Extending Anthophila research through image and trait digitization (Big-Bee)

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ADBC Summit, September 21, 2021
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What is Big-Bee?
Project Start Date: September 15, 2021
Project Period: 3 years
<table>
<thead>
<tr>
<th>Family</th>
<th>Genus</th>
<th>Species in ITIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apidae</td>
<td>Bombus, Peponapis, Xenoglossa, Xylocopa</td>
<td>678</td>
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<tr>
<td>Megachilidae</td>
<td>Osmia, Afroheriades, Ashmeadiella, Atoposmia, Chelostoma,</td>
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<tr>
<td></td>
<td>Haetosmia, Heriades, Hofferia, Hoplitis, Hoplosmia, Noteriades,</td>
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<tr>
<td></td>
<td>Ochreriades, Othinosmia, Protosmia, Pseudoheriades, Stenoheriades,</td>
<td>1087</td>
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<tr>
<td></td>
<td>Stenosmia, Wainia, Xeroheriades</td>
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<tr>
<td>Megachilini</td>
<td>Megachile</td>
<td>1522</td>
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<tr>
<td>Melittidae</td>
<td>Dasypoda, Samba, Capicola, Eremaphanta, Hesperapis, Ceratomonia,</td>
<td>206</td>
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<tr>
<td></td>
<td>Meganomia, Pseudophilanthus, Uromonia, Afrodasypoda, Macropis,</td>
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</tr>
<tr>
<td></td>
<td>Promelitta, Melitta, Rediviva, Redivivoides</td>
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</tr>
<tr>
<td>Andrenidae</td>
<td>Andrena</td>
<td>1556</td>
</tr>
<tr>
<td>Colletidae</td>
<td>Colletes</td>
<td>460</td>
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<tr>
<td></td>
<td><strong>Total species</strong></td>
<td><strong>5509</strong></td>
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</table>
## Digitization Goals

<table>
<thead>
<tr>
<th>Digitizing institution</th>
<th>Digitized specimens</th>
<th>Focus-stacked images</th>
<th>3D image suites</th>
<th>Additional Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona State University (ASUHIC)</td>
<td>10,000</td>
<td>0</td>
<td>0</td>
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<tr>
<td>California Academy of Sciences (CAS)</td>
<td>142,325</td>
<td>5,474</td>
<td>500</td>
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<tr>
<td>Florida State Collection of Arthropods (FSCA)</td>
<td>90,495</td>
<td>5,294</td>
<td>500</td>
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<tr>
<td>Harvard University (MCZ)</td>
<td>52,324</td>
<td>6,492</td>
<td>500</td>
<td></td>
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<tr>
<td>Karlsruhe Institute of Technology (KIT)</td>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>2,000 (microCT)</td>
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<tr>
<td>Natural History Museum of Los Angeles County (LACM)</td>
<td>72,681</td>
<td>6,543</td>
<td>500</td>
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<td>San Diego Natural History Museum (SDMC)</td>
<td>14,224</td>
<td>797</td>
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<tr>
<td>University of California-Berkeley (EMEC)</td>
<td>69,297</td>
<td>9,892</td>
<td>100</td>
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<tr>
<td>University of California, Santa Barbara (UCSB)</td>
<td>8,697</td>
<td>5,092</td>
<td>4,000</td>
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<tr>
<td>University of Colorado (UCMC)</td>
<td>62,677</td>
<td>10,160</td>
<td>100</td>
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<tr>
<td>University of Kansas (SEMC)</td>
<td>9,495</td>
<td>28,185</td>
<td>100</td>
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<tr>
<td>University of Michigan Museum of Zoology (UMMZI)</td>
<td>27,815</td>
<td>15,198</td>
<td>500</td>
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<tr>
<td>University of New Hampshire Collection of Insects and Arthropods (UNHC)</td>
<td>6,783</td>
<td>12850</td>
<td>500</td>
<td>1,000 (CLSM)</td>
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<td>USGS Native Bee Inventory and Monitoring Lab (USGS BIML)</td>
<td>4000</td>
<td>4,000</td>
<td>0</td>
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<tr>
<td><strong>Total:</strong></td>
<td><strong>572,813</strong></td>
<td><strong>109,977</strong></td>
<td><strong>10,300</strong></td>
<td><strong>3,000</strong></td>
</tr>
</tbody>
</table>
3D image suites

Diagnostic Images

Label with Specimen Images

Euglossa intersecta

det. J. S. Ascher 2015

UCSB-IZC00012458

00°40'36"S 76°24'02"W
ECUADOR, Napo Prov.,
Yasuni Scientific Station
20:IV:1998, 210m,
Col. K. Will, Headlamp
Trait Digitization

- Biotic Associations
  (parasites, pathogens, floral specialization)

- Body size, color, hairiness

- Nesting Biology

- Phenology
  (seasonality, flight period)
Biodiversity Data Science (a dataset approach)

1. Bee Specimens
2. Data Acquisition
   - Arctos
   - In-house databases
   - EMu
   - SymBiot
   - Specify
   - TaxonWorks
3. Data Aggregation
   - SCAN
   - GBIF
   - iDigBio
   - BEE LIBRARY (Symbiota)
4. Notes from Nature
5. Georeferencing Gazetteer
6. External data sources
7. Open Traits
8. Data Dissemination
   - Discover Life
   - EOL
   - Global
Trait and Specimen Datasets

**Occurrence Dataset Management**

These tools will allow you to define and manage datasets properly.

** SCI Checklist (5)**
Plants of SCI
Created: 2021-05-05 11:04:17

**Shared with You**
There are no datasets shared with you

Bee Library for Supporting Dataset Creation and Trait Digitization (Symbiota-Light)
Notes From Nature

Label transcription
Measurement Tool for **Intertegular Span**
Biotic Interaction Datasets

TPT Collections Status

Click on badges to browse/download Indexed records or inspect automated reviews.

- BPBM / Bishop Museum / J. Linsley Greathouse Center for Research in Entomology
- BYU / Brigham Young University Arthropod Museum BYU / Monte L. Bean Museum of Life Science Museum Insects and Arachnids
- CAS / California Academy of Sciences / Entomology Collection
- CUAC / Clemson University / Clemson University Arthropod Collection

Indexed Interactions Tables
Indexed Names Tables

Review Notes

Configuration
Translation Tables
Data Location

Discussion
Questions
Notes

Browse
Explore
Discover

https://globalbioticinteractions.org/bigbee
Broader Impacts - Computer Science
Broader Impacts - Broad participation & training

US National Native Bee Monitoring RCN