息
- 【05月19日】更新：批量鉴定后刷新网页的方式
- 【05月10日】新增功能：显示照片原始文件名
- 【05月05日】新增功能：按地名查询照片并连续浏览
- 【05月04日】查询结果照片的连续浏览
- 【05月01日】新增物种照片浏览器
- 【04月24日】新增相册引用及相册信息开关按钮

物种检索

中名或俗名:

资源统计

- 相册总数: 4085 个
- 照片总数: 1232863 张
- 鉴定照片: 615532 张
- 鉴定名称: 18162 个 [+]
- 今日上传: 107 张
- 注册用户: 1923 人

资源索引

- 发图排行榜
- 鉴定排行榜
- 物种照片分类树
- 用户相册树



Internet

100%

中国自然标本馆 CFH



中国科学院植物研究所
INSTITUTE OF BOTANY, THE CHINESE ACADEMY OF SCIENCES



- 01 yanyh 75668张
- 02 张金龙 64211张
- 03 林秦文 62703张
- 04 陈彬 60626张



陈彬

中国科学院植物研究所

个人相册

- 05 feng 52370张
- 06 Hezuxia 49347张
- 07 刘冰 46181张
- 08 于胜祥 44981张
- 09 南程慧 38612张
- 10 Abies 27791张



友情链接

- 中国数字植物标本馆
- 《中国植物志》
- 普兰塔

自动化的功能体系

Major functions of CFH



- 物种名称与分类系统管理 Management of naming and classification system
- 互动在线鉴定 On-line interactive key
- 自动编目 Automatic checklist system
- WebGIS系统 WebGIS system
- 子站定制 Creation of CFH branch
- 百科系统 Encyclopedia of CFH
- 网络社区 Forum



中名或俗名

拉丁学名

Solanum tuberosum

物种库条目：

马铃薯 Solanum tuberosum

查询

显示物种详情

中名或俗名

马铃薯

拉丁学名

物种库条目：

马铃薯 Solanum tuberosum

查询

显示物种详情

中名或俗名

土豆

拉丁学名

物种库条目：

落花生 Arachis hypogaea

马铃薯 Solanum tuberosum

黄独 Dioscorea bulbifera

蒟蒻 Tadehagi pseudotriquetrum

蒟蒻 Tadehagi triquetrum

查询

显示物种详情

CFH 物种信息卡

Solanum tuberosum Linn.

马铃薯



显示大图 共有18 张照片

学名：Solanum tuberosum Linn.

中名：马铃薯

引用：<http://www.cfh.ac.cn/31846.spid> [复制](#)

照片集引用：<http://www.cfh.ac.cn/31846.spalbum> [复制](#) [打开照片集](#)

科信息：Solanaceae 茄科

属信息：Solanum 茄属

在分类系统中的位置：

1. Engler系统的茄科Solanaceae
2. Hutchinson系统的茄科Solanaceae

该节点下的分类子树：

[Solanum tuberosum Taxon Tree](#)

别名：

马铃薯 土豆 洋芋 阳芋 宝贝蛋 茨仔 地蛋 荷兰薯 马铃薯 山洋芋 山药蛋 山药豆 薯仔 图木苏 洋山芋



CFH首页 | 物种库

查询提示：在“中名或俗名”框里输入中文名，或者在“拉丁学名”框里输入不带命名人的拉丁名，然后点击“查询”按钮，确认要检索的目标种之后点击“显示物种详情”按钮。

中名或俗名

拉丁学名

物种库条目：
 锥栗 *Castanea henryi*
 甜槠 *Castanopsis eyrei*

查询

显示物种详情





- 照片管理
- 照片信息
- 物种鉴定
- 照片评论
- 显示地图
- 同物种照片
- 同地区照片
- 同采集号照片
- 同标本号照片



1:1

✂️ 📁 🔄 📄 ⬇️

⏪ ⏩

Castanopsis eyrei (Champ.) Tutch.

甜槠

鉴定人: ssxx

采集人: 半桶水 地点: 时间: 2010-1-4 15:48:20

- 照片管理
- 显示地图
- 照片信息
- 引用信息
- 物种鉴定
- 照片评论
- 同采集号照片
- 同自然标本号照片
- 同物种照片
- 同地



Castanopsis eyrei
甜槠



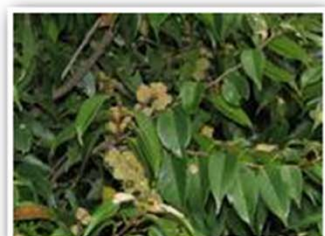
Castanopsis eyrei
甜槠



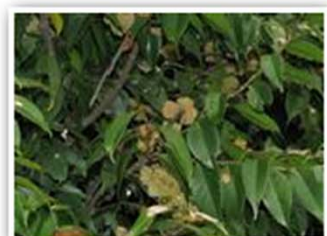
Castanopsis eyrei
甜槠



Castanopsis eyrei
甜槠



Castanopsis eyrei
甜槠



Castanopsis eyrei
甜槠



Castanopsis eyrei
甜槠



Castanopsis eyrei
甜槠



Castanopsis eyrei
甜槠



Castanopsis eyrei
甜槠



Castanopsis eyrei
甜槠



Castanopsis eyrei
甜槠



照片管理

显示地图

照片信息

引用信息

物种鉴定

照片评论

同采集号照片

同自然标本号照片

同

请为当前照片添加鉴定标签：27dff68-8ea2-4969-8ee0-6124cf20bc17



假酸浆

2048 × 1536

鉴定历史

刷新列表

添加鉴定

Solanaceae 茄科

Nicandra 假酸浆属

Nicandra physalodes (Linn.) Gaertn. 假酸浆

鉴定人：陈彬

鉴定时间：2010-03-30



0



0



×

Solanaceae 茄科

Physalis 酸浆属

Physalis alkekengi Linn. 酸浆

鉴定人：毛岭峰-植物狂人

鉴定时间：2009-10-09



0



0



×

通过物种库鉴定

提交临时鉴定（当前物种库中没有收录时）

学名

俗名

鉴定备注

签名

查询物种

提交正式鉴定

Nicandra physalodes

假酸浆

采集人：毛岭峰

照片管理

显示地图



白背叶 *Mallotus apelta*



学名:[Mallotus apelta](#)

中名:[白背叶](#)

作者:[陈彬](#)

拍摄时间:2008-5-14 11:12:22

照片尺寸:1944×1296

[浏览该张照片的大图](#)

[浏览该照片所在相册](#)

[浏览同一物种的照片](#)

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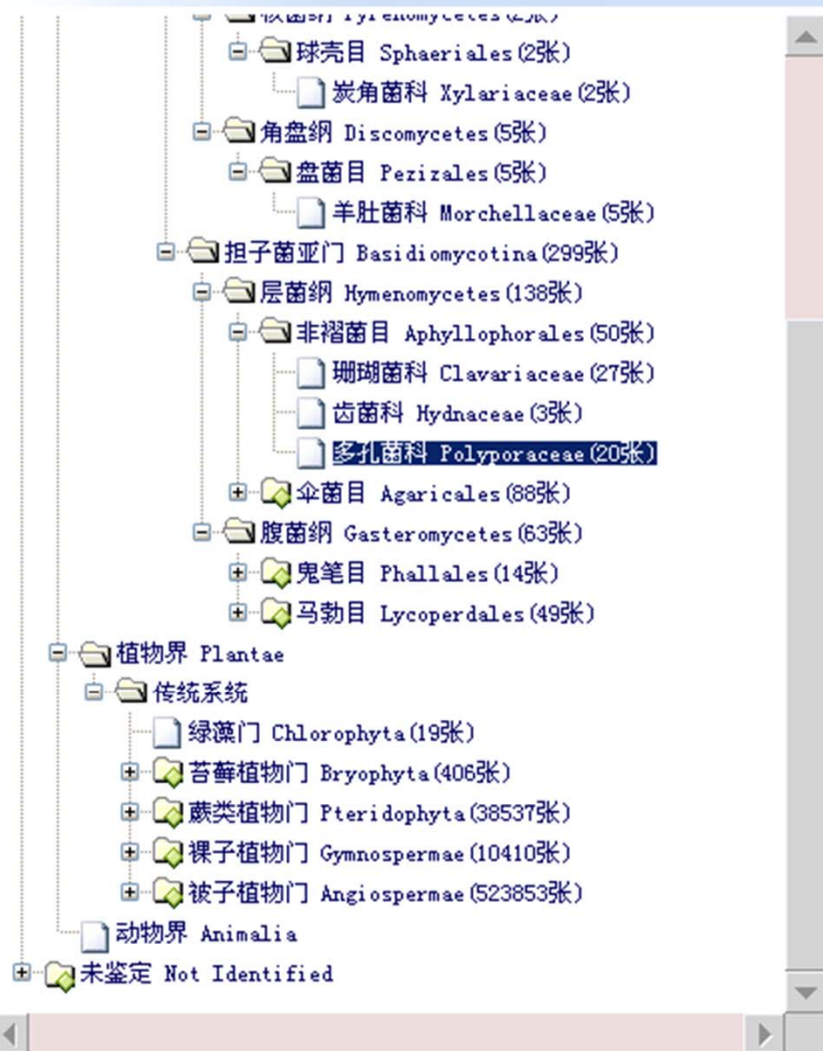
路线：[以此处为终点](#) - [以此处为起点](#)

中国自然标本馆 CFH



中国科学院植物研究所
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CFH首页 | CFH图库 | 物种照片统计



提示：单击选择框选定照片，或者按下鼠标划过照片一次性选择多张。

批量引用

批量鉴定

批量删除

[【清除选择】](#)

共有 20张照片



Polyporaceae

多孔菌科



Polyporaceae

多孔菌科



Polyporaceae

多孔菌科



Polyporaceae

多孔菌科



36 个子站点 CFH branches



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教你认植物 站长: 精思入神



丽娃草木 站长: Celtis



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行摄峨眉 站长: 丫头



华南植物园 站长: allon

数据统计 Statistics (2010-10-22)



- 注册用户 Registered users: 2192
- 照片总数 Total No. of photos: 1.42 M
1/3 georeferenced
- 鉴定照片 Photos identified: 0.703 M
- 鉴定名称 No. of species: 18956
- 平均日增 Photos uploaded per day: 2000



Biodiversity Informatics Projects hosted by IBCAS



中国科学院植物研究所
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1. Chinese Virtual Herbarium, CVH
2. Catalogue of Life-Higher Plants in China, CNPC
3. Plant Photo Bank of China, PPBC
4. Chinese Field Herbarium, CFH
5. Biodiversity Heritage Library China Node, BHL-China
6. China Plants Red List
7. Encyclopedia of Life: China Regional Center-Plants Data Center
8. Species 2000 China Node



China Regional Center



Encyclopedia of Life



请输入标本资源中文名

检索

国家标本资源共享平台

推荐标本

标本资源状况(测试数据, 2009-4-30)
 资源平台子系统: 6个
 参与单位: 137家
 标本总数: 477 181份 (详细情况)

标本资源平台子系统



凤头鹰普通亚种(动物) 松果菊(教学) 藏南绣线菊(植物) 冰藻样品(极地) 铜铅矿(岩石矿物)

-  中国数字植物标本馆
-  国家动物数字博物馆
-  教学标本资源共享平台
-  保护区标本共享网站
-  国家岩矿化石标本资源网
-  极地标本资源共享平台

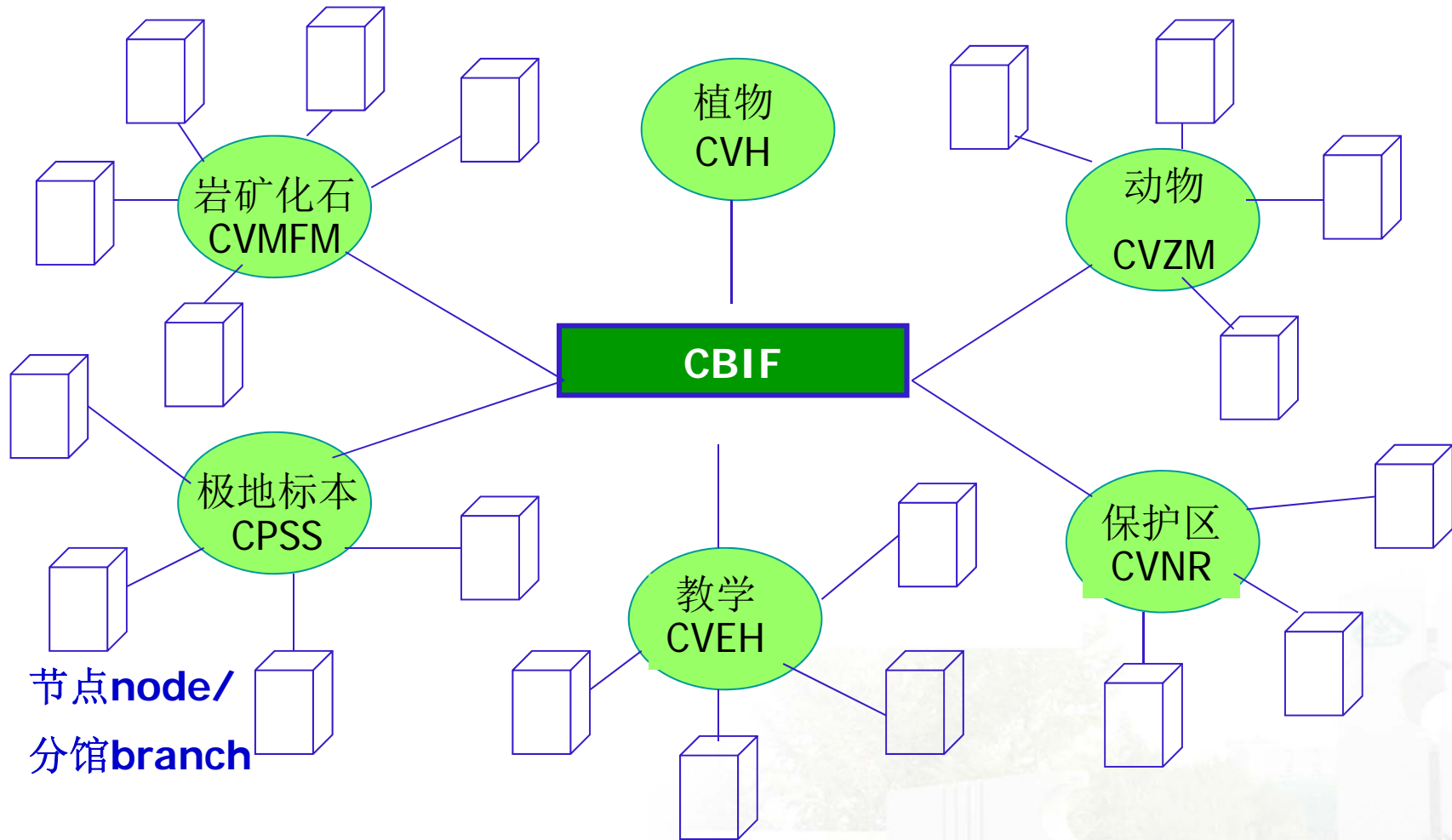
图片新闻



相关链接

国家自然科技资源平台 GBIF

China Biodiversity Information Facility 国家标本资源共享平台网络化体系







生物多样性是生命
生物多样性就是我们的生命
BIODIVERSITY IS LIFE BIODIVERSITY IS OUR LIFE



Thanks
谢谢!

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