Proposed Research: A Taxonomic Revision of the Rove Beetle Genus *Phlaeopterus* (Coleoptera: Staphylinidae: Omaliinae)

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Taxonomic Context

Family: Staphylinidae
- 50,000 + species
- Truncated elytra, flexible abdomen

Subfamily: Omaliinae
- Ocellate rove beetles

Tribe: Anthophagini
- “A taxonomic dumping ground” – Newton et al. 2000

Genus: Phlaeopterus
Motschulsky 1853

Fig. 4. Summary phylogeny of the superfamily Staphylinoidae. Width of branches is proportional to the present-day species richness. Numbers indicate species richness for respective clades as of mid-2011. Note the most contrasting difference in species richness between two sister-families: Silphidae (188 described extant species) and Staphylinidae (57,638 described extant species).

Grebennikov & Newton (2012)
Genus *Phlaeopterus* Motschulsky 1853

<table>
<thead>
<tr>
<th>Species</th>
<th>Author</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>P. fusconiger</em></td>
<td>Motschulsky</td>
<td>1853</td>
</tr>
<tr>
<td><em>P. cavicollis</em></td>
<td>Fauvel</td>
<td>1878</td>
</tr>
<tr>
<td><em>P. longipalpus</em></td>
<td>Casey</td>
<td>1885</td>
</tr>
<tr>
<td><em>P. filicornis</em></td>
<td>Casey</td>
<td>1886</td>
</tr>
<tr>
<td><em>P. brevipennis</em></td>
<td>Casey</td>
<td>1894</td>
</tr>
<tr>
<td><em>P. castaneus</em></td>
<td>Casey</td>
<td>1894</td>
</tr>
<tr>
<td><em>P. rufitarsis</em></td>
<td>Casey</td>
<td>1894</td>
</tr>
<tr>
<td><em>P. cascadiensis</em></td>
<td>Hatch</td>
<td>1957</td>
</tr>
<tr>
<td><em>P. frosti</em></td>
<td>Hatch</td>
<td>1957</td>
</tr>
<tr>
<td><em>P. houkae</em></td>
<td>Hatch</td>
<td>1957</td>
</tr>
<tr>
<td><em>P. kootenayensis</em></td>
<td>Hatch</td>
<td>1957</td>
</tr>
<tr>
<td><em>P. lagrandeuri</em></td>
<td>Hatch</td>
<td>1957</td>
</tr>
<tr>
<td><em>P. loganensis</em></td>
<td>Hatch</td>
<td>1957</td>
</tr>
<tr>
<td><em>P. stacesmithi</em></td>
<td>Hatch</td>
<td>1957</td>
</tr>
</tbody>
</table>

**Table 1.** A comprehensive list of currently described *Phlaeopterus* species by author and year of description.

Casey, T. 1885

Hatch, M. 1957

Milt Campbell’s Unpublished Key


Revision 6 (Phlaeopterus) never completed or published
Genus *Phlaeopterus* Motschulsky 1853

**Distribution**

- North America
  - Pacific coast, Rocky Mountains

**14 Species Currently Known**

- 4 spp. known from Alaska
  - 2 possible new records
- 9 spp. known from Canada

Image generated with Berkeley Mapper
Genus *Phlaeopterus* Motschulsky 1853

**Macrohabitat**
- Alpine, snow fields
- Edges of streams and lakes

**Microhabitat**
- Under rocks
- Wet moss

**Ecology**
- Predators/scavengers
- Windblown insect fallout on snowfields

Photo: D. Sikes
Heintzleman Ridge, North of Juneau, AK
Specimen Acquisition

Specimen Loans:

- University of Alaska Museum
  - 68 specimens, 10 locations

- Field Museum of Natural History

- Oregon State Arthropod Collection

- Canadian National Collection of Insects, Arachnids, and Nematodes

- California Academy of Sciences Entomology Collection

http://bugguide.net/node/view/490345
Specimen Acquisition: Field Collecting

*Phlaeopterus* undescribed species collection sites:

1) Parks Highway, Alaska Range

2) Hatcher Pass, Talkeetna Mountains

3) 8 miles northwest of Haines
Morphology

1) Adult external morphology
   - Observed under dissecting microscope
   - SEM images of diagnostic features

2) Morphology of male genitalia
   - Dissected and placed in vials of glycerin
   - Line drawings of diagnostic features

Campbell, J. M. (1983)
Genetic Data

Two genes:
1) Mitochondrial gene: cytochrome c oxidase subunit 1 (CO1)
   - n=10 individuals per population
   - P. lagrandeuri sequence
2) Nuclear gene: carbamoyl-phosphate synthetase 2, aspartate transcarbamylase, and dihydroorotase (CAD)
   - will sample CAD for a subset of COI clades

Methods:
1) Extraction with QIAGEN kit
2) PCR amplification at UAM molecular lab
3) Sequencing at University of Washington High Throughput Sequencing Facility
Outgroup Selection

Used to “root” phylogenetic trees

Genus *Lesteva* Latreille 1796
  • Tribe Anthophagini

Genus *Phloeonomus* Heer 1839
  • Tribe Omaliini

http://evolution.berkeley.edu/evolibrary/article/phylogenetics_02

http://bugguide.net/node/view/376574/bgimage

*Phloeonomus laesicollis*
Outcomes

1) Modernized species limitations and dichotomous key for genus *Phlaeopterus*

2) Species descriptions, illustrations and SEM images, taxonomic synopsis, bionomics, and distribution maps

3) M.S. thesis and two manuscripts