Mapping Collection Data Based Research

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Institute of Botany, Chinese Academy of Sciences 2018-08-14

国家标本资源共享平台

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国家标本资源共享平台
National Specimen Information Infrastructure

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莫里斯植物园牵头大西洋中部地区植物标本的数字化信息建设   (2018-06-29)

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国际鹤类基金会考察组到鄱阳湖保护区考察   (2017-12-27)

2017国际自然保护地联盟培训交流暨联盟年会在唐家河自然保护区开幕   (2017-10-24)

22位IUCN国际代表"论智"钱江源国家公园   (2017-09-28)

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国家标本平台

子平台公众号
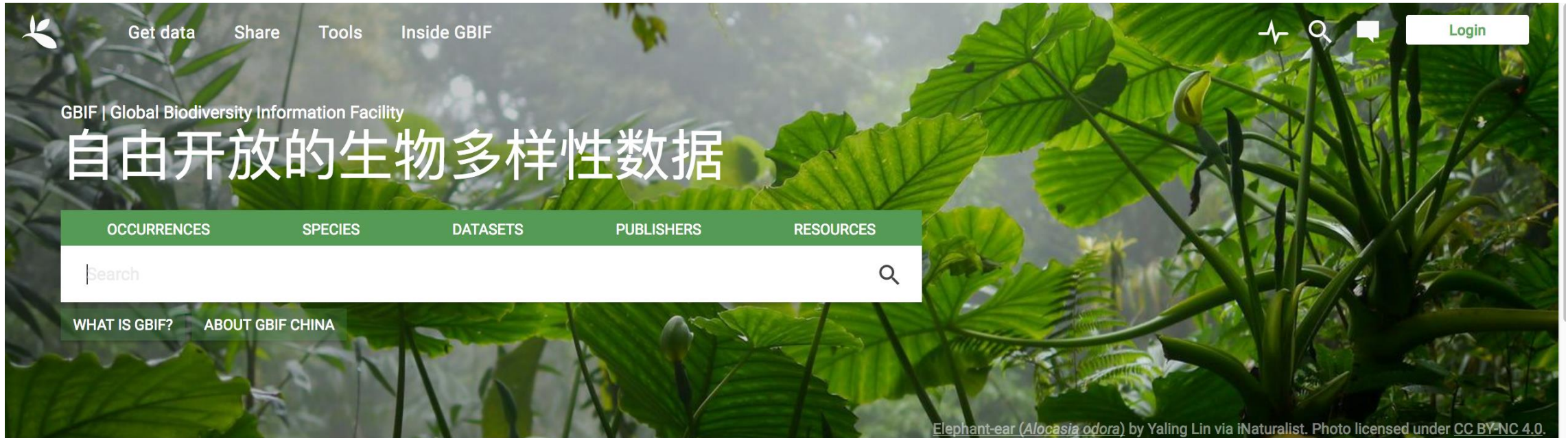
国家标本资源共享平台
National Specimen Information Infrastructure

植物资源	动物资源	地质资源	极地资源	专题资源
名录库	名录库 标本	标本库	植物园街景
标本库	标本库 系统矿物学	科普库	大样地系统
图片库	图片库 古生物群	成果库	保护区名录
性状库	生态图片 矿床	极地科普馆(全景)	保护区科普
中华本草	标本图片 珠宝玉石		模型和工作流
精细解剖	物种库 科普		永兴岛标本数据集
高等植物名录	精细解剖		GBIF上的中国数据
术语图解	文献库		课件与学术视频资源
模式标本	专题库		
综合志书	红外相机库		
	中国动物志		

GBIF | Global Biodiversity Information Facility

Peer-reviewed publications using GBIF-mediated data

Year	Value	Projected
2017	212	636
2016	428	
2015	407	
2014	350	
2013	249	
2012	229	
2011	169	
2010	148	
2009	89	
2008	52	

■ Peer-reviewed publications using GBIF-mediated data   ■ Year to date (projected)
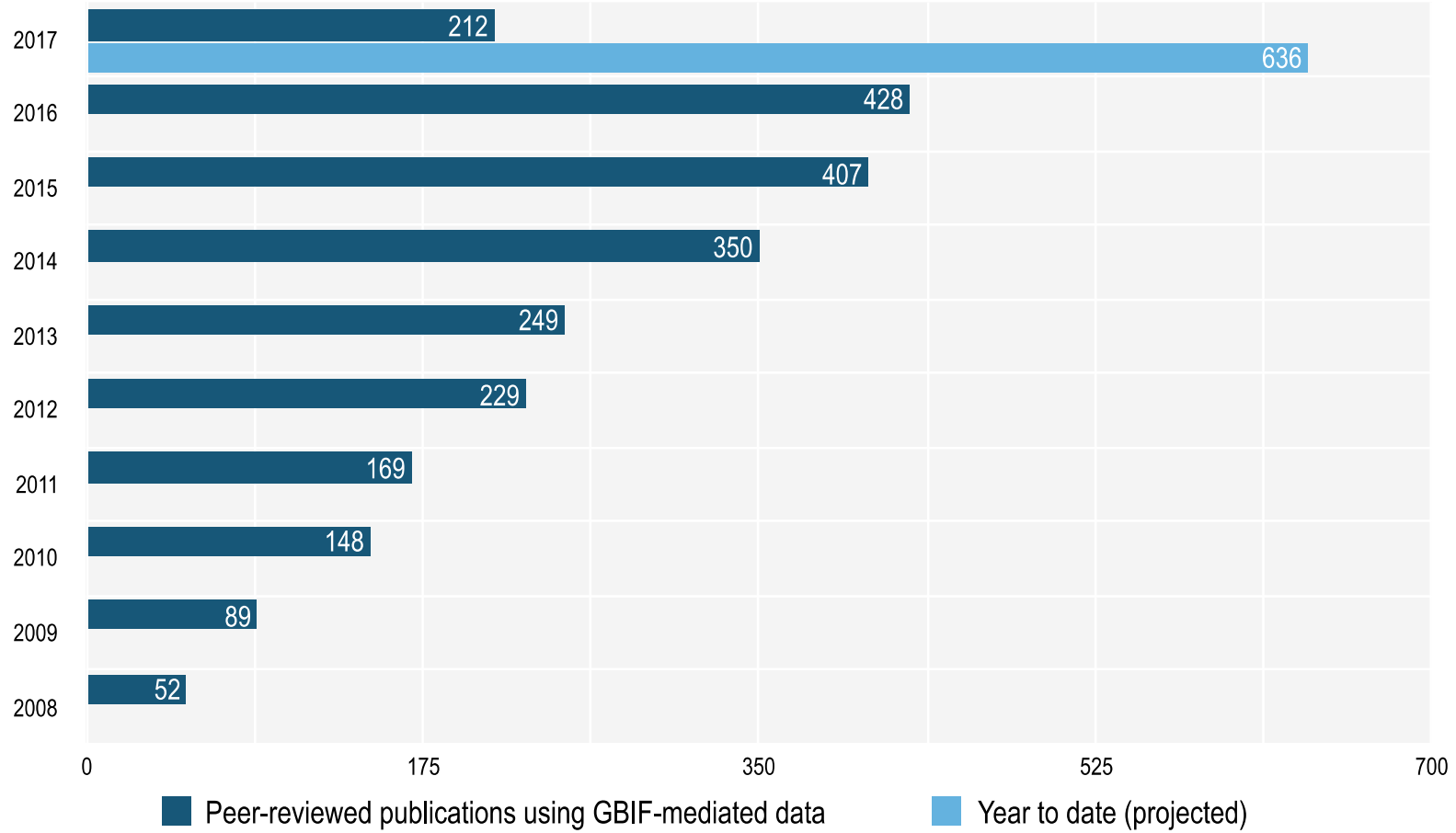
利用GBIF数据发表论文的主题

Invasive alien species ....

Impacts of climate change ....

Species conservation and protected areas .

Biodiversity and human health.....................

Food, farming and biofuels ....

Advancing biodiversity science ....

Mapping Collection Data Based Research

- Conservation

- Climate change

- Invasion ecology

- Biological association

- Phenology

- Biogeography

- Taxonomy

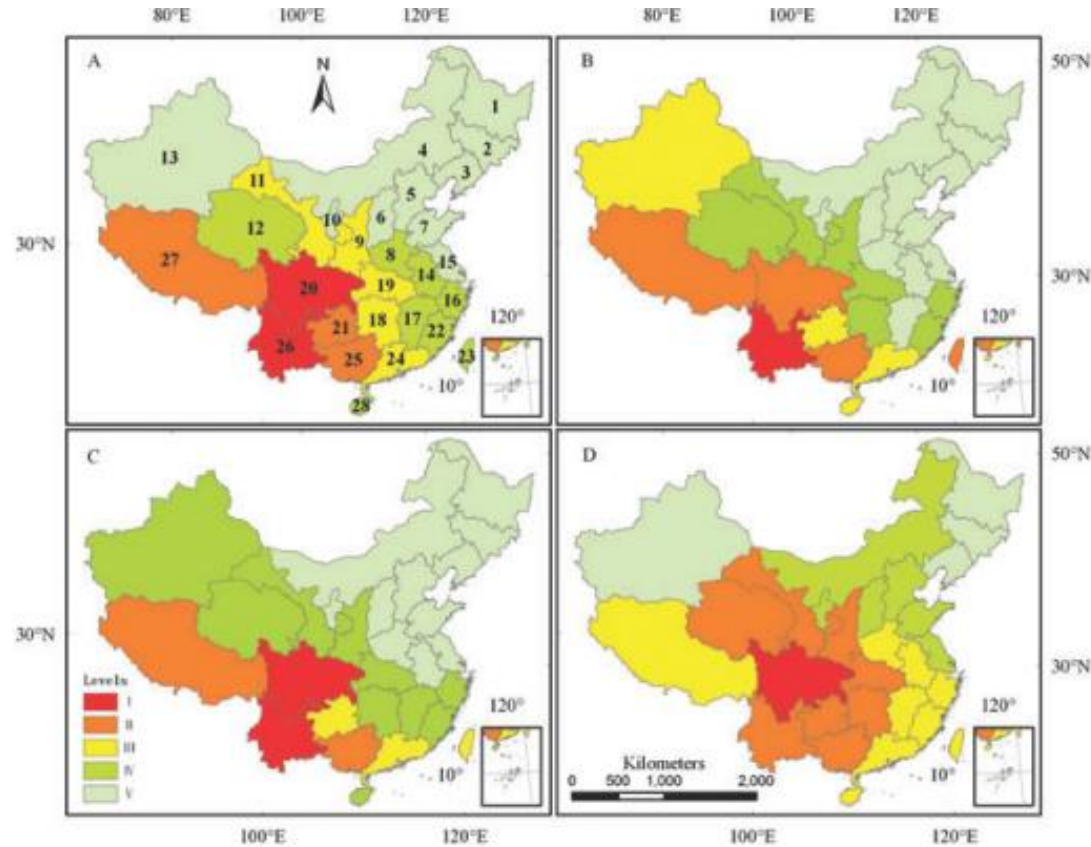# Distribution of Endemic Plants in China

Fig. 3. Distribution of Chinese endemic species diversity by province as an operable geographical unit. A, Chinese endemic species richness. 1, Heilongjiang; 2, Jilin; 3, Liaoning; 4, Neimenggu; 5, Hebei; 6, Shanxi; 7, Shandong; 8, Henan; 9, Shaanxi; 10, Ningxia; 11, Gansu; 12, Qinghai; 13, Xinjiang; 14, Anhui; 15, Jiangsu; 16, Zhejiang; 17, Jiangxi; 18, Hunan; 19, Hubei; 20, Sichuan; 21, Guizhou; 22, Fujian; 23, Taiwan; 24, Guangdong; 25, Guangxi; 26, Yunnan; 27, Xizang; 28, Hainan. B, Local (provincial) endemic species richness. C, Weighted endemism. D, Proportion of endemism. The Chinese administrative map was downloaded from the National Fundamental Geographic Information System in China (http://nfgis.nsdi.gov.cn/nfgis/chinese/c_xz.htm). Levels I–V represent five levels for each of the above four indices using Jenks' optimization method (Jenks, 1967).

Families: 193

Genera: 1513

Species: 15103

SCIENTIFIC REPORTS

Diversity distribution patterns of Chinese endemic seed plant species and their implications fo conservation planning

Jihong Huang[1,2,3], Jianhua Huang[4], Xinghui Lu[1,2] & Keping Ma[3]

Endemism is an important concept in biogeography and biodiversity conservation. China is of the richest countries in biodiversity, with very high levels of plant endemism. In this stud analysed the distribution patterns of diversity, the degree of differentiation, and the enden Chinese endemic seed plants using the floristic unit as a basic spatial analysis unit and 11 in analysis was based on distribution data of 24,951 native seed plant species (excluding subsp varieties) and 12,980 Chinese endemic seed plant species, which were sourced from both sp records and published references. The distribution patterns of Chinese endemic flora were g consistent but disproportionate across China for diversity, degree of differentiation and end The South Hengduan Mountains Subregion had the highest values for all indices. At the reg both the Hengduan Mountains and the Central China regions were highest in diversity and of differentiation. However, both the rate of local endemic to native species and the rate of to Chinese endemic species were highest in the Taiwan Region and the South Taiwan Regio Hengduan Mountains Region and the Central China Region are two key conservation priorit Chinese endemic seed plants.
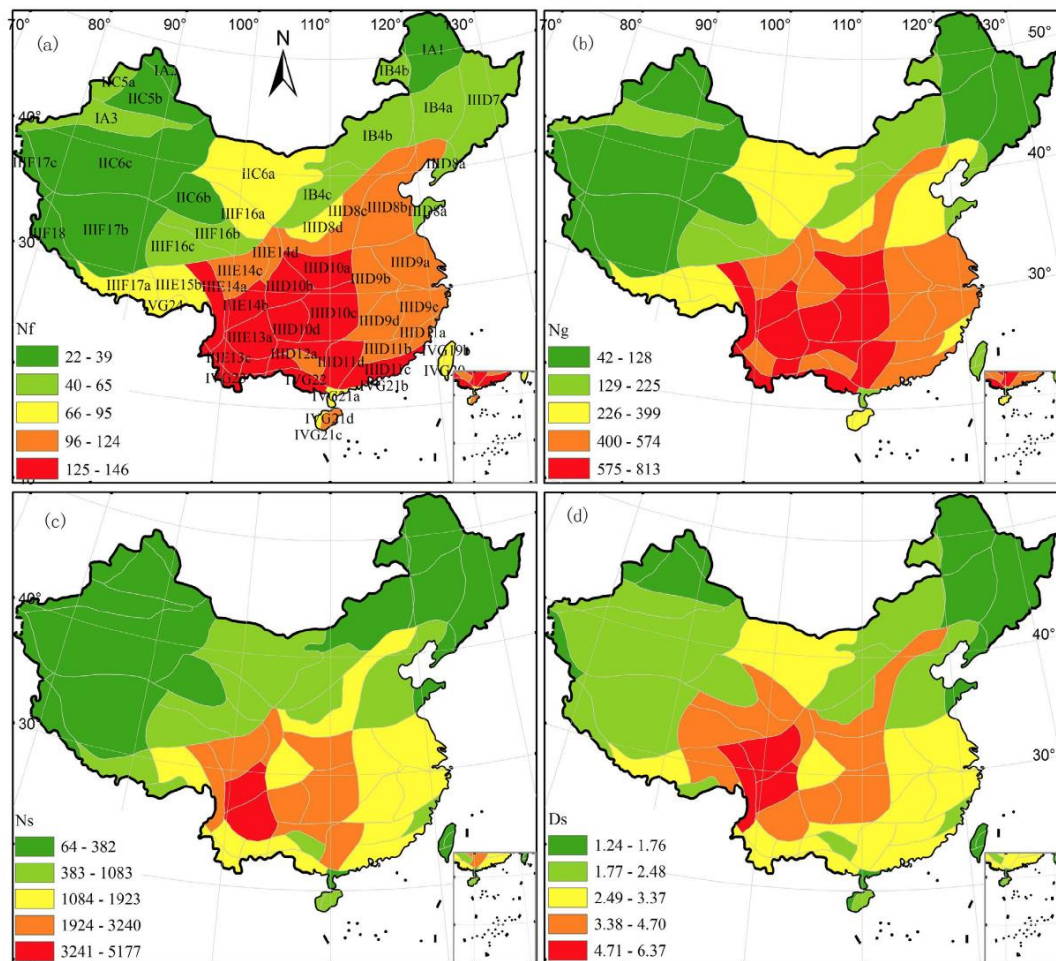
Distribution of biodiversity and differentiation indices across Chinese floristic units.
(**a**) N_f = number of families of Chinese endemic seed plants, (**b**) N_g = number of genera of Chinese endemic seed plants, (**c**) N_s = number of species of Chinese endemic seed plants, (**d**) D_s = degree of species differentiation among Chinese endemic seed plants, (**e**) D_g = degree of genus differentiation among Chinese endemic seed plants, and (**f**) D_{sf} = degree of species–family differentiation of Chinese endemic seed plants. Five levels for each index were categorized using the Natural Breaks (Jenks) method in ArcGIS. Albers projection. The subregion codes on the map are consistent with those provided in Table 1. The map was generated using ArcGIS 9.3 (ESRI, Redlands, CA, USA; http://www.esri.com).

BIODIVERSITY
RESEARCH
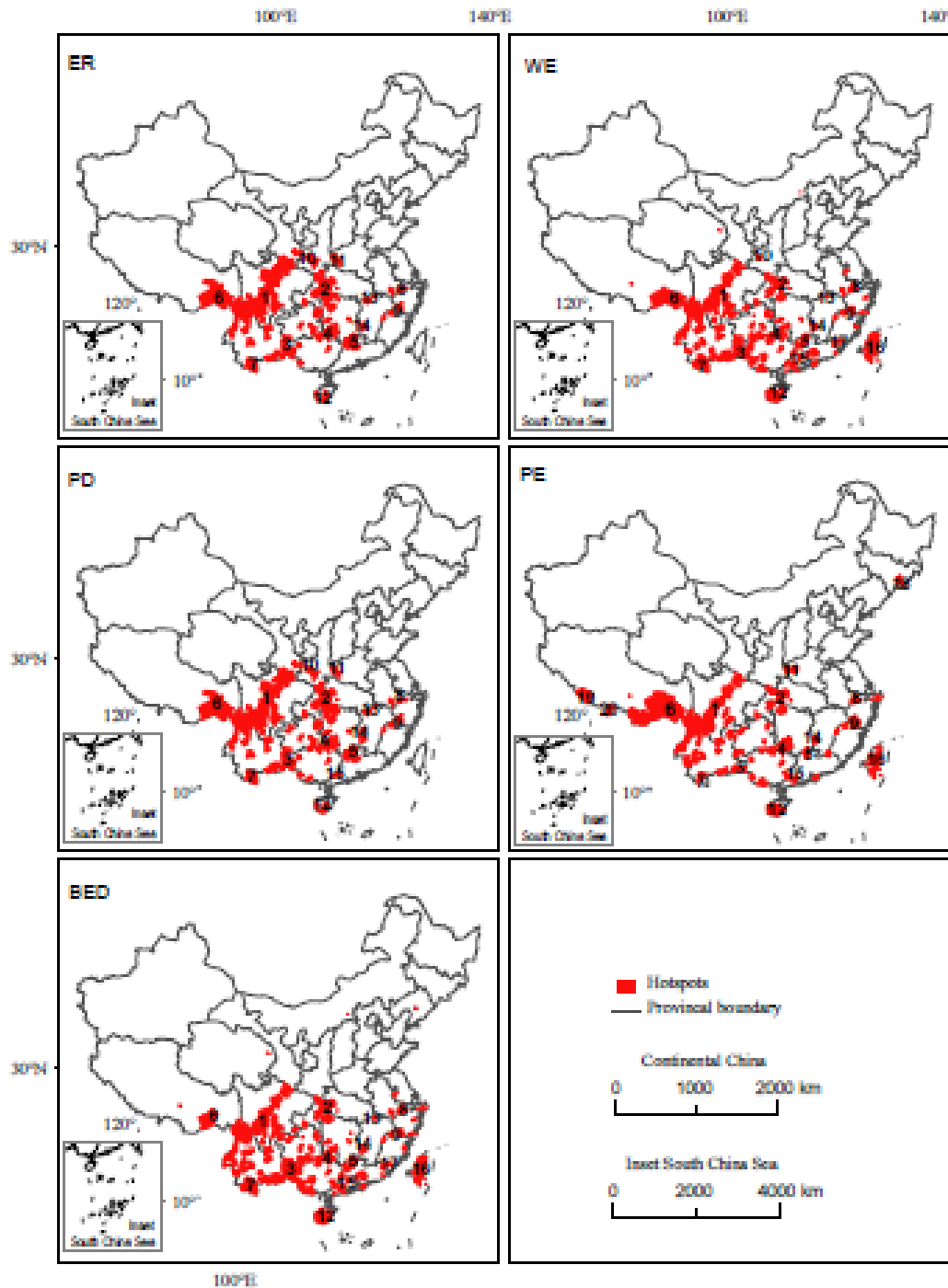
Identifying hotspots of endemic woody seed plant diversity in China

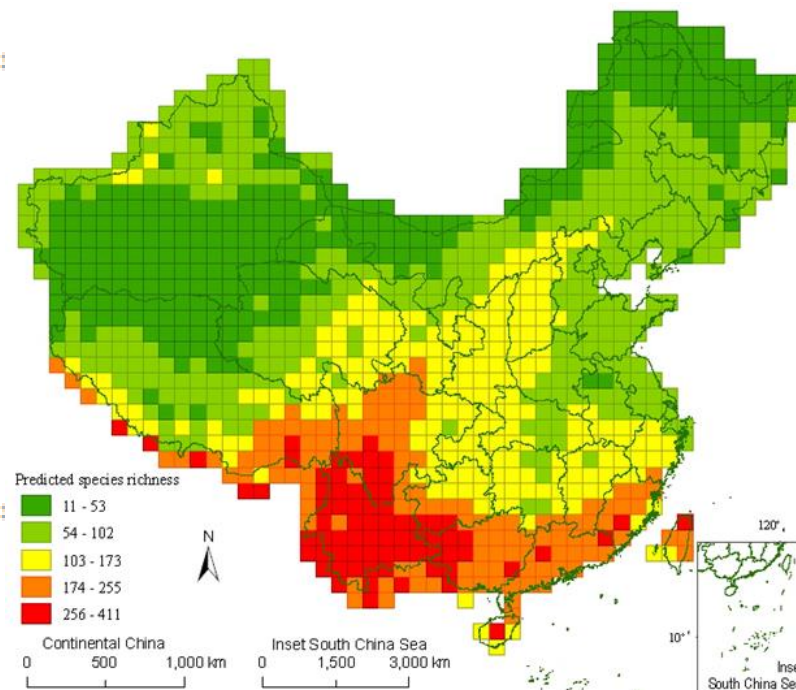Jihong Huang[1,2]†, Bin Chen[1,2,3]†, Canran Liu[4], Jiangshan Lai[1], Jinlong Zhang[1] and Keping Ma[1]*

Predicted species richness
- 11 - 53
- 54 - 102
- 103 - 173
- 174 - 255
- 256 - 411

Continental China
0 — 500 — 1,000 km

Inset South China Sea
0 — 1,500 — 3,000 km

Inset South China Sea

Hotspots
Provincial boundary

Continental China
0 — 1000 — 2000 km

Inset South China Sea
0 — 2000 — 4000 km

Figure 3 Geographic distribution of hotspots identified with five diversity indices for Chinese endemic woody seed plant species (CEWSPS). Five indices include endemic richness (ER), weighted endemism (WE), phylogenetic diversity (PD), phylogenetic endemism (PE), and biogeographically weighted evolutionary distinctiveness (BED). For each diversity index, hotspots are defined with local maximization method at the 5% level of area. Albers projection. Hotspot centre codes are consistent with Table 5.

Diversity and **Distributions**

Diversity hotspots and conservation gaps for the Chinese endemic seed flora

Jihong Huang [a,b,c], Jianhua Huang [d], Canran Liu [e], Jinlong Zhang [f], Xinghui Lu [a,b,c], Keping Ma [b,*]

[a] Key Laboratory of Forest Ecology and Environment, State Forestry Administration, Institute of Forest Ecology, Environment and Protection, Chinese Academy of Forestry, Beijing 100091, China
[b] State Key Laboratory of Vegetation and Environmental Change, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China
[c] Co-Innovation Center for Sustainable Forestry in Southern China, Nanjing Forestry University, Nanjing 210037, China
[d] School of Economics, Minzu University of China, Beijing 100081, China
[e] Arthur Rylah Institute for Environmental Research, Department of Environment, Land, Water and Planning, Heidelberg, Victoria 3084, Australia
[f] Flora Conservation Department, Kadoorie Farm and Botanic Garden, Lam Kam Road, Taipo, NT, Hong Kong, China

ARTICLE INFO

ABSTRACT

The flora in China is highly endemic. Decisions about conservation and management of biodiversity based on hotspots and conservation gaps of endemic seed plant species diversity in China are essential. In this paper, based on a species distribution data set with 12,824 Chinese endemic plants, we measured Chinese endemic seed plant diversity using five indices: endemic species richness (ER), weighted endemism (WE), phylogenetic diversity (PD), phylogenetic endemism (PE), and biogeographically weighted evolutionary distinctiveness (BED). Five percent of China's total land area with the highest biodiversity was used to identify hotspots for each index. In total, 19 hotspots covering 7.96% of China's total land area were identified. Most hotspots are located in mountainous areas, mainly in the Qinling Mountains and further south or in the Hengduan Mountains and to the east in China. Nine hotspots are identified with all five indices. These hotspots include the Hengduan Mountains, the Xishuangbanna Region, the Qinling Mountains, southwest Chongqing, and five mountainous areas (located in east Chongqing and west Hubei; in east Yunnan and west Guangxi; in north Guangxi, southeast Guizhou and southwest Hunan; in north Guangdong and south Hunan; and in southeast Tibet, respectively). Furthermore, we detected conservation gaps for hotspots of Chinese endemic seed flora by overlaying national nature reserves with the identified hotspots, and we designated priority conservation gaps for hotspots by overlaying global biodiversity hotspots with conservation gaps for hotspots. Most hotspots for Chinese endemic seed plant species are badly protected. Only 26.48% of the hotspot areas of Chinese endemic seed plant species were covered by nature reserves. We suggest that it is essential to pay more attention to herbaceous plants in biodiversity conservation, and to promote a network function of nature reserves within these hotspots in China.

Distribution and conservation of orchid species richness in China

Zejin Zhang [a], Yujing Yan [a], Yu Tian [b], Junsheng Li [b], Jin-Sheng He [a], Zhiyao Tang [a,*]
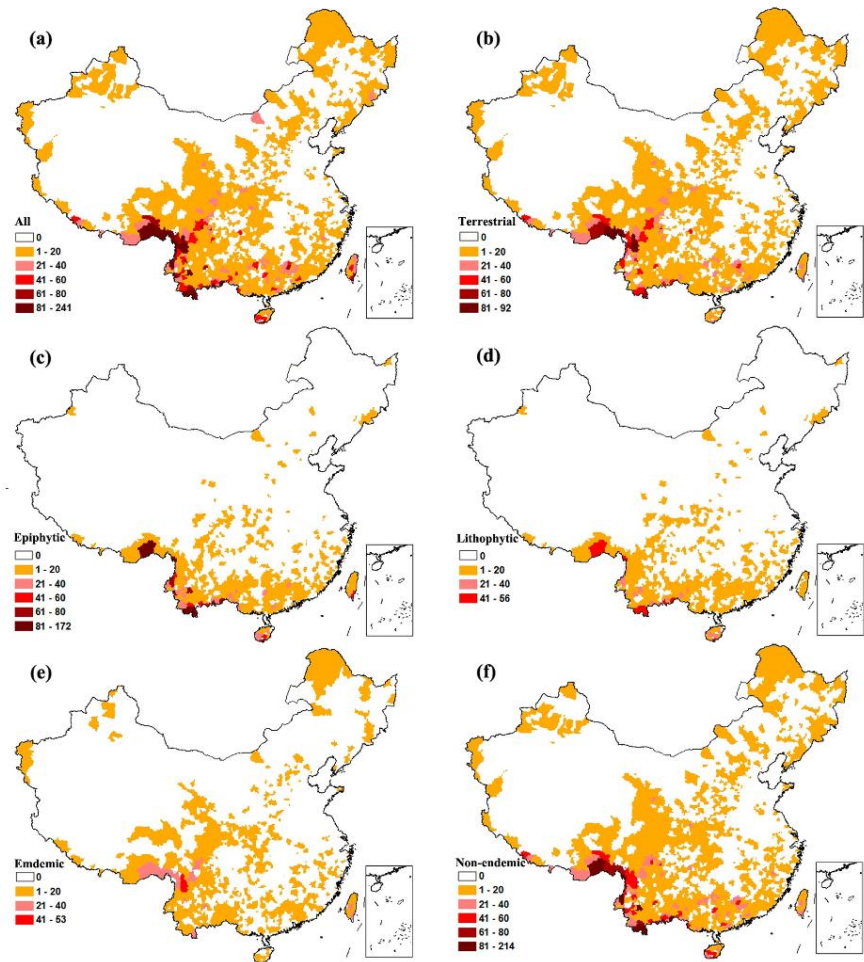
Distribution of orchid richness in China:

(a) all orchids,

(b) terrestrial orchids,

(c) epiphytic orchids,

(d) lithophytic orchids,

(e) orchids endemic to China,

and (f) orchids

non-endemic to China.

Integrated maps of biodiversity in the Qinling Mountains of China for expanding protected areas

Yin-bo Zhang [a,b], Yu-zhuo Wang [a], Nathan Phillips [b], Ke-ping Ma [c], Jun-sheng Li [d], Wei Wang [d]

[a] Institute of Loess Plateau, Shanxi University, Taiyuan 030006, China
[b] Department of Earth and Environment, Boston University, Boston, MA 02215, USA
[c] Laboratory of Vegetation and Environmental Change, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China
[d] Biodiversity Research Center, Chinese Research Academy of Environmental Sciences, Beijing 100012, China

ARTICLE INFO

ABSTRACT

Habitat fragmentation and loss is the main cause of species extinction; thus, the appropriate placement of protected areas is critical for saving vulnerable and threatened species. However, how to expand the existing protected areas network for improving conservation efficiency is a vital concern. We examined the Qinling Mountains — a widely recognized biogeographic treasure in China and East Asia, to identify key biodiversity areas (KBAs) and compare them with existing protected areas. We focused on 259 key protected wild plant and animal species and modeled species distributions with elevation and habitat preference. We then adapted two established algorithms (biodiversity hotspots of species richness [BHSR] and systematic conservation planning [SCP]) to identify priority areas, respectively. Results from these two algorithms addressed two conservation criteria: "represented" single species and "well-represented" species assemblages. SCP showed better performance (~90%) than BHSR (~78%) using the "represented" criterion covering a small portion (~8%) of the total region; conversely, BHSR showed better performance (~61%) than SCP (~55%) using the "well-represented" criterion. The overlapping priority areas of both methods could achieve an optimal conservation that met dual criteria, which is considered as the candidate KBAs in this study. Surprisingly, we found that 63% of KBAs are not co-occurring with existing national nature reserves (NNRs). We highlight the unoccupied KBAs as deserving additional protection, with a result that the expansion of NNRs to KBAs will increase overall conservation coverage and efficiency. The integrated method developed here can be used generally as a repeatable and quantitative assessment framework to be implemented in protected areas network expansion and planning, in China and beyond.

Distribution and conservation of threatened plants in China

CrossMark

Zejin Zhang [a], Jin-Sheng He [a,b], Junsheng Li [c], Zhiyao Tang [a,b,*]

[a] *Department of Ecology, College of Urban and Environmental Sciences, and Key Laboratory of Earth Surface Processes of Ministry of Education, Peking University, Beijing 100871, China*
[b] *Collaborative Innovation Center for Ecology, Beijing 100871, China*
[c] *Chinese Research Academy of Environmental Sciences, Beijing 100012, China*

ABSTRACT

China is very rich in biodiversity, however, it is also characterized by a long history of civilization. As a result, China has a large number of threatened species. Recently the Chinese government evaluated the living status of plants, and published the China Biodiversity Red List: Higher Plants. However, little is known about how threatened plants are distributed and conserved in China. In this study, we developed a fine resolution distribution database for 3244 threatened plants, explored richness patterns and evaluated the in situ conservation status of the threatened plants by overlapping the species distribution with terrestrial national and provincial nature reserves (NNRs and PNRs) in China. We found the greatest richness of threatened plants in the southwestern region of mainland China (mainly Yunnan, southeastern Xizang and western Sichuan), northwestern Guangxi, northern Guangdong, Hainan Island and the mountainous region of Taiwan, while the lowest richness was found in Qinghai, Hebei, Shandong, Jiangsu and Chongqing Provinces. On average, NNRs covered 18.8%, and NNRs and PNRs together covered 27.5%, of threatened plant distribution areas. However, 827 threatened plants (including 627 species endemic to China) were not covered by NNRs and 397 threatened plants (including 293 endemic to China) were not covered by either NNRs or PNRs. We proposed that nature reserves specifically de-

Rhododendron diversity patterns and priority conservation areas in China

Fangyuan Yu[1] (iD) | **Andrew K. Skidmore[1]** | **Tiejun Wang[1]** (iD) | **Jihong Huang[2]** | **Keping Ma[3]** | **Thomas A. Groen[1]**

[1]Department of Natural Resources, Faculty of Geo-Information Science and Earth Observation, University of Twente, Enschede, The Netherlands

[2]Key Laboratory of Forest Ecology and Environment, the State Forestry Administration, Institute of Forest Ecology, Environmental and Protection, Chinese Academy of Forestry, Beijing, China

[3]State Key Laboratory of Vegetation and Environmental Change, Institute of Botany, Chinese Academy of Sciences, Beijing, China

Correspondence
Fangyuan Yu and Tiejun Wang
Department of Natural Resources, Faculty of Geo-Information Science and Earth Observation, University of Twente, Enschede,

Abstract

Aim: To predict Rhododendron diversity patterns and identify Rhododendron hotspots and priority areas for their conservation.

Location: China.

Methods: We predicted the distribution of 212 Rhododendron species by applying a spatially explicit species assemblage modelling (SESAM) framework on a 10 × 10 km grid across China. We evaluated Rhododendron diversity based on species richness, β-diversity and weighted endemism (also known as range-size rarity), and then identified hotspots formed by the top 1%, 5%, 25% and 50% of record-containing grid cells for each diversity metric separately and for the combination of the three diversity metrics. We determined the priority conservation areas for Rhododendrons by overlaying the hotspots with the map of the 2139 nature reserves existing in China, and calculated the percentage of hotspots that is protected. The same analysis was also

The Sampled Red List Index for Plants, phase II: ground-truthing specimen-based conservation assessments

Neil Brummitt[1], Steven P. Bachman[2], Elina Aletrari[1,3], Helen Chadburn[2], Janine Griffiths-Lee[2], Maiko Lutz[2], Justin Moat[2], Malin C. Rivers[2,4,†], Mindy M. Syfert[1,5] and Eimear M. Nic Lughadha[2]

[1]Department of Life Sciences, The Natural History Museum, Cromwell Road, South Kensington, London SW7 5BD, UK
[2]Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, UK
[3]King's College London, Strand, London WC2R 2LS, UK
[4]School of Biology, University of St Andrews, St Andrews, Fife KY16 9TH, UK
[5]Department of Plant Sciences, University of Cambridge, Cambridge, UK

Opinion piece

The IUCN Sampled Red List Index (SRLI) is a policy response by biodiversity scientists to the need to estimate trends in extinction risk of the world's diminishing biological diversity. Assessments of plant species for the SRLI project rely predominantly on herbarium specimen data from natural history collections, in the overwhelming absence of accurate population data or detailed

Mapping Collection Data Based Research

- Conservation

- Climate change

- Invasion ecology

- Biological association

- Phenology

- Biogeography

- Taxonomy

Herbarium specimens show contrasting phenological responses to Himalayan climate
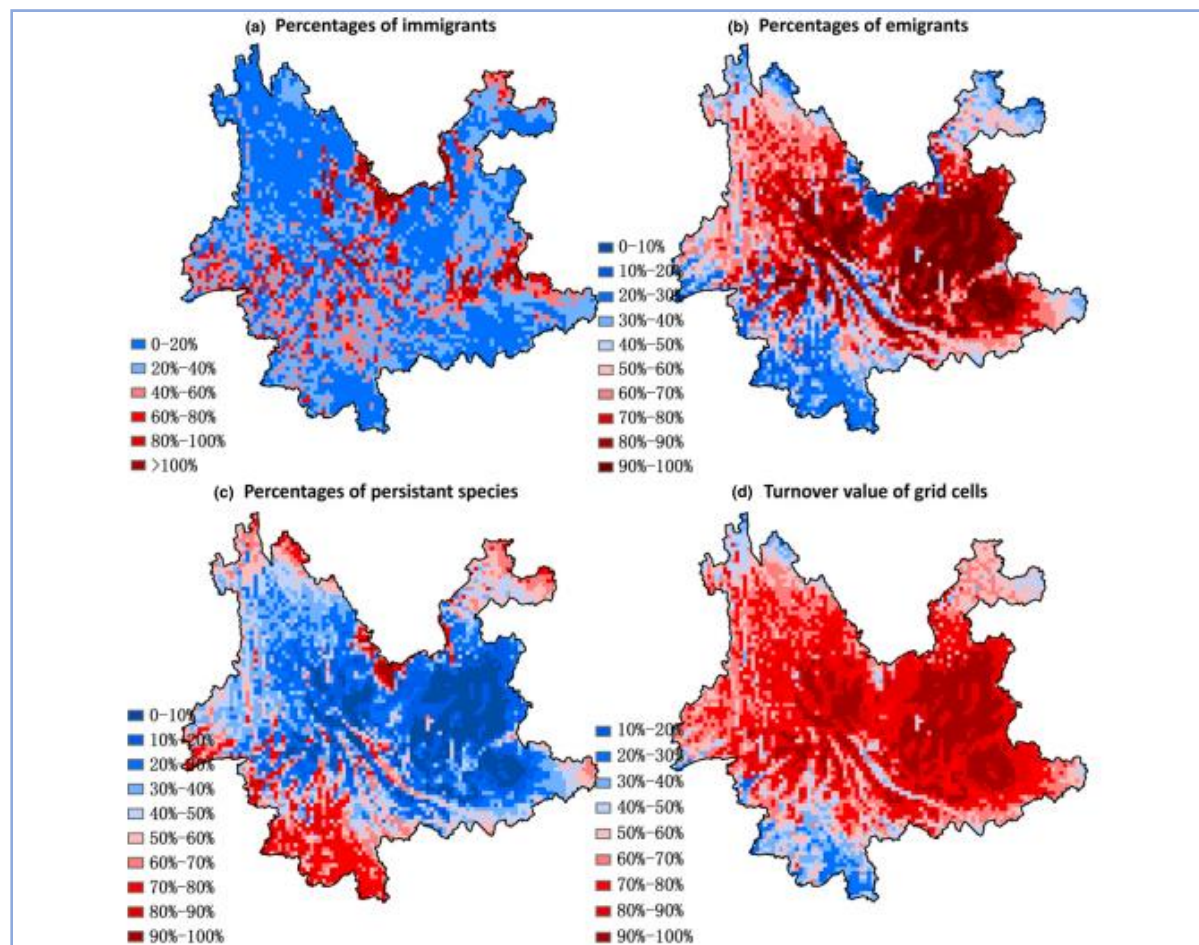
Robbie Hart[a,b,1], Jan Salick[b], Sailesh Ranjitkar[c,d], and Jianchu Xu[c,d]

Through analyses of 10,295 herbarium specimens of Himalayan Rhododendron collected by plant hunters and botanists since 1884, we were able to separate these responses into significant components. However, over the full 125 y of collections, mean flowering time shows a significant response to year-to-year changes in temperature, and this response varies with season of warming. Mean flowering advances with annual warming (2.27 d earlier per 1 ° C warming), and also is delayed with fall warming (2.54 d later per 1 ° C warming). The lack of a directional response suggests that contrasting phenological responses to temperature changes may obscure temperature sensitivity in plants. By drawing on large collections from multiple herbaria, made over more than a century, we show how these data may inform studies even of remote localities, and we highlight the increasing value of these and other natural history collections in understanding long-term change.

BIODIVERSITY RESEARCH

Major declines of woody plant species ranges under climate change in Yunnan, China

Ming-Gang Zhang[1,2,3], Zhe-Kun Zhou[1,4], Wen-Yun Chen[4], Charles H. Cannon[5,6], Niels Raes[7] and J. W. Ferry Slik[1]*

Figure 5 Vulnerability of Yunnan's seven floristic regions to climate change based on the most severe climate change scenario (CCCM

Diversity and Distributions

ORIGINAL RESEARCH

Phylogenetic conservatism and trait correlates of spring phenological responses to climate change in northeast China

Yanjun Du[1]* | Jingru Chen[2]* | Charles G. Willis[3] | Zhiqiang Zhou[2] iD |
Tong Liu[4] | Wujun Dai[2] | Yuan Zhao[5] | Keping Ma[1]

[1]State Key Laboratory of Vegetation and Environmental Change, Institute of Botany, Chinese Academy of Sciences, Beijing, China

[2]The Key Laboratory of Forest Plant Ecology of Ministry of Education, Northeast Forestry University, Harbin, China

[3]Harvard University Herbaria, Cambridge, MA, USA

[4]School of Forestry, Northeast Forestry University, Harbin, China

[5]South China Botanical Garden, Chinese Academy of Sciences, Guangzhou, China

Abstract

Climate change has resulted in major changes in plant phenology across the globe that includes leaf-out date and flowering time. The ability of species to respond to climate change, in part, depends on their response to climate as a phenological cue in general. Species that are not phenologically responsive may suffer in the face of continued climate change. Comparative studies of phenology have found phylogeny to be a reliable predictor of mean leaf-out date and flowering time at both the local and global scales. This is less true for flowering time response (i.e., the correlation between phenological timing and climate factors), while no study to date has explored whether the response of leaf-out date to climate factors exhibits phylogenetic signal. We used a

Mapping Collection Data Based Research

- Conservation

- Climate change

- Invasion ecology

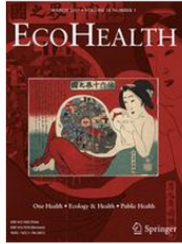- Biological association

- Phenology

- Biogeography

- Taxonomy

Predicting the spatial distribution of an invasive plant species (*Eupatorium adenophorum*) in China

Li Zhu · Osbert J. Sun · Weiguo Sang ·
Zhenyu Li · Keping Ma

Spatiotemporal trends in crofton weed (*Eupatorium adenophorum*) invasion in south-west China. Geographical distribution of training data was plotted on the bottom x–y axis. Invasion history of distribution points based on recording dates was plotted on the vertical axis. The black lines represent the equal invasion time and the grey arrows indicate the direction of spread.
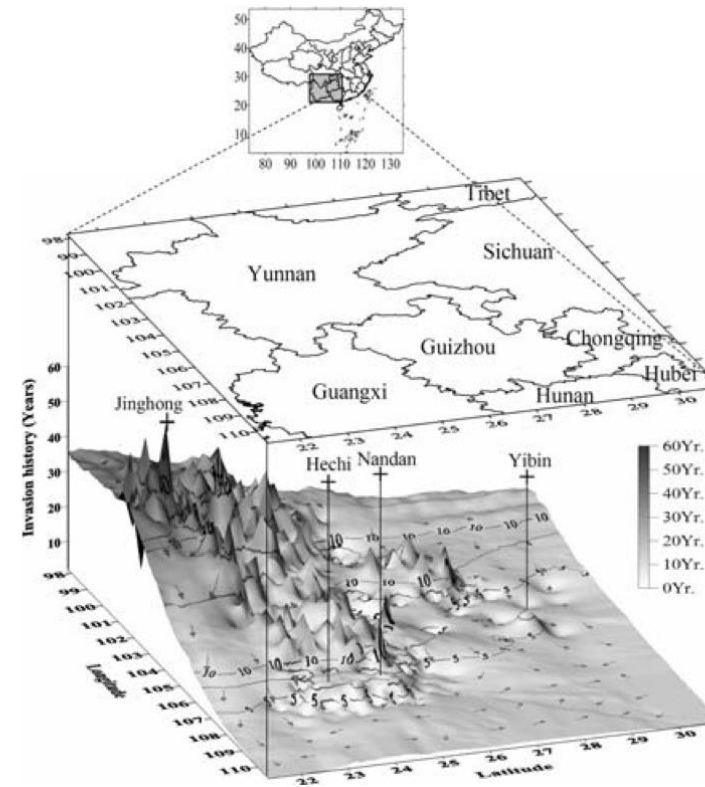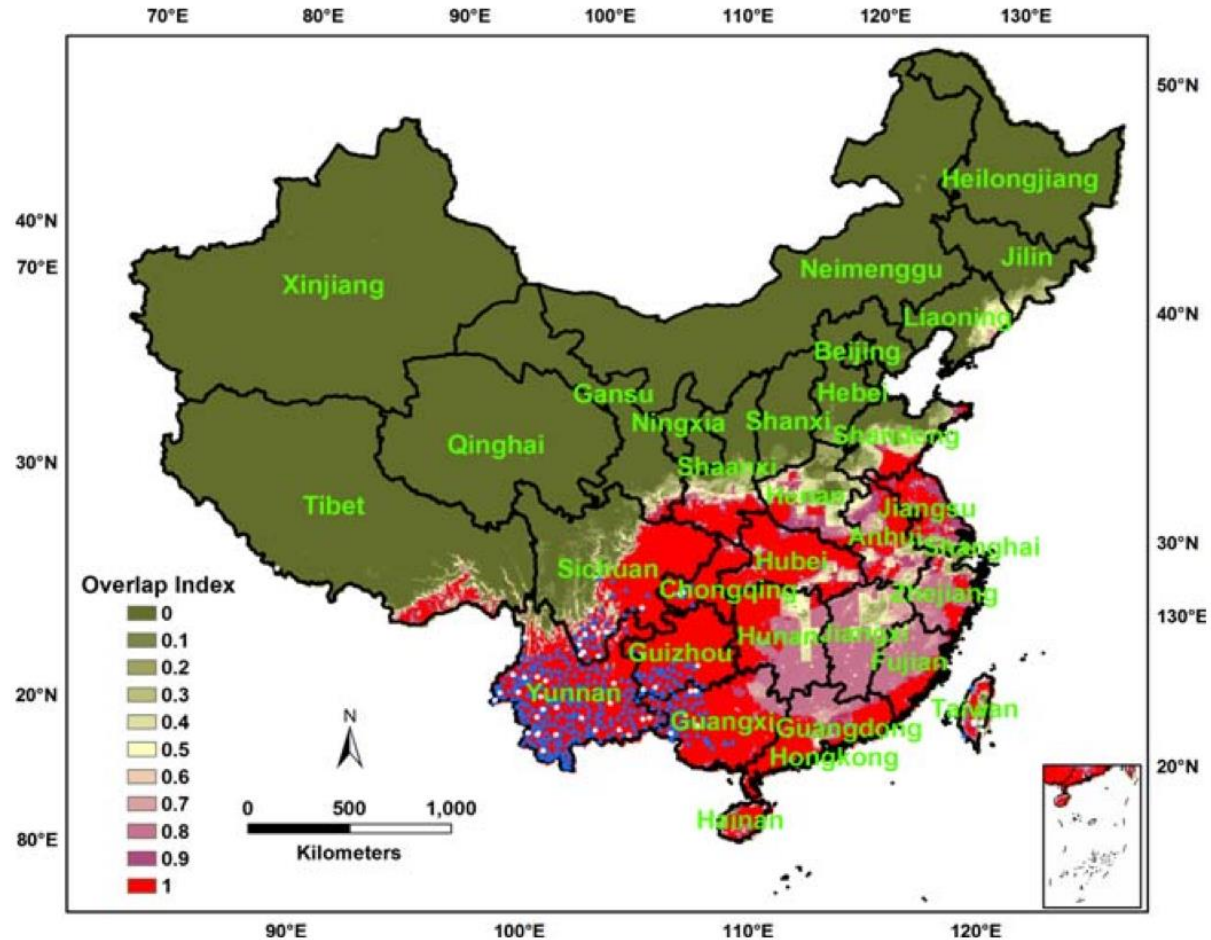
Geographic predictions for crofton weed (*Eupatorium adenophorum*) in China. Blue triangles represent the 390 spots used to train the predicted models and where the weed is known to occur, and white circles represent 51 extrinsic testing data used to test the predicted geographic range.
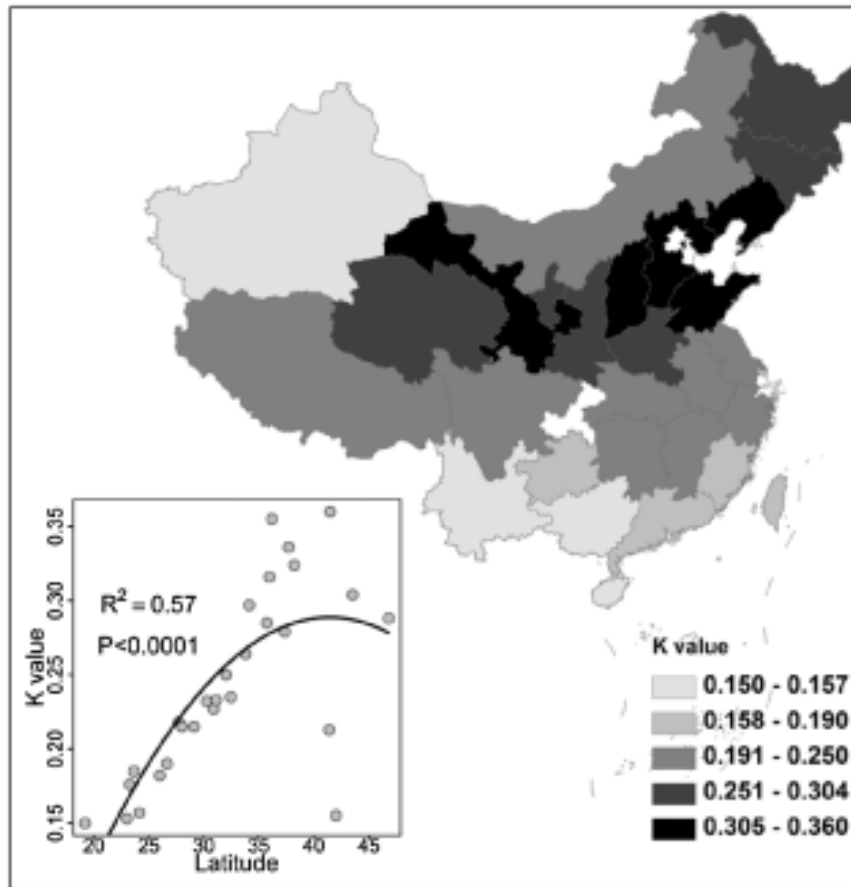
Mapping Collection Data Based Research

- Conservation

- Climate change

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- Biological association

- Phenology

- Biogeography

- Taxonomy

The potential for the use of herbarium specimens to determine the host plants of *Ceutorhynchus* (Coleoptera: Curculionidae)

David R. Gillespie [a1] and Beth I. Gillespie [a2] ⊕

Abstract

The host plants of native *Ceutorhynchus* Germar (Coleoptera: Curculionidae) species are poorly known in North America, and knowledge of these is essential for biological control programmes involving this genus of weevils. We hypothesised that weevil larva emergence holes on plant specimens in herbarium collections might reveal potential plant-insect associations, and help locate populations of hosts for non-target testing. We examined 1114 plant specimens in 16 genera and 60 species of Brassicaceae and found 70 specimens among 30 species that showed evidence of feeding injury and exit holes typical of *Ceutorhynchus*. We used this information to locate populations of two species of *Ceutorhynchus*. Herbarium collections may be useful tools for developing knowledge of host plant associations for species of *Ceutorhynchus*.

Predicting the Potential Role of Non-human Hosts in Zika Virus Maintenance
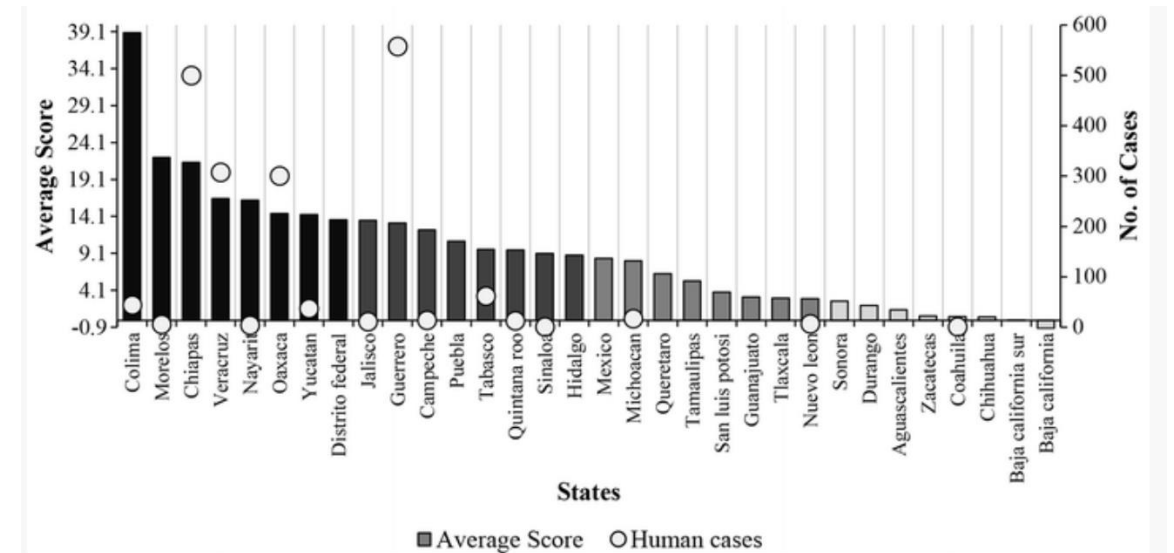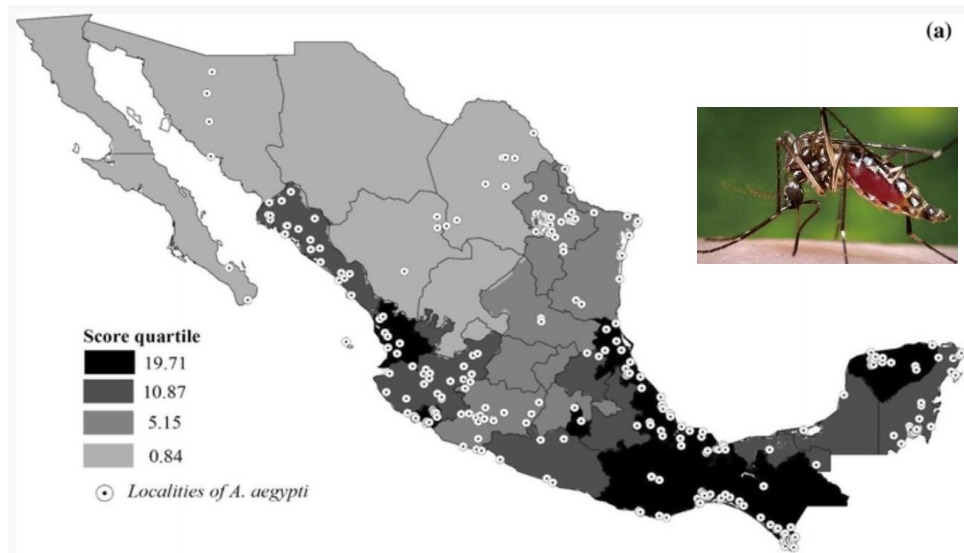
a Potential distribution of *Aedes aegypti* (埃及伊蚊)based on mammal ranges by States in Mexico.
b Average score (i.e. probability of *A. aegypti* presence) by these states and number of human cases confirmed of Zika virus at present.

Mapping Collection Data Based Research

- Conservation

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- Taxonomy

RESEARCH PAPER

Phylogenetic constraints and trait correlates of flowering phenology in the angiosperm flora of China

Yanjun Du[1], Lingfeng Mao[2], Simon A. Queenborough[3], Robert P. Freckleton[4], Bin Chen[1] and Keping Ma[1]*

Regression between the strength of phylogenetic conservatism in flowering phenology (Blomberg's K) and latitude, and the geographical patterns of the K-values in China estimated at the province scale. Each point in the regression represents a province of China. The line is the polynomial regression line with a quadratic term.

Mapping Collection Data Based Research

- Conservation

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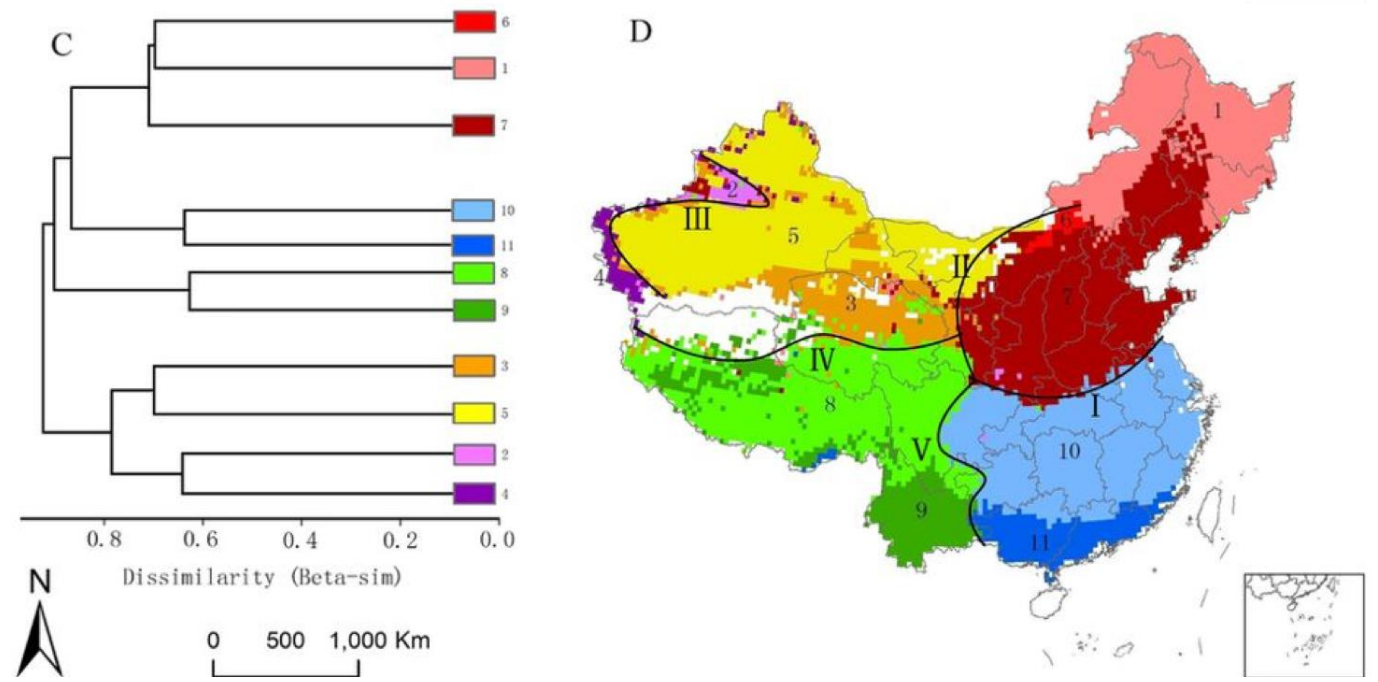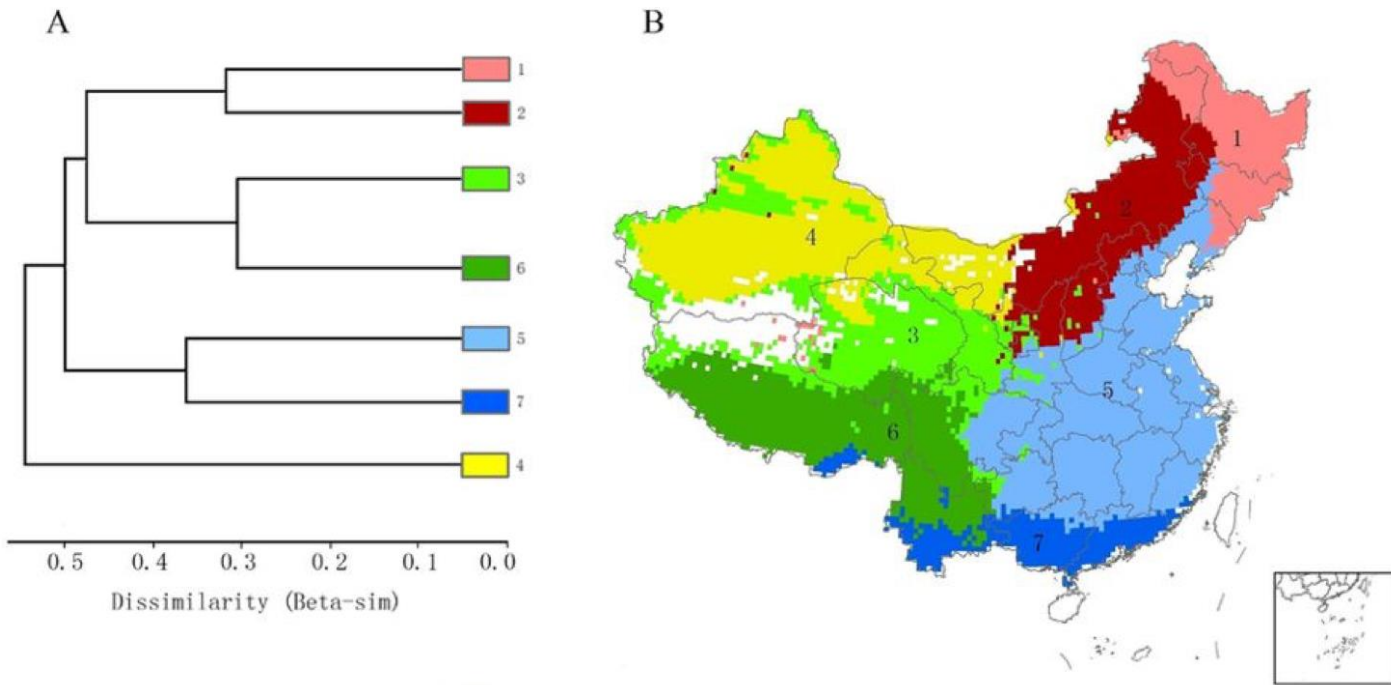
Dendrograms (**A,C**) and maps (**B,D**) resulting from UPGMA hierarchical clustering of grid cell assemblages based on beta-sim dissimilarity matrices for woody plants at the level of genus (**A,B**) and species (**C,D**). Line: I, II, III, IV, V indicate 5 major divisions of continental China.

A phylogenetically informed delineation of floristic regions within a biodiversity hotspot in Yunnan, China

Rong Li, Nathan J. B. Kraft, Jie Yang & Yuhua Wang
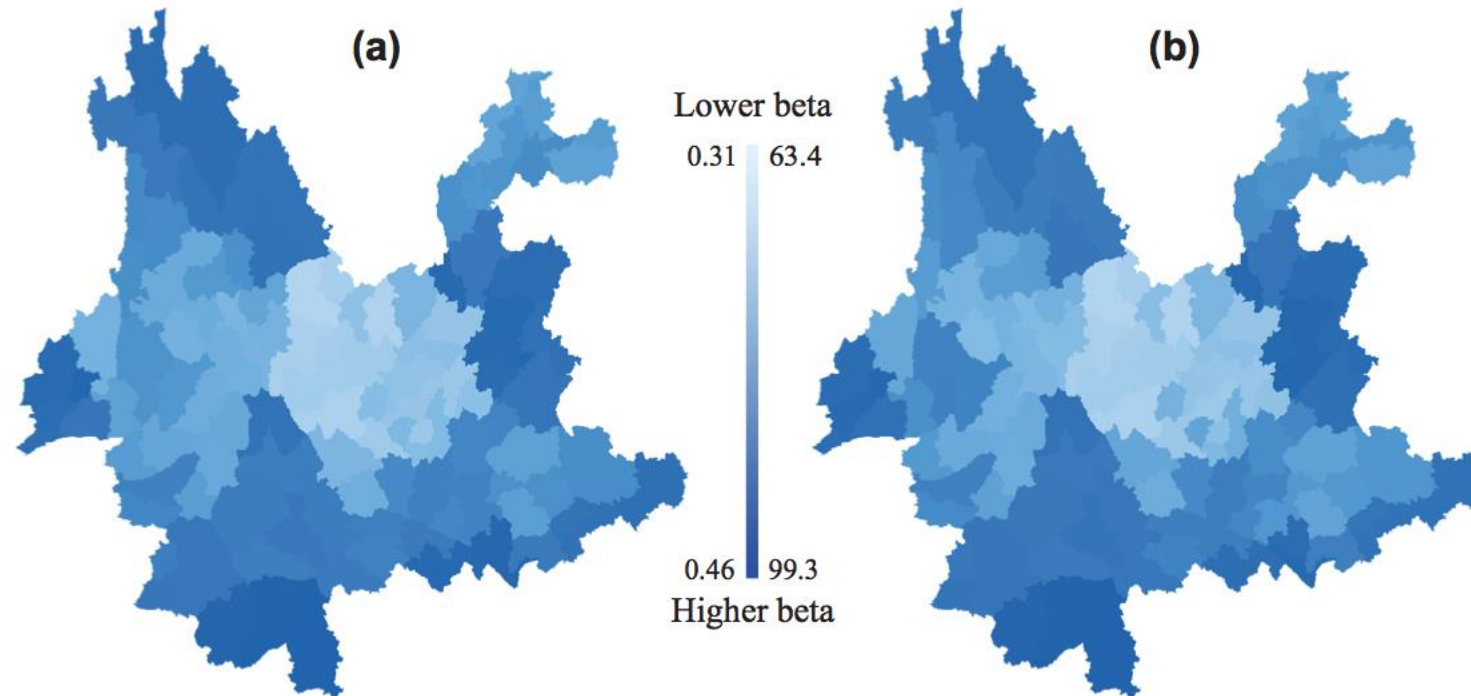
Maps of spatial turnover of Yunnan floristic assemblages in taxonomic composition (a) and phylogenetic composition (b). Color scale depicts the degree of taxonomic and phylogenetic turnover between the focal region and all other regions. The maps were generated using DIVA-GIS 7.5.
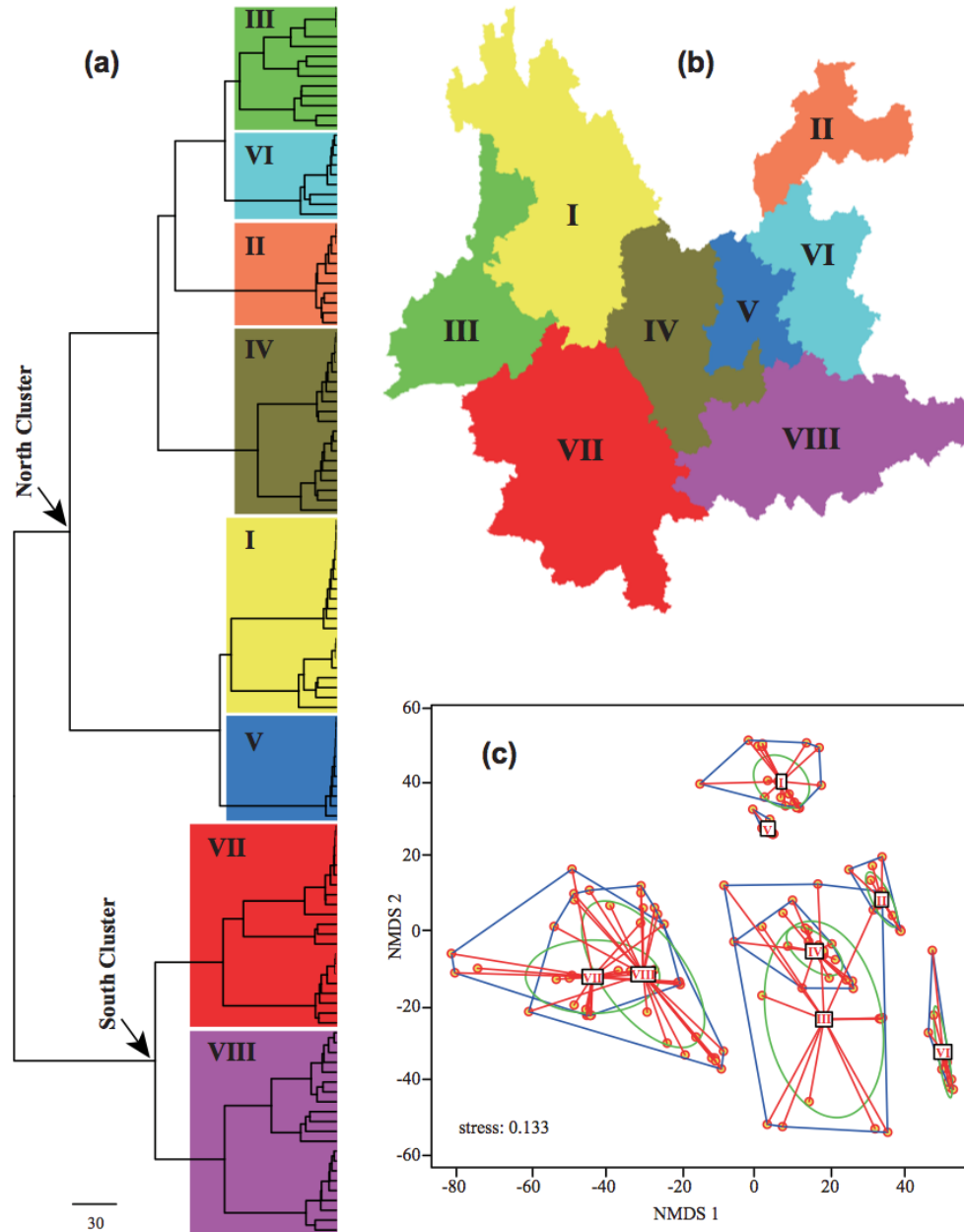
Dendrogram (a) and map (b) resulting from Ward hierarchical clustering and scatter plot (c) from non-metric multidimensional scaling (NMDS) two-dimensional ordination for floristic assemblages of Yunnan based on phylogenetic beta diversity distance matrices at the genus level. The eight distinct floristic regions are highlighted in the dendrogram with large colored rectangles and displayed in the map in different colors. The map was generated using DIVA-GIS 7.5.

Mapping Collection Data Based Research

- Conservation

- Climate change

- Invasion ecology

- Biological association

- Phenology

- Biogeography

- Taxonomy

Geographical sampling bias in a large distributional database and its effects on species richness–environment models

Wenjing Yang[1,2,3], Keping Ma[1]* and Holger Kreft[2]*

RESEARCH PAPER
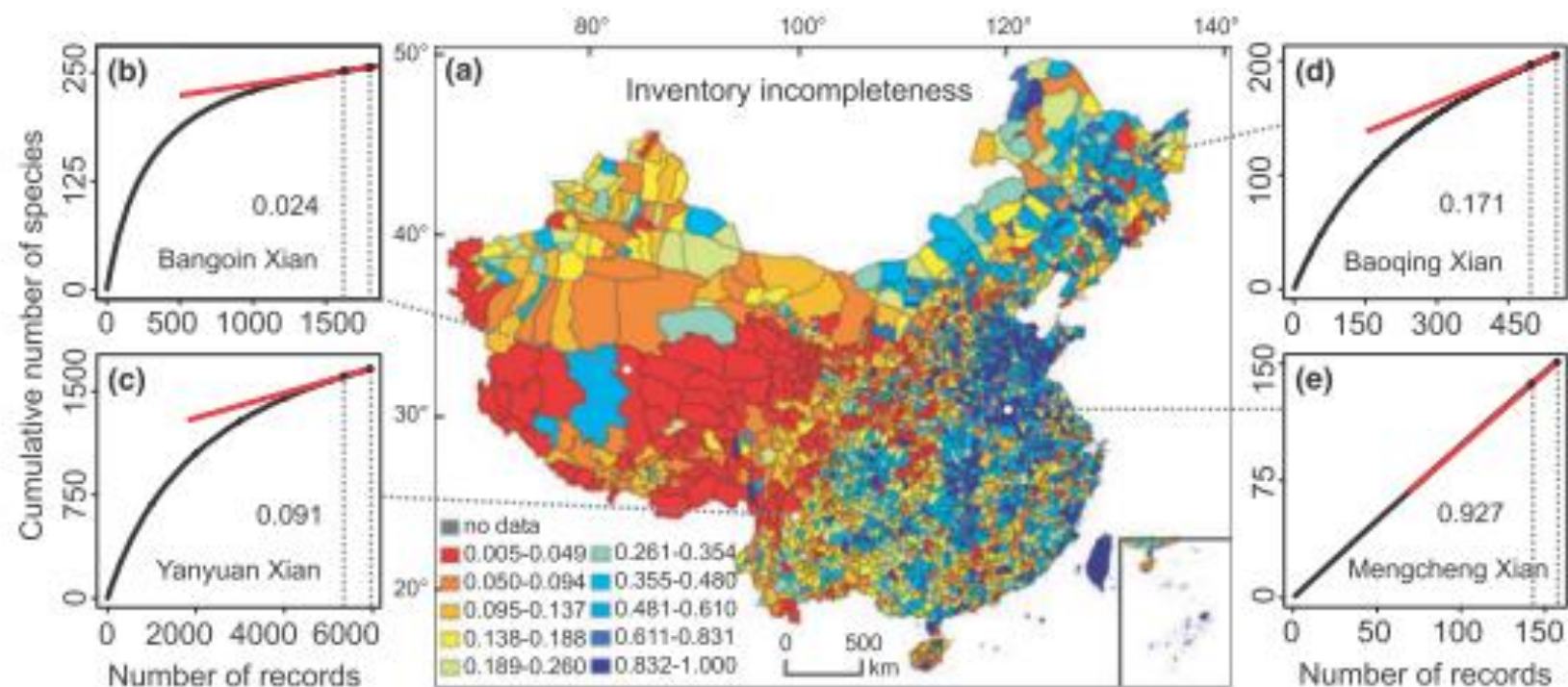
Environmental and socio-economic factors shaping the geography of floristic collections in China

Wenjing Yang[1,2,3], Keping Ma[1]* and Holger Kreft[2]*
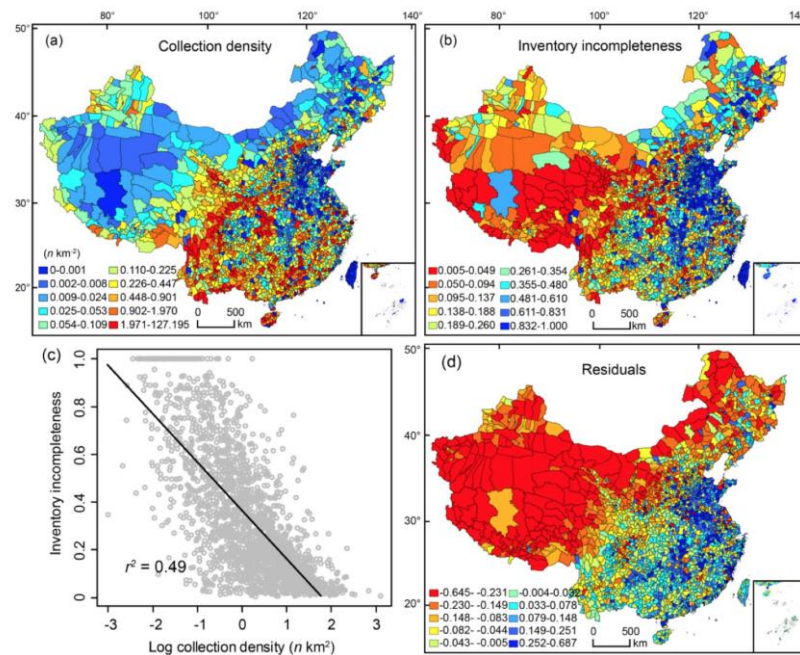
Mountainous areas are most intensively collected in China, whereas densely populated areas tend to be neglected by plant collectors. This sampling bias leads to woefully incomplete inventories, particular in urban and agricultural areas, and thus to a pronounced 'Wallacean shortfall', i.e. an incomplete documentation of species ranges.

Maps of (a) collection density and (b) inventory incompleteness as indicators of collecting effort for vascular plants in 2377 Chinese counties. (c) Relationship between collection density and inventory incompleteness. (d) Map of absolute residuals from ordinary least-squares regression in (c).

Developing integrative systematics in the informatics and genomic era, and calling for a global Biodiversity Cyberbank
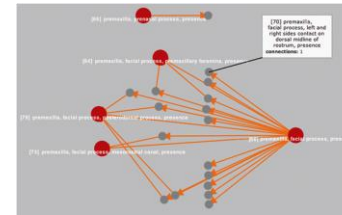
Jun Wen[1]*, AJ Harris[1], Stefanie M. Ickert-Bond[2], Rebecca Dikow[3], Kenneth Wurdack[1], and Elizabeth A. Zimmer[1]
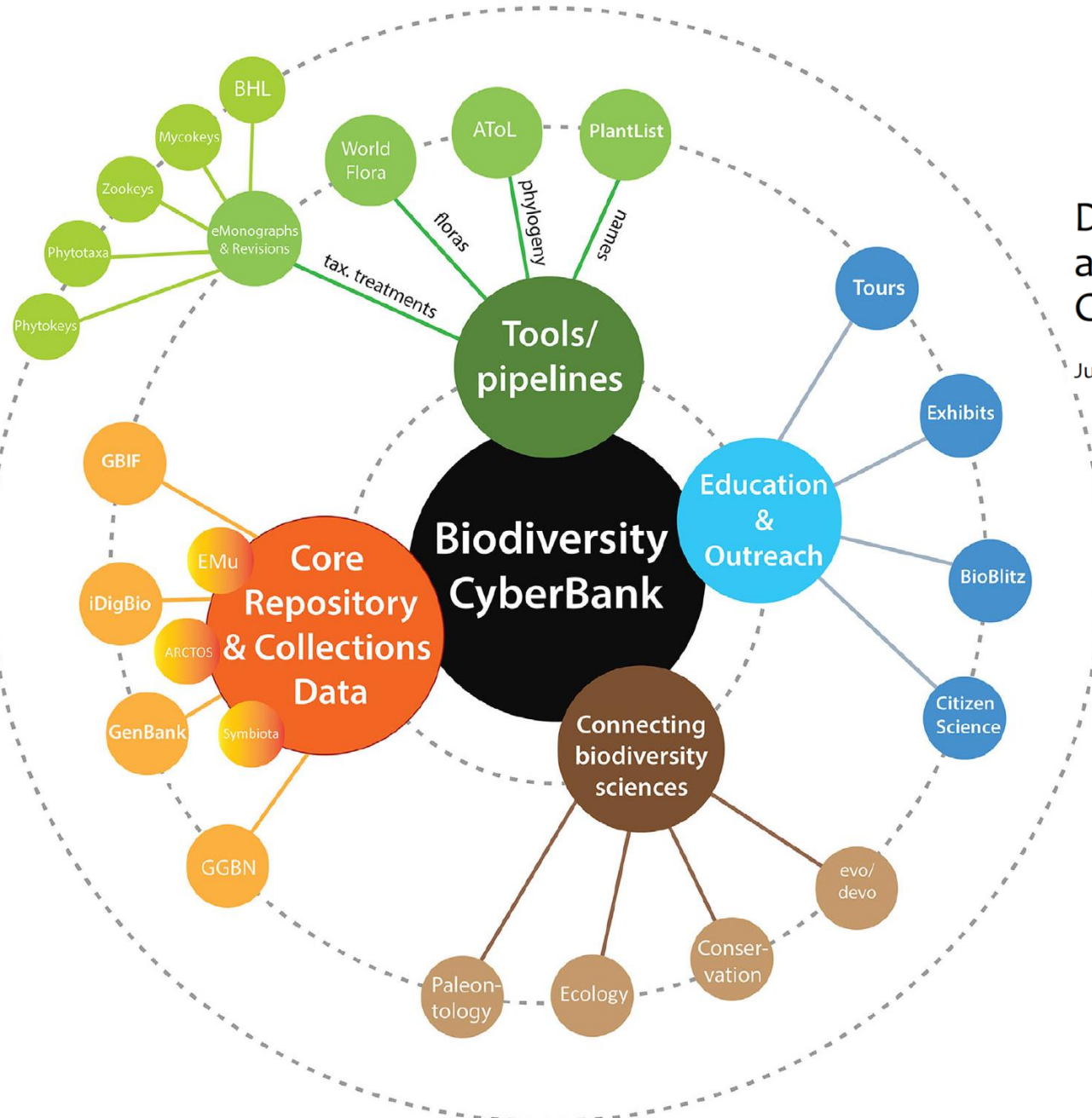
Biodiversity Cyberbank as the world's primary biodiversity data repository and containing important cybertaxonomy tools.

GLOBAL FOREST WATCH

开放数据

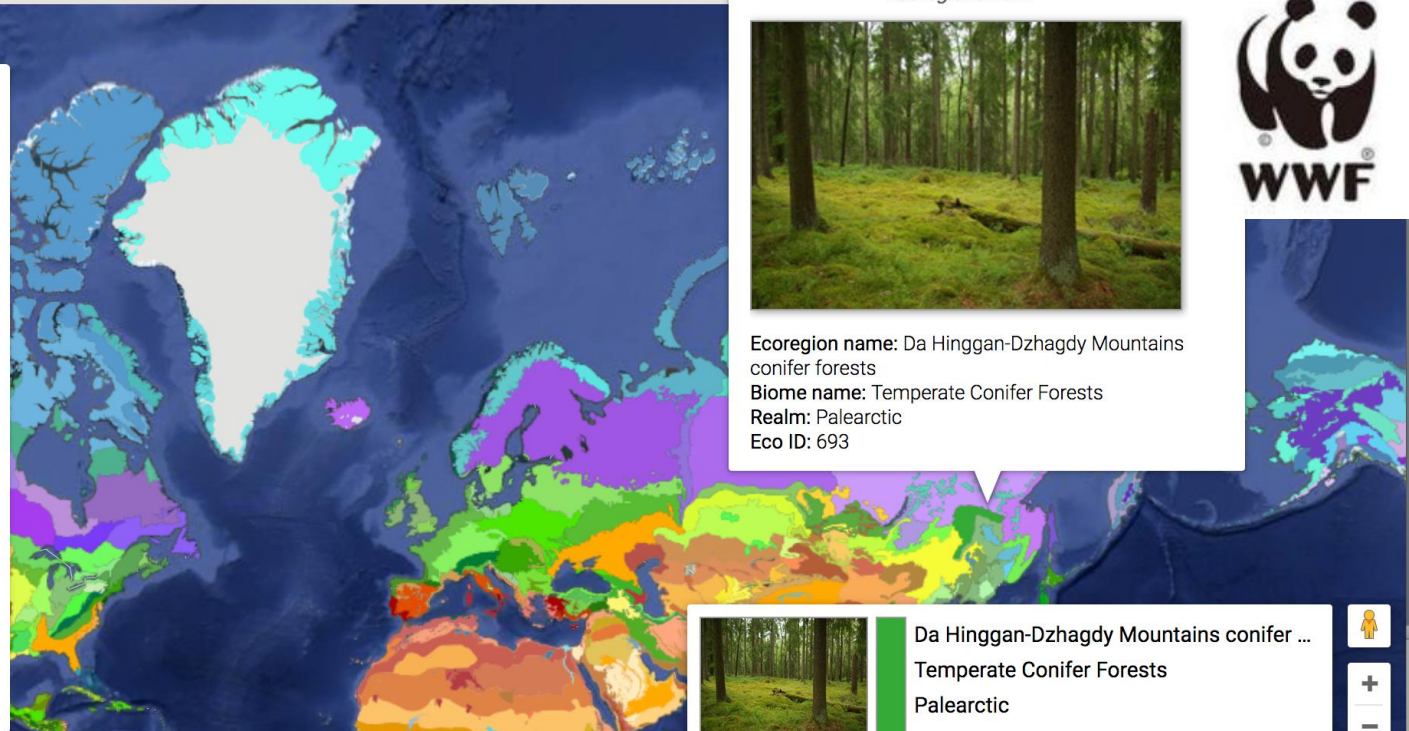GLOBAL WETLANDS V2

Global Grasslands
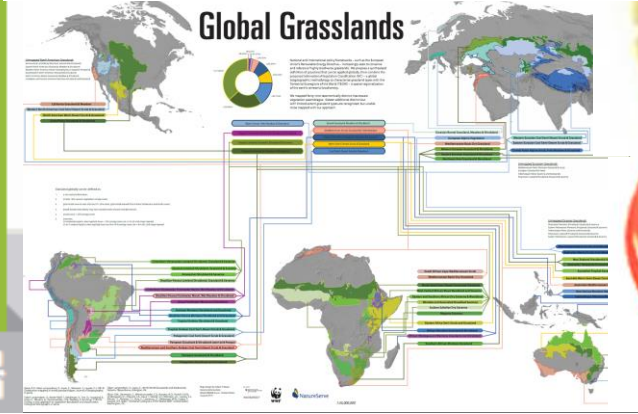
sPlot

VEGBANK

find [plots ▼] containing

地图   卫星图像   **Ecoregion**   Biome   Protected   Realms   Home   About

RESOLVE

Ecoregions 2017 ©

Ecoregion name: Da Hinggan-Dzhagdy Mountains conifer forests
Biome name: Temperate Conifer Forests
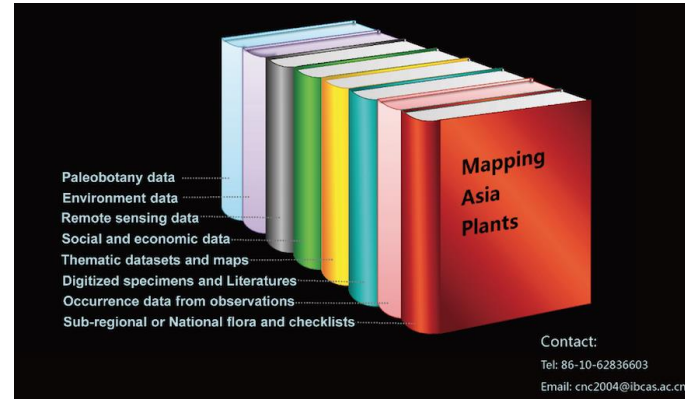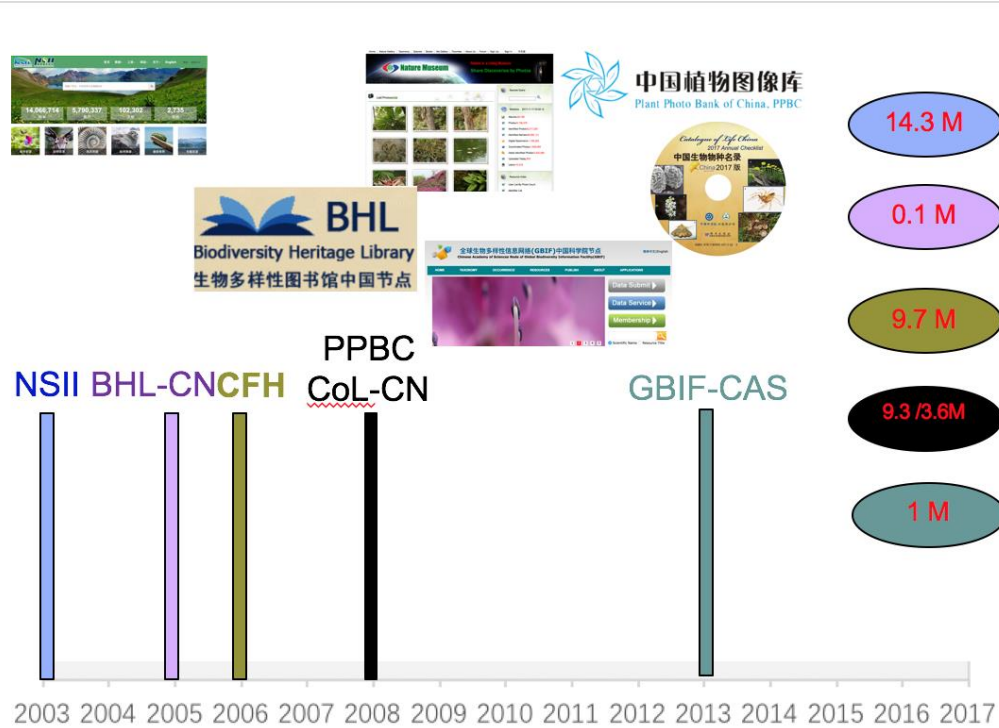**Realm:** Palearctic
Eco ID: 693

WWF

Boreal Forests/Taiga

| Alaska Peninsula montane taiga |
| Central Canadian Shield forests |
| Cook Inlet taiga |
| Copper Plateau taiga |
| East Siberian taiga |
| Eastern Canadian forests |
| Eastern Canadian Shield taiga |
| Iceland boreal birch forests and alpine tundra |
| Interior Alaska-Yukon lowland taiga |
| Kamchatka-Kurile meadows and sparse forests |
| Kamchatka taiga |
| Mid-Canada Boreal Plains forests |
| Midwest Canadian Shield forests |
| Muskwa-Slave Lake taiga |
| Northeast Siberian taiga |
| Northern Canadian Shield taiga |
| Northern Cordillera forests |
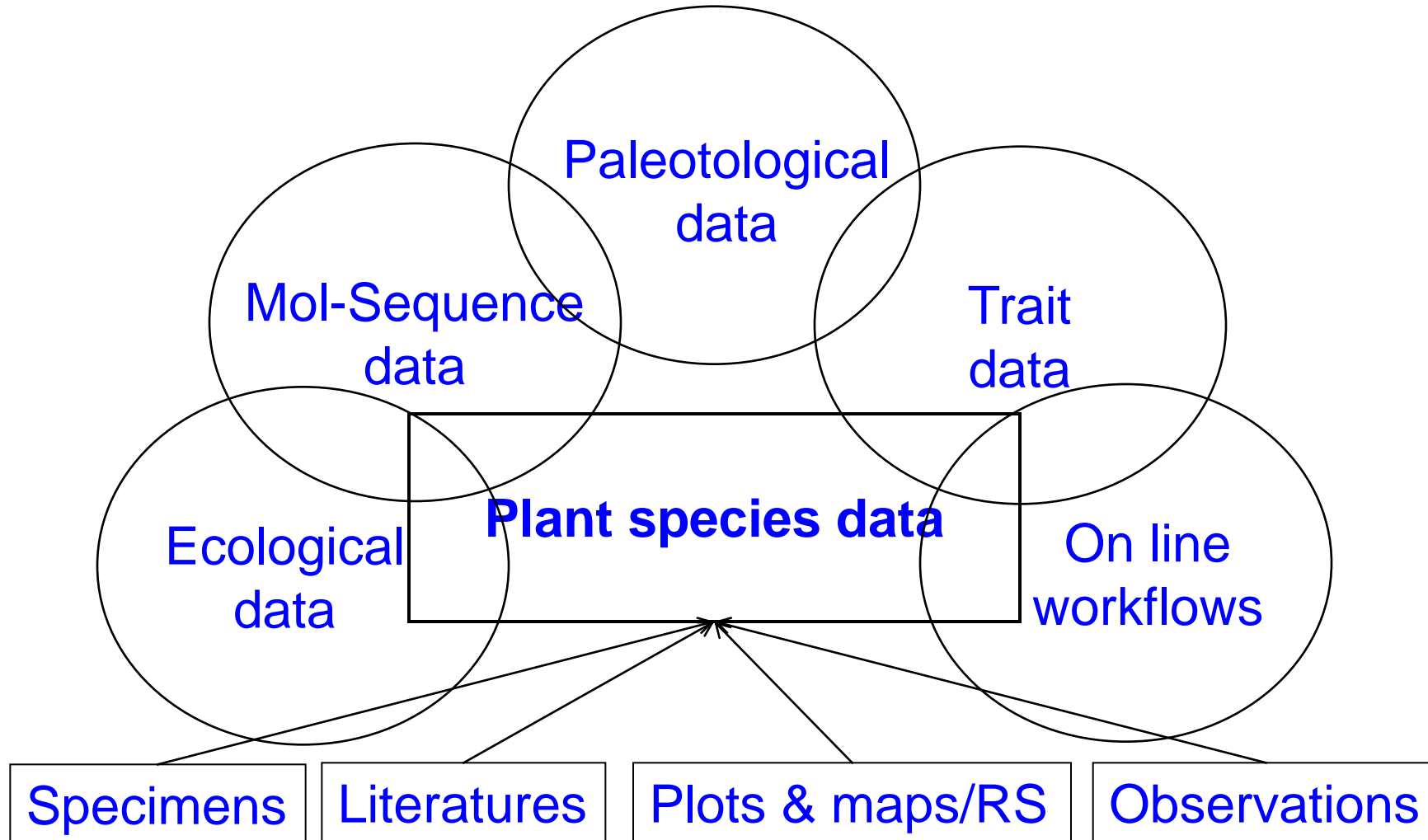
Da Hinggan-Dzhagdy Mountains conifer ...
Temperate Conifer Forests
Palearctic

Google

地图数据 ©2017 GS(2011)6020 Imagery ©2017 NASA, TerraMetrics   使用条款

The way forward
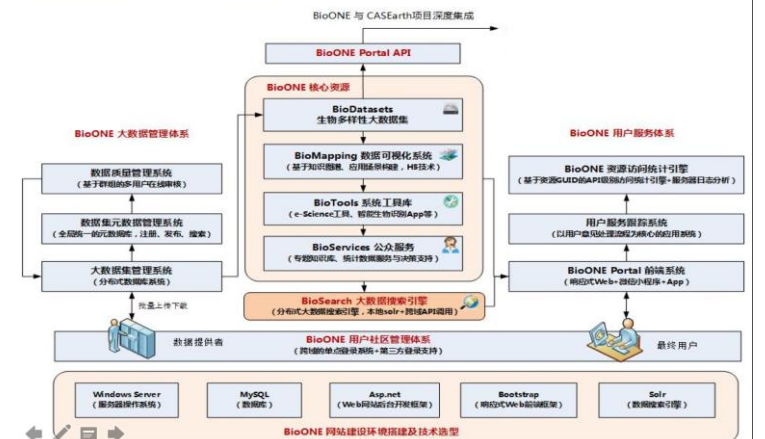
谢谢大家
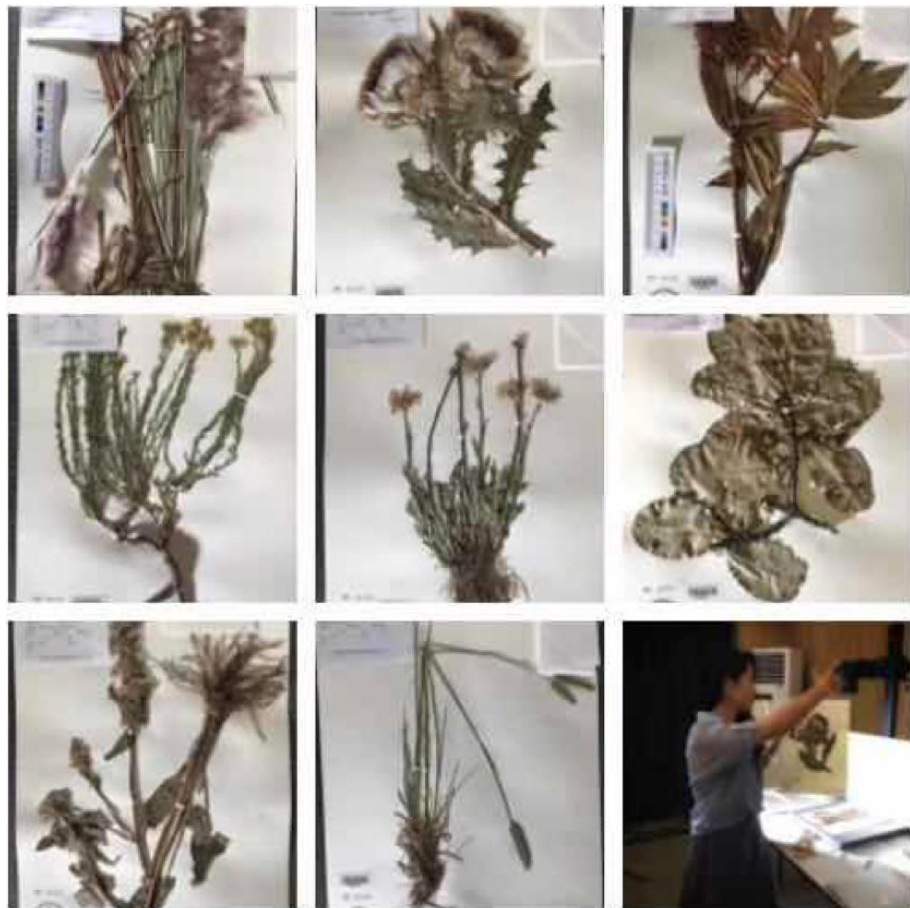
实体标本远比想象中颜值高太多。惊艳是今天标本的关键词。同一份标本，不同的人制作，烘干，上台纸，出来的效果截然不同。而数字化拍照呈现的作品更是千差万别。也许，我们不仅应该培训数字化技术，对标本的珍爱情怀异乎寻常的重要。情人眼里出西施，只有爱之真，情之切，才会有美的作品呈现。标本数字化，任重而道远。

--肖翠 （NSII办公室）