Stuart M. Fullerton Collection of Arthropods at the University of Central Florida

Past, Present, and Future

Hojun Song
Department of Biology
University of Central Florida

http://bugcloset.cos.ucf.edu/
Why are regionally focused collections important?

The continuous surface model representation of Rarity-Weighted Richness (RWR) of critically imperiled (G1) and imperiled (G2) species provides a picture of areas that represent concentrations of limited-range species and highlights locations with species composition different from adjacent areas. By combining overall species richness and the relative rarity (based on restricted distributions) of the species, this analysis points to locations that are essentially irreplaceable, and which present conservation opportunities that are found in very few other places.
The Stuart M. Fullerton Collection of Arthropods at the University of Central Florida (UCFC)

- Regionally focused research collection
- Core mission: to document the biodiversity of insects and related arthropods in Central Florida
- The best recent material for Central Florida insects
- The largest regional collection that has the entire holdings digitized
It all started with Stuart M. Fullerton
History of the Bug Closet

• In 1990, **Stuart M. Fullerton**, upon retirement, decided to create a formal research collection based on local insect fauna.
• In 1993, UCF Dept. Biology gave him a closet-sized room (7 ft x 16 ft), which was affectionately dubbed as the “Bug Closet.”
• Mostly collected by passive traps: Malaise trap, FIT, yellow pan trap, pit fall trap, etc.
• In 1997, Dept. Biology created a museum range to house natural history collections.
• In 1997, Fullerton created an endowed account known as the "Fullerton Family Fund" in memory of his family ($100K + $50K match).
• The entire operation largely self-funded by Fullerton.
• The collection grew to ~400K specimens.
• *It is estimated that Fullerton has given over 1 million dollars in building UCFC.*
Period of transformation (2010-2014)

• First curator of UCFC (2010): Hojun Song
• Dept. Biology hired another entomologist (2011): Josh King
• Establishment of a full-time collection manager (2012): Sandor “Shawn” Kelly
• Digitization process ongoing
• Current size: 555,714 specimens (as of 11/10/14)
## Taxonomic breadth and holdings of UCFC (as of 2013)

<table>
<thead>
<tr>
<th>Order</th>
<th># family</th>
<th># genera</th>
<th># species</th>
<th># specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hymenoptera</td>
<td>74</td>
<td>1,235</td>
<td>2,330</td>
<td>360,339</td>
</tr>
<tr>
<td>Coleoptera</td>
<td>102</td>
<td>1,012</td>
<td>1,477</td>
<td>97,784</td>
</tr>
<tr>
<td>Diptera</td>
<td>72</td>
<td>426</td>
<td>538</td>
<td>21,238</td>
</tr>
<tr>
<td>Lepidoptera</td>
<td>27</td>
<td>160</td>
<td>233</td>
<td>1,818</td>
</tr>
<tr>
<td>Other Holometabola</td>
<td>29</td>
<td>54</td>
<td>88</td>
<td>3,669</td>
</tr>
<tr>
<td>Hemiptera</td>
<td>55</td>
<td>242</td>
<td>335</td>
<td>17,905</td>
</tr>
<tr>
<td>Other Paraneoptera</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>940</td>
</tr>
<tr>
<td>Polyneoptera</td>
<td>27</td>
<td>98</td>
<td>147</td>
<td>5,060</td>
</tr>
<tr>
<td>Palaeoptera</td>
<td>13</td>
<td>50</td>
<td>92</td>
<td>1,579</td>
</tr>
<tr>
<td>Non-insect Hexapoda</td>
<td>9</td>
<td>-</td>
<td>-</td>
<td>99</td>
</tr>
<tr>
<td>Other Arthropoda</td>
<td>35</td>
<td>109</td>
<td>131</td>
<td>2,806</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>446</strong></td>
<td><strong>3,386</strong></td>
<td><strong>5,371</strong></td>
<td><strong>513,237</strong></td>
</tr>
</tbody>
</table>

Currently, 555,714 specimens
Health of UCFC

Level 1: Conservation problem
Level 2: Specimens unidentified and inaccessible
Level 3: Specimens identified to family and accessible
Level 4: Specimens identified to subfamily or genus and accessible
Level 5: Specimens identified to species and accessible but curation incomplete
Level 6: Specimens identified to species and properly curated in accordance with collection standards
Level 7A: Data capture: Research data capture
Level 7B: Scientific voucher material

(Cornell-style drawers, wooden open-face cabinets, metal cabinets)
Geographic profile of UCFC holdings (as of 2013)

<table>
<thead>
<tr>
<th>Region</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Florida</td>
<td>329,486</td>
<td>64.20%</td>
</tr>
<tr>
<td>Central California</td>
<td>61,040</td>
<td>11.89%</td>
</tr>
<tr>
<td>Northern Florida</td>
<td>42,236</td>
<td>8.23%</td>
</tr>
<tr>
<td>Great Smoky Mts</td>
<td>21,432</td>
<td>4.18%</td>
</tr>
<tr>
<td>Other USA</td>
<td>28,353</td>
<td>5.52%</td>
</tr>
<tr>
<td>International</td>
<td>30,690</td>
<td>5.98%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>513,237</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>
New species described from UCFC

To date, a total of **20 new species** (16 in Hymenoptera, 3 in Coleoptera and one in Diptera) have been described based on recently-collected material.
New species described from UCFC

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**UCFC Database (Stuart’s foresight)**

- FileMaker Pro database
- Lot database & Specimen database
- Ecological data (habitat)
- Large series
- Complete and ongoing
- 555,714 specimens databased to date

### Specimen Data

<table>
<thead>
<tr>
<th>Lot ID</th>
<th>Family</th>
<th>Genus</th>
<th>Species</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100369</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>quadrirugata</td>
<td>(Say)</td>
</tr>
<tr>
<td>0100370</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>quadrirugata</td>
<td>(Say)</td>
</tr>
<tr>
<td>0100371</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>quadrirugata</td>
<td>(Say)</td>
</tr>
<tr>
<td>0100372</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>quadrirugata</td>
<td>(Say)</td>
</tr>
<tr>
<td>0100373</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>quadrirugata</td>
<td>(Say)</td>
</tr>
<tr>
<td>0100374</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>brocathla</td>
<td>(Cresson)</td>
</tr>
<tr>
<td>0100375</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>brocathla</td>
<td>(Cresson)</td>
</tr>
<tr>
<td>0100376</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>brocathla</td>
<td>(Cresson)</td>
</tr>
<tr>
<td>0100377</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>brocathla</td>
<td>(Cresson)</td>
</tr>
<tr>
<td>0100378</td>
<td>Multidio</td>
<td>Dasyflavida</td>
<td>brocathla</td>
<td>(Cresson)</td>
</tr>
</tbody>
</table>

### Geographic Data

- **Habitat**: Long Leaf/Sand Pine
- **State**: FL
- **County**: Orange
- **City**: Orlando
- **Location**: UCF Campus

### Additional Information

- **Collection Date**: Sep 14, 1993
- **Collector**: S.M. Fullerton
- **Lot Data**:
  - **Lot ID**: 15
  - **Geopontine Data**: USA
  - **Notes**:
- **Specimen ID**:
  - **Family**: Dasyflavida
  - **Genus**: Dasyflavida
  - **Species**: quadrirugata
  - **Author**: (Say)
Database conversion initiative

• Limitation of custom-made FileMaker-based database
  - Not in Darwin Core format
  - Accessibility cumbersome
  - Online, but hidden

• Collaboration with Norman F. Johnson at the Charles A. Triplehorn Insect Collection at the Ohio State University (OSUC)
  - OSUC Hymenoptera Online as a backbone
  - Oracle RDBMS
  - Registered data provider for the GBIF through a DiGIR interface
http://bugcloset.cos.ucf.edu

The Bug Closet
The Stuart M. Fullerton Collection of Arthropods at the University of Central Florida (UCFC)

Welcome to the on-line home of Central Florida’s preeminent insect collection: The Bug Closet!
The Stuart M. Fullerton Collection of Arthropods at the University of Central Florida, Orlando, FL
UCFC

Collection Stats
# of Primary Types: 0
# of Secondary Types: 4
# of Species-group Taxa w/ Specimens: 1,153
# of Specimens: 38,955
Oldest Specimen: June 14, 1958 (UCFC 0 039 242)
Time Last Specimen Entered: November 15, 2014, 04:18:30 PM
Info for Specimen: UCFC 0 135 828

- **Locality Info**
  - Locality Name: Orlando, 28°36'7"N 81°12'1"W, 70ft, UCF Campus, Orange Co., FL
  - Coordinates: 28.6019°N 81.2003°W (label)
  - Elevation: 21m
  - Country: United States (Country)
  - State: Florida (State)
  - County: Orange (County)
  - Town: Orlando (Town)

- **Collecting Trip Info**
  - Date: 20 March 1991
  - Collector(s): Fullerton, S. M. (1)
  - Collecting Method: none specified
  - Field Code: UCFC Lot ID: 78

- **Determination(s)**
  - Identified As: Ammophila umaria Dahlbom
  - Determined By: Fullerton, S. M. (Stuart M.)
  - Date of Determination: 2002
  - Determination Status: CURRENT

- **Weather**
  - Temperature: 25°C (77°F) - 11°C (52°F)
  - Humidity: 93% - 25%
  - Barometric Pressure: 1021mb - 1018mb
  - Wind: 19km/hr (12mph) - 0km/hr (0mph)

- **Biological Info**
  - Habitat:
  - Association(s):
Search UCFC Holdings

Hierarchy: Arthropoda > Hexapoda > Hymenoptera > Apoidea > Sphecidae > Ammophilinae > Ammophila > Ammophila urnaria

- General Information
  - Species: Ammophila urnaria
  - Author: Dahlbom
  - Status: Valid, Original name/combination
  - Rank: Species
  - Generate taxon checklist:

- Contributors
  - Taxonomy: Joseph R. Cora [1], Norman F. Johnson [2]
  - Occurrence: Joseph R. Cora [1], Nancy DeRup [2], Stuart M. Fullerton [3], Zachary R. Hurley [4], Victor Zeinner [5]

- Valid Subordinate Taxa
  - Specimens: 8

- Synonyms
  - View fossils: ✓

- Map
  - Show all records: □
  - View large map

- Literature
  - Show synonyms: □
  - Show all annotations: □
  - View type: annotation-view bibliography-view

- Types
  - Show all types: □

- Determiners

- Associations
  - Show options

- Habitat

- Collecting Methods

- NCBI (48)
Friends of the Bug Closet

Robert Zuparko (Chalcidoidea)

Lubomir Masner
(parasitic Hymenoptera)

Gary Gibson (Chalcidoidea)

Kevin Pitz (Braconidae)

Jason Gibbs (Lasioglossum)

Margaret Thayer and Al Newton
(Staphylinidae)

Matthias Buck (Vespoidea)

... and many more...
Outreach

Outreach Coordinator: Derek A. Woller
Entomological Society of Central Florida
Stuart M. Fullerton (1940-2014)
Stuart M. Fullerton (1940-2014)
The Future of UCFC

- UCF commitment
- Endowment
- Facility renovation planned
- Seeking a new curator (tenure-track faculty position)
  - http://biology.cos.ucf.edu/faculty-positions/
Stuart M Fullerton ROF