



A taxonomic review of Alaskan Snow Scorpionflies

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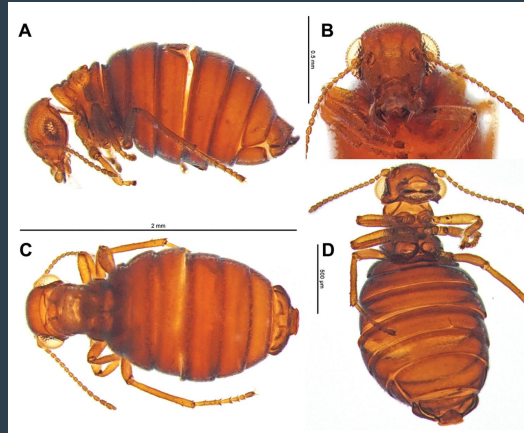
Photo: Derek Sikes

Boreus (Mecoptera: Boreidae) - Snow Scorpionflies



Panorpa helena

Ted MacRae



Caurinus tlagu

Derek Sikes & Jill Stockbridge



Boreus sp.

Boreus (Mecoptera: Boreidae)

- Flightless
- 2.0-7.4 mm
- Mostly found in and feed on mosses
- Holarctic
- Cold adapted



Boreus (Mecoptera: Boreidae)

- Active in the winter months
- Can be collected on top of the snow on warmer winter days
- Unknown life history in Alaska



Boreus brumalis, Massachusetts, Tom Murray

Alaskan *Boreus*

- *Boreus borealis* (Banks 1923)
- *Boreus intermedius* (Lloyd 1934)
- *Boreus nix* (Carpenter 1935)
 - Not endemic
- 2+ undescribed species (?)
- 22 specimens total

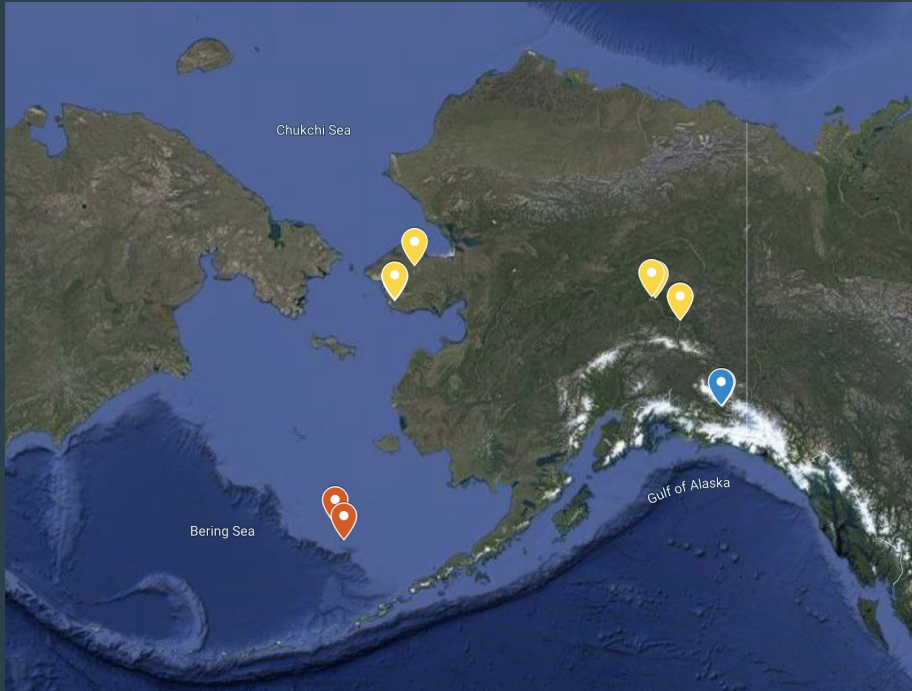


B. borealis



B. nix

Distribution in Alaska



Type localities:

B. borealis: Pribilof Islands

B. intermedius: Kennicott

Goal: Characterize the diversity of Alaskan *Boreus*

Objectives:

- 1) **Taxonomically describing undocumented Alaskan *Boreus* species**
- 2) Writing a key to identification
- 3) Infer a phylogeny of Alaskan *Boreus*

1) Taxonomically describing undocumented Alaskan *Boreus* species

- Collecting new specimens
 - Interior
 - Kennicott
 - St. Paul Island



1) Taxonomically describing undocumented Alaskan *Boreus* species

- Collecting new specimens
- DNA Barcoding
 - COI gene sequences from the Canadian Center for DNA barcoding



1) Taxonomically describing undocumented Alaskan *Boreus* species

- Collecting new specimens
- DNA Barcoding
- Morphological analysis
 - Comparison with type specimens
 - Identifying diagnostic characters



Goal: Characterize the diversity of Alaskan *Boreus*

Objectives:

- 1) Taxonomically describing undocumented Alaskan *Boreus* species
- 2) Writing a key to identification**
- 3) Infer a phylogeny of Alaskan *Boreus*

2) Writing a key to identification

- Based on diagnostic characters identified during morphological analysis



2) Writing a key to identification

- Based on diagnostic characters identified during morphological analysis
- Make identification much easier

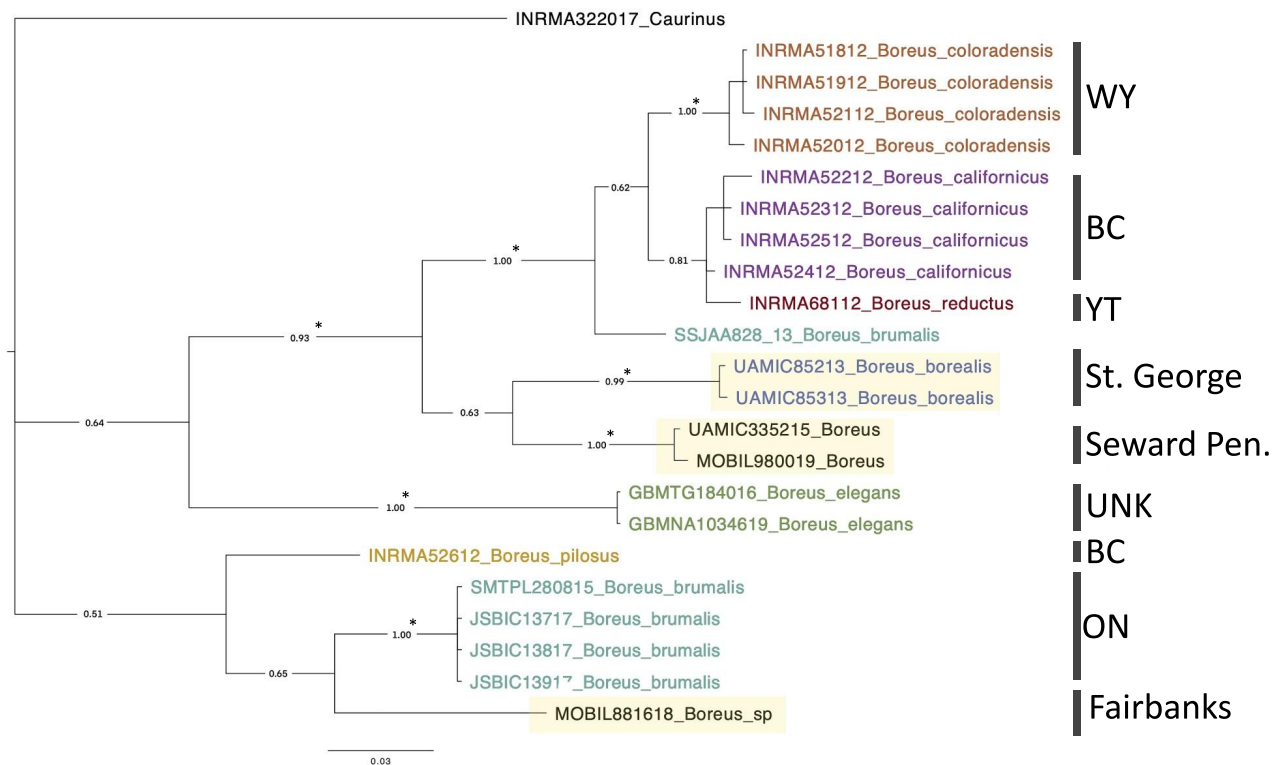


Goal: Characterize the diversity of Alaskan *Boreus*

Objectives:

- 1) Taxonomically describing undocumented Alaskan *Boreus* species
- 2) Writing a key to identification
- 3) Infer a phylogeny of Alaskan *Boreus***

Preliminary Bayesian COI phylogeny



St. George Island



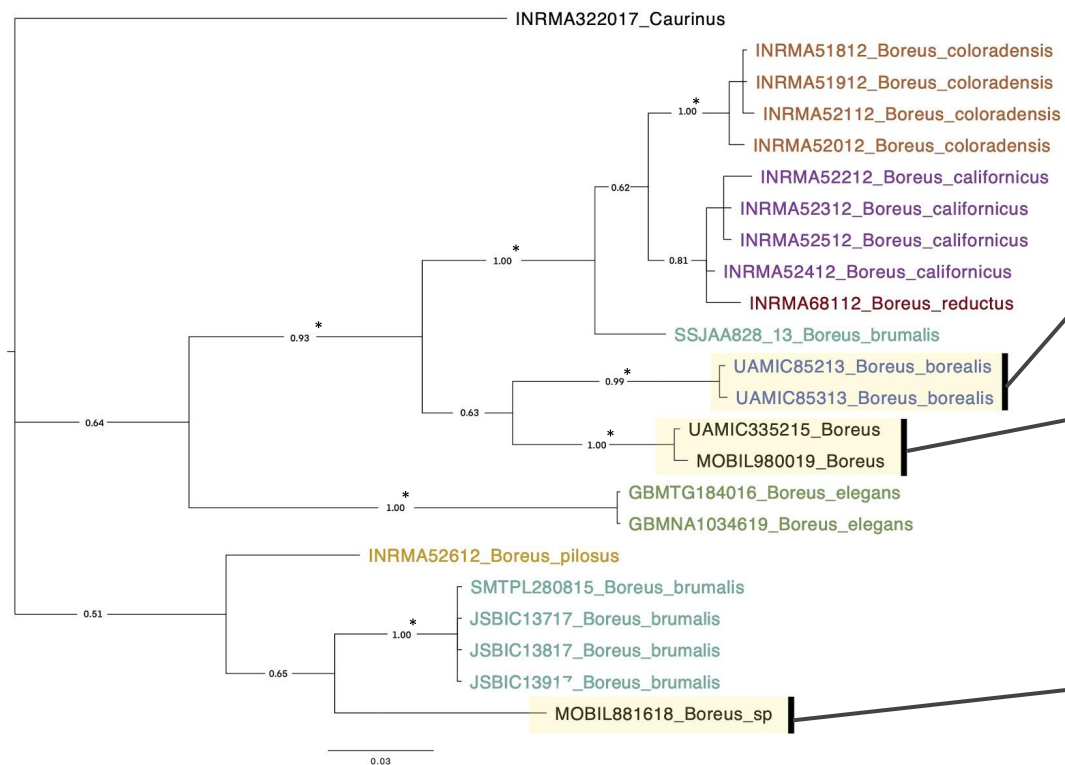
Seward Peninsula



Fairbanks



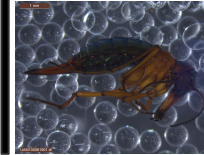
Preliminary Bayesian COI phylogeny



St. George Island



Seward Peninsula



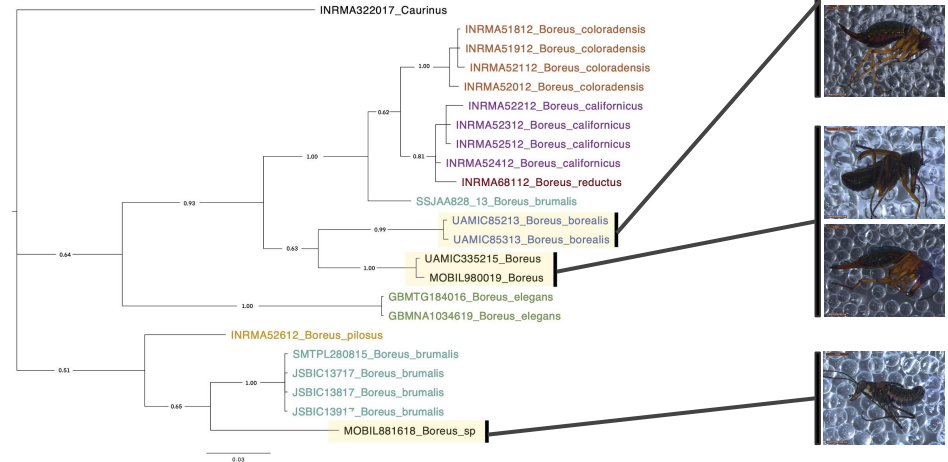
Fairbanks



3) Infer a phylogeny of *Boreus*

- Morphological characters and COI

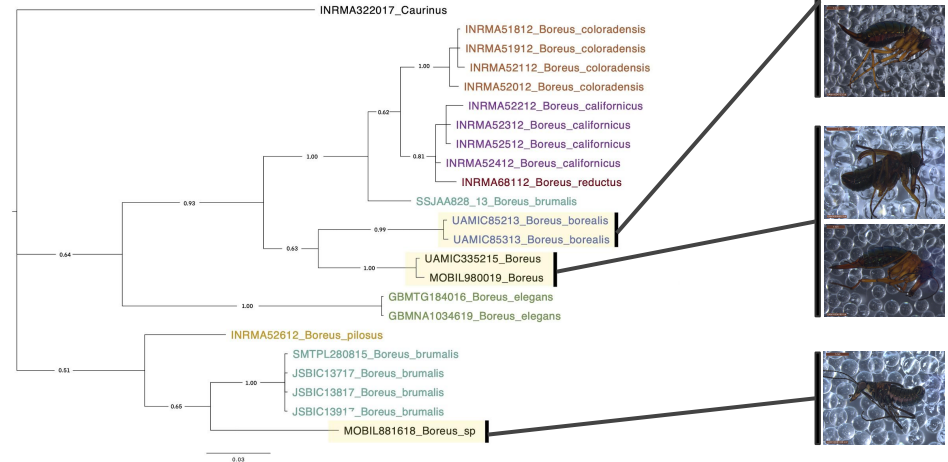
Preliminary Bayesian phylogeny



3) Infer a phylogeny of *Boreus*

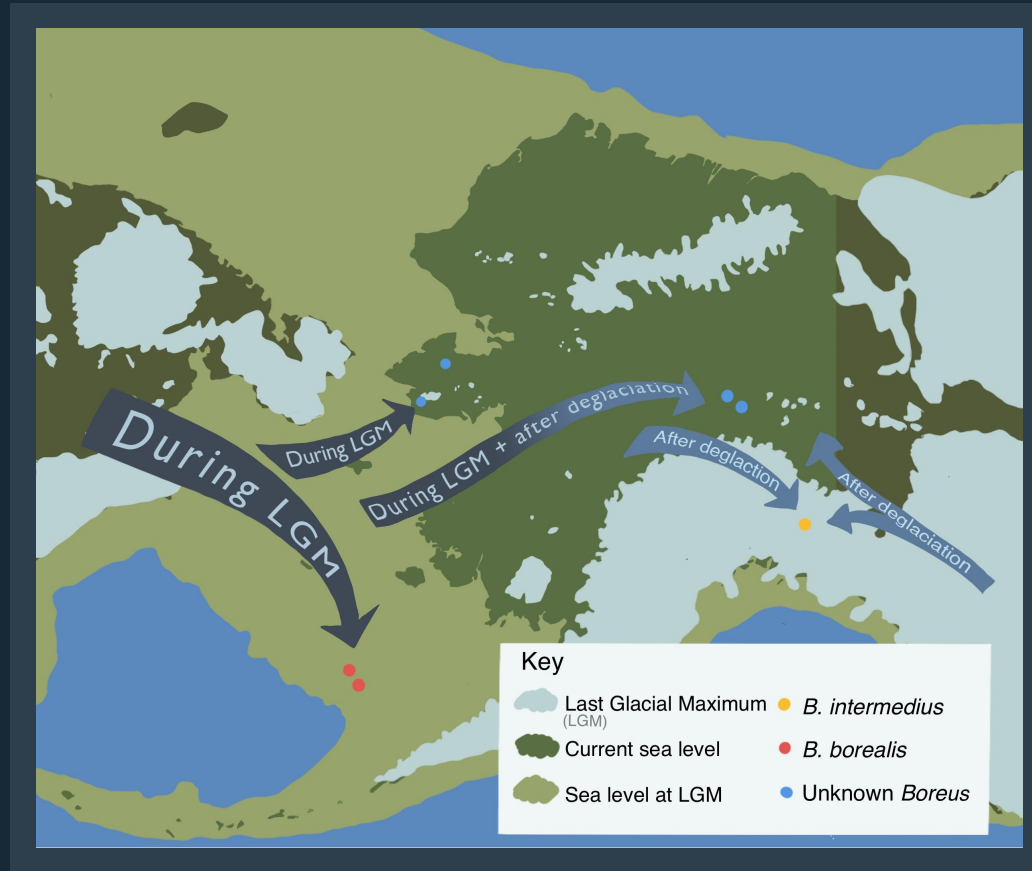
- Morphological characters and COI
- Evolutionary relationship of Alaskan *Boreus*

Preliminary Bayesian phylogeny



3) Infer a phylogeny of *Boreus*

- Morphological characters and COI
- Evolutionary relationship of Alaskan *Boreus*
- Biogeographic history



Broader impacts

- Documenting Alaskan biodiversity



Broader impacts

- Documenting Alaskan biodiversity
- Alaskan endemic arthropods



Broader impacts

- Documenting Alaskan biodiversity
- Alaskan endemic arthropods
- Conservation





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