Biodiversity for Sustainable Futures

Coleoptera of Alberta: Visual Guide to Common Terrestrial Families (Adults)

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Carson, A., Gee, G., Summers, M. (2024). Coleoptera of Alberta: Visual Guide to Common Terrestrial Families (Adults). QUBES Educational Resources.

Coleoptera terrestrial families found in Alberta – page 1

Adephaga
- **Carabidae** (p. 7)
- Rhysodidae*
- Trachypachidae*

Archostemata
- Cupedidae*
- Micromalthidae*

Polyphaga
- Bostrichoidea
  - Bostrichidae*
  - **Dermestidae** (p. 14)
  - Endecatomidae*
  - Ptinidae
- Derodontoidea
  - Derodontidae*
  - Nosodendridae*
- Scarabaeoidea
  - Geotrupidae*
  - Glaphyridae*
  - Glaresidae*
  - Hybosoridae*
  - Lucanidae*
  - Ochodaeidae
  - Passalidae*
  - **Scarabaeidae** (p. 17)
  - Trogidae

Polyphaga: Elateriformia
- Buprestoidea
  - **Buprestidae** (p. 9)
- Byrrhoidea
  - Byrrhidae
  - Dryopidae*
  - Elmidae*
  - Heteroceridae
  - Limnichidae*
  - Lutrochidae*
  - Psephenidae*
  - Ptilodactylidae*
- Dascilloidea
  - Rhipiceridae*
- Elateroidea
  - Artematopodidae*
  - Cantharidae
  - **Elateridae** (p. 15)
  - Eucnemidae
  - Lampyridae
  - Lycidae
  - Phengodidae*
  - Throscidae*
- Scirtoidea
  - Clambidae*
  - Eucinetidae*
  - Scirtidae

Polyphaga: Staphyliniformia
- Hydrophiloidea
  - Georissidae*
  - Helophoridae
  - Histeridae
  - Hydrochidae*
  - Sphaeritidae*
- Staphylinoidea
  - Agyrtidae*
  - Hydraenidae*
  - Leiodidae
  - Ptiliidae*
  - **Silphidae** (p. 18)
  - **Staphylinidae** (p. 19)

black text = families
blue text = other taxonomic levels
bold text = included in identification guide
* = family unlikely to be found

Coleoptera terrestrial families found in Alberta – page 2

Polyphaga: Cucujiformia

Chrysomeloidea

- **Cerambycidae** (p. 10)
- **Chrysomelidae** (p. 11)
- Megalopodidae*
- Orsodacnidae

Cleroidea

- Biphyllidae*
- Byturidae
- Cleridae
- Melyridae
- Trogossitidae*

Coccinelloidea

- Anamorphidae*
- Bothrideridae*
- Cerylonidae*
- **Coccinellidae** (p. 12)
- Corylophidae*
- Endomychidae
- Euxestidae*
- Latridiidae
- Mycetaeidae*
- Murmidiidae*

Cucujoidea

- Cryptophagidae
- Cucujidae
- Cybocephalidae*
- Erotylidae*
- Kateretidae
- Laemophloeidae*
- Monotomidae*
- Nitidulidae
- Passandridae*
- Phalacridae*
- Silvanidae
- Sphindidae*

Curculionoidea (p. 13)

- Anthribidae
- Attelabidae
- Brachyceridae*
- Brentidae
- Cimberididae*
- Curculionidae
- Dryophthoridae*

Lymexyloidea

- Lymexylidae*

Tenebrionoidea

- Aderidae*
- Anthicidae
- Boridae*
- Ciidae*
- Ischaliidae
- Melandryidae
- **Meloidae** (p. 16)
- Mordellidae
- Mycetophagidae*
- Mycteridae*
- Oedemeridae*
- Prostomidae*
- Pyrochroidae
- Pythidae*
- Ripiphoridae*
- Salpingidae*
- Scraptiidae*
- Stenotrachelidae
- Synchroidae*
- **Tenebrionidae** (p. 20)
- Tetratomidae*
- Zopheridae

black text = families
blue text = other taxonomic levels
bold text = included in identification guide
* = family unlikely to be found

Coleoptera families you can identify with this guide – page 1

ADEPHAGA

Carabidae
(ground beetles)

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POLYPHAGA

Buprestidae
(metallic wood-boring beetles)

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Cerambycidae
(long-horned beetles)

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Chrysomelidae
(leaf beetles)

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Coccinellidae
(lady beetles)

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Curculionoidea
(snout and bark beetles, weevils)

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Coleoptera families you can identify with this guide – page 2

POLYPHAGA continued

Dermestidae
(skin beetles)

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Elateridae
(click beetles)

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Meloidae
(blister beetles, oil beetles)

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Scarabaeidae
(scarab beetles)

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Silphidae
(carrion beetles)

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Staphylinidae
(rove beetles)

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Tenebrionidae
(darkling beetles)

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Coleoptera: Adephaga versus Polyphaga

Adephaga

- hind coxae fused to metasternum and divide the first abdominal ventrite
- notopleural sutures present (see p. 7)

One family commonly found in Alberta: Carabidae

proceed to next page

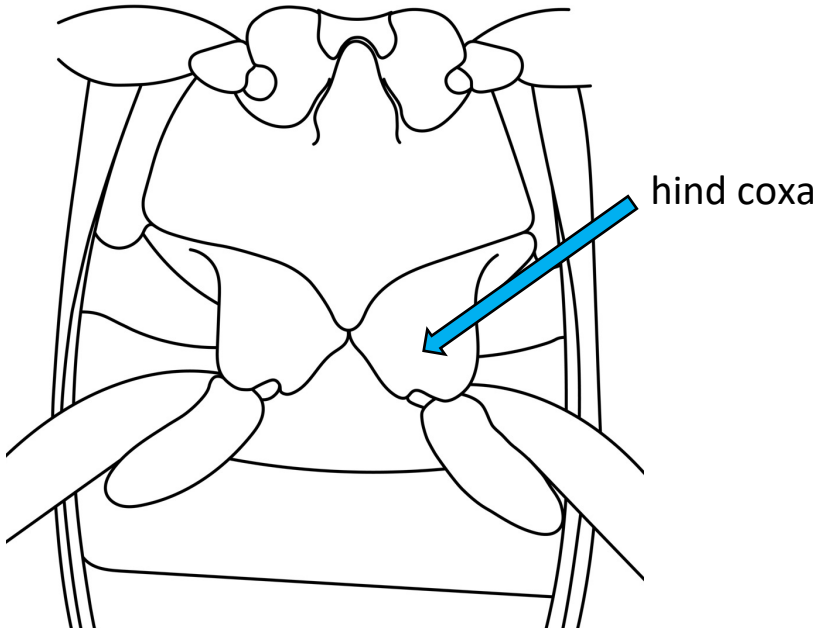

Illustration by Arminty Carson

Polyphaga

- hind coxae are mobile and do not divide the first abdominal ventrite (posterior portion extends across abdomen)
- notopleural sutures absent

proceed to page 8

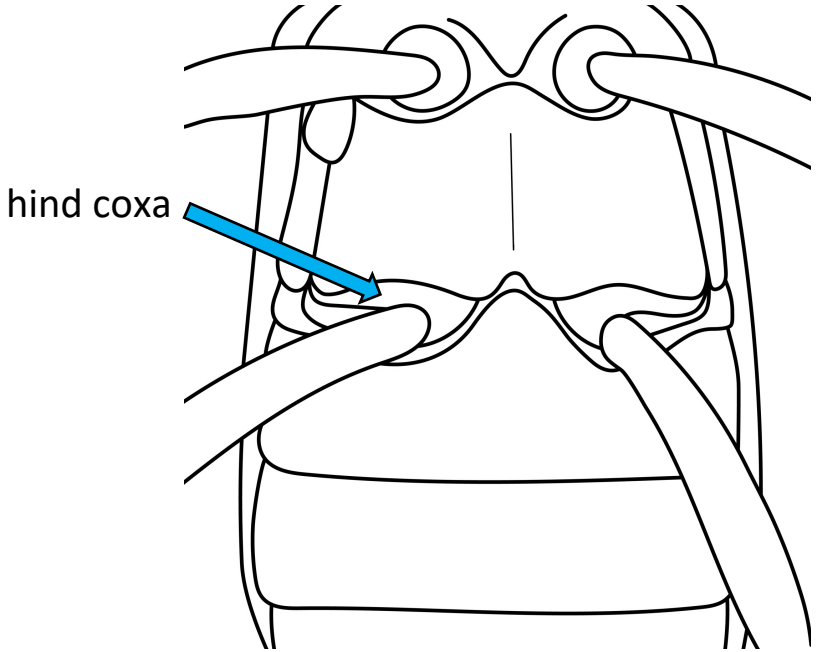

Illustration by Arminty Carson

Adephaga: Carabidae

Carabidae (ground beetles)

- **hind coxae fused to metasternum and divide the first abdominal ventrite**
- **notopleural sutures present**
- **fore tibia with antenna cleaner on inner apical angle**
- **tibial spurs present**
- tarsal formula 5,5,5
- usually black or dark coloured

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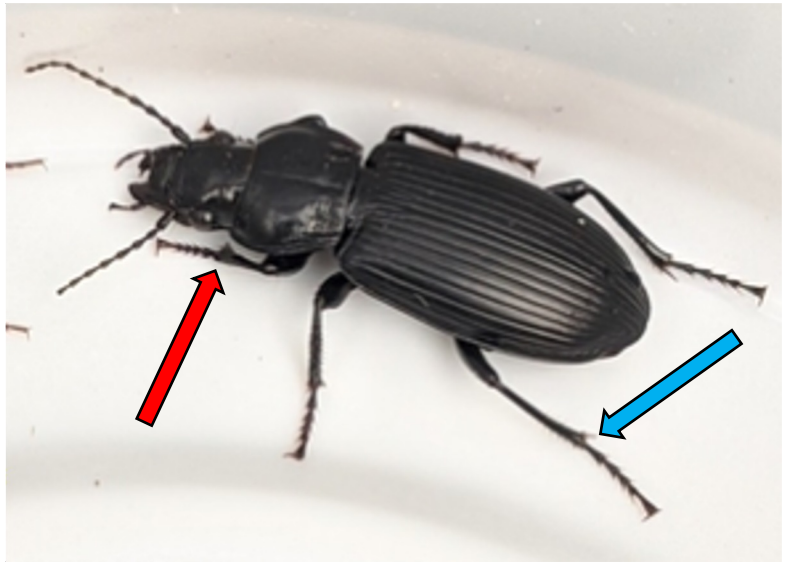
Carabus nemoralis



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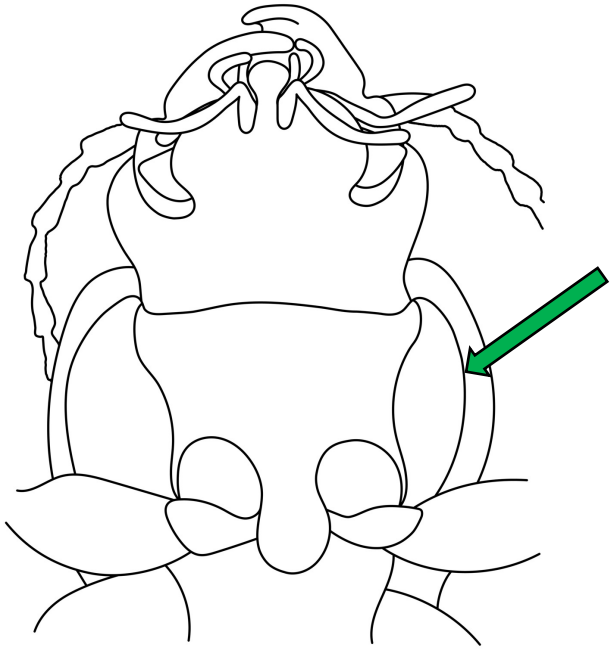
Pterostichus melanarius



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Polyphaga: narrow choices down using visible traits

antennae
fit into grooves below sides of pronotum? Dermestidae
lamellate? Scarabaeidae
partly surrounded by compound eye? Cerambycidae
hidden from above by extension of head? Tenebrionidae

head
elongated with distinct snout? Curculionoidea
mostly or completely concealed from above by pronotum? Coccinellidae, Dermestidae

pronotum
clearly narrower than head and base of elytra? Meloidae
posterior corners prolonged into sharp points? Elateridae
prosternal process extends into groove on mesosternum? Buprestidae, Elateridae

abdomen
4 - 6 complete abdominal segments visible beyond elytra? Staphylinidae

tarsal formula
4,4,4? Coccinellidae*
5,5,4?Meloidae, Tenebrionidae
5,5,5? Cerambycidae^, Chrysomelidae^, Curculionoidea, Scarabaeidae, Silphidae

^pseudotetramerous
*pseudotrimerous

tibial spurs present
Cerambycidae

Polyphaga: Buprestidae

Buprestidae (metallic wood-boring beetles)

- **very metallic, especially on ventral body and dorsal abdomen**
- **prosternal spine extending into groove on mesosternum**
- **abdominal segments 1 and 2 fused on ventral side**
- characteristic shape: rounded anterior, nearly parallel sides, tapered posterior
- antennae short; serrate or filiform

Similar family:
Elateridae, but their abdominal segments are not fused and their prothorax and mesothorax are firmly joined (inflexible); see p. 15

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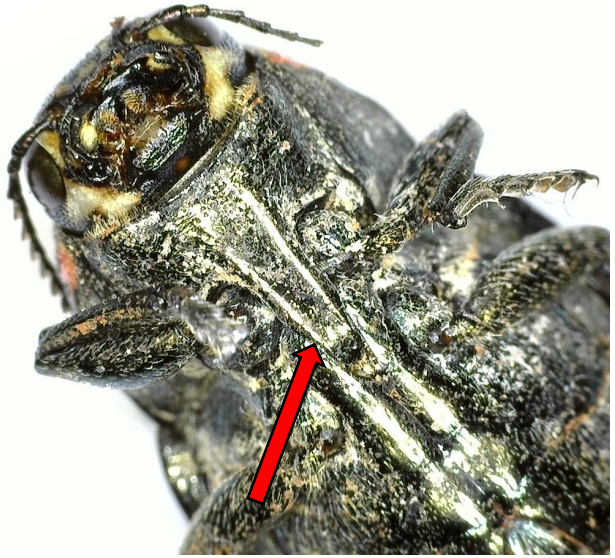
Anthaxia inornata



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Buprestis lyrata

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Buprestis confluenta

Polyphaga: Cerambycidae

Cerambycidae (long-horned beetles)

- **antennae nearly always at least half as long as body, usually longer**
- **compound eyes wrap part way around base of antennae**
- **tarsal formula 5,5,5; pseudotetramerous (4th tarsomere small and hidden)**
  (see photo on next page)
- **tibial spurs well developed**
- antennae filiform or nearly so
- body usually elongate and cylindrical

Similar family:
Chrysomelidae, but lack tibial spurs and antennae are less than half length of body; see p. 11

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Monochamus scutellatus

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Lepturobosca chrysocoma

Polyphaga: Chrysomelidae

Chrysomelidae (leaf beetles)

- **antennae nearly always < half as long as body**
- **tarsal formula 5,5,5; tarsi pseudotetramerous (4th tarsomere hidden in notch in 3rd tarsomere)**
- tibial spurs absent
- antennae filiform or nearly so

Similar family:
Cerambycidae, but they have tibial spurs and their antennae are much longer; see p. 10

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Calligrapha verrucosa

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Chrysochus auratus

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Lilioceris lilii

Polyphaga: Coccinellidae

Coccinellidae (lady beetles)

- **pronotum mostly or completely conceals head from dorsal view**
- **tarsal formula 4-4-4; tarsi pseudotrimerous (3rd tarsomere small and nested in 2nd tarsomere)**
- **tarsal claws are toothed (tooth is not as long as claw)**
- body broadly oval to nearly spherical; strongly convex dorsally
- antennae short; club of 3-6 segments

Note: Many species of Coccinellidae have numerous colour morphs. Refer to John Acorn's "Ladybugs of Alberta"; For *Adalia bipunctata* can also look at https://bugguide.net/node/view/78798#id

Similar family:
Chrysomelidae, but they have pseudotetramerous tarsi; see p. 11

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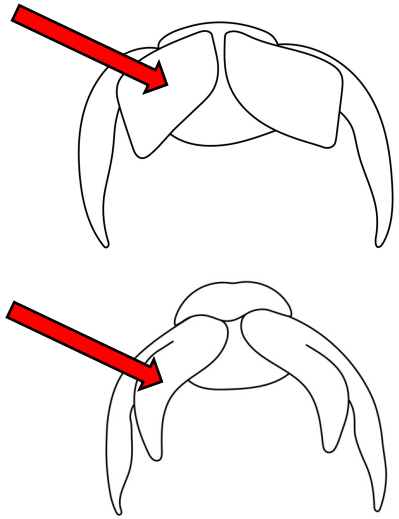
Calvia quatuordecimguttata



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Adalia bipunctata

Polyphaga: Curculionoidea

Curculionoidea (snout and bark beetles, true weevils, leaf-rolling weevils)

- **head prolonged; snout either short and broad, or long and slender; snout usually curves downward**
- **antennae arise from sides of snout**
- **tarsal formula 5,5,5; tarsi pseudotetramerous (4th tarsomere small and nested in 3rd tarsomere)**
- Curculionidae: antennae geniculate, club compact, beak has protective groove for scape, 2nd tarsal segment rounded at apical angles
- Attelabidae: antennae straight, ≥ segments of club articulated loosely, 2nd tarsal segment **projecting at apical angles**
- there are other families found in Alberta; all families can be difficult to distinguish between

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Polydrusus impressifrons

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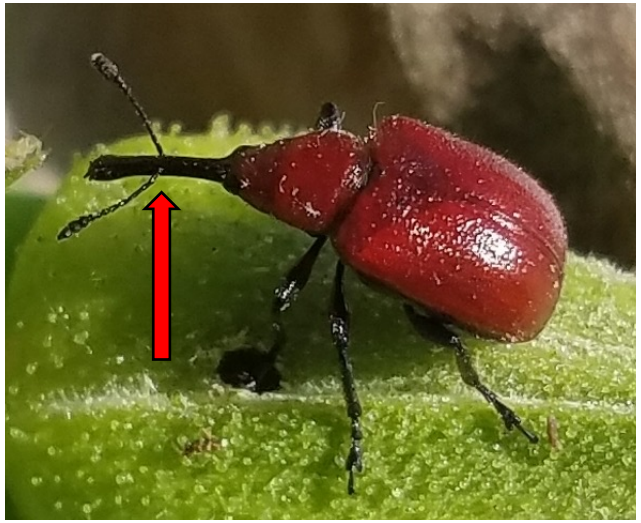

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Merhynchites bicolor

Polyphaga: Dermestidae

Dermestidae (skin beetles)

- **head mostly to completely concealed from above by pronotum**
- **antennae fit into grooves/concave spaces below the pronotum, so may not be visible from above**
- **usually covered with scales or hairs**
- body elongate to broadly oval
- brown or black, sometimes patterned
- antennae short; last 3 segments clubbed

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Dermestes lardarius

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Dermestes lardarius

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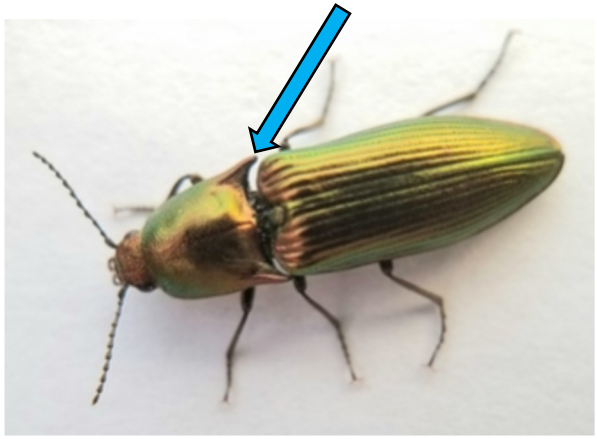
Anthrenus verbasci

Polyphaga: Elateridae

Elateridae (click beetles)

- **prosternal spine extending into groove on mesosternum**
- **prothorax firmly joined to mesothorax, which, when combined with prosternal spine, makes a "click mechanism"** (helps beetle right itself from its back)
- **posterior corners of pronotum are prolonged backward into sharp points or spines**
- antennae serrate
- body elongate, slender, parallel-sided, and rounded at each end

Similar family:
Buprestidae, but their prothorax and mesothorax are independently mobile, and abdominal segments 1 and 2 are fused on ventral side; see p. 9



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Nitidolimonius resplendens

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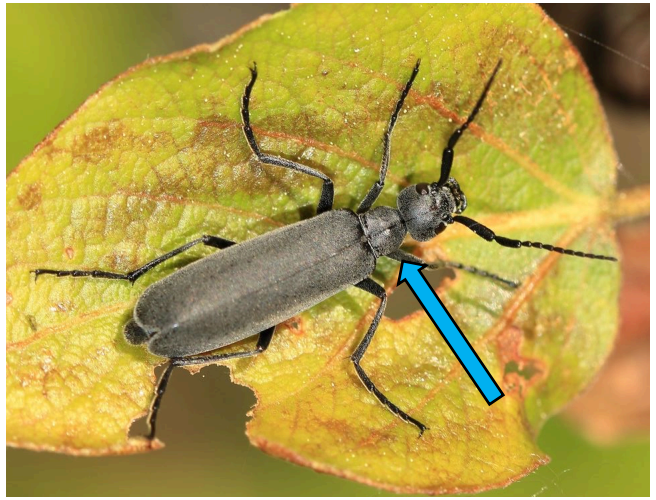
Ampedus apicatus

Polyphaga: Meloidae

Meloidae (blister beetles, oil beetles)

- **pronotum narrower than both head and base of elytra**
- **tarsal claws are bifid (looks like there are 4 claws)**
- head broad; strongly constricted at base
- antennae filiform or moniliform
- body elongate, parallel-sided
- tarsal formula 5,5,4

Similar family:
Tenebrionidae have same tarsal formula, but tarsal claws are not split; see p. 20



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Epicauta pennsylvanica

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Lytta nuttalli

Polyphaga: Scarabaeidae

Scarabaeidae (scarab beetles)

- **antennae lamellate; lamellae may be spread or held together**
- **front tibiae outer edge scalloped or spiny**
- heavy-bodied, oval or elongate, convex dorsal profile
- tarsal formula 5,5,5

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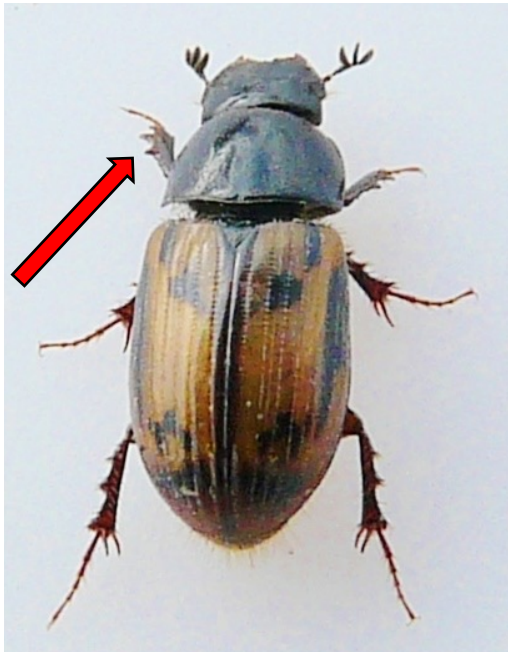
Triciotinus assimilis



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Aphodius distinctus

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Polyphylla decemlineata

Polyphaga: Silphidae

Silphidae (carrion beetles)

- **four apical antennomeres expanded into asymmetrical club (clavate or capitate)**
- **first antennomere of club is shiny, last 3 antennomeres tomentose and not shiny**
- **elytra usually black with yellow, orange, or red markings; occasionally all black**
- body is dorsoventrally flattened
- tarsal formula 5,5,5

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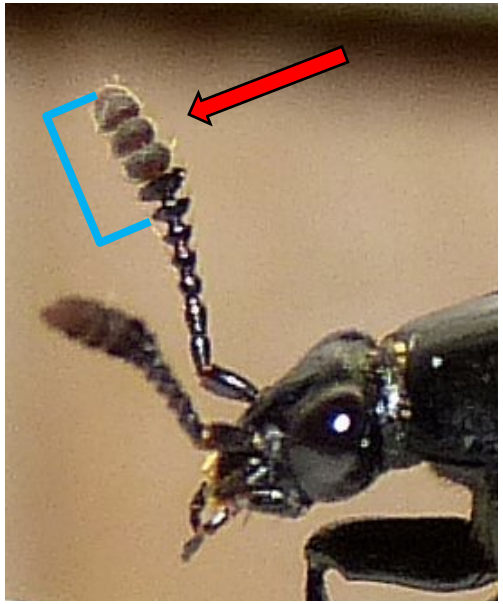
Necrodes pustulatus



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Necrodes surinamensis

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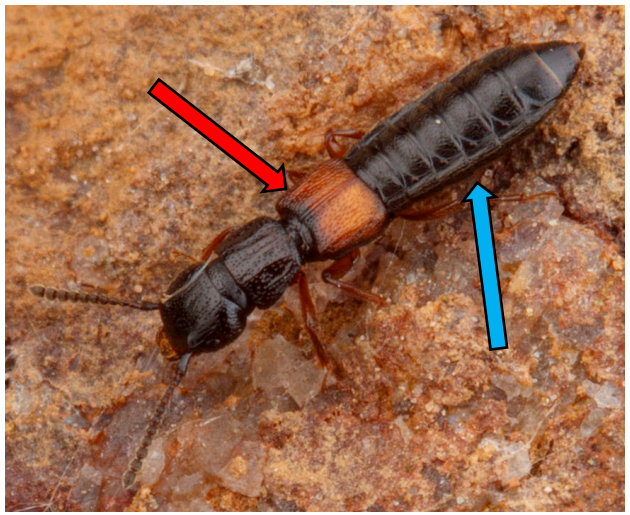
Necrodes surinamensis

Polyphaga: Staphylinidae

Staphylinidae (rove beetles)

- **very short elytra, usually not much longer than their combined width**
- **4-6 complete abdominal segments exposed dorsally posterior to elytra**
- body elongate and very slender (usually parallel-sided)
- abdomen flexible and often bent upward
- antennae filiform or weakly clubbed
- usually black or brown



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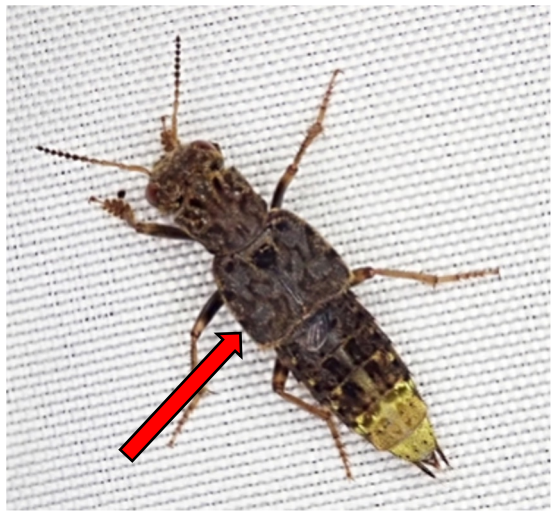
Anotylus insecatus



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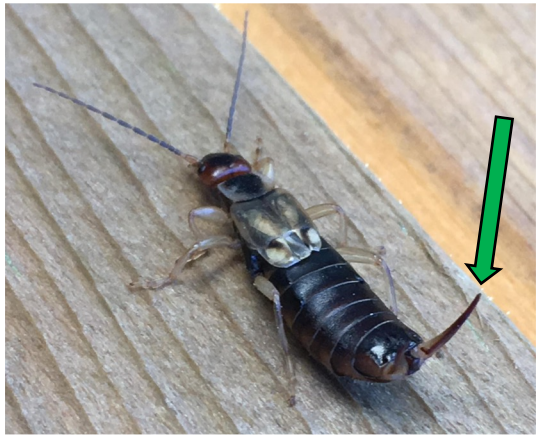
Ontholestes cingulatus

Similar to Dermaptera, but without **cerci** at tip of abdomen.

Dermaptera



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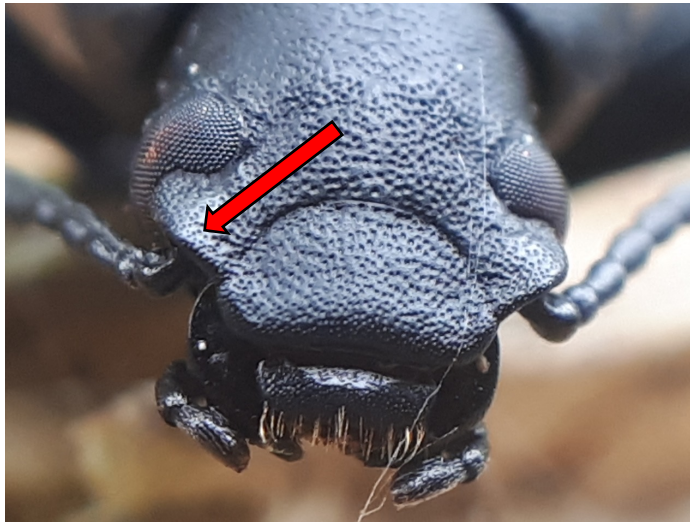
Polyphaga: Tenebrionidae

Tenebrionidae (darkling beetles)

- **antennal insertions hidden from above by extension of front of head that continues between eyes**
- antennae usually 11-segmented; filiform, moniliform, or slightly clubbed
- **pronotum keeled laterally**
- **tarsal formula 5,5,4**; tarsal claws simple
- dull black or brown

Similar family:
Meloidae have same tarsal formula, but their tarsal claws are split; see p. 16

Some appear similar to Carabidae, but Carabidae are in Adephaga; see p. 7



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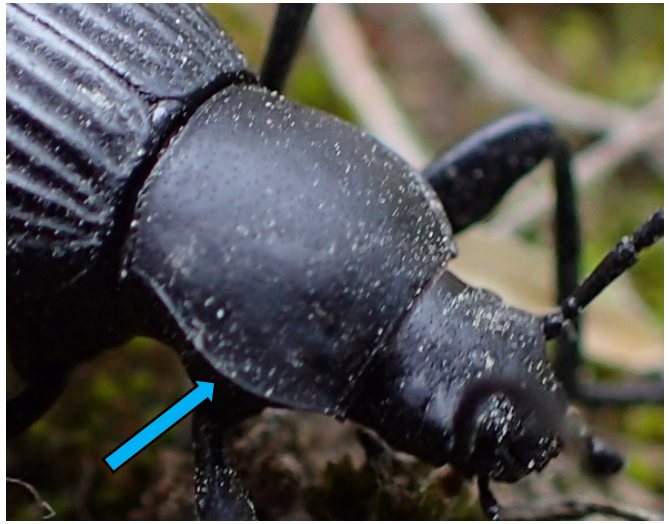
Upis ceramboides



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Upis ceramboides

Glossary

antennomere: antennal segment; antennomere 1 is the scape; antennomere 2 is the pedicel; antennomeres 3 and above are part of the flagellum (and more accurately called flagellomeres)

notopleural suture: suture between the sclerites of the notum and pleuron

notum: dorsal sclerite of a thoracic segment

pleuron: lateral sclerite of a thoracic segment

pseudotetramerous / pseudotrimerous: tarsi appear to have one segment fewer than actually have because one segment is very small and hidden, usually in a notch of another segment; pseudotetramerous appear to have four segments but actually have five; pseudotrimerous appear to have three segments but actually have four

Good photos of these can be found in the family Spot IDs at:
https://genent.cals.ncsu.edu/insect-identification/order-coleoptera/

sclerite: hardened body-wall plate surrounded by sutures or membranous areas

tarsal formula: indicates number of tarsal segments on fore, mid, and hind tibia respectively; e.g. 5,5,4

tomentose: covered with dense, short, matted hairs

ventrite: visible sternite (ventral abdominal segment); ventrite number may not equal sternite number

References

Borror, D.J. & White, R.E. (1983). *A field guide to beetles of North America*. Houghton Mifflin.

Borror, D.J., & White, R.E. (1998). *A field guide to insects: America north of Mexico.* Houghton Mifflin.

Bousquet, Y. (1990). *Beetles associated with stored products in Canada: An identification guide.* Canadian Government Publishing Centre. Retrieved September, 2020, from https://esc-sec.ca/wp/wp-content/uploads/2017/03/AAFC_bousquet1990.pdf

Choate, P.M. (2003). Dichotomous keys to some families of Florida Coleoptera. In *Identification of beetles (Coleoptera)*. University of Florida. Retrieved September, 2020, from http://entnemdept.ufl.edu/choate/beetles1a.pdf

Choate P.M. (2008). Ground Beetle (Coleoptera: Carabidae) Taxonomy. In J.L. Capinera (Ed.) *Encyclopedia of Entomology*. Springer, Dordrecht. Retrieved September, 2020, from https://doi.org/10.1007/978-1-4020-6359-6_1202

Ivie, M.A. (2002). Key to families of beetles in America north of Mexico. In R.H. Arnett, M.C. Thomas, P.E. Skelley, & J.H. Frank (Eds.), *American Beetles, Polyphaga: Scarabaeoidea through Curculionoidea* (pp. 816-835). Retrieved September, 2020, from http://academic.uprm.edu/~franz/WeevilCourseResources/Ivie2002-KeyToFamilies.pdf

NC State Agriculture and Life Sciences. (2015). *ENT 425 – General Entomology. Coleoptera*. Retrieved September, 2020, from https://genent.cals.ncsu.edu/insect-identification/order-coleoptera/

References

Scudder, G.G.E., & Cannings, R.A. (2005). *Key to Families of Coleoptera in British Columbia*. Beetle Families of British Columbia. Retrieved September, 2020, from https://www.zoology.ubc.ca/bcbeetles/Text%20files/coleoptera%20keys.htm

Triplehorn, C., & Johnson, N. (2005). Borror and DeLong's Introduction to the study of insects (7th Edition). Brooks/Cole.