BOLD数据库常用功能操作流程

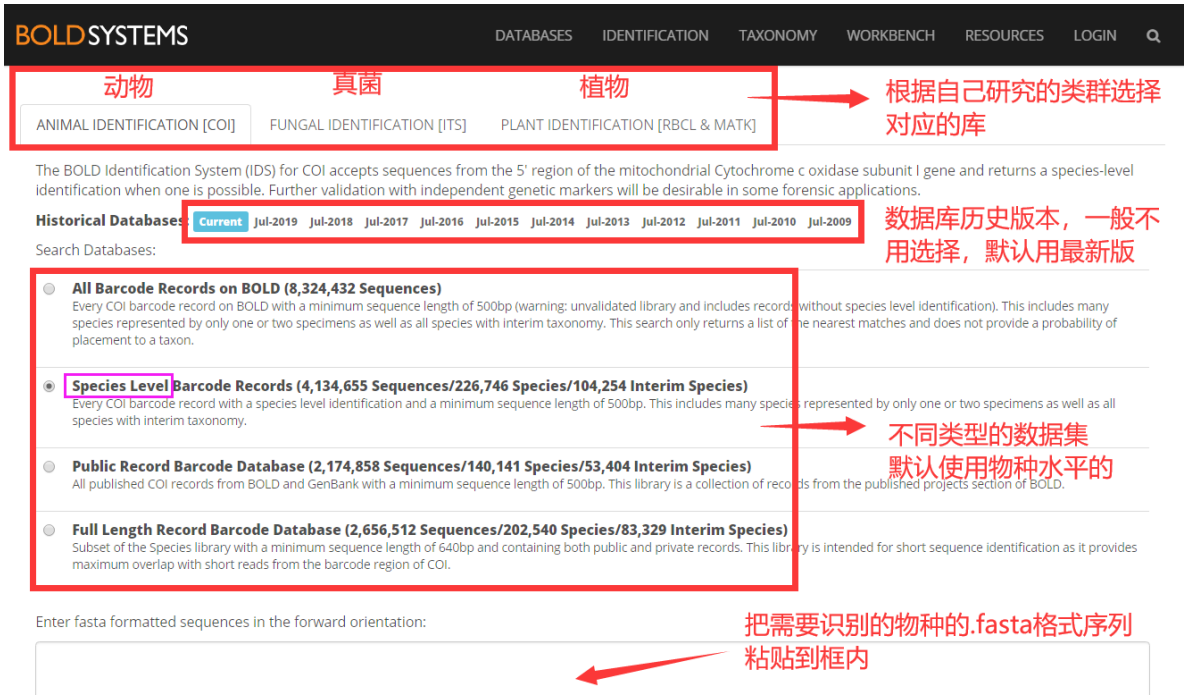
> 2021-07-03 首都师范大学 遗传多样性与进化实验室 王瑛 整理，有任何错误和不足，欢迎指出。
>
> 如有建议或意见，请邮件联系2200801021@cnu.edu.cn

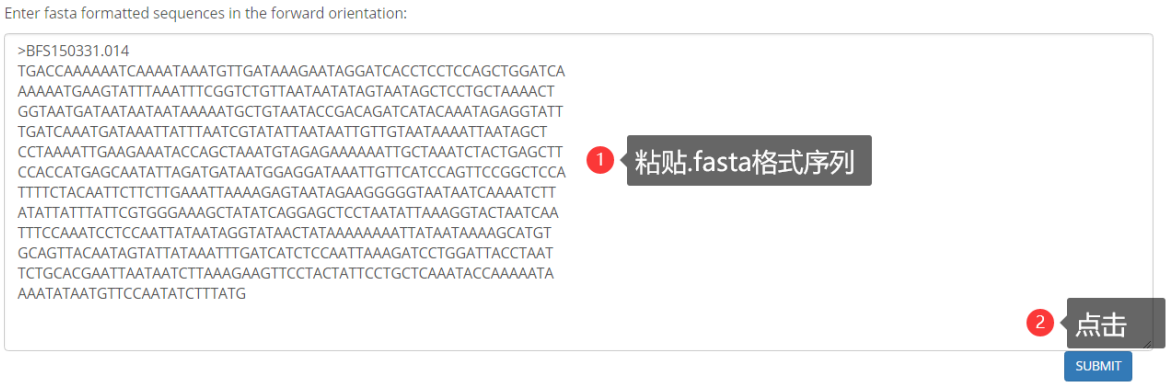
BOLD官网：http://www.boldsystems.org/

1. 条码物种识别

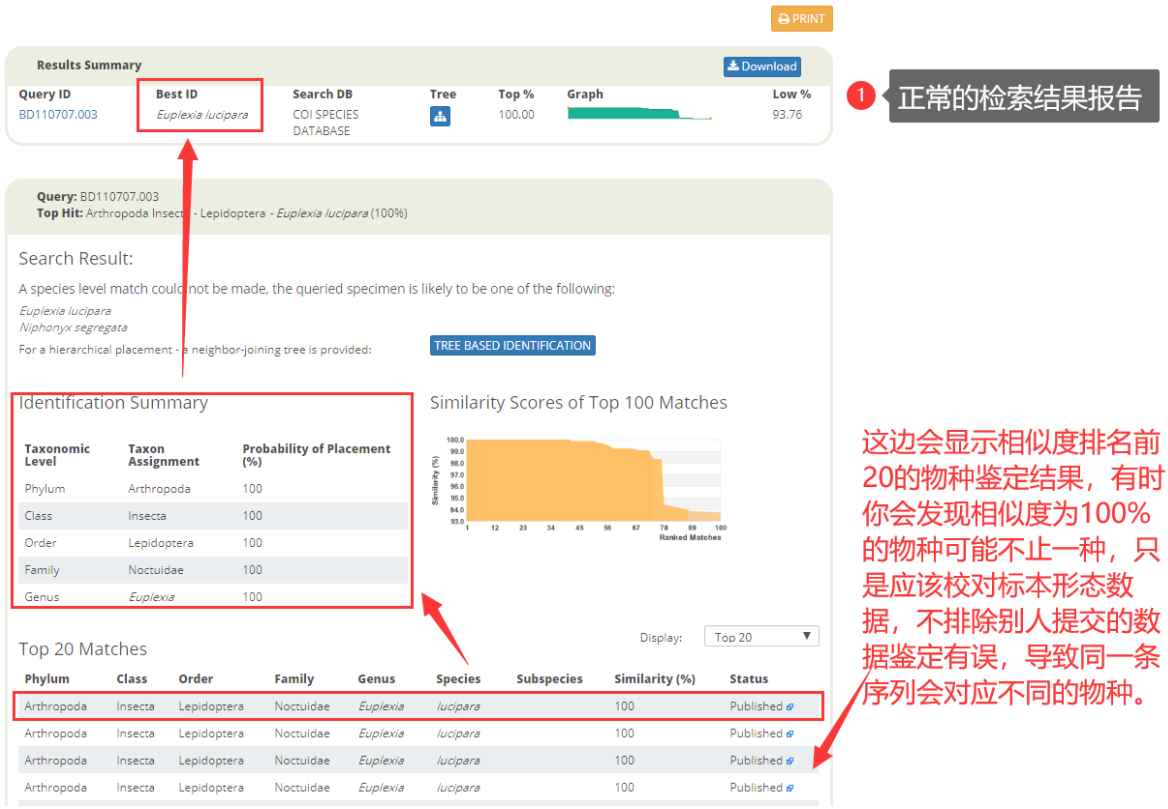
DESIGNED TO SUPPORT THE GENERATION & APPLICATION OF DNA BARCODE DATA

BOLD is a cloud-based data storage and analysis platform developed at the Centre for Biodiversity Genomics in Canada. It consists of four main modules, a data portal, an educational portal, a registry of BINs (putative species), and a data collection and analysis workbench.





这边BOLD数据库无匹配的一个最大的可能是提交的序列由于拼接过程中正反向序列拼接顺序颠倒，导致序列反向互补，此时最好使用相关软件（例如：seqkit）把序列反向互补，虽然这边BOLD也提供了链接直接跳转GenBank 进行BLAST，但是经测试，结果也不是很准确，最理想的方式还是把序列反向互补回去。



注意：

在考虑存在人为识别错误的情况下，往往匹配到的第一条识别结果不一定是正确的，正如上图，其实除了上面的几条识别结果是*Euplexia lucipara*，其他识别结果都是*Niphonyx segregata*，当然必须参考形态数据。BOLD数据库也提供了物种的标本照供参考。具体操作，见下文。

Top 20 Matches

Display: Top 20

Phylum	Class	Order	Family	Genus	Species	Subspecies	Similarity (%)	Status
Arthropoda	Insecta	Lepidoptera	Noctuidae	*Euplexia*	*lucipara*		100	Published
Arthropoda	Insecta	Lepidoptera	Noctuidae	*Euplexia*	*lucipara*		100	Published
Arthropoda	Insecta	Lepidoptera	Noctuidae	*Euplexia*	*lucipara*		100	Published
Arthropoda	Insecta	Lepidoptera	Noctuidae	*Euplexia*	*lucipara*		100	Published
Arthropoda	Insecta	Lepidoptera	Noctuidae	*Euplexia*	*lucipara*		100	Published
Arthropoda	Insecta	Lepidoptera	Noctuidae	*Niphonyx*	*segregata*		100	Published
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Arthropoda	Insecta	Lepidoptera	Noctuidae	*Niphonyx*	*segregata*		100	Published

2. 物种分类地位查询

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Niphonyx segregata | SEARCH TAXONOMY

1 输入待检索的物种拉丁名

2 点击

12,193,872 Specimen Records

9,235,973 Specimens with Barcodes

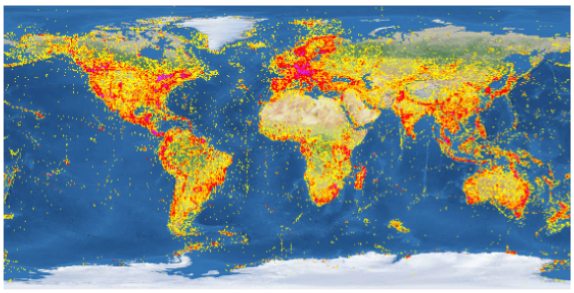
321,110 Species with Barcodes

Animals:
- Acanthocephala [2306]
- Acoelomorpha [20]
- Annelida [102966]
- Arthropoda [10064904]
- Brachiopoda [310]
- Bryozoa [4133]
- Chaetognatha [1743]
- Chordata [839228]
- Cnidaria [29865]
- Ctenophora [511]
- Cycliophora [326]
- Echinodermata [57293]
- Entoprocta [65]
- Gastrotricha [1351]
- Gnathostomulida [24]
- Hemichordata [234]
- Kinorhyncha [720]
- Mollusca [243108]
- Nematoda [34770]
- Nematomorpha [401]
- Nemertea [5669]
- Onychophora [1393]
- Phoronida [160]
- Placozoa [20]
- Platyhelminthes [38589]
- Porifera [7808]
- Priapulida [148]
- Rhombozoa [48]
- Rotifera [12761]
- Sipuncula [1318]
- Tardigrada [2908]
- Xenacoelomorpha [18]

Plants:
- Bryophyta [21902]
- Chlorophyta [14519]
- Lycopodiophyta [1215]
- Magnoliophyta [366736]
- Pinophyta [7068]
- Pteridophyta [11393]
- Rhodophyta [54629]

Fungi:
- Ascomycota [98396]
- Basidiomycota [66496]
- Chytridiomycota [293]
- Glomeromycota [3529]
- Myxomycota [235]
- Zygomycota [3273]

Protists:
- Chlorarachniophyta [67]
- Ciliophora [788]
- Heterokontophyta [7209]
- Pyrrophycophyta [2337]



目前数据内已有类群的分类

Arthropoda / Insecta / Lepidoptera / Noctuidae / Noctuinae / Xylenini / Niphonyx / Niphonyx segregata

1 分类

2 标本照

CC BY-NC-SA Axel Hausmann 2010

Image of Niphonyx segregata

Taxon Description (Wikipedia)

Niphonyx is a monotypic moth genus of the family Noctuidae erected by Shigero Sugi in 1982. Its only species, Niphonyx segregata, the hops angleshade, was first described by Arthur Gardiner Butler in 1878. It is endemic to eastern Asia, including the Russian Far East, the Korean Peninsula, Japan, China and Taiwan. It was introduced to the north-eastern United States in the 1990s and is found from Connecticut south to at least Delaware. The wingspan is 25–30 mm. There are two generations per year in North America. The larvae feed on hop species. full article at Wikipedia

3 维基百科介绍

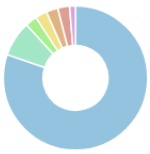
4 条码组成情况

Statistics

Specimen Records:	76
Specimens with Sequences:	76
Specimens with Barcodes:	74
Subspecies:	0
Subspecies with Barcodes:	0
Public Records:	70
Public Subspecies:	0
Public BINs:	3

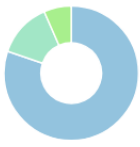
SUBSPECIES LIST | PUBLIC DATA

Specimen Depositories



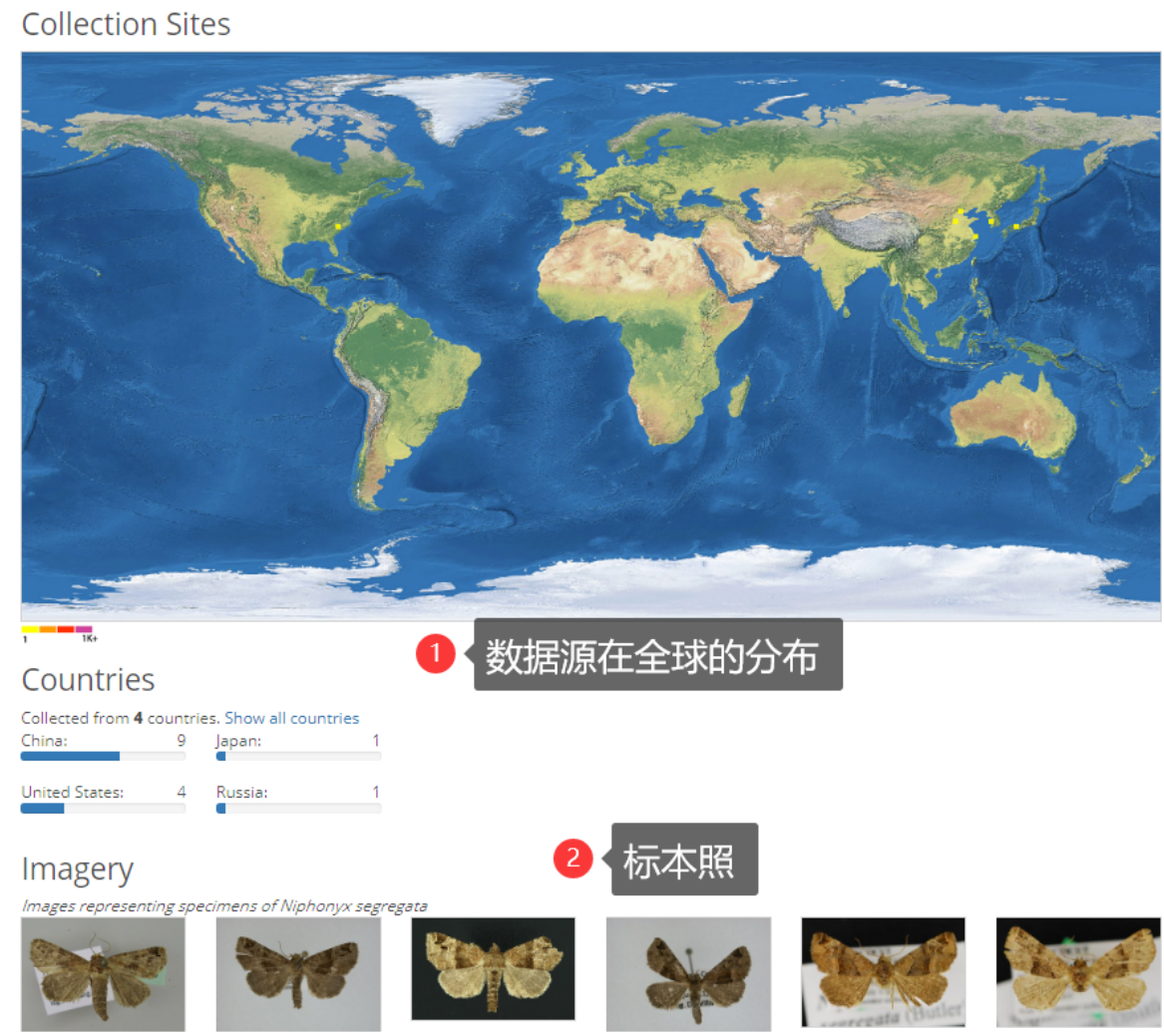
- Mined from GenBank, NCBI [61]
- Centre for Biodiversity Genomics [6]
- University of Oslo, Natural History Museum [2]
- SNSB, Zoologische Staatssammlung Muenchen [2]
- Research Collection of J. B. Sullivan [2]
- Canadian National Collection of Insects, Arachnids and Nema... [2]
- University of Maryland [1]

Sequencing Labs



- Mined from GenBank, NCBI [61]
- Biodiversity Institute of Ontario [10]
- Centre for Biodiversity Genomics [5]

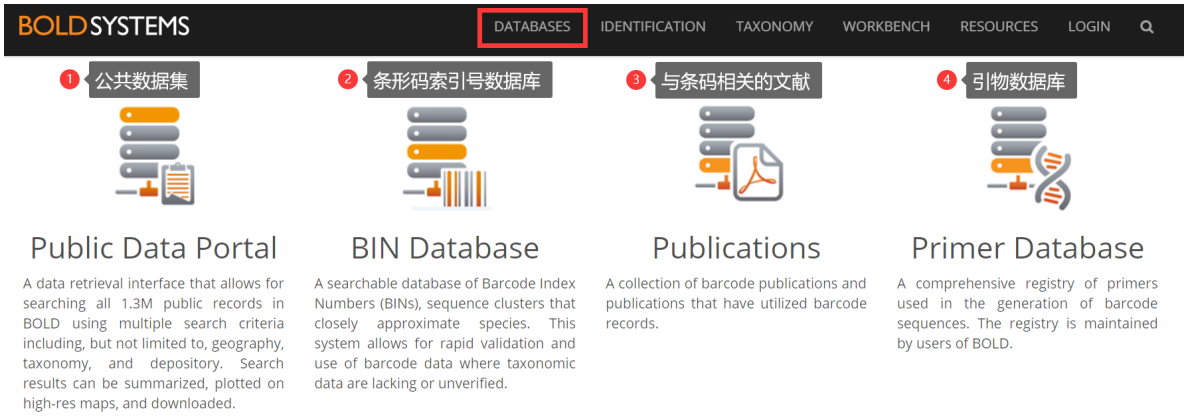
5 条码数据来源分析

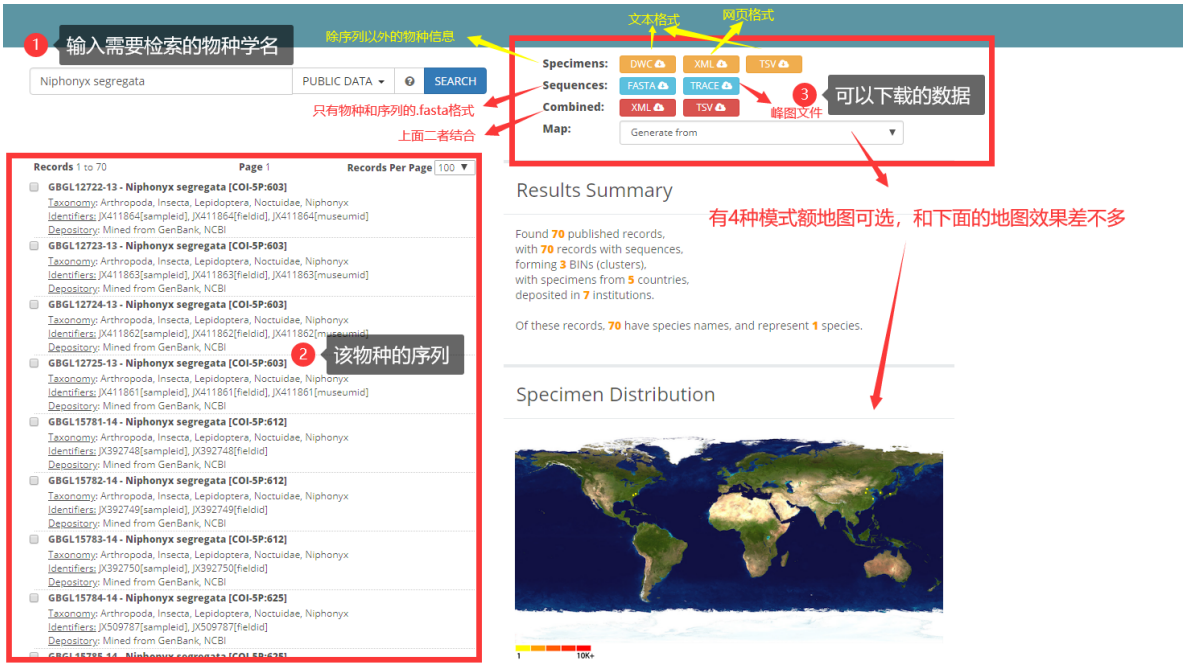


这些标本照片也是可以通过API批量下载的。

3. 物种条码数据获取

条码数据和下面要提到的物种分布数据都需要从 `Public Data Portal` 模块中下载。





4. 物种分布数据获取

见上图。

5. 文章发表前条码数据提交和更新

此模块演示起来比较困难，建议直接参考官网提供的手册： "BOLD Print Handbook for BOLD v4"

6. 其他资源