

Perspectives on Arthropod Collections and Data

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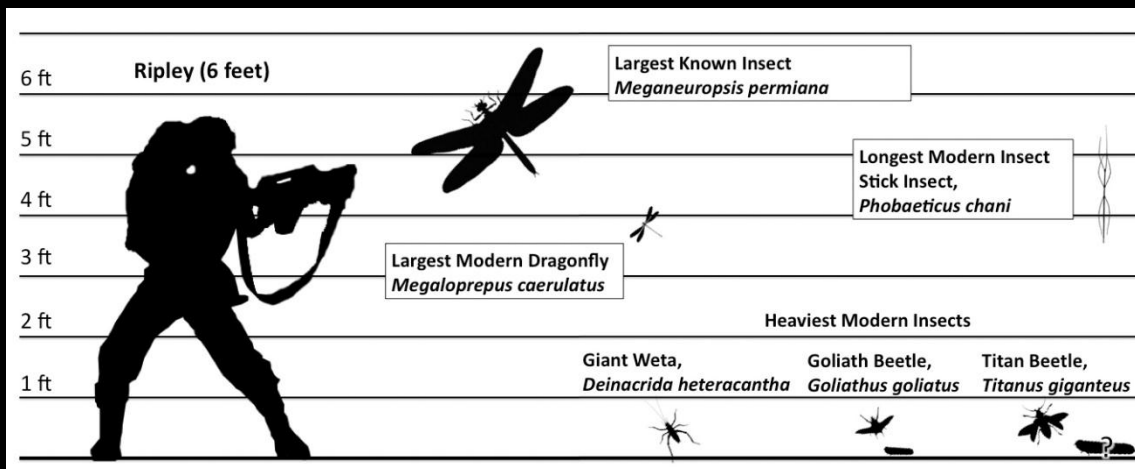


Obstacles

- Arthropods are problematic from a diversity standpoint
 - Size of specimens
 - Numbers of specimens
 - Diversity of kinds
 - Goals and motives of projects

Specimen size

- Most arthropod species are less than 5mm
- Hard to know what you're collecting in the field
- DNA extraction is relatively destructive



Numbers of specimens

- Vast numbers of specimens (10,000,000,000,000,000,000,000 alive at any time)
- Hard to individualize specimen collection and processing
- Impossible to collect all specimens (must prioritize)
- Impractical to process and database all specimens collected



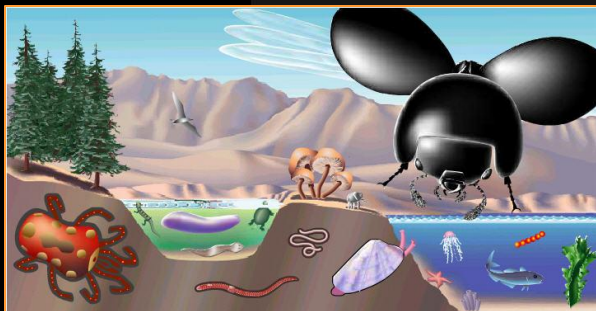
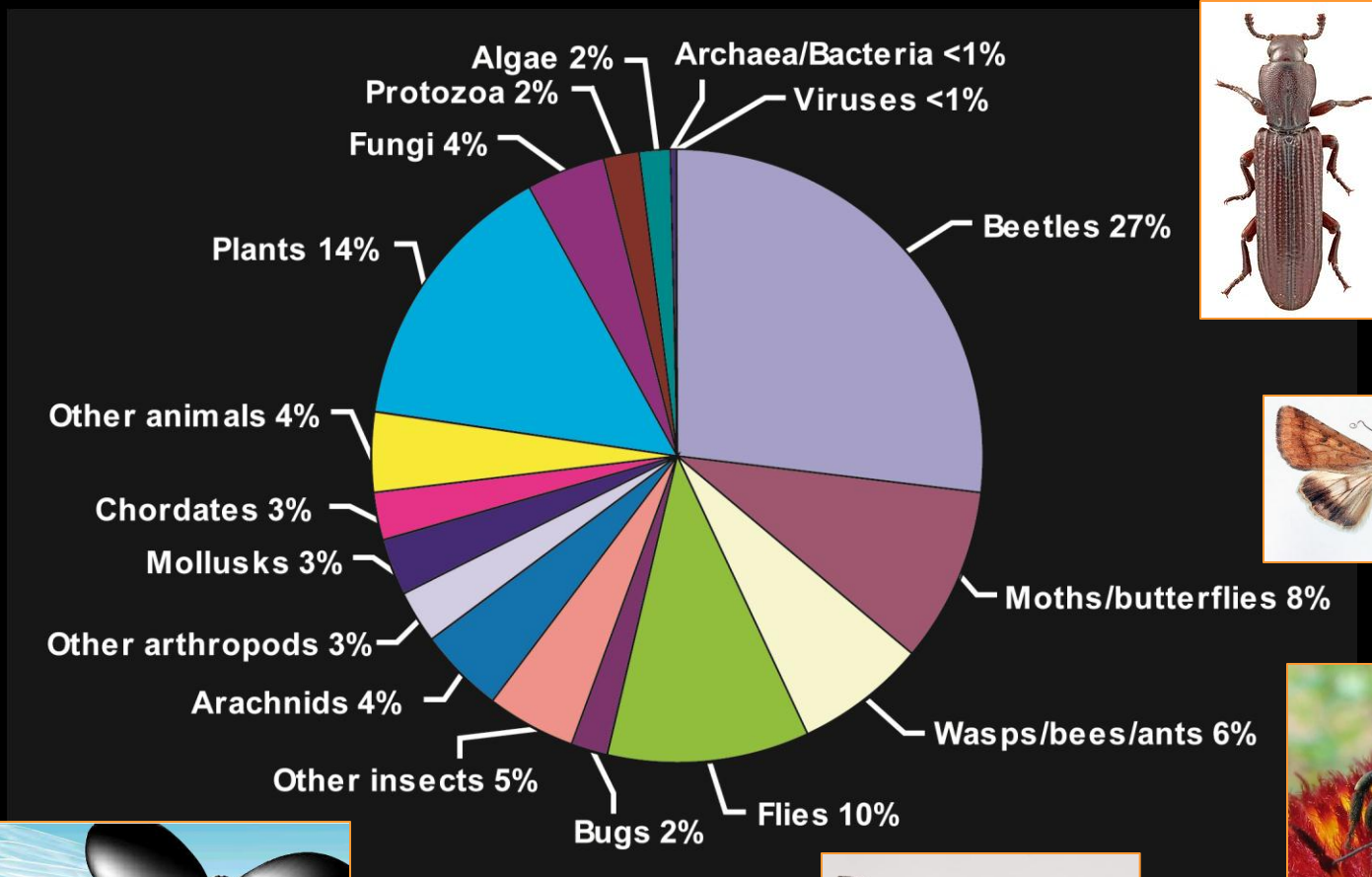




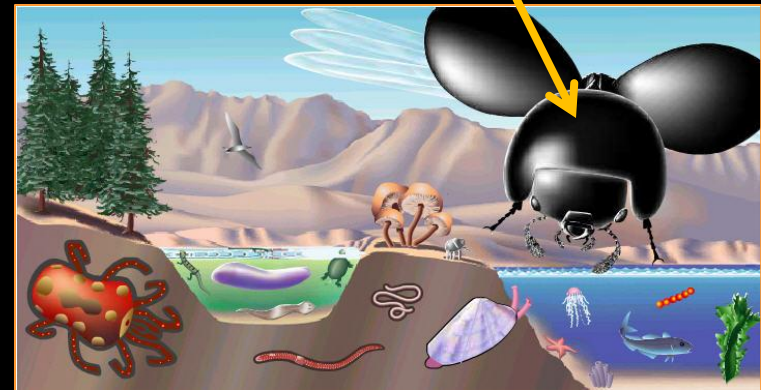
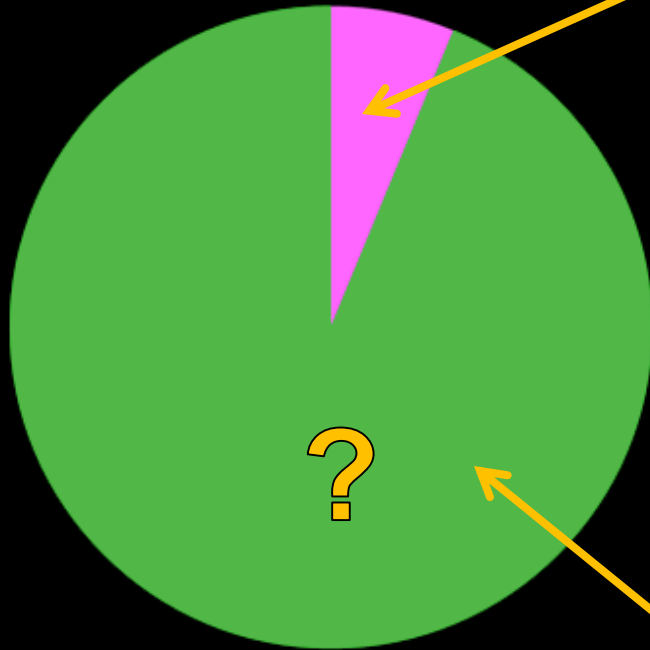
Problems in arthropods

- Numbers of known species and numbers of unknown species
 - Most known species (and probably most unknown species) are arthropods

~1.7 million species of living things



Known insects (~950,000 species)



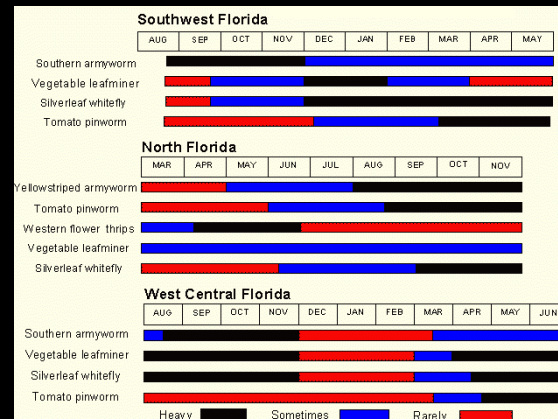
**Estimated unknown insect diversity
(~15 million species???)**

Variable collecting techniques

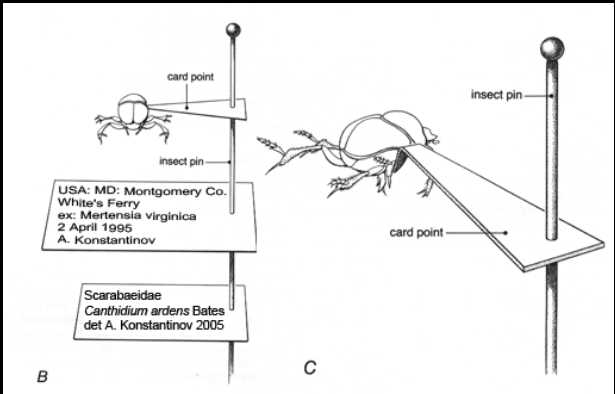
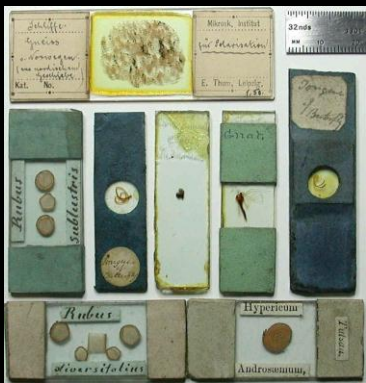
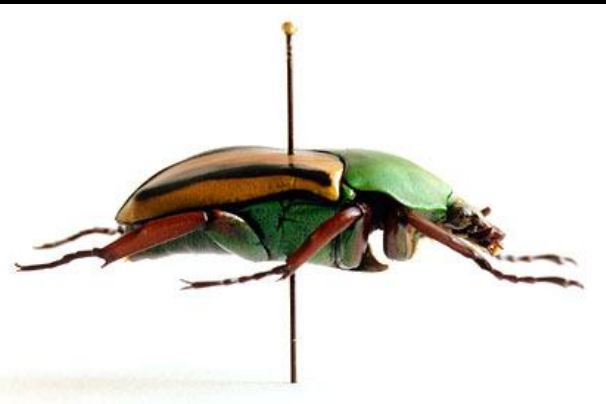
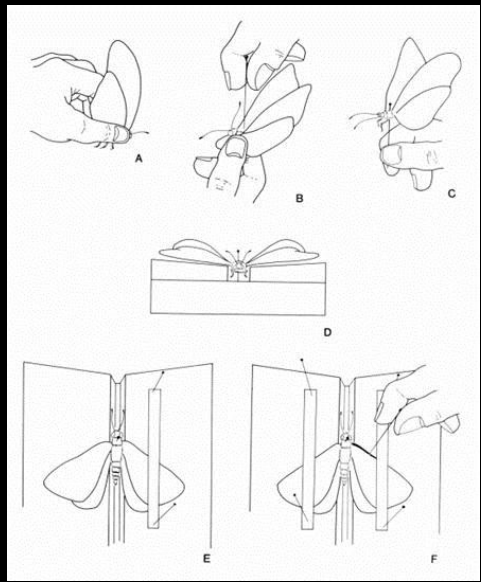
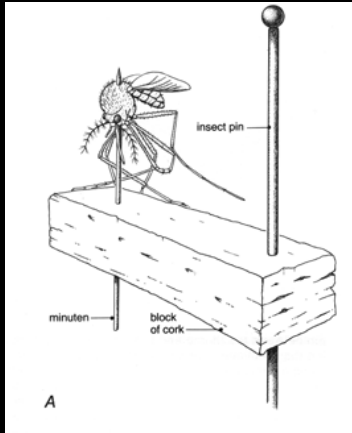


Variable data

- Host records
- Microhabitats
- Life stages
- Seasonality
- Water characteristics
- Etc.



Variable curating techniques



USA: MD: Montgomery Co.
Whiter's Ferry
ex: Mertensia virginica
2 April 1995
A. Konstantinov

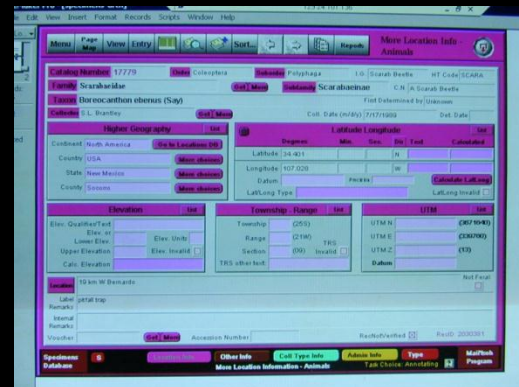
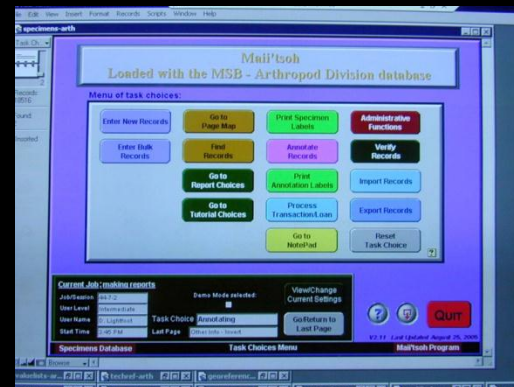
Scarabaeidae
Canthidium ardens Bates
det A. Konstantinov 2005

Implications

- Most species diversity is unknown
- Of most of the known diversity, little or nothing is known about its biology
- No one can be an expert in all or even many collecting techniques, curatorial techniques and taxa
- Taxonomy changes regularly
 - Nomenclature is rearranged
 - New taxa are described
 - Identifications change

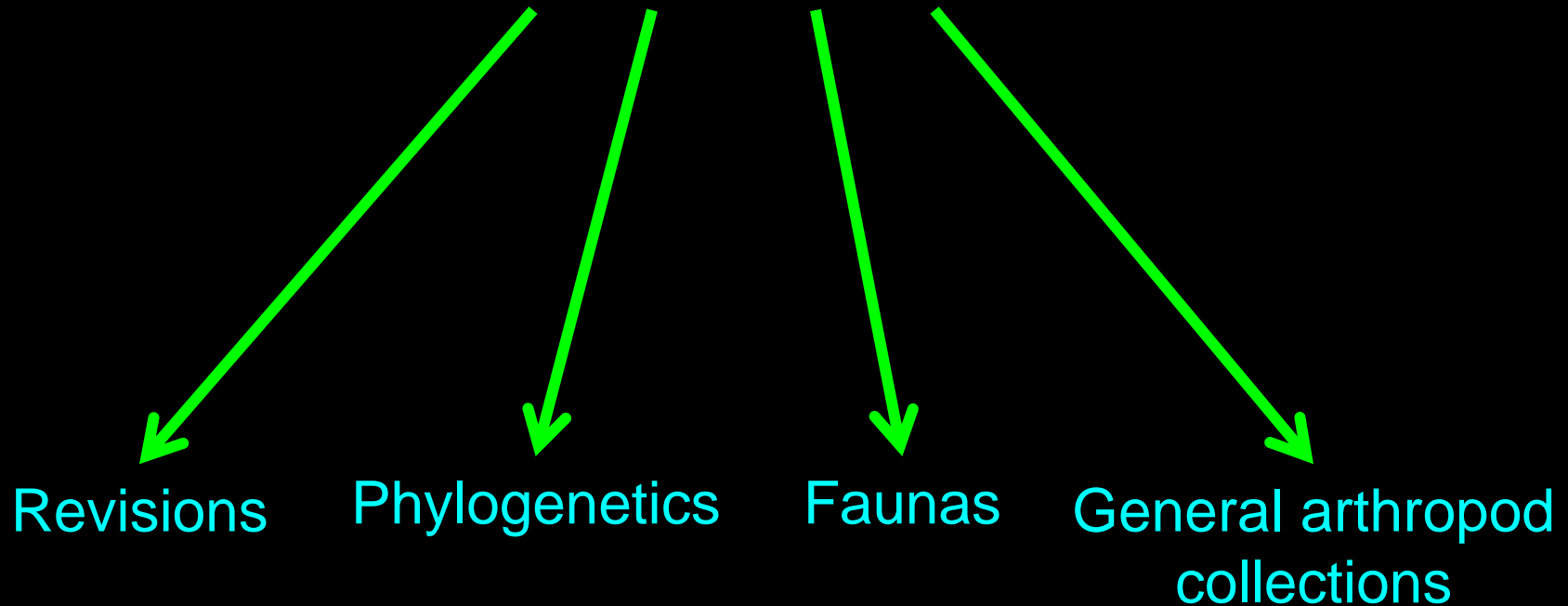
Databasing

- Database specimens or other objects (series, vials of specimens, etc.)
- Identifications often “coarse”
 - Better identifications delayed (need experts)
- May be incorrect or under an old name
- Incomplete for various reasons
 - Numbers of specimens, species, techniques
- Resource tradeoffs
 - More databasing vs. more specimens



Goals, motives and limitations

Different goals / different strategies



Education

- Biodiversity studies
 - Megadiversity of arthropods
 - Scales of habitat use
 - Identification resources
 - Reference collections
 - Digital libraries
- Integration with other databases
 - Host/parasites
 - Host/pollinators/herbivores
 - Water quality/arthropod distributions

Venezuela

Aquatic Insects of
Insectos Acuáticos de **VENEZUELA**

- Water beetles in ~16 families

- Recorded species ~175
- Range extensions ~100
- Expected new species ~200
- Expected total ~475

- Revised expected new species >350
- Revised total ~625
- [Link](#)

