

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

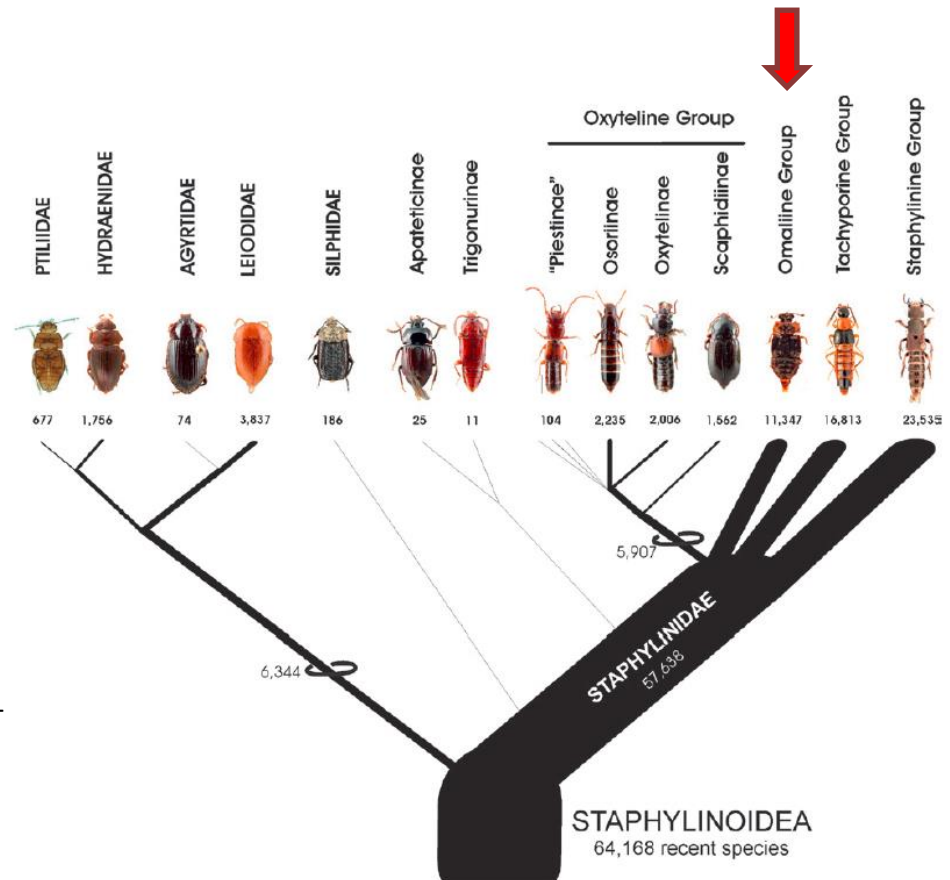


Fig. 4. Summary phylogeny of the superfamily Staphylinoidea. Width of branches is proportional to the present-day species richness. Numbers indicate species richness for respective clades as of mid-2011. Note the most contrasting difference in species richness between two sister-families: Silphidae (186 described extant species) and Staphylinidae (57,638 described extant species).

Grebennikov & Newton (2012)

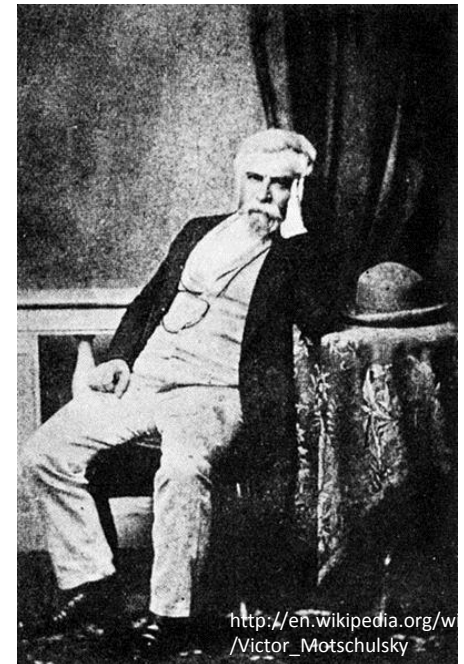
Genus *Phlaeopterus* Motschulsky 1853

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

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

Casey, T. 1885

Hatch, M. 1957



Milt Campbell's Unpublished Key

North American Omaliinae revision series: 1-5 published 1979 – 1983

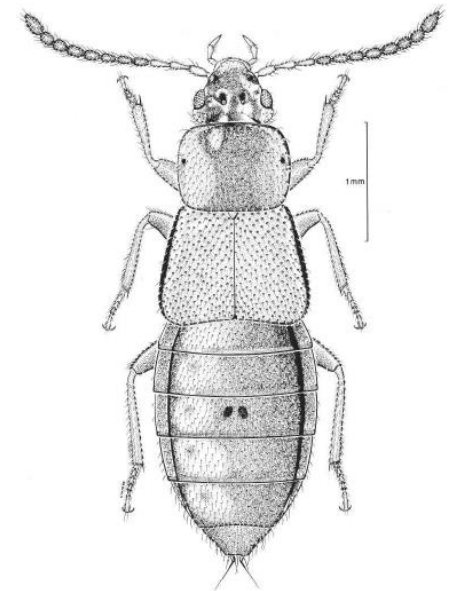
Revision 6 (*Phlaeopterus*) never completed or published

**A REVISION OF THE NORTH AMERICAN OMALIINAE
(COLEOPTERA: STAPHYLINIDAE)**

**THE GENERA *ARPEDIUM* ERICHSON AND
EUCNECOSUM REITTER¹**

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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

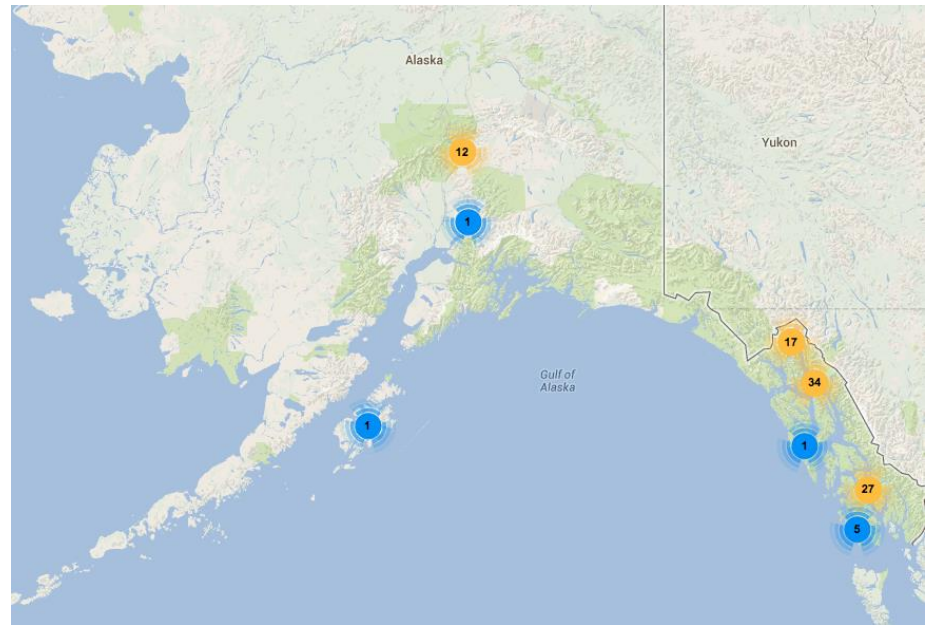


Image generated with Berkeley Mapper

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



Heintzleman Ridge, North of Juneau, AK



Specimen Acquisition

Specimen Loans:

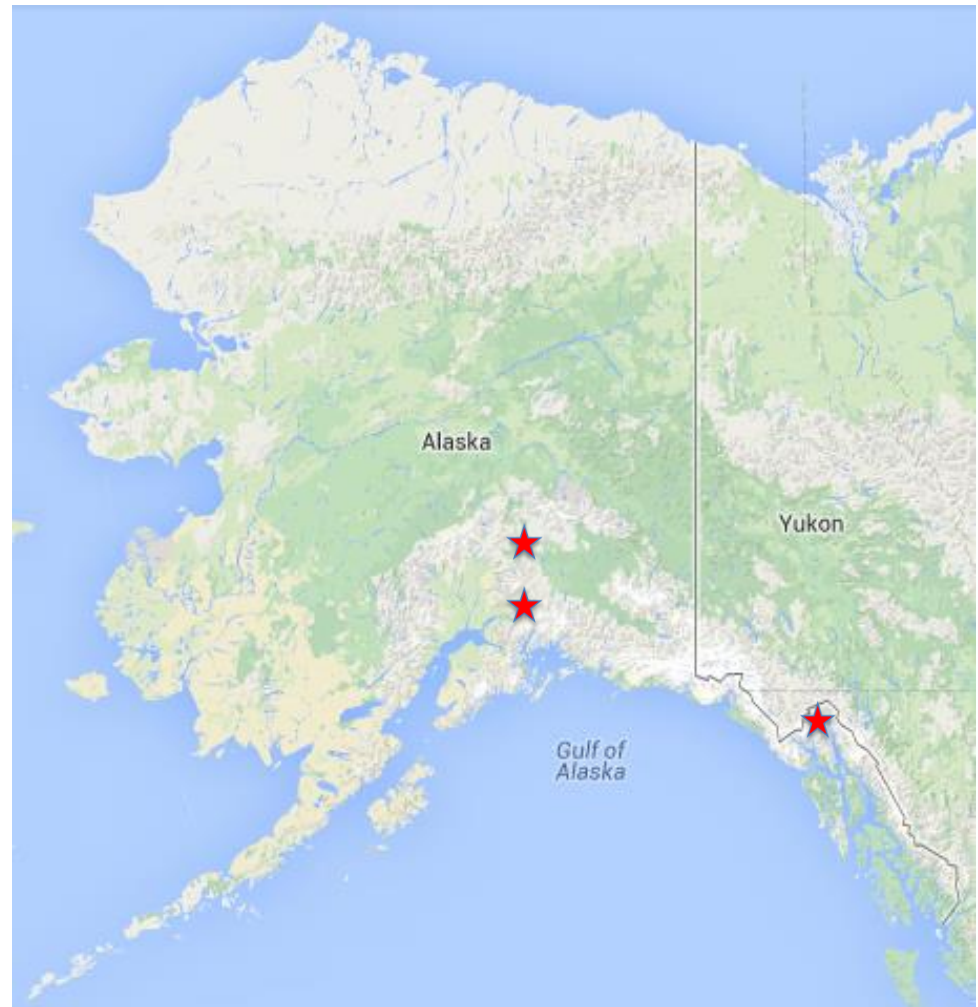
- University of Alaska Museum
 - 68 specimens, 10 locations
- Field Museum of Natural History
- Oregon State Arthropod Collection
- Canadian National Collection of Insects, Arachnids, and Nematodes
- California Academy of Sciences Entomology Collection



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



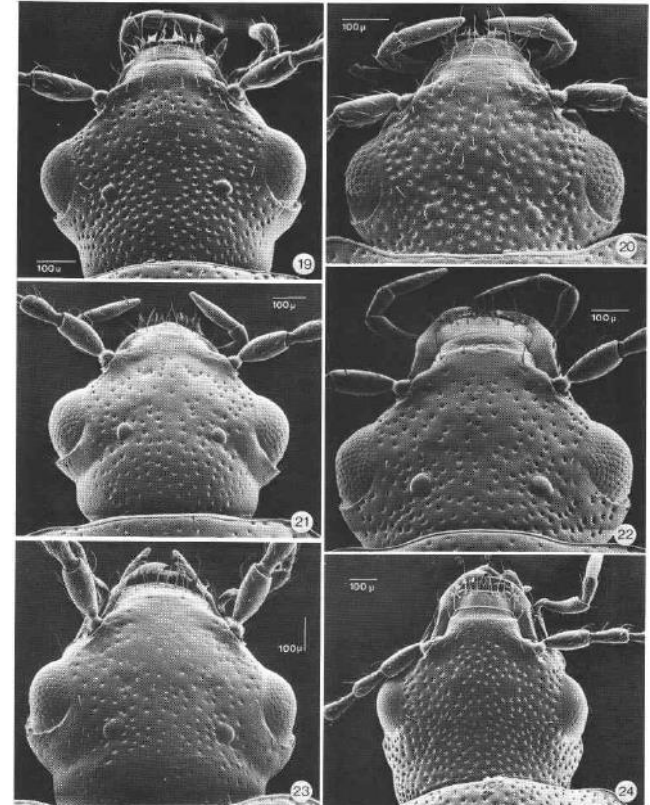
Morphology

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:

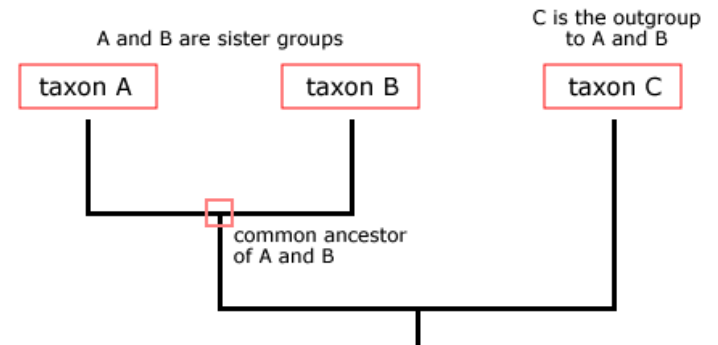
- 1) Mitochondrial gene: cytochrome c oxidase subunit 1 (CO1)
 - n=10 individuals per population
 - P. lagrandeuri sequence
- 2) Nuclear gene: carbamoyl-phosphate synthetase 2, aspartate transcarbamylase, and dihydroorotase (CAD)
 - will sample CAD for a subset of COI clades

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



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

Genus *Lesteva* Latreille 1796

- Tribe Anthophagini

Genus *Phloeonomus* Heer 1839

- Tribe Omaliini



<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



Photo: D. Sikes